GLOBALIZATION, DEMOCRATIZATION AND GOVERNMENT EDUCATION PROVISION IN EAST ASIA

by

JING CHEN

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ABSTRACT OF THE DISSERTATION

GLOBALIZATION, DEMOCRATIZATION AND GOVERNMENT EDUCATION PROVISION IN EAST ASIA

By JING CHEN

Dissertation Director:

Robert R. Kaufman

How would globalization and democratization affect government education provision in East Asia? My dissertation conducts the first systematic statistical and comparative case study in South Korea, Taiwan, Singapore, Hong Kong (before 1997), Malaysia, Indonesia, Philippines and Thailand.

The statistical study covers all eight cases for the time period 1971 to 2003. It finds no robust effects of trade and capital account openness on government education provision, evaluated from resources, participation, attainment, and gender equity. However, comparative case studies of Taiwan, Singapore, Malaysia and Thailand show significant effects of globalization. As governments in these cases adopted an outward-oriented economic strategy, increasing competition from the global market eventually pressured them to adapt their education systems to the needs of the economy and the global market. Common reform measures include expanding education access, updating vocational,

science and technology education, administrative reforms and learning reforms. The role of the state is critical in this process of education upgrading. The states that prioritize the importance of human capital in their development model early and have efficient policy linkages matching economic demand and education supply did better. The case studies also show that the globalization indicators used in the statistical study cannot capture its impacts well.

Democratization has been found to have positive effects on government education provision in both the statistical and the case studies. The statistical study finds that comparing with their authoritarian counterparts, democracies in East Asia have a higher per capita education spending, a higher per student spending as percent of GDP per capita at the primary and the secondary levels and a higher gross secondary school enrollment. Consistently, the case studies show that democratization is associated with expanding education access, redistributing education resources from the elites to the masses and fundamental education reforms. However, the mechanisms producing these changes vary by case. The civil society played a major role in initiating changes in Taiwan whereas electoral competition had limited effects. In Thailand, the main architects of reform were educational and bureaucratic elites in the 1970s and might be the civil society and democratic elites in the recent democratic period.

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Chapter 1 Globalization, Democratization and Government Education Provision: An Overview and My Study in East Asia

Introduction

The development of mass education, globalization[1] and democratization can be said to be three great phenomenon of the twentieth century. Mass education was made compulsory in 80 percent of the countries of the world by 1985 (Ramirez, 1989). By 2000, around 83 percent of the world's children are enrolled in school; the overall global adult literacy rate now stands at 84 percent for men and 75 percent for women (UNESCO, 2006)[2]. The integration of the global market has also progressed at an unprecedented speed. The new information technology has made production, consumption and investment truly possible on a global scale.[3] Accompanying the expansion of mass education and globalization are waves of democratization that swept countries across the globe. Though the transition to and consolidation of democracy is never an easy story, democratic regimes, in which the voice of ordinary citizens is valued and absolute power is contested, seem to have become the choice of the century (Lipset and Lakin, 2004).

The important role of education in individual welfare and national development has been well-documented in the literature. Education is enshrined as a fundamental human right in the 1948 United Nations *Universal Declaration of Human Rights*. It affects individual

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[1] Globalization is a term that has various meanings. This study looks at the economic dimension of globalization. Following conventions in the literature, two dimensions of economic globalization are studied: trade openness, the integration of countries into global trade and capital account openness, the integration of countries into global capital markets.

[2] Data accessed from UNESCO statistics online on July 13th, 2006. (http://www.uis.unesco.org/ev.php?URL_ID=5204&URL_DO=DO_TOPIC&URL_SECTION=201)

[3] The global export as % of GDP was 9% in 1929, about 5.5% by 1950s; by 2003, however, the global trade peaked about 20% of world GDP. Foreign liabilities as % of global GDP also rose from around 25% in 1980s to nearly 140% today. Data source: Waynne, Mark A., "Globalization and Monetary Policy", *Southwest Economy*, Federal Reserve Bank of Dallas, Issue 4, July/August 2005.

welfare such as income, health and social mobility (Asian Development Bank Key Indicator Series, 2003; Carnoy, 1993; Inkeles and Smith, 1974; Hannum and Buchmann, 2003). Women's education has received increasing attention for its impact on family health, fertility and infant mortality (Ainsworth, Beegle and Nyamete, 1995; Benefo and Schultz, 1994). On a national scale, education is regarded as a catalyst for national development. Even though the empirical evidence is inconclusive whether and how education contributes directly to economic growth (Pritchett, 1999; Temple, 2001; Hannum and Buchmann, 2003; Lopez, Thomas and Wang, 1998)[4], there is more consensus that education lowers fertility rate and improves public health, and thus contributes indirectly to national development (Baum, 2003; Hannum and Buchmann, 2003).

Table 1.1 shows the successful economic growth of East Asian countries with relative equity. While this success has often been attributed to the importance they attach to the basic education of their citizens, as shown in Table 1.2 (White and Goodman, 1998; Morris, 1996; Tilak, 1994; World Bank, 1993), little is known how recent global trends of economic openness and democratization would affect governments' provision of education in this region. Would East Asian governments cut education spending as part of the efforts to be more efficient and attractive in the global market? Or would states

[4] The review of the literature suggests an inconclusive relationship between education growth and economic growth (Pritchett, 1999; Temple, 2001; Hannum and Buchmann, 2003). Pritchett (1999) presents three reasons why the effects of education might get lost at the national level: 1) schooling quality may have been so low that it does not raise cognitive skills or productivity; 2) the stagnation of demand for education with the expansion of the supply of education may cause a decline in the return to education; 3) the educated labor force are directed to socially wasteful and counter-productive activities. Lopez, Thomas and Wang (1998) suggest two conditions that education will bring a country high payoffs: first, the distribution of education matters. In most countries, an unequal distribution of education has a negative impact on per capita income; second, the policy environment matters. Economic policies that suppress market forces tend to dramatically reduce the impact of education on development.

compensate the victims of the open economy and improve their “human capital” by investing more in education? What other effects might globalization have on East Asian governments’ education provision in East Asia? In addition, given that the authoritarian governments in this region have been quite successful in promoting education and development, what are the effects of recent democratization on governments’ education provision? Do East Asian democracies also provide better education prospects to their citizens than non-democracies as proved in studies of Latin America and Africa?

My dissertation conducts the first systematic empirical study of these questions in East Asia. The impacts of globalization and democratization on governments’ provision of education are studied in South Korea, Taiwan, Singapore, Hong Kong, Malaysia, Indonesia, Philippines and Thailand. The study period covers from 1950s to present. A Time-Series Cross-Sectional statistical analysis is first conducted to explore regional patterns; comparative case studies are then used to investigate the research questions in specific historical and national contexts.

Chapter 1 proceeds as follows: section 1.1 reviews the literature; section 1.2 addresses the limitations of current literature and introduces my study; my research questions and hypotheses are presented in section 1.3; section 1.4 elaborates my research design. The rest of the chapters are outlined in section 1.5.

Table 1.1 Growth and Equality: East Asia in Comparative Perspective (1970-2004)

	1970s	1980s	1990s	2000-04
GDP Growth				
East Asia & Pacific	**7.21**	**7.72**	**8.22**	**7.98**
Latin America & Caribbean	5.64	1.74	3.01	2.26
Middle East & North Africa	5.27	2.49	4.32	3.76
Sub-Saharan Africa	4.02	2.19	2.05	3.80
South Asia	2.99	5.71	5.38	5.46
Europe & Central Asia	NA	NA	-1.67	5.26
GDP per capita Growth				
East Asia & Pacific	**5.02**	**6.01**	**6.82**	**7.03**
Latin America & Caribbean	3.12	-0.35	1.32	0.78
Middle East & North Africa	2.33	-0.44	2.00	1.81
Sub-Saharan Africa	1.15	-0.75	-0.55	1.44
South Asia	0.61	3.43	3.32	3.65
Europe & Central Asia	NA	NA	-1.89	5.30
Inequality, Gini Index Multiplied by 100				
Latin America & Caribbean	49.06	49.75	49.31	NA
Sub-Sahran Africa	48.19	43.46	46.95	NA
Middle East & North Africa	41.93	40.45	38.03	NA
East Asia & Pacific	**39.88**	**38.70**	**38.09**	**NA**
South Asia	39.95	35.01	31.88	NA
Industrial and high income developing countries	34.76	33.23	33.75	NA
Eastern Europe	24.63	25.01	28.94	NA

*Entry refers to the average for the time period specified. NA indicates the data is not available.

Sources: World Development Indicators (2005 online). Data for Inequality is from Deininger and Squire, 1997.

Table 1.2 Education Attainment: East Asia in Comparative Perspective (1970-2000)

	1970s	1980s	1990s	2000
Average Years of School				
Developed Countries	7.3	8.2	8.9	9.4
Transitional Economies	7.3	8.0	8.7	8.9
East Asia	**5.0**	**6.3**	**7.2**	**7.8**
Latin America & Caribbean	4.2	5.0	5.7	6.2
Middle East & North Africa	3.1	4.1	5.5	6.3
Sub-Saharan Africa	1.9	2.4	3.1	3.6
South Asia	1.8	2.5	3.2	3.4
% of Population with No Schooling				
Developed Countries	6.8	5.6	4.3	4.0
Transitional Economies	9.2	8.5	5.9	5.6
East Asia	**27.2**	**18.7**	**16.3**	**13.5**
Latin America & Caribbean	27.6	20.6	17.6	16.1
Middle East & North Africa	57.0	49.1	34.7	27.2
Sub-Saharan Africa	65.4	57.9	49.2	45.4
South Asia	70.9	62.1	53.2	47.0
% of Population with Primary School Attained				
Transitional Economies	56.0	44.0	36.4	34.4
Latin America & Caribbean	51.3	51.5	48.0	45.4
Developed Countries	47.4	38.3	33.2	30.1
East Asia	**45.6**	**42.3**	**36.1**	**34.1**
Sub-Saharan Africa	27.3	30.9	34.5	36.4
Middle East & North Africa	23.4	22.2	26.6	27.4
South Asia	17.8	19.7	23.0	27.4
% of Population with Secondary School Attained				
Developed Countries	37.1	43.1	44.6	43.3
Transitional Economies	29.4	40.5	48.5	49.0
East Asia	**23.3**	**31.8**	**36.9**	**38.2**
Latin America & Caribbean	18.0	22.3	25.7	27.4
Middle East & North Africa	15.7	22.7	29.0	33.1
South Asia	9.7	16.4	21.4	22.7
Sub-Saharan Africa	6.5	10.4	14.8	16.4
% of Population with Post-Secondary School Attained				
Developed Countries	8.6	13.0	17.9	27.7
Transitional Economies	5.2	7.1	9.1	11.0
East Asia	**3.9**	**7.2**	**10.7**	**14.1**
Latin America & Caribbean	3.1	5.6	8.7	11.1
Middle East & North Africa	3.0	6.0	9.6	12.2
South Asia	1.5	1.8	2.3	2.8
Sub-Saharan Africa	0.5	0.8	1.4	1.8

[1.] Entries represent average values for all the countries in that region and time period. Only countries with complete data are included. Source: Barro and Lee (2000)

1.1 Literature Review

How would governments' provision of education be affected by various economic, political and social factors at both the domestic and the international level? The review below highlights the role of globalization and democratization; other theories such as the logic of industrialization, ethnic fraction, diffusion and inequality are also briefly summarized.

1.1.1 Globalization and Government Education Provision

Theories

Negative Relation: Efficiency Takes Priority

One theoretical perspective emphasizes the economic incentives for governments to cut education spending and social spending in general in order to be competitive in the global market. It is known in the literature as the "efficiency hypothesis" (Garret, 1998).

On one hand, higher social spending usually involves higher payroll taxes that increase the cost of labor and reduce the competitiveness of both exports and domestic products subject to import competition. Even though education spending is not typically financed by payroll taxes and thus does not increase labor costs in the same way as social security spending, it can be costly for the government. Increases in government spending in turn can drive up interest rates, crowding out private investment, driving up real exchange rates and inflation, creating a macro-economic environment unattractive to global investors. Thus business groups are expected to pressure governments to cut taxes as

well as social spending as they become increasingly exposed to international competition. Integration into the global capital markets would compound this pressure, since it increases the exit opportunities available to asset holders who respond negatively to macro-economic indicators such as high inflation and debt-service ratio (Garret, 1998; Kaufman and Segura-Ubiergo, 2001: 556; Mosley, 2000). This pressure should be more severe in developing countries where trade is more volatile and capital is lacking (Wibbels, 2003).

On the other hand, facing global integration of trade and capital, the labor's capacity to resist reductions in social spending can be expected to decline. Especially in developing countries, capitalists have more exits than labor in this age of capital mobility: they could close or relocate their factories as labor costs increase. Moreover, the large population of unskilled and surplus workers in these countries causes collective action problems which offset their potential political gains from globalization (Kaufman and Segura-Ubiergo, 2001; Rudra, 2002). Regarding governments' education provision, the usual beneficiaries – students and parents at primary and secondary schools, face the same collective action problem to organize themselves effectively.

Positive Relation: Political Compensation and Human Capital Investment

Another theoretical perspective posits a completely different relationship between globalization and social spending in general. Ever known as the "compensation hypothesis", this perspective highlights the political incentives for governments to increase social spending in response to globalization. As summarized by Garret (Garret,

2001), increasing economic openness is likely to be associated with two results that would increase citizens' demand for more government spending: more social inequality and more economic insecurity. According to Heckscher-Ohlin models, trade would benefit the abundant factors in a country (labor in the "south" and capital in the "north"). This would result in increasing inequality in the OECD countries but more equality in the developing countries. In contrast, developing countries would suffer from more volatile trade patterns than OECD countries since the latter mostly engage in intra-industry and intra-firm trade.

The effect of capital mobility is likely to increase inequality in both developed and developing countries since it mainly benefits the liquid asset holders and those in the financial sector; there is no evidence their income would trickle down to other segments of society, or across national borders. More financial integration also comes hand in hand with more massive volatility in the international economy, as witnessed by headlines of financial crises in the 1990s.

So, as countries increase their exposure to international markets, citizens, suffering from increasing economic inequality and/or insecurity, would demand more government spending to compensate them from risk (Rodrik, 1997). This is likely to involve measures such as unemployment protection and job training. On the other hand, it is also in the interests of governments and businesses to ensure social stability by providing welfare transfers to social sectors or regions that had fallen behind the process of change (Kaufman and Segura-Ubiergo, 2001).

Besides the political incentive of compensating disadvantaged groups, social spending could also be used to enhance the skill level and productivity of the labor force, a long-term economic incentive for the government to increase social welfare of their citizens; businesses should also welcome these measures by the government that would improve the competitiveness of an economy as a whole (Kaufman and Segura-Ubiergo, 2001). This is especially expected to be true in the realm of education. Primary and secondary education, and increasingly tertiary education, have proved to be important in improving the "human capital" of a nation, long argued in the economics literature to be important for its economic growth (Psacharopoulos and Patrinos, 2002; Psacharopoulous, 1994; Tilak, 1994; Barro, 1991; Schultz, 1961). Knowledge is also the generator of growth in the endogenous growth literature (Becker, 1990; Romer, 1986).[5] The high educational outcomes in East Asian countries have been regarded as the main contributor to their high economic growth; upgrading the skill level of their labor force through education has also been accepted as a successful strategy of industrialization in the region (Adams, 2002; Mingat, 1998; Tilak, 1997; Stiglitz, 1996). On a micro level, individuals and families also have incentives to demand better education services in order to be competitive in the labor market.

Moreover, cultivating "human capital" is also in the interests of foreign investors who could expect higher returns from workers with better education and skills. Higher skilled

[5] However, as mentioned in the introduction, the empirical evidence is inconclusive whether education contributes directly to economic growth (see footnote 4 of this chapter).

workers are also in need for the proper functioning of the financial market, which is growing increasingly complex nowadays.

Empirical Literature

There are a number of studies that investigate the effects of globalization on education provision; however, neither the "efficiency" nor "political compensation + human capital" perspective gains overwhelming support. The pioneering effort was made by Kaufman and Segura-Ubiergo in their study of social spending in Latin America. They have found that trade integration doesn't have a significant impact on health and education spending; however, capital account openness, which measures a country's integration into the global capital market, appears to encourage government to spend more on health and education though the result is not very stable in alternative specifications of their model (Kaufman and Segura-Ubiergo, 2001).

Kaufman and Segura-Ubiergo's null-effect finding of trade integration on education spending has been corroborated by Brown's similar study in Latin America (Brown, 2004). However, two other studies of Latin America have found that trade increases education spending (Huber, Mustillo and Stephens, 2004; Avelino, Brown and Hunter, 2005). Another two studies of more general sample produced mixed results: in Dion's study of the middle income countries, he finds a significant positive impact of the level of trade on the level of education spending while changes in trade have no significant effect on changes in education spending (Dion, 2005). Rudra and Haggard show in a sample of developing countries that trade decreases education spending, but it has no significant

impact on either primary and secondary or tertiary gross school enrollment (Rudra and Haggard, 2005).

Regarding the effects of capital account openness, two studies in Latin America after Kaufman and Segura-Ubiergo have shown that it has no impact on education spending (Huber, Mustillo and Stephens, 2004; Avelino, Brown and Hunter, 2005). Rudra and Haggard also found no effects of capital account openness on either education spending or gross school enrollment in their sample of developing countries (Rudra and Haggard, 2005). The effects of capital account openness are mixed in Dion's study of middle income countries: while foreign direct investment has no impact on education spending and capital flows has a positive impact in his level models, the effect of capital flow is negative in his difference model[6]. The same mixed results are reported by Hecock's study of subnational units in Brazil: maquila export activity has a positive effect on primary spending per student whereas foreign direct investment has a negative effect (Hecock, 2006). [7]

Qualitative studies in South Korea and Taiwan have identified how economic globalization profoundly changed the role of states in higher education in terms of education provision, financing, and regulation (Mok, 2000, 2001, 2002 and2003).

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[6] The level model measures the long-term relation between capital flows and education spending whereas the difference model measures the relationship between changes in capital flows and changes in education spending.

[7] The results of empirical tests are also mixed in a broader literature studying the effects of globalization on total government spending or social spending. Among them the compensation hypothesis has received a lot of initial support (Cameron, 1978; Katzenstein 1985, Ruggie 1982; Rodrik, 1998; Quinn, 1997) but some recent studies support the efficiency hypothesis (Garret and Mitchell, 2001; Kaufman and Segura-Ubiergo, 2001, Wibbels, 2003; Avelino, Brown and Hunter, 2005). Caution has been cast on how different way of modeling could influence the results (Garrett, 2001; Plumper, Troeger and Philip, 2005)

Significant changes also can be seen in the emphasis of school curriculum (Law, 2004). However, Akoojee and McGrath (2004) show that the fiscal constraint policy adopted by the government in response to globalization had a disastrous effect on both school quantity and quality in South Africa.

1.1.2 Democratization and Government Education Provision

Theories

Democracy Provides Better Education

One commonly held view is that since politicians in democracies are constrained by electoral competition, they would allocate more resources to social welfare to attract the support of the "median voter" who would vote for more redistribution if their income is below the mean (Meltzer and Scott, 1981). Expanding education, especially that of basic level, is one of the few effective channels to transfer resources from the rich to the poor, which composes the majority of voters (Brown, 2002). On the other hand, in authoritarian regimes which effectively limit the franchise to some subgroup of the population, the median voter is no longer a poor citizen favoring progressive redistribution and social insurance; rather, she is a richer, low-risk type who sees no gains from transferring income or from compulsory risk pooling (Boix, 1998; Rudra and Haggard, 2005). An economic theory of state would also imply more public services would be provided in a democracy since the political market is more contestable which constrains the politicians to exercise their monopoly power (Lake and Baum, 2001).

Another theoretical perspective highlights the rationality of politicians. Bueno de Mesquito, Morrow, Siversen and Smith (2002) argue that it is in the interests of politicians to provide more public goods under democracy. They assume that politicians provide a mixture of public and private goods to secure support from their core constituencies. When the franchise is small, political leaders could maintain the support of their small number of core constituencies through providing predominantly private goods. However, when the franchise becomes large, it is more economical for them to secure the support of a larger number of core constituencies by providing public goods.

Theories focusing on the influences of interest groups on policy making arrive at similar conclusions. Interest groups form with the fundamental aim to redistribute resources toward themselves (Olson, 1982). Networks of NGOs, for example, have been proved to be an important force initiating education reforms and improving education qualities worldwide (UNESCO World Education Forum, 2000). Democracy does not guarantee that the interest groups would overcome their collective action problems but it provides more freedom and channels for interest groups to mobilize and participate in the policy making process. Obtaining and disseminating information, organizing, assembling and lobbying the government, is not just easier, but the rights for doing so are protected by law in a democracy. All these increase the probability of generating more social redistribution. In contrast, authoritarian regimes censor the distribution of interest groups from the outset, limiting opportunities for groups which could benefit from progressive social policies (Brown and Hunter, 1999; Grossman and Helpman, 2002; Rudra and Haggard, 2005).

No Systematic Relation Between Democratic Regime and Education Provision

Yet, other scholars contend that there is no clear relationship between democratic regime and education provision. Monene and Wallerstein argue that it is simplistic for the politicians to assume that median voters necessarily prefer more social welfare, regardless of how the policy is designed. In policy areas such as basic education where the benefits are received by all regardless of their employment status, the redistribution and insurance motives of the median voter may balance out; in other words, since the median voters have to pay for those without jobs, they may not prefer more spending (Wallerstein and Monene, 2003). On the other hand, there might be an underinvestment in public education in a majority democracy if the poor majority thinks they benefit less from public education than the richer, as demonstrated by Turrini's formal two-sector, two-generation model (Turrini, 1998). Last but least, the median voter paradigm is only useful when the polarization between the parties are not too large and when the political leaders are sufficiently office-motivated (Cukierman and Spiegel, 2003).

In response to the theories highlighting the rationality of politicians to provide more public goods under democracy, scholars argue various other factors affect politicians' motives to build broad-based support. Institutional factors, such as the features of constitutional design, party systems, partisan politics, explain politicians' motives better than the simple dichotomy between democracy and non-democracy (Geddes, 1995; Haggard and Kaufman, 1995; Przewoski and Limongi 1993; Nelson, 1990). These factors shape the scope and character of benefits a politician must distribute to build and maintain his support base (Persson and Tabellini, 2002). In addition, various kinds of

political market imperfections also distort politicians' motives to provide high quality public services. Examples include lacking of information among voters about politicians' performance, social fragmentation among voters manifested as identity-based voting and lack of credibility of political promises to citizens, especially in new democracies (Keefer and Khemani, 2003). Studies have shown that in new democracies where democratic institutions are still weak, they may suffer from "kleptocracies" which implement highly inefficient economic policies, expropriate the wealth of their citizens and use the proceeds for their own glorification or consumption. Examples are the Philippines under Ferdinand Marcos, Democratic Republic of Congo under Mobutu, Nicaragua under the Somozas, Uganda under Idi Amiin, Liberia under Charles Tayler (Acemoglu, Robinson and Verdier, 2003). It is hard to expect these kleptocracies would be interested in providing their citizens with better education.

Counterarguments have also been made to the theories focusing on the influences of interest groups. The optimistic view on democracy assumes the same organizational capabilities of different groups and ignores collective action problem and distributional conflicts among them. Experience in Latin America has shown that money has been often drawn toward higher education since its lobby group, mainly composed of middle- and upper- class students and faculty members, is the most powerful; on the other hand, the constituencies for primary education, the parents of public grade school children and their teachers, are politically less organized (Brown and Hunter, 2004).

On the other side of the coin, authoritarian regimes may also have incentives to invest in education such as boosting legitimacy and facilitating economic growth. Educational expansion in Bismarck's Prussia, Soviet Russia, and Communist China all testify to the effectiveness authoritarian regimes possess in expanding school enrollment. Education expansion in East Asian region under authoritarian rule (South Korea, Singapore, Malaysia, Thailand and Indonesia) provides further evidence that democracies are not the only guarantors of high enrollment rates (Brown, 1999; Wintrobe, 1998). Authoritarian regimes may even have stronger incentives to spend more on education for the purposes of social indoctrination (Lott, 1999).

Empirical Literature

The empirical literature on the relationship between democratization and government education provision provides no conclusive evidence either; however, the evidence for positive effects of democracy on education provision is stronger.

The evidence democracies spend more on education is bountiful. Democracy has found to be positively associated with education spending in developing countries and middle income countries respectively but the effects are not very significant (Rudra and Haggard, 2005; Dion, 2005). Democracy's positive role in education financing is more significant in regional literatures. Latin America is the region where this topic is most studied. Ames concludes that heightened electoral competition (not necessarily democracy per se) generated real increases in social expenditures, including education, in 17 Latin American countries between 1947 and 1982 (Ames, 1987). Democracy is

associated with more health and education spending in three other Latin America studies (Kaufman and Segura-Ubiergo, 2001; Brown, 2004; Aveline, Brown and Hunter, 2005). In other regions, Chan finds democracy has a higher per capita education spending after analyzing cases of South Korea, Taiwan and Singapore (Chan, 1997). The recent study done by Stasavage also identifies a positive relationship between multiparty competition and overall education spending in Africa (Stasavage, 2005a).

Regarding where democracy is likely to allocate its educational resources, primary education has been found to be the area in study of Latin America and Africa respectively (Brown and Hunter, 2004a; Stasavage, 2005a). Hecock shows electoral competition has a positive effect on primary spending per student in his study of subnational units in Brazil (Hecock, 2006). In single country studies, the effect of democracy is apparent in greater financing for basic education in Brazil, Argentina, Uganda and South Africa (Brown, 2002; Corrales, 2004; Stasavage, 2005b; Crouch, 2005; Engelbrecht, 2006).

Going beyond the education spending indicators, the positive roles of democracy in enrolling children in schools at the secondary level have been identified in studies of global sample (Lake and Baum, 2001 & 2003). Brown also discovered a strong relationship between gross primary school enrollment and democracy in the developing regions of Central and South America, the Middle East, South and East Asia, and sub-Saharan Africa. Yet the impact of democracy is not uniform: it is most pronounced among the poorest countries of the world and seems to diminish with economic development (Brown, 1999). The above findings are mostly consistent with that of Rudra and Haggard, who recently identify positive impacts of democracy on gross school

enrollment at all three levels of education in a sample of developing countries (Rudra and Haggard, 2005).

Some literature studies other indicators of government education provision such as gender equality in education and literacy rate. Brown discovers no relationship between broad measure of democracy and gender equality but the positive effects of competitive executive recruitment on gender equality is significant (Brown, 2004). Siegle's study demonstrates that low-income democracies outdo their autocratic counterpart on nearly all qualify-of-life measures including that of literacy rate (Siegle, 2004). Political freedom has been found to have a positive effect on grade five completion rate in Stroup's study of 121 countries but its effects diminish with the degree of economic freedom (Stroup, 2007).

The positive effect of democracy in improving education participation and enrollment is also apparent in some regional literature. Engerman, Mariscal and Sokoloff argue for a strong relation between the expansion of suffrage and primary school enrollment and increase in literacy in America and Canada (Engerman, Mariscal and Sokoloff, 1998). Their conclusion has been reinforced by Lindert, who finds that the expansion of suffrage is correlated with the expansion of early mass education in France, England, America, Germany and Britain before 1914 (Lindert, 2004).[8]

[8] In a broader literature that analyzes the relationship between democracy and social welfare, democracy has been found to be more likely to maintain social programs when facing economic crisis (Hunter and Brown, 1999). A number of studies also show that democracies have a higher social spending in general (Adsera and Boix, 2002; Wibbels, 2003).

A few empirical studies didn't find a clear impact of democracy on government education provision. Sloan and Tedin (1987) investigated the relation between regime type and output in five areas of public policy. They found that comparing with other regime types such as Communist or bureaucratic authoritarianism, the achievements of democratic countries are not remarkable in four measures: elementary school enrollments, secondary school enrollments, college enrollments, and literacy rates. Lindert (2003) concludes that both full autocracy and democracy provides better primary education than benign autocracy or elite democracy. In a working paper by Huber Mustillo and Stephens, democracy is also found to have a positive impact on health and education spending; however, this impact disappears once left party is entered into the equation and shown to have a positive influence (Huber, Mustillo and Stephens, 2004). Lott identifies a negative relationship between democracy and education spending in a global sample of 99 countries for the time period 1985-1992 (Lott, 1999).

1.1.3 Other Theories of Education Expansion

Logic of Industrialization

Economic development increases educational expansion through both individual and state mechanisms. At the micro-level, the theory suggests that more industrialized countries increasingly organize labor market around educational credentials; thus individuals would desire and demand more schooling to increase their economic reward (Blau and Duncan, 1967; Bowles and Gintis, 1976 & 2002). At the macro level, states require a more skilled labor force and at the same time, they have more resources to devote to education expansion both as an investment and consumption good (Blaug,

1968; Checchi, 2003). However, other studies show that the labor markets in non-industrialized societies are also organized around education credentials (Hansen and Haller, 1973; Heyneman, 1976).

Ethnic Fractionalization

Some analysts suggest that state-formation, and the education expansion it prompts, are more costly and conflict-laden in an ethnically heterogeneous society (Warren, 1977). However, one could also speculate education expansion is prioritized in an ethnically more heterogeneous society for the purpose of national integration. One of the most consistent findings in social science research on ethnic attitudes is the negative association between educational attainment and ethnic prejudice: Higher educated people are less prejudiced toward ethnic outgroups and also less favorable to ethnic ingroups (Coenders and Peer, 2003). In countries such as Malaysia and Singapore, national integration is one of the two most important goals of education, along with that of economic development (Morris and Sweeting, 1995).

Inequality

Inequality could put fiscal constraints on poor families to send their children to school. Checchi (2003) finds that inequality is significantly negatively correlated with enrollment at the secondary level. Studies also suggest inequality reduce investment in secondary and tertiary education investment in African countries (Odedokun and Round, 2004). In Latin America, high income inequality is found to be associated with high public

education spending, an average of high schooling for the minority and very low levels of schooling for the majority (Birdsall, 1999).

Diffusion

Meyer and his coauthors challenge the structural theories of education expansion[9] at the state level (Meyer, Ramirez, Rubinson and Boli-Bennett, 1977; Meyer, Ramirez, Soysal, 1992). In their multivariate analysis, all the structural theories are rejected after demographical characteristics of the states are taken into consideration. On the other hand, most of the variations in school expansion can be explained by the diffusion theory: the available population to be educated (both available from previous level and from the same age-group not in school). Their earlier article suggests the world social system as the reason for diffusion: the importance of education has been accepted as the main discourse in terms of economic development, state-governing, universal human rights and state competition in the world social system. Their later article suggests that since education serves the function of linking individual to the state, it becomes an integral part of the nation-state model and expands where the nation-state expands.

1.2 Limitations of Current Literature and My Study

1.2.1 Limitations of Current Literature

As reviewed above, there is a growing body of empirical literature that studies the effects of globalization and democratization on government education provision in recent years (Brown, 1999&2004b; Kaufman and Segura-Ubiergo, 2001; Lake and Baum,

[9] These theories include economic development, political and social modernization, the type of the political regime, ethnic plurality, and dependency (Meyer, Ramirez, Rubinson and Boli-Bennett, 1977).

2001&2003; Brown and Hunter, 2004a; Huber, Mustillo and Stephens, 2004; Stasavage, 2005; Rudra and Haggard, 2005; Dion, 2005; Avelino, Brown and Hunter, 2005). The pioneering efforts are well applauded. However, the limitations of current literature have also been recognized.

(1) The empirical evidence on the effect of globalization is not very strong.

Most of the studies use the trade ratio indicator (trade ratio=import+export/GDP) to measure globalization. However, this indicator is criticized by its sensitivity to factors such as country size and exchange rate (Leamer 1988, Avelino, Brown and Hunter, 2005). A study in Latin America which used a Purchasing Power Parity measure of trade produces different effect of trade integration than most of the other studies that used the trade ratio indicator (Avelino, Brown and Hunter, 2005). The evidence for the null-effect of capital account openness is stronger but no definitive conclusion has been reached. Scholars have also disagreed on which indicator – foreign direct investment, private capital flow or a policy indicator of capital account openness – is the best to use. Thus there is a special need for more empirical studies that pay close attention to how the model results would be affected by the choice of the globalization indicators.

(2) The second objection to the current literature is that the dependent variable is not measured adequately.

A number of statistical studies rely highly on aggregate measures of education spending (Kaufman and Segura-Ubiergo, 2001; Huber, Mustillo and Stephens, 2004; Dion, 2005; Avelino, Brown and Hunter, 2005). However, aggregate measures cannot capture the

distributional conflict at different levels of education which is at least as important as the level of total spending (Mares, 2005). If increasing spending under democracy mostly goes to the tertiary level whose main beneficiaries are the better-off in a society, democracy is properly not so much desired for the poor, who benefits most from investment in primary and secondary education. In response to this criticism, efforts have begun to study how globalization and democratization would influence the distribution of expenditures at different levels of education (Brown and Hunter 2004a, Stasavage, 2005).

The second point is that the aggregate spending measures can't totally capture the actual education outcomes, which might be completely different in two countries with similar levels of social spending depending on how their expenditure is distributed and programs targeted. Similarly, more spending does not necessarily lead to better education outcome if resources are not used efficiently. A survey study in Uganda found that the schools, on average, only received 13% of the funding on material from the central government; most of the funding is captured by local politicians (Ritva Reinikka and Jakob Svensson, 2004). Nevertheless, studies do exist that show a positive relation between more public financing and better access and attainment in schools (Gupta, Verhoeven and Tiongsn, 2002; Checchi, 2003). On the other hand, efficiency reform may increase the quality of education with a decreased budget. A separate body of literature exists that investigates the effects of democratization on education outcomes such as school enrollment ratios and gender parity (Brown, 1999; Lake and Baum, 2001&2003; Brown 2004; Siegle, 2004; Stroup, 2006). Efforts have started to be made in the literature to use both spending

and school enrollment indicators to measure government education provision (Rudra and Haggard, 2005). This is a worthwhile trend to follow.

(3) The third contention concerns the absence of political analysis in the empirical literature.

Scholars criticize the absence of an analysis of politics in the existing empirical literature on the relationship between globalization and social protection (Huber and Stephens 2001; Adsera and Boix 2002). As Huber and Stephens express their concern, "we are skeptical about the openness argument, both with regard to its presumed direct effect on welfare state expansion and its indirect effect via corporatism, because decisions about welfare state expansion are politically mediated rather than automatic reactions to needs for social protection" (Huber and Stephens 2001: 48) Adsera and Boix contend that the positive relation between globalization and the size of the public sector should not be deterministic. Three possible trade regimes could possibly result from actors' calculations when integrating into global economy: 1) a closed economy without necessity for compensation 2) a free trade regime with compensation packages 3) an authoritarian regime with no compensation taking place (Adsera and Boix 2002). Studies on East Asian welfare states also prove it is more fruitful to study the impacts of globalization and local political processes (democratization included) together since national responses to the former is always mediated by the latter (Kwon, 2005; Law, 2004; Mok, 2003).

Although the statistical finding on the effect of democracy on education provision is stronger but the causal story is much less explored. Given the quite rich theoretical literature on this relationship, there is a special need for case studies, especially structured comparative case studies to systematically explore which causal mechanism are at work and analyze in detail the politics of government education provision. Several studies have pioneered the efforts in this regard (Engerman, Mariscal and Sokoloff, 1998; Brown, 2002; Lindert, 2004; Corrales, 2004; Stassavage, 2005b; Crouch, 2005).

(4) Lastly, another gap in the current literature is the lack of study in East Asia. Plenty of statistical studies have been done in Latin America (Kaufman and Segura-Ubiergo, 2001; Brown and Hunter, 2004; Huber, Mustillo and Stephens, 2004; Avelino, Brown and Hunter, 2005) and one in Africa (Stasavage, 2005). However, as far as the author knows, no such region-wide statistical investigation exists for East Asia[10]. The impacts of democratization on health care and social insurance have been explored in the study of East Asian welfare states (Kwon, 2005; Wong, 2004; Aspalter 2002) but not its effects on education[11]. The effects of globalization on educational reform have been studied in Taiwan and Hong Kong (Law, 2004) and more literature is available on how the provision, financing and regulation of higher education has been affected by

[10] The only one statistical study on East Asia to the author's knowledge is by Chan (Chan, 1998). However, he only investigates three countries: South Korea, Taiwan and Singapore.

[11] Students of East Asian welfare states have focused their attention primarily on the impacts of democratic transition in the sectors of health care and social insurance. Wong finds that in both South Korea and Taiwan, democratic transition was associated with the universalization of health care; moreover, in late 1990s, democratic government in South Korea responded to societal demands for greater redistribution by transforming the health care system from a multi-carrier system to a more integrated one; in Taiwan, the KMT government was forced to retract its health care privatization reform since it was not able to craft any societal consensus (Wong, 2004). Aspalter argues for a positive relation between electoral competition and social insurance and welfare expansion in Taiwan (Aspalter, 2002).[11] Democratization, together with economic reform, has also played a profound role in transforming the welfare states from selective to universal in Taiwan and South Korea (Kwon, 2005).

globalization in these two societies (Mok, 2000, 2001, 2002&2003). But studies need to be extended to other countries in the region. Given the perceived important role of education in East Asian's model of economic growth and the profound economic and political transitions this region has gone through in the past several decades, studying the impacts of globalization and democratization on government education provision in East Asia should fill an important gap in the literature.

1.2.2 My Study and Its Significance

My study of the impacts of globalization and democratization on government education provision in eight East Asian countries tries to fill a regional gap in this body of literature. It also hopes to overcome limitations in the current literature by a systematic and innovative research design, which not only measures education provision by multiple indicators at different levels of education, but also combines statistical study with comparative case analysis.

Situated at the conjuncture of welfare state studies, comparative political economy, democratic theory and East Asian studies, my dissertation hopes to contribute to the literature in the following ways.

(1) It produces to my knowledge the first piece of systematic statistical and comparative evidence in East Asia where education is highly valued by the government and where is also deeply touched by the trends of globalization and democratization.

Comparing with other regions, education has been especially placed at a strategic position by the East Asian governments despite a relatively small social spending budget (Asher and Newman, 2001) (See Appendix 1.1-1.6)[12]. The important role of education in East Asian countries' economic development, beneficial demographic transition and poverty alleviation has been well-documented in the literature (ADB, 2003; Kwon, H.J. 1998; Goodman, White and Kwon, 1998; World Bank, 1993). East Asian governments adopted a centralized, standardized, top-down approach for their early education systems which aimed at increasing the education level of the citizens. Such government highly regulated education system was not only important for strengthening the competitiveness of their economy, but also for establishing and consolidating the legitimacy of the governments by securing economic development (Holliday and Wilding, 2003; Bray and Lee, 2001; Tilak, 1994; Morris and Sweeting, 1995). Review of education systems and education reforms have been introduced in the last decade with the belief that a more flexible and innovative education system is necessary to ensure the competitiveness of the labor force in the global information economy (Sharpe and Gopinathan, 2002; Mok, 2001; Cheng and Townsend, 2000).

Secondly, East Asian countries have been praised by some as the dream cases of achieving both economic development and social equality. Paradoxically, they seem to provide "most likely cases" for both "efficiency" and "compensation+human capital " hypothesis. On one hand, East Asian countries' economies have been highly export-oriented and increasingly integrated to the global market; thus reducing the cost of

[12] Comparing with developed countries and Latin America countries, developing countries in Africa and Asia generally devote a larger proportion of government spending to education than to health and social security spending.

production, attracting global capital and keeping export competitive are the logical priorities of East Asian governments. Moreover, unions are traditionally weak in this region; the large number of unskilled labor further poses problem for collective action. (Rudra, 2002) On the other hand, East Asian countries and families have always attached great value to their education; high educational outcomes have been regarded as a core for the newly industrialized countries (NICs) to achieve remarkable economic growth (Holliday and Wilding, 2003; Bray and Lee, 2001; Tilak, 1994; Morris and Sweeting, 1995). To remain competitive in the global market, there is enough incentive for East Asian governments to continue investment in human capital (Asian Development Bank Report, 2003). At the same time, sectors that lose in the export-oriented economy or suffer from its volatility are expected to demand some kind of compensation from the government. It will be very interesting to see which logic would dominate in the East Asian case or whether the "efficiency" and "human capital" motives of East Asian governments would cancel each other.

Thirdly, on a political dimension, East Asia also serves as an ideal region to study the impact of democratization. The third wave of democratization has changed countries such as South Korea, Taiwan, Philippines, Indonesia and Thailand. Meanwhile, countries such as Malaysia and Singapore remain undemocratic. This provides a great opportunity to do comparative case studies on the impacts of democratization. The test of democracy in this region will be a tough one since authoritarian regimes in this region have proven to be successful in both economic development and social service provision.

Let me also locate my study in East Asian welfare studies. The study of East Asian welfare states has become increasingly prominent in the literature since the 1980s. Compared with their Western counterparts and other developing countries, East Asian countries seem to have achieved fair social outcomes with low social spending. Studies have been emphasizing the "developmental nature" of East Asian Welfare Regimes: emphasis on the family as the welfare provider, low expectation of the state and the subordination of social policy to economic policy. [13] However, scholars of East Asian welfare states have also cautioned the possible changes of these regimes as some of them experience democratization (Goodman, White and Kwon, 1999). Existing studies have devoted their efforts primarily to examining democratization's impacts on health care and social protection (Kwon, 2005; Wong, 2004; Aspatler, 2002). South Korea and Taiwan are most studied. These might be the sectors whether the impacts of democratization and globalization are more politically contested and thus salient. However, given that education is one significant category of social welfare in the Western literature and its strategic position in East Asia's model of economic growth, it is an important research question how government education provision in this region has been affected by the trends of globalization and democratization. Moreover, welfare studies in this region have been primarily country and sector case studies. I have seen one statistical study so far which covers three countries (Chan, 1997). My study is useful not only in exploring any general pattern in East Asia but also in engaging in dialogues with similar studies done in global samples and other developing countries.

[13] For a review of East Asia welfare studies, see Holliday and Wilding, 2003.

(2) In the statistical study part, multiple measures of education provision at different levels of education help examine the differentiated effects of globalization and democratization, and careful robustness checks increase the confidence in the validity of the findings.

Government education provision in the statistical part of my study is examined by multiple measures, which include spending as well as three outcome indicators – school enrollment, attainment and gender equity in education. For the first three indicators, both aggregate and disaggregate measures at first/secondary/tertiary levels of education are used. This set of measures directly addresses the limitation of current literature as discussed in section 1.2. They are included in the sixteen mostly commonly used education statistical indicators by UNESCO[14]. While spending measures governments' fiscal commitment to education, outcome indicators capture to some degree whether the resources are used efficiently. On the other hand, disaggregate indicators of spending and outcome are employed to measure government spending priorities within the education sector.

In addition, a number of robustness checks are carried out to see whether the findings are sensitive to alternative measures of critical variables, controls included, sample variation and estimation method used.

[14] For a conceptual framework of education indicators used by UNESCO, see http://www.uis.unesco.org/i_pages/indic_spec.htm, accessed June 3, 2007.

(3) Comparative case studies trace the causal mechanisms behind the statistical findings and reveal other impacts of globalization and democratization that can't be operationalized in the statistical study.

With many countries at hand, the strength of statistical study is framing the research and eliminating rival theories (Tarrow, 1995; Lijphart, 1971). However, as is often (and rightly) criticized, statistical study only explores general probabilistic pattern; it does less well in teasing out the causal mechanisms[15] that link the explanatory variables to the interested dependent variable. On the other hand, comparative case studies usually locate the research question in specific historical and national context. By methods such as process tracing and most similar/different design, they could be used for causal analysis, demonstration of theory and contrasts of contexts (Collier, 1993). Historical dynamics and critical events can also be analyzed in case studies (Tarrow, 1995). Triangulating comparative case studies with results of statistical studies will help identify a more deterministic causal relationship and underlying causal processes (Tarrow, 1995; Laitin, 2002). Moreover, comparative case study could also help reveal other impacts of globalization and democratization that cannot be captured by the statistical study such as changes in school curriculum and the role of state in school management. Any new findings would then contribute to new theory building.

[15] Causal mechanism is a concept whose meaning is often assumed. I use the definition below in this study: causal mechanism is the processes or pathways through which an outcome is brought into being (Encyclopedia of Social Science Research Methods, 2003).

Triangulation is my strategy of research in this study. Statistical study on South Korea, Singapore, Hong Kong, Taiwan, Indonesia, Malaysia, Philippines, and Thailand are first conducted to explore the regional pattern; comparative case studies on selected countries are then carried out to analyze the causal mechanisms underlying the statistical findings and explore other impacts of globalization and democratization.

1.3 Research Questions and Hypotheses

My study investigates how globalization and democratization affect government education provision in East Asia. Two sets of research questions guide my investigation, one on the impact of globalization and the other on that of democratization. The first set of questions asks:

G1: Do East Asian governments spend more on the education of their citizens as their economies become more integrated into the global market?

G2: How does this integration affect their allocative priorities among different levels of education?

G3: Are citizens in East Asia also better educated with the increasing globalization of their economy?

G4: What are other effects of globalization on government education provision?

G5: What are the reasons for the relationships discovered?

The second set of questions considers the impacts of democratization in East Asia:

D1: Do democratic governments spend more on the education of their citizens?

D2: Is the spending pattern of democratic governments among different levels of education different from that of non-democratic governments?

D3: Are East Asian citizens better educated under democratic governments?

D4: What are other effects of democratization on government education provision?

D5: What are the reasons for the relationships discovered?

For question G1 - the impacts of globalization on government education spending, I hypothesize a positive relationship in the East Asian context for the following reasons. Firstly, the important role of education is well-documented in the literature of East Asian model of economic growth (ADB, 2003; Kwon, H.J. 1998; Goodman, White and Kwon, 1998). Thus there is good reason to expect East Asian governments to increasingly valorize education of their workers as their economies become more open to the global market, which is becoming more information- and skill- intensive. On the other hand, since East Asia countries already have a relatively small government comparing with developed countries and other developing countries (see Appendix 1.7), they are less pressured to cut government spending in order to be viewed as "more efficient" in the global market.

HG_1: The more open East Asian countries' economies are to the global market, the more their governments spend on education.

However, I do not expect East Asian governments to attach the same importance to education at the primary, secondary and tertiary levels as their economies become more open. In the East Asian model of economic growth, countries usually start from export-oriented, labor-intensive industry, which requires only very basic education of the workers. However, as countries and political entities such as Taiwan, South Korea,

Singapore and Hong Kong become more developed, their export-oriented economies start to shift to more skill-intensive. However, tertiary education has lower rates of social return comparing with education at the primary and secondary level (see Table 1.3) (Andreosso-O'Callaghan, 2003; Psacharopoulos and Patrinos, 2002; Mingat, 1998); moreover, in countries such Philippines, South Korea and Taiwan, tertiary education is mainly privately financed (see Table 1.4). Plus, a recent trend in higher education reform in the East Asian countries is de-regulation and marketization (Mok, 2003). Thus I would hypothesize that East Asian governments would increase spending on primary and secondary education as their economies become more open but that spending on tertiary education would not be affected.

HG_2: As East Asian countries become more open to the global market, their governments spend more on education at the primary and secondary level; spending on tertiary education is not affected.

Table 1.3 Returns to Investment in Education by Level, Full Method, Latest Year, Regional Average (Percentage)

	Social			Prviate		
Region	Primary	Secondary	Higher	Primary	Secondary	Higher
Asia*	16.2	11.1	11.0	20.0	15.8	18.2
Europe/Middle East/North Africa*	15.6	9.7	9.9	13.8	13.6	18.8
Latin America/Caribbean	17.4	12.9	12.3	26.6	17.0	19.5
OECD	8.5	9.4	8.5	13.4	11.3	11.6
Sub-Saharan Africa	25.4	18.4	11.3	37.6	24.6	27.8
World	18.9	13.1	10.8	26.6	17.0	19.0

Source: Psacharopoulos and Patrinos, 2002 *Non-OECD

Table 1.4 Unit Cost of Regular Higher Education Institutions in Asian Countries (End of 1980s)

	Unit Cost of Regular Public Institutions (in GDP per capita)	Share of Private Financing (%)
Hong Kong	NA	NA
Philippines	0.5	85
Korea, Rep. of	1.04	62
Taiwan	0.92	50
Indonesia	1.06	48
Thailand	1.78	26
Singapore	0.55	25
Malaysia	1.9	15

Source: Mundle (1998) *NA refers to not available

I hypothesize a general positive relation between globalization and the education achievements in East Asian countries. On one hand, this hypothesis is based on the assumption that more government educational resources with increasing economic openness would improve education access and quality; on the other hand, the demand side of education – students and parents – also have incentives to participate and perform better in education so they could be rewarded by the global economy which requires increasingly higher skills. Thirdly, to ensure the competitiveness of the labor force in the global economy, the policy makers also have incentives to introduce a more flexible and innovative education system, as can be evidenced by the review of education systems and educational reforms in the region for the past decade (Sharpe and Gopinathan, 2002; Mok, 2001; Cheng and Townsend, 2000). One would expect in turn a renovated education system would improve education access and particularly quality. My hypothesis is also based on the possible “diffusion effect” in education: the improvement

in the participation and quality at one school level is highly likely to improve that of next level since there will be a larger and better pool of people to be educated at the next level.

HG_3: The more open East Asian countries' economies are to the global market, the better educated their citizens at all three levels of education.

Women's education has gained particular attention in the global war of being competitive due to its special positive role in public health, birth control and economic development. I would hypothesize a positive relation between economic openness and gender equity in education.

HG_4: The more open East Asian countries' economies are to the global market, the higher gender equity in education.

Regarding the impacts of democratization, I hypothesize a positive relationship between democratic regime and total education spending. This is because: 1) existing evidence from other regions is pretty strong to support a positive relation (Aveline, Brown and Hunter, 2005; Brown, 2004; Kaufman and Segura-Ubiergo, 2001; Ames, 1987); 2) one study in South Korea, Taiwan and Singapore finds democracy has a higher per capita spending (Chan, 1997); 3) there is also evidence that democratization expands health care and social security in South Korea and Taiwan through both channels of electoral competition and interest group mobilization (Kwon, 2005; Wong, 2004; Aspatler, 2002). I would expect similar expansion takes place in the education sector.

There are theoretical reasons to believe that democratic governments are more likely to allocate education resources to primary and secondary education since this is one of the effective channels to transfer resources from the rich to the poor, which composes the majority of voters. Existing empirical evidence also suggests that the effect of democracy is significant in financing basic education (Brown and Hunter, 2004a; Stasavage, 2005a&2005b; Brown, 2004). Thus I would hypothesize a positive relation between democratic governments and primary and secondary spending in the East Asian case.

HD_1: Democratic governments spend more on education than non-democratic governments in East Asia.

HD_2: Democratic governments spend more on primary and secondary education than non-democratic governments in East Asia; but there is no significant relationship between democratic governments and tertiary spending.

On the relationship between democratic governments and education outcomes, I hypothesize a general positive relation for the following reasons: 1) I assume that at the primary and the secondary level, better education financing would generally improve education access and quality; 2) better education outcomes at the primary and the secondary level would in turn improve outcomes at the tertiary level due to “diffusion effects”; 3) democratization is also likely to involve a more flexible and versatile education system: de-centralization of management and more autonomy of the schools and the teachers. Such system would better adapt to the local needs of the schools,

teachers and students, produce more spaces for participation and improve education quality; 4) Existing empirical evidence has suggested a positive relation between the expansion of suffrage and the expansion of mass education in other parts of the world (Engerman, Mariscal and Sokoloff, 1998; Lindert, 2004) and a positive relation between democratic regime and school enrollment at all three levels (Lake and Baum, 2001&2003; Brown, 1999; Rudra and Haggard, 2005). Democratic regime is also found to outdo their authoritarian counterparts on measures such as gender equity and literacy rates (Brown, 2004; Siegle, 2004).

HD_3: Democratic governments have better education outcomes than non-democratic governments in East Asia.

Table 1.5 summarizes the above hypothesized effects.

Table 1.5 Hypothesized Effects of Globalization and Democratization

	Globalization	Democratization
Education Spending		
Total	+	+
Primary Level	+	+
Secondary Level	+	+
Tertiary Level	No Effect	No Effect
Education Participation &Attainment		
General	+	+
Primary Level	+	+
Secondary Level	+	+
Tertiary Level	+	+
Gender Equity in Education	+	+

Note: "+" stands for a positive effect.

1.4 Methodology

Triangulation is my strategy of research in this study. Two methods are used in combination. First, a time-series cross-sectional analysis explores the regional pattern of the effects of globalization and democratization on government education provision in East Asia. Then comparative case studies are conducted to identify the causal mechanisms behind the statistical findings and reveal the political stories of government education provision.

1.4.1 Time-series Cross-sectional Analysis

Time-series Cross-sectional analysis (TSCS hereafter) has become increasingly popular in the field of comparative political economy in recent years. Treating a country at different years as separate cases and pooling different “country-years” together for estimation has proved promising to solve the notorious “small-N” problem in comparative research. By increasing the degrees of freedom, this method allows researchers to estimate more fully specified models with more powerful statistical methods (Plumper, Troeger and Manow, 2005; Beck, 2001). Pooling also makes it possible to control for exogenous shocks common to all countries in the sample (by controlling for time effects) and to reduce the omitted variable bias (by controlling for unit effects) (Plumper, Troeger and Manow, 2005). It is so widely used in comparative political economy that “it has become difficult to defend not using it” (Kittel andWinner, 2005).

Following this trend in the literature, I am conducting to my knowledge the first TSCS analysis in East Asia to explore the average impacts of globalization and democratization on government education provision.[16] The application of this method has particular importance for East Asia given its rather small number of countries comparing with other regions.

Countries and Study Period

Countries and political entities included in this study of East Asia need to be clarified first. It includes eight countries/political entities: South Korea, Taiwan, Hong Kong (before 1997), Singapore, Indonesia, Malaysia, Philippines, and Thailand. There are a number of reasons to choose this group of countries. First of all, since unit homogeneity is a desirable quality for statistical tests, these countries are chosen to make the degree of unit heterogeneity as small as possible. These are the countries listed in "East Asia" and "South East Asia groupings" of Asian Development Bank. To a large extent, they share similar developmental characteristics. South Korea, Taiwan, Hong Kong and Singapore are Newly Industrialized countries (NICs hereafter) in the region, with relatively high levels of economic development, openness, urbanization and education. Malaysia, Indonesia, Philippines and Thailand are the second tier of rapidly growing open economies in the region (Adams, 2002:8).

[16] I am aware of one statistical study by Steven Chan, which employs time-series regression to study the effects of democratization on government welfare spending in South Korea, Taiwan and Singapore. However, he didn't use the pooling method.

Other countries in the "East Asia" and "South East Asia" groupings are excluded for the following reasons. China, Mongolia in East Asia, Cambodia, Lao PDR, Viet Nam in Southeast Asia are either former or current communist/socialist countries. Most of their spending data during the communist period is not available. Doubts are also cast on the reliability of those data that are available. Myanmar is characterized by relatively low level of economic development and degree of openness; culturally, it is also classified sometimes as part of South Asia (Encyclopedia of Modern Asia, 2002).

The countries in my sample are all included in group 2 and group 3 in previous studies done by Asian Development Bank. ADB groupings are partly defined by sets of indicators that include demographic factors, economic factors, employment factors, levels of literacy and Human Development Index (HDI) (Lewin, 1996).[17] My sample includes all countries in group 2 and 3 except Pakistan and Sri Lanka, which are usually classified into South Asia. Such selection ensures the "most similar system" design to isolate the effects of the independent variables of interest.

The study period for the TSCS analysis is 1971 to 2003. Partly this is the period when data on government spending and outcomes is available. Moreover, this period is also ideal for studying the impacts of globalization and democratization since it sees rapid

[17] ADB developing member countries are categorized into 7 groups. Group 1 consists of the PRC and India. Group 2 includes the NICs – Hong Kong, China; Republic of Korea, Singapore, Malaysia and Taipei,China. Group 3 includes Indonesia, Philippines, Thailand, Sri Lanka, Pakistan and Group 4 contains countries such as Bangladesh, Mongolia, Myanmar, and Viet Nam. Group 5 comprises Afghanistan, Bhutan, Cambodia, Lao PDR, and Nepal. Group 6 countries are Kazakhstan, Kyrgyz Republic, and Uzbekistan. Group 7 includes the Pacific DMCs which include Cook Islands , Fiji Islands , Kiribati, Maldives, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tuvalu, and Vanuatu. For specific characteristics of this grouping, see Lewin (1996).

economic development, increasing degree of openness, and drastic political change in this region.

Variables and Data

Government Education Provision

Government education provision is measured comprehensively in this study. Four dimensions of government education provision are examined: resources, participation, attainment and gender equity.

Resources directly measure governments' efforts in providing education to their citizens. Total government education spending as well as government education spending at primary/secondary/tertiary levels are investigated. By employing both the aggregate and disaggregate measures, I hope to capture government allocation to the education sector in general as well as the government's allocative priorities within the education sector. Spending data for East Asia is available from Asian Development Bank Key Indicators, Government Financial Statistics and UNESCO education datasets.

Measurements of participation can give a sense how well citizens are able to participate in the education system of their country. These measures summarize government provision of education (opportunities available to citizens) as well as household participation behavior (actual participation behavior). Gross School Enrollment Ratios at Primary, Secondary and Tertiary Levels are used to measure participation in this study. The gross school enrollment is expressed as a ratio of the number of students enrolled at a

certain level over the number of children in the country's school-age group at that level.[18] Data on participation are obtained from UNESCO yearbook, various years.

Education attainment reflects the efficiency and quality of a country's education system. The measurement developed by Barro and Lee—the percentage of the population who has successfully completed a given level of schooling is "a straightforward way to show the population's attainment of skills and knowledge associated with a particular level of education". It has been used in many previous studies (Barro and Lee, 2000). This study borrows six indicators from Barro and Lee to measure education attainment of a nation: average years of school for the total population; average years of school for male; average years of school for female; % of population with primary school attained; % of population with secondary school attained and % of population with post-secondary school attained.

A last measure of government education provision is gender equity. Women's education has gained increasing importance due to its special role in public health, birth control and economic development. Two measures of gender equity are studied: ratio of girls to boys in primary and secondary education and ratio of girls' average year of schooling versus that of boys. The data on the first indicator is obtained from World Development

[18] A more accurate measure for participation is net school enrolment ratio which excludes children enrolled at a certain level but above the official school age. However, this measure suffers serious missing data problem for countries in my sample. To give some idea of the discrepancy between gross and net school enrolment, the simple Pearson correlation between gross primary enrolment ratio and net enrolment ratio is only .37; however, the correlation between gross and net secondary enrolment ratio is .97. Thus gross secondary enrolment ratio is a good approximation for participation at the secondary level. There is no net enrolment data available for the tertiary level.

Indicators; the second indicator is constructed based on data from Barro and Lee. For both indicators, a ratio of 1 indicates gender equity.

Globalization

Globalization is measured in two ways: trade integration and capital account liberalization. Following conventions in the literature, trade integration is measured as (import + export) / GDP. The data is obtained from World Development Indicators (WDI hereafter) 2005 online. Data on Taiwan is from Penn Table 6.1.

For capital account openness, I use the index developed by Quinn (Quinn, 1997). Quinn codes both the current and the capital account openness of 64 nations based on IMF's Annual Report on Exchange Restrictions. For capital account openness, regulations on both capital payments and receipts are coded and countries are given scores from 0 (not free) to 4 (free). I have extended Quinn's indicators to annual data for countries included in this study based on his coding rules.

Democratization

Democracy is probably one of the hardest concepts in social science. Surprisingly, despite their somewhat different definitions, commonly used indicators of democracy are highly correlated and thus reliable (Inkeles, 1991; Munck andVerkuilen, 2002). I will use a dichotomous measure of democracy to intuitively capture its possible distinct effect from non-democracy. This is one convention in the literature (Alvarez, Cheibub, Limongi, and Przeworski, 1996; Kaufman and Segura-Ubiergo, 2001). Scores from Keith and Gurr's Polity IV dataset will be used as the base for coding (Marshall, Jaggers

and Gurr, 2003). The "authoritarian" score of each country will be subtracted from its "democratic" score. Any country scored above 6 will be coded as democratic, otherwise non-democratic.

Control Variables

A number of economic, political and demographical controls are included in the model. The specific controls of each model vary depending on the dependent variable. To give a comprehensive list here, the economic controls include GDP per capita, business cycle, government revenue, capital intensity of economy and urbanization. One political control is electoral cycle. Demographic controls include % of youth population (0-14) and populations to be educated from previous level.

Country and Decade Dummies

Country and decade dummies are put into the models when appropriate to control for omitted variable bias and exogenous shocks respectively.

The specifics of the variables are further elaborated in corresponding chapters. Appendix 1.8 details variable construction and data sources.

<u>The Model</u>

Equation 1.1 depicts a classical time-series cross-sectional model.

$$Y_{it} = \beta X_{it} + \mu_{it} \qquad (1.1)$$

where i indicates unit, t indicates time. Y is the dependent variable, β represents a column vector of coefficients to be estimated, X represents a matrix of independent variables, μ_{it} is the error term.

It is well known that OLS estimates of the above statistical model will be inefficient and the standard errors might be incorrect if the error term μ_{it} doesn't meet the Gauss-Markov assumption, i.e.

$$E(u_{i,t}u_{j,s}) = \begin{Bmatrix} \sigma^2 & \text{if } i = j \text{ and } s = t \\ 0 & \text{Otherwise.} \end{Bmatrix} \tag{1.2}$$

Unfortunately, TSCS datasets are likely to violate these assumptions (Beck and Katz, 2001). In particular, the error terms of TSCS could show (Equation 1.3):

1) panel heteroskedasticity, i.e. each country may have its own error variance;
2) contemporaneous error correlation, i.e. errors of one country might be correlated with errors with another country at the same year;
3) serially correlated errors, i.e. the errors of a given country is serially correlated with previous errors of that country.

$$E(u_{i,t}u_{j,s}) = \begin{Bmatrix} \sigma_i^2 & \text{if } i = j \text{ and } s = t \\ \sigma_{ij} & \text{if } i \neq j \text{ and } s = t \\ 0 & \text{Otherwise.} \end{Bmatrix} \tag{1.3}$$

$$u_{i,t} = u_{i,t-1} + v_{it} \quad v_{it} \sim N(0, \sigma^2)$$

Beck and Katz recommended panel-corrected standard errors to correct for panel heteroskedasticity and contemporaneous error correlation; but serial correlation of the errors must be dealt with before panel corrected standard error can be applied (Beck, 2001; Beck and Katz 2004).

Another aspect for modeling TSCS data is stationarity. It is the idea that the time series under analysis have constant mean without differencing, i.e. the data is homogeneous (McCleary and Hay, 1980). Consider a simple time series representation:

$y_t = \rho y_{t-1} + \varepsilon_t \quad \varepsilon_t \sim N(0, \sigma^2)$.

ρ dictates how strongly the present value of y is dependent upon its past values. If $\rho = 1$, the series have a permanent memory and all past shocks are cumulated; the series is called integrated or not stationary in this case. Non-stationary series pose challenges for modeling since the series depend on random shocks which are not predictable. Stationarity is of primary importance when analyzing time-series data: 1) the downward bias of the least squares estimator when the data is not stationary has been widely documented; 2) unaccounted non-stationarity may cause spurious correlations between the dependent and the explanatory variables (Stock and Watson, 1988; Greene, 2003).

Unit heterogeneity is another problem of concern when modeling TSCS data (Beck, 2001; Beck and Katz, 2004). Equation 1.1 assumes countries in the sample come from a homogeneous universe, i.e. the impacts of the explanatory variables are the same in different countries. However, it might not be the case: unit heterogeneity might be an

interesting feature of the data that needs to be modeled. My selection of the sample has minimized unit heterogeneity to some extent but the remaining unit heterogeneity will still be modeled.

Scholars generally agree that there is no panacea for modeling TSCS data (Beck and Katz, 2004). However, any modeling strategy must be sensitive to its error structure, variable stationarity and unit heterogeneity. Since the data structure for different dependent variable in my study vary, I have applied different modeling strategy accordingly: an error-correction model is applied to the education spending variables; for education outcome models, either error-correction model or fixed effects model is applied. These models will be elaborated in their respective chapters (Chapter 2 and 3).

Robustness Check

Findings in this literature have recently been criticized as being sensitive to model specification (Plumper, Troeger and Manow, 2005; Kittel and Winner, 2005). Thus I am very careful in this study to only emphasize findings that are relatively insensitive to changes in model specifications. Even though there is no standard definition of "robustness", people would generally agree that a finding is robust when the signs and/or significance of the coefficients remain constant despite changes in specifications (Learmer 1985; Salai-I-Martin, 1997).

Four types of robustness checks are conducted in the study:

(1) varying the specifications of the globalization and democratization variables;

(2) varying controls entered into the model;

(3) slightly changing countries in the estimation sample;

(4) varying estimation method.

A finding is regarded as a robust one if it is insensitive to all four changes in the model.

1.4.2 Case Studies

The purposes of case studies are twofold: 1) to study in specific national and historical context the effects of globalization and democratization on government education provision; 2) to identify the causal mechanisms from globalization and democratization to government education provision respectively.

Case Selection

Four countries/political entities are chosen for case studies: Taiwan, Singapore, Malaysia and Thailand. These four cases not only provide a representative sample of the region, but also have variations on the interested variables and thus provide a great opportunity to do "structured case comparison".

First of all, these countries give a nice representation of the region. Economically, Taiwan and Singapore exemplify the first tier of newly industrialized countries (NICs) while Malaysia and Thailand belong to the second tier of fast growing economies in the region.[19] Taiwan and Singapore are also relatively poor in natural resources comparing with Malaysia and Thailand. Ethnically, Taiwan is relatively homogeneous while

[19] Between 1971 and 2003, the average GDP per capita is $13,659 for Singapore, $8640 for Taiwan, $6,032 for Malaysia and $4,052 for Thailand (Author's calculation from Penn Table 6.1). The GDP growth rate of Thailand and Malaysia started to catch that of Taiwan and Singapore in late 1980s.

Malaysia, Thailand and Singapore are more heterogeneous. Regarding external influence, Taiwan is influenced by the United States, Singapore and Malaysia are former colonies of Great Britain whereas Thailand avoided colonization in its history.

More importantly, these countries have variations in globalization, democratization and government education provision that I am interested in. Taiwan is the “early opener” in the sample, already adopting an outward-oriented policy in the 1960s; Singapore and Malaysia started an industrial policy of export promotion later, in the 1970s; Thailand integrated into the global market the latest among the four by opening up its economy in the middle 1980s.

Politically, Taiwan and Thailand went through democratic transition in the late 1980s and both states became democracies in 1991 based on the standard Polity democracy coding; Singapore remains to be an authoritarian regime under the leadership of the People’s Action Party since 1959. The Malaysian regime also exhibits authoritarian feature as it is always dominated by a grand coalition, the United Malay’s National Organization (UMNO) and later Barisan Nasional (BN), but comparing with Singapore, the Malaysia regime is more competitive, receiving a polity coding of 3 to 4 versus –2 in Singapore.

These four countries also vary on education spending and outcomes. Thailand and Malaysia are the high spenders in the sample, which devote on average 20% of government spending to education. Singapore and Taiwan spend less government

resources on education, about 15%.[20] By 2000, Taiwan has the highest secondary and tertiary school enrollment, followed by Singapore, and then Malaysia and Thailand. During the study period, average years of school is the highest in Taiwan, followed by Singapore, Malaysia and Thailand.[21]

Thus this selection of countries provides a great opportunity to analyze the effects of globalization and democratization through "structured case comparison". Given that all four countries gradually opened up their economy (though at different points in time), we could compare their governments' educational responses to their integration into the global market. Similar government education initiatives that follow reforms to open the economy and that reflect the demands of the open economy are likely effects of globalization. Moreover, since the four countries can be grouped into three based on the timing of opening their economy – Taiwan in the 1960s, Singapore and Malaysia in the 1970s, and Thailand in the middle 1980s, the likely effects of globalization on government education provision should be seen sequentially in these countries. Thirdly, by comparing changes of government education provision in two subgroups of countries – Taiwan and Thailand vs. Singapore and Malaysia, we could see whether the effects of globalization on education provision are the same in countries which went through democratization and which didn't.

Similar changes in government education provision in Taiwan and Thailand after democratization are likely candidates for its effects. However, if similar changes can be

[20] Data is from Author's database. For data sources, please see Appendix 1.8.
[21] Data comes from Barro and Lee, 2000.

seen in either Singapore and/or Malaysia at around the same time, they are less relevant effects of democratization since they take place under both democratic and authoritarian regimes and thus might be caused by some structural factors of this period and/or region. In addition, since the Malaysian regime is more competitive than that of Singapore, the identified differences in their government education provision are likely effects of a more competitive regime, which can be compared with those found in Taiwan and Thailand – the democratization cases.

Other countries in the sample are not chosen for the following reasons. South Korea is positioned similarly along the two dimensions of globalization and democratization as Taiwan, an early opener to the global market which started to democratize in the late 1980s. Philippines is positioned similarly as Thailand, a late opener to the global market and a democratizing country in the 1980s. So these two countries are nicely represented by Taiwan and Thailand. Another reason to choose Taiwan over South Korea is that I have the language expertise to study the former. Indonesia is also a late opener as Thailand but only democratized recently so it is not an ideal candidate to study the effects of democratization which may take some time to be realized. There is also less education data available for Indonesia and Philippines based on my preliminary research. The special political status of Hong Kong during the study period makes it a relatively unique, but also less representative case of the sample.

Focus of Analysis

The focus of analysis in the case studies will be two: 1) identify the effects of globalization and democratization on government education provision; 2) identify the arrow of the causal relations and trace the causal mechanisms that link globalization and democratization to their effects on government education provision.

(1) Identify the Effects of Globalization and Democratization

As already described in the "case selection" section, structured case comparison will be used to identify the effects of globalization and democratization on government education provision in the four cases. Besides focusing on changes in education spending and outcome indicators used in the statistical studies, special attention will be given to the changes in the core educational system[22] that cannot be captured by the statistical indicators such as changes in education structure, curriculum, and ways of financing. For example, existing researches show that globalization and democratization lead to decentralization, privatization and more local autonomy in East Asia's education system, especially at the tertiary level (Law, 2004; Mok, 2002). Law also demonstrates that to be more competitive in the global economy, governments in both Taiwan and Hong Kong have restructured their education system, emphasizing the teaching of transnational skills such as English and ICT (information and communication technology) (Law, 2004).

(2) Identify the Causal Relations and Trace the Causal Mechanisms

[22] Another important part of government education provision besides the formal education system is vocational training. I will only focus on changes in the formal education system in this dissertation. Changes in vocational training scheme associated with globalization in East Asia have been dealt with by authors such as Ritchie (2001).

Identifying the Causal Relations

It is well known in the literature that statistical study is relatively weak in identifying the causal arrows. For example, even though we might be able to identify a positive relation between globalization and education spending from the statistical study, we still need clues as to which way the causal arrow goes. Arguments can be made that better education leads to more productive labor force, higher economic growth and less poverty; a country's economy is thus more competitive in the global market, which might encourage the government to open its economy. Carefully designed statistical study can help determine the causal arrow to some extent but the conclusion has to be corroborated by the case studies, which could trace the economic and education history of the specific country to see how openness and government education provision interacts with each other.

Similarly, it might be true that better education cultivates citizens capable of participating in democracy. Better education could also stimulate democracy indirectly through the logic of industrialization given its positive impact on economic development. Case studies can be used to study whether education progress under the authoritarian regime is accompanied by participatory citizens and/or whether democratic governments devote more efforts to education comparing with their authoritarian counterparts. The causal arrow may even go both ways, which needs to be clarified in the case study.

Tracing the Causal Mechanisms

Another limitation of the statistical study is that it cannot reveal the causal stories behind. Thus it is unable to fully evaluate the theories since competing theories may claim the

same relationship but the causal mechanisms can be totally different. By tracing the linkages from the independent variable to the dependent variable in specific case studies, a better picture is obtained and the theories are examined more fully. Below is how the causal mechanism will be traced in my case studies.

Globalization and Government Education Provision

If a negative relationship were identified between globalization and education spending and/or globalization is associated with other negative changes of government education provision, based on the "efficiency hypothesis", we would expect to see in the case studies that the competitiveness of the export sector and attracting global capital preoccupies government policy-making. We would also expect to see business groups, export sectors and global investors pressure government to decrease taxes and lower inflation; as a result, government would cut public spending programs and devote fewer resources to education.

If a positive relationship were identified between globalization and education spending and/or globalization is associated with other structural changes of government education provision, we would expect in the case studies either the "compensation effect" or "human capital investment incentive" or both. For the former mechanism, we should see the victims of volatile open economy pressure government for compensation. Governments expand public spending programs such as increasing education subsidies as a result. It is also possible that governments take initiatives to expand public spending to co-opt the losers of the open economy and to ensure social stability. For the human

capital investment incentive, we would expect to see to be competitive in the global market, governments attach great importance to education as a form of human capital investment for economic development. The private sector demands skilled labor. Individuals also demand the government to provide better education services to prepare themselves for the competitive labor market. We would also expect the specific nature of the global economy matters: governments adjust their education policies based on the specific requirements of the global economy; the effects of integration into the global market might be different depending on the positioning of the country's economy in the global economy.

In particular, two questions need to be studied carefully in the case studies: 1) in what ways does integration into the global market matter? 2) how does integration into the global market translate into changes in government education provision, if any? What are the policy linkages?

Democratization and Government Education Provision

If a positive link were identified between democratization and education spending or any pro-poor spending/programs, several mechanisms could be traced in the case studies: 1) The politicians expand education spending programs and/or increase education subsidies, especially that of primary or secondary, to attract votes and gain popularity. We should particularly see this behavior of politicians before each election. 2) Interest groups, especially that of parents and teachers, mobilize to demand more spending and/or resist any retraction in education spending.

If no systemic relation were found between democratic regime and education spending/programs, we would expect below mechanisms (or some of them) at work: 1) politicians are not office motivated; 2) interest groups are not active due to collective action problems; 3) voters have different interests due to their income level and skill specificity; 4) authoritarian leaders also value education to boost economic development and legitimacy.

Study Period and Data

For Singapore and Malaysia, the study period will start from their independence year. For Taiwan, 1949, the year when the Nationalist Party flee from the Mainland and began its rule in Taiwan will be the starting point of the study. The study on Thailand begins in 1958, which marks the modern economic development period of Thailand (Dixon, 1999). All four case studies cover materials available until present.

Data for the case studies will be obtained from government documents, websites, newspapers and secondary literature. Information on below variables will be collected: 1) changes in a country's integration into the global economy and the nature of this integration; 2) changes in government education provision associated with changes in its globalization; 3) policy linkages that link globalization to changes in government education provision, if any; 4) the process of democratic transition and/or the maintenance of authoritarian regimes; 5) changes in government education provision associated with democratic transition; 6) electoral competition and interest group activities that produce changes in government education provision, if any.

1.5 Outline of the Dissertation

The rest of the dissertation is structured as follows. Chapter 2 and 3 use the statistical method to study the impacts of globalization and democratization on government education spending and outcomes. Chapter 4 through 7 investigates the effects of globalization and democratization on government education provision in Taiwan, Singapore, Malaysia and Thailand respectively. Chapter 8 concludes.

Chapter 2 Globalization, Democratization and Education Spending in East Asia (1971-2003)

This chapter uses the statistical method to study the impacts of globalization and democratization on resources East Asian governments allocate to education. First analyzed are their impacts on total government education spending; the effects on spending at primary, secondary and tertiary levels are then examined to see how globalization and democratization might affect government allocative priorities within the education sector.

Section 1.3 of Chapter 1 has developed four hypotheses to be tested in this chapter:

HG_1: the more open East Asian countries' economies are to the global market, the more their governments spend on education.

HG2: As East Asian countries become more open to the global market, their governments spend more on education at the primary and the secondary levels; spending on tertiary education is not affected.

HD_1: Democratic governments spend more on education than non-democratic governments in East Asia.

HD_2: Democratic governments spend more on primary and secondary education than non-democratic governments in East Asia; but there is no significant relationship between democratic governments and tertiary spending.

Section 2.1 presents data and operationalization of the variables, followed by model specification in Section 2.2. Statistical results on total education spending models are discussed in section 2.3. Section 2.4 reports results on disaggregate spending models. Section 2.5 offers the conclusion for this chapter.

2.1 Data and Variables

Countries and Studying Period

The statistical study in this chapter includes eight countries/political entities: South Korea, Taiwan, Hong Kong (before 1997), Singapore, Indonesia, Malaysia, Philippines, and Thailand. The study period is 1971-2003.[23]

Education Spending

Education spending directly measures government investment in education. Given that the state is still the dominant funder in East Asian countries (particularly at the primary and the secondary level), studying government spending can give us a sense of the major educational resource available to citizens in East Asia (Holliday and Wilding, 2003).

Following Kaufman and Segura-Ubiergo (2001), three indicators of education spending are used in this study. Education spending as a percentage of total government spending captures budget priorities of the government; education spending as a percentage of GDP reflects allocative priorities within the national economies as a whole; and education spending per capita captures potential resources available to citizens. All three indicators

[23] For a discussion on reasons to choose these countries and this study period, please refer to Introduction, section 1.4.1.

have been used in other studies and there is no consensus on which one is the best specification (Brown, 2004; Rudra and Haggard, 2005; Stasavage, 2005; Dion, 2005; Avelino, Brown and Hunter, 2005; Huber, Mustillo and Stephens, 2004). Simple Pearson correlations tests show these three indicators are only partially correlated in my sample (See Table 2.1). Employing all three has the advantage of capturing different dimensions of spending.

Three similar indicators are used for government spending at different levels. Primary/Secondary/Tertiary spending as a percentage of total government education spending is used to capture government allocative priorities within the education sector; Primary/Secondary/Tertiary spending as a percentage of GDP measures allocative priorities within the national economy as a whole; Primary/Secondary/Tertiary spending per student as % of GDP per capita reflects actual resources available to students at different levels. Again, simple Pearson correlation tests demonstrate the three indicators are only partially correlated (See Table 2.1). It is highly likely they are capturing different dimensions of spending at various levels.

Table 2.1 Three Specifications of Education Spending: Pearson Correlation

Total Government Education Spending

	as % of government Spending	as % of GDP	per capita
as % of government Spending	1		
as % of GDP	.74***	1	
per capita	.46***	.5***	1

Current Education Spending, Primary

	as % of total education spending	as % of GDP	per student as % of GDP per capita
as % of total education spending	1		
as % of GDP	.63***	1	
per student as % of GDP per capita	-.19**	.13	1

Current Education Spending, Secondary

	as % of total education spending	as % of GDP	per student as % of GDP per capita
as % of total education spending	1		
as % of GDP	.49***	1	
per student as % of GDP per capita	.44***	.36***	1

Current Education Spending, Tertiary

	as % of total education spending	as % of GDP	per student as % of GDP per capita
as % of total education spending	1		
as % of GDP	.57***	1	
per student as % of GDP per capita	.03	.36***	1

: significant at .05 level *: significant at .01 level

Due to data limitation, except for Taiwan, government current education spendings[24] at primary/secondary/tertiary levels are used to approximate total education spending at primary/secondary/tertiary levels. This is a reasonable approximation as suggested by

[24] Current education expenditure refers to expenditure for goods and services consumed within the current year and which would be renewed if needed in the following year. It includes expenditure on: staff salaries, pensions and benefits; contracted or purchased services; other resources including books and teaching materials; welfare services; and other current expenditure, such as subsides to students and households, furniture and minor equipment, minor repairs, fuel, telecommunications, travel, insurance and rents. In contrast, capital expenditure refers to expenditure for assets that last longer than one year. It includes expenditure for construction, renovation and major repairs of buildings and the purchase of heavy equipment or vehicles. Definition source: UNESCO online glossary, http://www.uis.unesco.org/glossary/index.aspx?list=C&lang=en, accessed June 29, 2007.

Table 2.2. Except for Indonesia, government current expenditure composes of more than 78 percent of total education spending on average from 1970 to 1997 for all countries/political entities in the sample.[25]

Aggregate education spending data are from Government Financial Statistics and Asian Development Bank Key Indicator Series. Spending at different levels data are obtained from UNESCO. Corresponding GDP data are from World Development Indicators. Data on Taiwan come from national sources. All data contain only central government spending. Appendix 1.8 details variable sources and construction. Appendix 2.1 provides summary statistics of the variables and Appendix 2.2 shows their time trends.

Table 2.2 Current Expenditure as % of Total Education Expenditure (1970-97)

Country	Percentage (%)*
Philippines	91
Hong Kong	90
Malaysia	84
Singapore	82
Korea, Republic of	81
Thailand	78
Indonesia	58

*The entries are average percentage between 1970-97.
Source: UNESCO.

[25] For Indonesia, current expenditure only composes 58 percent of total education spending during the study period. However Indonesia has only several data points for all three levels of education and thus shouldn't influence the model in a significant way. To make sure the validity of the results, the spending level models are estimated with and without Indonesia to see whether the results might differ.

Globalization

Globalization is measured in two ways: trade integration and capital account liberalization.

Trade Integration

Following conventions in the literature, trade integration is measured as (import + export) / GDP. However, this measure might reflect "trade intensity" rather than "institutional openness" to trade. Trade intensity of a country is a function of various factors including resource supplies, prices of products in international markets, technology, tastes, natural barriers to trade and artificial trade barriers (Leamer 1988). Moreover, as a flow measure, this indicator also disregards the stock that is already in place. For example, "a low FDI could be interpreted as low economic integration although, in fact, a saturated stock of FDI in place indicating that the country has been open to foreign capital" (Lehmkuhl, 2005).

Alternative indicators have been constructed that control for the country size effect. One measure regresses the log of the trade ratio on the log of GDP and retrieves the residuals (Plumper 2001).[26] Another alternative looks at the policy indicator, which measures directly institutional openness to trade and has the advantage of not being influenced by country size or geographical locations. Both alternative indicators have been used in this

[26] Another measure of this kind is gravity models, which regress the bilateral trade flow on the log of the exporting country's GDP, the log of the GDP of the importing country, the distance between two countries and some other geographical variables such as a dummy for landlocked countries. The residuals retrieved from the gravity models are then used to represent the part of trade that can't be explained by either country size or geographical effect and thus represent "institutional openness to trade".

study to check whether the findings based on the trade ratio variable are robust. The construction of the policy indicator is explained below.

Capital Account Openness

To measure capital account openness, I build on the index developed by Quinn (Quinn, 1997). Quinn codes both the current and the capital account openness of 64 nations based on IMF's *Annual Report on Exchange Restrictions*. Regulations on imports, exports and invisibles are coded to measure current account openness, which ranges from 0 (not free) to 8 (free). For capital account openness, regulations on both capital payments and receipts countries are coded and countries are ranked from 0 (not free) to 4 (free). Quinn's indicators prove to be quite reliable after several reliability checks. I extend Quinn's indicators to annual data for countries included in this study based on his coding rules.[27] The capital account openness policy indicator is used directly in modeling while the current account openness policy indicator is used as an alternative for the trade ratio variable to check whether the findings are robust.

Other outcome measures have been applied in the literature for capital account openness. One is private capital flow. Some authors feel this measure may capture more directly a country's exposure to international capital movements than the policy measure based on capital controls (Haggard and Rudra, 2005). Another measure is foreign direct investment (Dion, 2005). However, counterarguments focus on the fact that a host of

[27] Quinn's measure provides data for 1973, 1982, 1988 and 1997. Simple Pearson correlation between my current account openness score and Quinn's is .93; the correlation between my capital account openness score and Quinn's is .96 (For the author's coding and a comparison of Quinn's coding and the author's, see Appendix 2.3 and 2.4).

factors other than government preferences, intentions and actions affect actual capital mobility, including other domestic policies, the global economic and financial climate and political circumstances (Eichengreen, 2001). Moreover, for countries included in this study, especially Hong Kong, the missing data problem is more serious for these two measures than for the policy indicator.[28] Thus, the policy indicator is chosen to measure capital account openness for the models; foreign direct investment and gross private capital flow are used later to check the robustness of the findings.

Democratization

Democracy is probably one of the hardest concepts in social science. Surprisingly, despite their somewhat different definitions, commonly used indicators of democracy are highly correlated and thus reliable (Inkeles, 1991; Munck andVerkuilen, 2002). I will use a dichotomous measure of democracy to intuitively capture its possible distinct effect from non-democracy. This is one convention in the literature (Alvarez, Cheibub, Limongi, and Przeworski, 1996; Kaufman and Segura-Ubiergo, 2001). Scores from Keith and Gurr's Polity IV dataset will be used as the base for coding (Marshall, Jaggers and Gurr, 2003). The "authoritarian" score of each country will be subtracted from its "democratic" score. Any country scored above 6 will be coded as democratic, otherwise non-democratic. Judging from the polity coding, we can see from Appendix 2.5 all

[28] There is no data available for Taiwan on any of these indicators. Thus Taiwan is actually excluded from the initial estimation. But models with slight change in specification and thus including Taiwan are estimated in the robustness check section.

countries/political entities in the sample except Malaysia and Singapore have gone through a change of democratization since the late 1980s.[29]

The Polity IV score emphasizes the institutional constraints in a democracy.[30] Other specifications of democracy, which prioritize other dimensions, serve as alternative indicators in the study to check whether the findings on democracy are robust. Among them, freedom house score highlights a list of political and civil rights citizens should enjoy in a democracy (Gastil, 1990). Following Dahl, Vanhanen defines democracy in terms of "participation" and "contestation" and rely on election results to code democracy (Vanhanen, 2000).[31] Another dichotomous measure of democracy highlights its contestation and participation nature (Alvarez, Cheibub, Limongi, and Przeworski, 1996).[32] A last alternative democracy measure is a combination of two indicators: the size of winset and democracy residual (Bueno de Mesquita, Smith, Siverson and Morrow, 2002&2003). The winset indicator is to capture the institutional constraints in a regime and it is designed as such that a democracy usually has a larger winning coalition than a non-democracy. The democracy residual variable is constructed by regressing the polity score on the winset variable; it represents the part of democracy that can't be explained

[29] There is no polity data available for Hong Kong. Hong Kong is thus also actually excluded from the estimation sample (it also lacks data on capital stock as % of GDP). However, models including Hong Kong are estimated in the robustness check section by changing some of the model specifications.
[30] A description of the component indicators of the democracy score in Polity IV can be found at their website: http://www.cidcm.umd.edu/inscr/polity/#data.
[31] Vanhanen defines democracy along two dimensions: 1) competitiveness, which is measured by the fraction of small parties in elections (either presidential or parliamentary); 2) participation, which is measured by the voting proportion of the total population. He multiplies these two dimensions to get a democracy index.
[32] Alvarez, Cheibub, Limongi, and Przeworski defines a regime as a dictatorship if all of the four conditions hold: 1) the executive is not elected; 2) the legislative is not elected; 3) there is no more than one party; 4) Type II error: The incumbents held office in the immediate past by virtue of elections for more than two terms or without being elected, and until today or the time when they were overthrown they have not lost an election. However, their data doesn't cover years after 1990. So I combined their dichotomous measure of regime type (1971-1990) with that of polity regime coding (after 1990).

by its institutional constraints. Appendix 2.6 shows the strong correlation of alternative measures of democracy in my sample. In addition, the time trends of various democracy codings are mostly consistent, as can be seen in Appendix 2.7. All these alternative measures of democracy, along with the continuous Polity score, are employed in the study to check the robustness of the findings.

Economic Controls

GDP per capita

It has been a convention to include GDP per capita in the literature to control for Wagner's law. Wagner's law states that wealthy nations tend to have a larger public sector for a number of reasons: firstly, as nations increase their real income, the increasing complexity of legal transactions and telecommunications would require greater oversight of the state, thus necessitating more state activity and expenditures; secondly, the demand for public goods such as education would also goes up since they are luxury goods and demand for them rise more than proportionate to a change in income (Chang, 2002). Moreover, the degree of industrialization and urbanization usually increases as countries become richer, which in turn creates rising demand for public education provision. This positive relationship between GDP per capita and education spending has been detected in several empirical studies (Kaufman and Segura-Ubiergo, 2001; Rudra and Haggard, 2005; Stasavage, 2005; Huber, Mustillo and Stephens, 2004). To allow valid cross-country and over-time comparison, a Purchasing Power Parity Measure of GDP per capita from Penn table is used.

Business Cycle

Government spending might be influenced by the business cycle. In the OECD countries, welfare spending is usually countercyclical: government spending on unemployment and other social transfers goes up when the economy is bad and falls when the economy recovers; however, governments in developing countries usually lack such stabilizing policies (Rudra and Haggard, 2005; Kaufman and Segura-Ubiergo, 2001). It could be hypothesized that in developing regions government spending on education is pro-cyclical: when the economy is thriving, education spending expands and vice versa. However, existent empirical studies in developing regions haven't found any significant positive relationship between economic growth and government education spending (Brown, 2004; Dion, 2005; Rudra and Haggard, 2005;Avelino, Brown and Hunter, 2005).

Following Kaufman and Segura-Ubiergo and Lehmkuhl (Kaufman and Segura-Ubiergo, 2001; Lehmkuhl, 2005), I have constructed an output gap variable to control for business cycle. This variable is popular among OECD economists. To derive this variable, I first used the Hodrick-Prescott filter[33] to calculate the underlying real GDP per capita trend. An λ of 6.25 is chosen. [34] The final output gap variable is constructed by the difference of the real GDP per capita and the trend variable as a percentage of the trend. A positive sign indicates pro-cyclical spending behavior and vice versa.

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[33] I used an excel add-in of the Hondrick Prescott filter, authored by Kurt Annen. This filter is downloadable at http://www.web-reg.de/hp_addin.html, accessed 4/13/06.

[34] A larger λ indicates a smoother series and more variation for the output gap variable constructed. An λ of 100 is usually suggested in the literature for yearly data. However, 6.25 could provide a smoother series for my data; it is among the ideal bandwidth ($6<\lambda<14$) recently suggested by economists for annual data (Maravall, Agustín, and Ana del Rio (2001), "Time Aggregation and the Hodrick-Prescott Filter," Banco deEspaña);. (Reference obtained from http://econ.ohio-state.edu/hwkim/hpfilter.pdf, accessed July 6, 2006).

Government Revenue

Besides business cycle, Wibbles' study shows that governments in developing countries are highly constrained by their financial capability (Wibbles, 2003). I have included government revenue as percentage of GDP in the model, controlling for the effect that how much governments spend on education may depend on how much they have at their disposal.

Ratio of Capital Stock to GDP

Governments' investment in human capital may also depend on the skill requirement of the economy. The assumption that there should be complementarities between human and physical capital in production has been demonstrated by some studies (Benabou, 1996a&1996b; Checchi, 2003). Bosworth and Collins have developed a measure of capital stock that has taken into particular consideration issues such as stock vs. investment and domestic vs. international prices (Bosworth and Collins, 2003). This measure is included as a control in the model.

Political Controls

Electoral Cycle

The electoral cycle literature suggests politicians might manipulate spending for electoral concerns. Even though the literature is divided on the rationality of the voters, people pretty much agree that politicians could manipulate the economy/spending either to attract supporters or signal their competence to the voters (Nordhaus, 1975; Nelson,

1990; Kwon, 2001). It is interesting that the electoral cycle hypothesis receives more support in the developing world than in the developed world (Ames, 1987; Alesina, Roubini, and Cohen, 1997; Schady, 2000; Andrikopoulos, Loizides and Prodromidis, 2003). Studies demonstrate that electoral politics matter in South Korea: levels of government expenditures increase in accordance with the electoral calendar (Kim, 1999; Kwon, 2001). Given that education spending, especially at the primary and the secondary level, is usually viewed as a public good that could attract the poor and the minority groups, I hypothesize that education spending, especially that of primary and secondary increases at election years.

My coding of the electoral cycle variable is based on the materials provided in Authur S. Banks: Political Handbook of the World (Banks, various editions). Either presidential or parliamentary election is coded depending on the political system of a country. For Taiwan, Indonesia, Korea, Philippines, presidential elections are coded. For Singapore, Malaysia and Thailand, parliamentary elections are coded.[35] Considering spending needs to take place before the election, the variable is coded 1 in the calendar year if the election is held in July through December; the variable is coded 1 in the year preceding the election year if the election is held in January through June (Kraemer, 1997).

Demographical Controls

Population ages 0-14

A younger population puts more pressure on the government to allocate resources to education, especially after they commit to universal schooling. On the other hand, since

[35] There is no election data available for Hong Kong.

primary and secondary education spending also has redistributive consequences, significant coefficient of this variable could also reflect government responsiveness to poorer parents whose children benefit more from basic schooling (Rudra and Haggard, 2005). Including this variable or similar demographical ones is already a convention in the literature (Dion, 2005; Rudra and Haggard, 2005; Stasavage, 2005; Brown, 2004; Kaufman and Segura-Ubiergo, 2001; Avelino, Brown and Hunter, 2005; Huber, Mustillo and Stephens, 2004).

However, this variable is highly correlated with GDP per capita in my sample. The simple Pearson correlation between these two variables is -.9 and the correlation is highly significant. This is probably because family size tends to decrease in rich countries (Rudra and Haggard, 2005). Consequently, following Rudra and Haggard, I estimate each model in three ways: 1) estimate the model with GDP per capita only; 2) estimate the model with the youth population control only; 3) estimate the model with both controls. Differences among the three ways of estimation are reported, if any.

Country and Decade Dummies

Country dummies are used in all model specifications. They correct for the problem of panel heterogeneity and omitted variables such as the size of the population, political history, and geographical location (Beck, 2001; Wilson and Butler, 2004; Kaufman and Segura-Ubiergo, 2001).

A decade dummy is employed to distinguish the 1990s from the years before. The years before 1990s are characterized by rapid expansion of education in this region, especially the introduction of free and compulsory education; in contrast, 1990s saw tides of comprehensive review of education systems and educational reforms (Holliday and Wilding, 2003). Moreover, the 1990s has been the decade of democratization in the region: South Korea, Taiwan, Philippines, Indonesia and Thailand have experienced transitions to democracy. Controlling for the decade effect would help isolate better the impacts of democratization.

Other Controls Considered

A number of other controls have been considered such as debt-service ratio, ethnic fractionalization, foreign aid, inflation and inequality.[36] They are not included in the final models either due to serious missing data problem (inequality and ethnic fractionalization) or insignificance of the variable in the East Asian cases (debt-service ratio, foreign aid and inflation).[37]

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[36] Debt might constraint a government's ability to spend (Brown, 2004; Huber, Mustillo &Stephens, 2004; Dion, 2005; Rudra and Haggard, 2005). Some countries in this region such as Indonesia, Malaysia Philippines, Burma are characterized by high degree of ethnic fraction (Survey of Asia's Regions and Nations, Encyclopedia of Modern Asia). One of the most consistent findings in social science research on ethnic attitudes is the negative association between educational attainment and ethnic prejudice: Higher educated people are less prejudiced toward ethnic outgroups and also less favorable to ethnic ingroups. (Coenders and Scheepers, 2003) One could hypothesize that the higher the level of ethnic fraction, the more resources governments would devote to education for the purpose of national integration. In developing regions such as Latin America and Africa, foreign aid is a factor that influences government spending (Dion, 2005; Stasavage, 2005; Huber, Mustillo and Stephens, 2004). Higher inflation may indicate that governments spend more than the revenues they collect; it also indicates governments face pressure to cut spending and social programs: education programs are frequently the first to cut (Avelino, Brown and Hunter, 2005). Inequality could put fiscal constraints on poor families to send their children to school. Checchi finds inequality is significantly negatively correlated with enrollment at the secondary level (Checchi, 2003). For a review of these alternative theories of education expansion, see section 1.1.3 of chapter 1.

[37] Please see Appendix 2.8 for the available data on ethnic fraction in East Asia. Appendix 2.9 places East Asia in a comparative context for data on debt, foreign aid and inflation. Data on inequality is better but the availability is still too limited for estimation. Appendix 2.13 gives tentative models which control for

2.2 Model Specification

My sample for education spending contains 8 countries and 33 years of each country. This is a time-series cross-sectional (TSCS) dataset as defined by Beck and Katz (Beck and Katz, 1995, 1996, 2001). All inferences in this kind of dataset are conditional on the sample. Such data characteristics also have important repercussions for both statistical modeling and error correction.[38]

I pursued the following modeling strategy. First of all, since my data is dominant in the time dimension (that is, I have more years than countries), stationarity of the variables must be checked first to build correct statistical model (Beck and Katz, 2001; Kittel and Winner, 2005)[39]. However, this is not an easy task. Even though stationarity of single time-series has been well studied, only recently the "second generation" tests for stationarity for large panels have become available (Hurlin and Mingnon, 2004) and we know little about stationarity in time-series cross-section data (Beck, 2001; Beck and Katz 2004).

Given the above methodological limitations, I checked stationarity in two ways. Firstly, I performed Im, Pesaran and Shin panel unit root test for heterogeneous panels (Im,

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inequality; the number of cases available for estimation is too small and almost no coefficients are significant.

[38] For a discussion of the characteristic of TSCS data and its common error structure, see section 1.4.1 of chapter 1.

[39] For a discussion of the importance of analyzing stationary for TSCS data, see introduction, see section 1.4.1 of chapter 1.

Pesaran and Shin, 2003; Kittel and Winner, 2005; Lehmkuhl, 2005).[40] Since this test only works for balanced panels without any gaps, I was only able to apply it to all the explanatory variables and the aggregate spending variables; a few data points have to be deleted to make the panel balanced before the test can be carried out. Table 2.3 shows that all the explanatory variables and the aggregate spending variables are not stationary for all panels; the stationarity of all these variables except the youth population control is achieved after being differenced once; the youth population control variable becomes stationary after being differenced twice. Given the still unclear behavior of these panel tests for TSCS data, I then applied Augmented Dicky-Fuller tests to individual time series in each country.[41] The results are mostly consistent with the panel unit root test results. Most of the individual time series are not stationary. There are quite a few missing data for spending at different levels data which make tests of stationarity less meaningful; but for those series I could carry an augmented Dicky-Fuller test, most of them are either not stationary or stationary with a trend and/or drift.

[40] Given that my sample contains countries that have diverse openness experiences such as Singapore and Indonesia, I feel Im, Pesaran & Shin panel unit root test for heterogeneous panels are more appropriate than panel unit root tests such as Levin, Lin and Chu which assumes homogeneous panels (Levin, Lin and Chu, 2002).

[41] Kit Baum has written a STATA module called panelunit. This module could perform unit root tests on individual time series in a panel (Baum, 2003).

Table 2.3 Spending Models: Stationarity Tests

	Individual Country Series Unit Root Test [1]									Panel Unit Root Test[2]
Variables	hk	ind	kor	mal	phl	sin	tha	taw	group [3]	
lntrade	I(1),t	I(0),t	I(1)	I(1)	I(1)	I(1)	I(1)	I(0)	I(1), t	I(1)*
lngdp_pc	I(1)	I(1)	I(1)	I(1)	I(1)	I(1)	I(1)	I(1)	I(1)	I(1)*
rev_gdp	I(0)	I(0)	I(1)	I(1)	I(1)	I(1)	I(1)	I(1)	I(1)	I(1)
outputga	I(0)	I(1)	I(0)	I(1)	I(1)	I(0)*	I(1)	I(0)	I(1)	I(1)
ks_gdp	no data	I(1)	I(1)	I(1)	I(1)*	I(1)*	I(1)	I(1)	I(1)	I(1)
urban	I(2)	I(2)	I(2)	I(2)	I(2)	I(0)	I(2)	I(2)	I(2)	I(2)
pop014	I(0), td	I(0), td	I(2)	I(2)	I(2)	I(0)	I(1)	I(1)*	I(2)	I(2)
e_gov	I(1)	I(1), t	I(1)	I(1)	I(0), t	I(1)	I(1)	I(1)	I(1), t	I(1)
e_gdp	I(1)	I(1), t	I(1)	I(1)	I(1)	I(1)	I(1)	I(1)	I(1), t	I(1)
lne_pc	I(0), td	I(1)	I(1)	I(0), td	I(1)	I(1)	I(1)	I(1)	I(1)	I(1)
prim_edu	I(1)	no data	I(0), td	I(0)	few obs.	I(0), td	I(2)	I(1)	I(2)	NA#
prim_gdp	I(1)	no data	I(0), td	I(1)	few obs.	I(1)	I(2)	I(1)	I(2)	NA#
primps	I(2)	no data	I(1)	I(1)	few obs.	I(3)	I(1)	I(1)	I(2)	NA#
sec_edu	I(1)	no data	I(2)	I(2)	few obs.	I(0)*	I(0), d	I(1)	I(2)	NA#
sec_gdp	I(1)	no data	I(2)	I(1)	few obs.	I(1)	I(1)	I(1)	I(2)	NA#
secps	few obs.	no data	I(1)	I(1)	I(1)	I(1)	I(1)	I(0), td	I(1)	NA#
ter_edu	I(0), td	few obs.	I(1)	I(1)	I(1)	I(0), td	I(1)	I(1)	I(1)	NA#
ter_gdp	I(0), td	few obs.	I(2)	I(1)	I(1)	I(1)	I(1)	I(1)	I(2)	NA#
terps	I(0), d	few obs.	I(1), td	I(1)	I(0)	I(1)	I(1)	I(1)	I(1)	NA#

1. Augmented Dicky-Fuller tests are applied to individual country series. For example, the first cell refers to the Dicky-Fuller test result of the lntrade variable for Hong Kong.

2. Implemented here is the Im, Pesaran and Shin panel unit root test for heterogeneous panels, augmented by 2 lags with both constant and trend. Exceptions are : lngdp_pc is augmented by 3 lags; ks_gdp is stationary at first difference without trend.

3. Group results refer to the highest order of integration among all the countries in the panel.

4. I(0) indicates the series is stationary by itself;
I(1) indicates the series is stationary after differencing once;
I(2) indicates the series is stationary after differencing twice; t indicates trend, d indicates drift.

*Stationary at .1 level. Other test results without notation are stationary at .05 level.

Panle unit root test can't be carried for these variables due to too many gaps (missing vales) in the data.

Both kinds of test show that non-stationarity characterizes my data. My model of choice is the error correction model, which is relatively robust to non-stationarity among available methodologies.[42] Another advantage of the error correction model is that it

[42] Another model of choice is the difference model (Wooldridge, 2001; Kittel and Winner, 2005; Lehmkuhl, 2005). However, since difference model can only capture short-term dynamics, it doesn't have

could capture both short and long term impacts of the explanatory variables on the dependent variables (Beck, 1991 and 2001; Banerjee, 1993).[43] It has been employed successfully in a number of studies (Kaufman and Segura-Ubiergo, 2001; Franzese, 2001; Keele, 2004b).[44]

The error correction model is given by[45]

$$\Delta Y_{it} = \alpha + \beta_k \Delta X_{it} - \phi(Y_{i,t-1} - \gamma X_{i,t-1}) + \varepsilon_{it} \qquad (2.1)$$

$$(i = 1, ..., N; \quad t = 2, ..., T.)$$

where Y_{it} represents in this study education spending for country i at time t; Δ is the first difference operator; X is a vector of independent variables to be estimated; ε_{it} is a random error.

Error correction model is a nice way to model dynamics by separating short term and long term relationship between the dependent and the explanatory variables. In equation

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much explanatory power for my model given that the impact of political variables such as democracy might take a long time to be felt.

[43] For single time series data, it is advised to use error correction model only when the variables are co-integrated, i.e. when the two integrated series never drift far apart from each other, that is they maintain an equilibrium (Engle and Granger, 1987; Greene, 2003; Keele, 2004a). Tests of co-integration have also been developed (Anderson and Hsiao, 1981). However, tests for co-integration in panel data is still in its early stage (Westerlund, 2005). I have applied the Anderson and Hsiao method to check co-integration for my model but the test is very preliminary given that available panel unit root test of the residuals require balanced panels without gaps (Im, Pearsan and Shin, 2003; Levin, Lin and Chu, 2001) On the other hand, Bannerjee et. Al. (1993) prove that ECMs are linear reparameterizations of autoregressive-distributed lag models (ADLs). The only difference is the short-term dynamics can be estimated directly from the error correction model. Thus, ECMs might be appropriate even if the data are not fully co-integrated but formal proof is still needed for this claim (Keele, 2004b).

[44] However, caution needs to be cast since error correction model is usually applicable to co-integrated theories but there is not much theory available yet for testing for co-integration in panel data.

[45] See Keele 2004a for a discussion of the derivation of the error correction model.

2.1, the short-term relationship is represented by $\Delta Y_{it} = \beta_k \Delta X_{it}$ and the long-term equilibrium by $Y_{i,t-1} = \gamma X_{i,t-1}$. As can be seen from equation 2.1, any impact of X on Y is composed of two parts: first, any short-term change of X, ΔX_t will have a contemporaneous impact on Y and the impact ΔY_t is determined by the coefficient β_k; then, if the short term changes disrupts the long equilibrium relationship between X and Y, Y will continue to change to adjust back to the equilibrium relationship with X at an yearly rate of ϕ. [46]

After rearranging terms, equation 2.1 can be rewritten as

$$\Delta Y_{it} = \alpha - \phi Y_{i,t-1} + \beta_k \Delta X_{it} + \phi\gamma X_{i,t-1} + \varepsilon_{it} \qquad (2.2)$$

Let $\beta_j = \phi\gamma$, then

$$\Delta Y_{it} = \alpha - \phi Y_{i,t-1} + \beta_k \Delta X_{it} + \beta_j X_{i,t-1} + \varepsilon_{it} \qquad (2.3)$$

Equation 2.3 can then be estimated through OLS (Greene, 2003; Kaufman and Segura-Ubiergo, 2001; Keele, 2004a). The interpretation of coefficients is then as follows:

β_k measures the short term impact of ΔX_t on ΔY_t;

γ $(\gamma = \beta j / \phi)$ measures the long-run equilibrium relationship between X and Y;

[46] More specifically, if $Y_{i,t-1}$ is higher than its equilibrium ($Y_{i,t-1} > \gamma X_{i,t-1}$), the third term of equation 2.4 $-\phi(Y_{i,t-1} - \gamma X_{i,t-1})$ will be negative so Y_t will decrease back to its equilibrium level at an yearly rate of ϕ; on the other hand, if $Y_{i,t-1}$ is lower than its equilibrium ($Y_{i,t-1} < \gamma X_{i,t-1}$), the third term of equation 2.4 will be positive so Y_t will increase to reach its equilibrium level at an yearly rate of ϕ.

ϕ is the yearly adjust rate.

The total impact of ΔX_t on ΔY_t is $\beta_k + \gamma = \beta_k + \beta_j / \phi$. (2.4)

Unit heterogeneity is another problem of concern when modeling TSCS data (Beck, 2001; Beck and Katz, 2004). Equation 2.3 assumes countries in the sample come from a homogeneous universe, i.e. the impacts of the explanatory variables are the same in different countries. However, it might not be the case: unit heterogeneity might be an interesting feature of the data that needs to be modeled. Following Kaufman and Segura-Ubiergo, I have included country dummies in the error correction model to control for unit heterogeneity (Kaufman and Segura-Ubiergo, 2001)[47]. Including country dummies could also control for the influence of omitted variables such as the size of the population, political history, and geographical location (Beck, 2001; Wilson and Butler, 2004; Kaufman and Segura-Ubiergo, 2001).[48] A decade dummy of 1990s is also included to help isolate better the impacts of democratization. [49]

Objections have been made that including country and decade dummies might absorb cross-section and cross-time variance; thus scholars need to be careful about using them by balancing their advantages and disadvantages (Plumper, Troeger and Manow, 2005). Beck and Katz also suggest the problem of pooling should be cautiously studied before a

[47] Random coefficient model is another model that compromise between assuming complete unit homogeneity and assuming complete unit heterogeneity. However, their utility in comparative politics is not clear yet, especially as T gets large, since we will observe the least shrinkage when we most need it (i.e. when the units are heterogeneous) (Beck, 2001).

[48] The use of country dummies is equivalent to the use of a fixed effects model, except that the fixed effect for different country is estimated directly. The appropriateness of fixed effects model for TSCS data over random effects model have been established by Hsaio (Hsaio, 1986: 41-43).

[49] See section 2.1 “Country and Decade Dummies” for more reasons to include the decade dummy.

decision on modeling is made (Beck and Katz, 2001&2004). In response to these concerns, F-test has been used in the study to assess whether country effects are required; some countries have also been added in or dropped from the model one at a time to see whether the results would differ.[50] In terms of using the decade dummy of 1990s, given that my data (8 countries, 33 years each) is dominant in the time dimension, I have less worry one decade dummy would badly absorb the variation.

The final model I estimate is the following:

$$\begin{aligned}\Delta Y_{it} = \alpha - \phi Y_{i,t-1} + \beta_k (&\Delta \ln trade_{i,t-1} + \Delta CapitalAccount_{i,t-1} + \Delta \operatorname{Re} gime_{i,t-1} + \Delta GDPpercapita_{i,t-1} \\ &+ \Delta CapitalIntensity_{i,t-1} + \Delta Government \operatorname{Re} venue_{it} + \Delta Bu \sin essCycle_{it}) \\ &+ \beta_j ((\ln trade_{i,t-2} + CapitalAccount_{i,t-2} + \operatorname{Re} gime_{i,t-2} + GDPpercapita_{i,t-2} \\ &+ CapitalIntensity_{i,t-2} + Government \operatorname{Re} venue_{i,t-1} + Bu \sin essCycle_{i,t-1}) \\ &+ \Delta election_{it} + \chi U + \delta T + \varepsilon_{it}\end{aligned} \tag{2.5}$$

As in equation 2.1, Y_{it} represents education spending for country i at time t; Δ is the first difference operator. The explanatory variables trade, capital account openness, regime, GDP per capita and capital intensity of the economy are lagged one year to increase confidence the causality occurs from these exogenous variables to the dependent variable. Government revenue and business cycle are not lagged since they capture shock of the same year. $\Delta election_{it}$ is the differenced election dummy[51]; U is a vector of country dummies; T is the decade dummy; ε_{it} is a random error. The model is estimated through

[50] This technique is similar to cross-validation (Beck, 2001).
[51] Since I don't theoretically expect a long-run impact of election cycle on education spending, I have only included a differencing term for it.

OLS with Panel Corrected Standard Errors. Since panel corrected standard errors tend to be bigger than ordinary estimates and produce more conservative results (Beck and Katz, 1995), I would have a smaller probability to falsely reject the null hypothesis. Five variables - trade, GDP per capita, education spending per capita, tertiary spending as % of GDP and tertiary spending per student as % of GDP per capita have been logged to achieve normality since these variables are highly skewed.[52]

2.3 Aggregate Spending Model Results

2.3.1 Model Results

Explanatory Power

Table 2.4 shows the results for aggregate spending models. The D. line refers to the differenced term of the explanatory variable and the L. line refers to the lagged term. For clarity of presentation, the coefficients for country dummies are not shown. In general, the models explain about 27% to 36% of total variance in education spending. The fit is reasonable overall. However, the independent variables explain education spending as % of GDP and education spending per capita much better than explaining education spending as % of total government spending: the R^2 for the first two specifications are .36 while the R^2 is only .27 for education spending as % of total government spending model.[53] One possible explanation is that since most of the explanatory variables are

[52] See Appendix 2.10 for the effects of log transformation. Skewed distributions need to be transformed due to the following reasons: 1) highly skewed distributions are difficult to examine because most of the observations are confined to a small part of the range of the data; 2) transformation can bring apparently outlying values to the main body of data; 3) most common statistical methods such as OLS summarize distributions using means but the mean of a skewed distribution is not a good summary of its center (Fox, 1997).

[53] Except for trade, log GDP per capita and decade, none of the explanatory variables are significant for the education spending as % of total government spending model.

macro-economic ones[54], they cannot explain government budget priority as well.[55] One could speculate that total government spending might be constrained by macro-economic conditions,[56] but given total spending available, government budget priority might be influenced more by political variables such as the ideological orientation of the party in government, the number of veto points, the type of electoral and party systems, interest groups, bureaucratic politics, security concerns, policy prescriptions of the international financial institutions, none of which are included in the model (Huber, Mustillo and Stephens, 2004; Terai, 2004; Jonakin and Stephens, 2004; Tavits, 2004; Mukherjee, 2003).

Control Variables

Coefficients for the control variables are generally consistent with theoretical expectations. In Table 2.5, I translate the meaning of the coefficients based on formulas 2.4. There is a significant long term relationship between GDP per capita and all three specifications of education spending. The coefficients for the first two specifications are negative: richer countries in East Asia tend to devote a lower proportion of their government spending and GDP to education.[57] However, Wagner's law still applies

[54] The two political variables are democracy and election.

[55] Education spending as % of total government spending is a measure of government budget priority. My finding is consistent with Chan, who finds in his time series study of Taiwan, South Korea and Singapore, that the macro-economic variables explain education and social security spending per capita much better than explaining education and social security spending as percentage of government budget.

[56] Table 2.4 (model 4) shows the R^2 for total government spending as % of GDP is indeed higher. The same independent variables could explain 36% of variance in total government spending as % of GDP in contrast to only explaining 27% of education spending as % of total government spending.

[57] The highest spenders in the sample, Malaysia and Thailand, spend on average 5.6% and 3.7% of their GDP on education from 1971 to 2003. Their GDP per capita is less than half of the richest countries/entities in the sample, Hong Kong and Singapore, which devote on average 2.9% and 3.6% of their GDP to education.

when we consider the absolute educational resource available to citizens: the impact of GDP per capita on education spending per capita is positive and highly significant. [58]

The models also show that East Asian countries are constrained by their fiscal capability to spend on education. For both education spending as % of GDP and per capita spending models, the coefficients for government revenue are positive and significant in both short and long term.[59] Consistently, education spending in East Asia is pro-cyclical: a positive output gap leads to a decrease in spending as percent of GDP in the same year, but to a larger increase in the following years; economic growth also has a contemporaneous positive effect on per capita education spending.[60] Consistent with theoretical expectations, East Asian governments devote more to education as their economies become more capital-intensive, but the relationship is only a long-term equilibrium one: the coefficients for the long-term impact are positive for all specifications and highly significant for education spending as percent of GDP and per capita spending.[61]

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[58] One log GDP per capita increase would lead to a .53 increase in log education spending per capita. For example, if the poorest country in the sample, Indonesia, with an average GDP per capita of $2454, could improve its income level by 25%, to $3068, its education spending per capita would increase by about 13%, from $40 to about $45.

[59] A 10% government revenue increase relative to GDP would increase education spending as % of GDP by .5 percent immediately and 1 percent in the long run, a total effect of 1.5 percent. For a country like Korea with an education spending per capita of $246, which is about the average spending in the sample, 10% government revenue increase relative to GDP would increase its education spending per capita immediately by $24 and by $84 in the subsequent years, a total increase of $108 (a 44% increase).

[60] A 10% increase in economic growth would increase education spending by .3% relative to GDP and log per capita spending by .1. This means for a country like Korea with an average per capita spending of $246, a 10% increase in economic growth would increase its per capita spending to $270, an increase of 8%.

[61] A 1% increase in capital stock relative to GDP would increase education spending relative to GDP by .01 percent. Given that countries in the sample spend on average 3 percent of GDP on education with a capital stock of about 207% relative to GDP, this means 1% increase of capital stock would lead to a 13% increase in education spending. On the other hand, one percent increase of capital stock relative to GDP would increase log education spending per capita by .003. For example, for a country like Indonesia with an initial capital stock of 163% of GDP and $2454 education spending per capita, if its capital stock relative to GDP increases 1% of GDP (a .6% increase), its education spending per capita would reach $2461 (a .3% or $7 increase). The effect is pretty significant in scale.

Trade

We now turn to the substantive explanatory variables of the model. Trade integration has a long term positive impact on all specifications of education spending; the effects are slightly significant for as percent of government spending and as percent of GDP and highly significant for per capita spending specification. The effects of trade are positive in the short term for as percent of GDP and per capita spending as well but those effects are not significant. One unit increase of log trade in the long term would increase education spending by about 5% relative to total government spending, 1% relative to GDP and .31 unit of log per capita spending. This means if Indonesia, the country with the lowest level of trade integration in the sample, increase its trade level (52% of GDP) to that of Korea (63% of GDP), a 21% increase of trade for Indonesia, its education spending (about 8% relative to total government spending, 2% relative to GDP and $40 per capita) would increase 1% relative to total government spending (a 13% increase), .2% relative to GDP (a 13% increase) and its education spending per capita would increase $3 (a 8% increase). The effects are quite significant in scale.

Capital Account Openness

Both the short and long term impacts of capital account openness are negative but insignificant in all specifications of education spending. In accordance with Mosley's finding in the OECD countries (Mosley, 2000), the influence of financial markets may be "strong but narrow" as well in the East Asian case: education spending is not the indicator that financial investors would respond to. On the other hand, one could imagine

that high capital mobility not only provides financial investors with more exits when they are not satisfied with government policies, but also provides governments with alternatives to borrow in the global market. Such double-edged effect of capital mobility in the end cancel each other.

Democracy

Democracy doesn't have a significant impact on education spending as percent of total government spending. But for both education spending as percent of GDP and education spending per capita models, the impacts of democracy are positive and significant in both short and long term. Democracies would increase education spending by about .3% of GDP the next year immediately following democratization; then it would increase education spending more by about .5% of GDP gradually. Overall, democracies spend about 1% more of GDP on education than non-democracies in approximately six years.[62] Given that the average spending is about 3% of GDP in the region, this is about 33% increase in educational resources. Democratization would also improve log education spending per capita by .32 in total. For a country such as Malaysia, with an average education spending per capita of $319, this means education spending per capita would rise to $439 (a 38% increase) in approximately eight years.[63] This is a pretty large effect.

[62] The rate of adjustment is .4 (based on the coefficient of the lagged dependent variable) for education spending as % of GDP model. Since the short-term impact is significant, education spending would increase by .3% the next year immediately following democratization. Then, in the third year, education spending will increase by .4*.53=.21, the fourth year by (.53-.21)*.44=.14, the fifth year by (.53-.21-.14)*.44=.08, the sixth year by (.53-.21-.14-.08)*.44=.04 etc. until the effects go away. The total increase will be ..27%+.53%=.8%.

[63] The rate of adjustment for education spending per capita model is .36. Log education spending per capita would increase by .1 the next year immediately following democratization. Then in the third year, log spending per capita will increase by .22*.36=.08, the fourth year, by (.22 - .08)*.36=.05, the fifth year, by (.22-.08-.05)*.36=.03, the sixth year, by (.22-.08-.05-.03)*.36=.02, the seventh year, by (.22-.08-.05-.03-

Electoral Cycle

The effect of electoral cycle is not significant in any specifications of education spending. It seems politicians in East Asia do not manipulate education spending as a means either to attract voters directly or signal their competence at the time of election.

.02)*.36=.01, the eighth year, by (.22-.08-.05-.03-.02-.01)*.36=.01, etc. until the effects go away. The total effects will be .1+.22=.32.

Table 2.4 Total Government Education Spending Model Results

Model		(1)	(2)	(3)	(4)
		Education Spending as % of Government Spending	Education Spending as % of GDP	Education Spending per capita (log)	Government Spending as % of GDP
Trade (log) $_{t-1}$	D.	-.4	.37	.14	.03
		(1.4)	(.29)	(.09)	(.03)
	L.	1.4*	.27*	.11***	.02*
		(.74)	(.15)	(.04)	(.01)
Capital Account Openness $_{t-1}$	D.	-.4	-.03	-.02	.004
		(.42)	(.11)	(.03)	(.01)
	L.	-.04	-.03	-.01	-.01
		(.29)	(.06)	(.02)	(.01)
Regime $_{t-1}$	D.	.54	.27*	.1**	.02*
		(.74)	(.15)	(.05)	(.01)
	L.	-.25	.21**	.08**	.04***
		(.47)	(.11)	(.03)	(.01)
Election$_t$	D.	-.14	.04	.01	.004
		(.18)	(.04)	(.01)	(.003)
GDP per capita (log) $_{t-1}$	D.	-11	-2.3	-.08	-.02
		(7.2)	(1.5)	(.39)	(.07)
	L.	-1.1*	-.47***	.19***	-.02*
		(.67)	(.17)	(.07)	(.01)
Revenue as % of GDP $_t$	D.	-.09	.05***	.01**	.005***
		(.07)	(.01)	(.004)	(.001)
	L.	-.001	.04***	.01***	.004**
		(.06)	(.01)	(.003)	(.002)
Output Gap $_t$	D.	-.02	-.02**	.01**	-.001
		(.04)	(.01)	(.003)	(.001)
	L.	.01	.02*	.001	.001
		(.04)	(.01)	(.003)	(.001)
Capital Stock as % of GDP $_{t-1}$	D.	-.02	.0002	.0003	
		(.03)	(.005)	(.001)	
	L.	.01	.004***	.001**	
		(.01)	(.001)	(.0005)	
Lagged Dependent Variable		-.3***	-.4***	-.36***	-.49***
		(.06)	(.07)	(.06)	(.11)
Decade		.92**	-.14	-.03	-.04***
		(.45)	(.1)	(.03)	(.01)
Constant		8.1	2*	-.89**	.1
		(5.3)	(1.2)	(.42)	(.08)
R^2		.27	.36	.36	.36
N		159	159	159	159

1. All Models are estimated through OLS with panel corrected standard errors. D. refers to a differenced term of the explanatory variable and L. refers to a lagged term. In brackets are panel corrected standard errors.

2. Country Dummies are not shown for clarity of presentation. F tests indicate country dummies are significant in all the models except (1). Appendix 2.11 analyzes the residuals of these models. The residuals from model (1)&(2) still have slight panel heterogeneity after PCSEs are used. The residuals of Malaysia in Model (2) have slight autocorrelation.

*significant at .1 level; ** significant at .05 level; ***significant at .01 level.

Table 2.5 Total Government Education Spending - Interpretation of Results

Model		(1)	(2)	(3)
	Impacts	Education Spending as % of Government Spending	Education Spending as % of GDP	Education Spending per capita (log)
Trade (log) $_{t-1}$	short run	-.4	.37	.14
	long run	4.7*	.68*	.31***
	total	4.7*	.68*	.31***
Capital Account Openness $_{t-1}$	short run	-.4	-.03	-.02
	long run	-.13	-.08	-.03
	total	-.53	-.11	-.05
Regime $_{t-1}$	short run	.54	.27*	.1**
	long run	-.83	.53**	.22**
	total	-.29	.8*	.32**
Election$_t$	short run	-.14	.04	.01
	total	-.14	.04	.01
GDP per capita (log) $_{t-1}$	short run	-11	-2.3	-.08
	long run	-3.7*	-.1.2***	.53***
	total	-3.7*	-1.2***	.53***
Revenue as % of GDP $_t$	short run	-.09	.05***	.01**
	long run	-.003	.1***	.03***
	total	-.09	.15***	.04**
Output Gap $_t$	short run	-.02	-.02**	.01**
	long run	.03	.05*	.003
	total	.01	.03*	.01**
Capital Stock as % of GDP $_{t-1}$	short run	-.02	.0002	.0003
	long run	.03	.01***	.003**
	total	.01	.01***	.003**
Adjustment Rate		-.3***	-.4***	-.36***
Decade		.92**	-.14	-.03
Constant		8.1	2*	-.89**
R^2		.27	.36	.36
N		159	159	159

[1]Total impact is a summation of the significant short and long run impacts. If short and long run impacts have different level of significance, to be conservative, the lower level of significance is assigned to the total impact.

*significant at .1 level; **significant at .05 level; ***significant at .01 level.

2.3.2 Robustness Check

An often-criticized problem of statistical study is that changes in specifications would easily alter the results. Even though there is no standard definition of “robustness”, people would generally agree that a finding is robust when the signs and/or significance

of the coefficients remain constant despite changes in specifications (Learmer 1985; Salai-I-Martin, 1997).

The robustness of my findings are examined in the following ways: 1) using alternative measures of globalization and democracy; 2) slightly varying controls in the model; 3) cross-validating the results by adding and/or dropping individual country from the sample; 4) employing different estimation method.

Different Specification of Globalization and Democracy

Globalization

Table 2.6 shows the results of models with different specification of trade integration and capital account openness. Trade residual is the trade variable excluding the effect of country size. Current account openness is a policy indicator of trade originally developed by Quinn (Quinn, 1997) and extended to annual data by the author.[64] Foreign direct investment and gross private capital flow are alternative measures for capital account openness.

[64] For the coding rules, see section 2.1 in this chapter.

Table 2.6 Total Government Education Spending Models - Robustness Check - Alternative Measures of Globalization

Dependent Variable		Education Spending as % of Government Spending					Education Spending as % of GDP					Eduation Spending per capita (Log)				
Model		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
Trade $(log)_{t-1}$	D.	-.4		1.8			.37		.39			.14		.14		
	L.	1.4*		1.9*			.27*		.32*			.11***		.12**		
Trade $Residual_{t-1}$	D.		-.34					.35					.13			
	L.		1.3**					.19					.1**			
Current Account $Openness_{t-1}$	D.				-.23	.01				-.05	-.01				-.01	.01
	L.				-.06	-.24				.01	.05				.01	.02
Capital Account $Openness_{t-1}$	D.	-.4	-.4			-.39	-.03	-.03			-.02	-.02	-.02			-.04
	L.	-.04	-.1			.46	-.03	-.02			-.07	-.01	-.02			-.03
Foreign Direct Investment $(log)_{t-1}$	D.			-.18	-.11				-.01	0				-.01	-.003	
	L.			-.12	-.07				-.06	-.06				-.03*	-.03*	
Private Capital Flow $(log)_{t-1}$	D.			-.32	-.15				-.01	.002				-.01	-.01	
	L.			-.27	.12				-.06	.06				-.002	.02	
$Regime_{t-1}$	D.	.54	.52	.5	.56	.7	.27*	.28*	.34**	.35**	.27*	.1**	.1**	.12**	.12**	.11**
	L.	-.25	-.17	-.41	-.35	-.13	.21**	.21**	.23**	.24**	.17	.08**	.09**	.08***	.08**	.06*
$Election_t$	D.	-.14	-.15	-.15	-.21	-.13	.04	.04	.03	.02	.03	.01	.01	.004	.001	.01
GDP per capita $(log)_{t-1}$	D.	-11	-12	.03	-3.7	-9.5	-2.3	-2.4*	-2.2	-1.6	-2	-.08	-.14	.03	.28	.08
	L.	-1.1*	-1.7**	.03	-1.4	-1.1*	-.47***	-.55***	-.62***	-.71***	-.53***	.19***	.15**	.11	.09	.18***
Revenue as % of GDP_t	D.	-.09	-.09	.001	.03	-.08	.05***	.05***	.06***	.05***	.05***	.01**	.01**	.01***	.01**	.01**
	L.	-.001	-.01	.03	.03	.02	.04***	.04***	.05***	.05***	.04***	.01***	.01***	.01***	.01***	.01***
Output Gap_t	D.	-.02	-.02	-.04	-.04	-.01	-.02**	-.02*	-.01	-.01*	-.02*	.01**	.01**	.01***	.01***	.01***
	L.	.01	.01	.004	-.001	.01	.02*	.02**	.02**	.02**	.02**	.001	.002	.003	.003	.002
Capital Stock as % of GDP_{t-1}	D.	-.02	-.02	-.01	.01	-.01	.0002	.001	.001	.004	.002	.0003	.0002	.001	.002	.001
	L.	.01	.01	.01	.02*	.01**	.004***	.004***	.004***	.005***	.005***	.001**	.001**	.001**	.001***	.001***
Lagged Dependent Variable		-.3***	-.3***	-.27***	-.25***	-.3***	-.4***	-.4***	-.37***	-.38***	-.42***	-.36***	-.37***	-.33***	-.33***	-.38***
Decade		.92**	.85*	.83*	1.1**	1**	-.14	-.14	-.08	-.03	-.09	-.03	-.03	.004	.02	-.005
Constant		8.1	19***	-.86	13*	13**	2*	3.7***	3*	5.2***	4.4***	-.89**	-.1	-.33	.42	-.01
R^2		.27	.27	.21	.19	.26	.36	.36	.36	.35	.35	.36	.35	.35	.33	.34
N		159	158	133	133	159	159	158	133	133	159	159	158	133	133	159

[1.] Model (1) (6) and (11) are baseline models which are reported in table 2.4. *significant at .1 level; **significant at .05 level; ***significant at .01 level.

Model (1), (6) and (11) are the models originally reported in this section. They serve as baseline models during the robustness check. As can be seen from Table 2.6, results based on the trade residual indicator (models 2, 7, &12 in Table 2.6) are almost the same as those of the baseline models. However, a policy indicator of trade integration usually produce quite different results: the long term impact of trade on education spending as percent of government spending changes from positive to negative and the significance of the term goes away (Table 2.6, Model 4&5); for spending as % of GDP and per capita spending models, the long-term impact of trade is still positive but no longer significant (Table 2.6, Model 9&10, 14 &15).[65]

On the other hand, the finding on capital account openness is more robust: its insignificance and negative signs remain constant across different specification of trade integration, capital account openness and their combination.

Democracy

The finding on democracy is robust regardless of indicators chosen, as can be seen from Table 2.7. The alternative indicators of democracy have already been discussed in section 2.1. To recapitulate, ACLP regime is a dichotomous measure of democracy constructed by Alvarez, Cheibub, Limongi, and Przeworski;[66] polity score is a continuous measure of democracy from the Polity dataset; liberty score comes from the freedom house;

[65] I suspect one reason the significance goes way is probably that the trade intensity measure (a continuous variable) has more variation than the policy measure, which is a qualitative indicator with much less fine scales.

[66] The largest difference between the aclp regime measure and my regime measure based on the polity score lies in Thailand. Thailand is coded as a democracy from 1983 to 1990 by ACLP but coded as a non-democracy based on the polity score.

polyarchy is a democracy measure constructed by Vanhanen, relying mainly on election results; democracy residual is the part of polity score that cannot be explained by the size of winset based on the theory of Bueno de Mesquita, Smith, Siverson and Morrow. Democracy remains insignificant for all models of education spending as % of government spending (Table 2.7, Model 1- 6); however, the long-run positive effect of democracy on education spending as % of GDP is significant for almost all indicators except one (Table 2.7, Model 7 -12,); both the short and long run impacts of democracy on per capita spending remain positive and significant across indicators (Table 2.7, Model 13 – 18).[67]

[67] One remark on the side: contrary to the theory of Bueno de Mesquita, Smith, Siverson and Morrow, the size of winset doesn't have a significant impact for education spending.

Table 2.7 Total Government Education Spending Models - Robustness Check - Different Measures of Democracy

Dependent Variable		Education Spending as % of Government Spending						Education Spending as % of GDP						Eduation Spending per capita (Log)					
Model		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
Trade $(log)_{t-1}$	D.	-.4	-.45	-.38	-.23	-.36	-.42	.37	.46	.42	.35	.45	.41	.14	.16*	.15	.14	.16*	.14
	L.	1.4*	1.4*	1.4**	1.7**	1.6**	1.4*	.27*	.29*	.3**	.33**	.36**	.3**	.11***	.12***	.13***	.15***	.15***	.13***
Capital Account $Openness_{t-1}$	D.	-.4	-.41	-.41	-.39	-.4	-.38	-.03	-.02	-.03	-.02	-.04	-.02	-.02	-.02	-.02	-.01	-.02	-.02
	L.	-.04	-.06	-.09	-.06	-.08	-.03	-.03	-.05	-.04	-.02	-.06	-.03	-.01	-.02	-.02	-.01	-.03	-.01
$Regime_{t-1}$	D.	.54						.27*						.1**					
	L.	-.25						.21**						.08**					
ACLP $Regime_{t-1}$	D.		-.26						.14						.06**				
	L.		-.23						.09						.05*				
Polity $Score_{t-1}$	D.			-.04						.01						.01**			
	L.			-.02						.01*						.01**			
Liberty $Score_{t-1}$	D.				-.14						.07*						.03**		
	L.				.07						.09***						.04***		
Polyarchy $Score_{t-1}$	D.					-.01						.01						.004*	
	L.					.01						.01**						.003***	
Size of $Winset_{t-1}$	D.						-.61						.01						.03
	L.						-.5						.02						.02
Democracy $Residual_{t-1}$	D.						-.06						.01						.01*
	L.						.02						.02**						.01**
$Election_t$	D.	-.14	-.15	-.16	-.14	-.15	-.16	.04	.04	.04	.03	.04	.04	.01	.01	.01	.01	.01	.01
GDP per capita $(log)_{t-1}$	D.	-11	-10	-10	-9.1	-11	-11	-2.3	-2.2	-2.4	-2.6*	-2.5*	-2.4*	-.08	-.15	-.15	-.27	-.2	-.18
	L.	-1.1*	-1	-1.1	-.75	-.92	-.98	-.47***	-.49***	-.42**	-.45***	-.49***	-.4**	.19***	.15**	.2***	.19***	.17**	.21***
Revenue as % of GDP_t	D.	-.09	-.09	-.09	-.08	-.1	-.09	.05***	.05***	.05***	.04**	.05***	.04***	.01**	.01**	.01**	.01	.01**	.01**
	L.	-.001	0	.003	-.01	-.01	.003	.04***	.04***	.04***	.03**	.04***	.04***	.01***	.01***	.01***	.01**	.01***	.01***
Output Gap_t	D.	-.02	-.02	-.02	-.03	-.02	-.03	-.02**	-.01*	-.02*	-.01	-.01*	-.02**	.01**	.01***	.01***	.01***	.01***	.01**
	L.	.01	-.003	.002	-.01	-.001	-.003	.02*	.02**	.02**	.02**	.02**	.02**	.001	.003	.002	.003	.002	.002
Capital Stock as % of GDP_{t-1}	D.	-.02	-.02	-.02	-.02	-.02	-.02	.0002	.001	.0003	0	0	0	.0003	0	.0002	0	.0002	0
	L.	.01	.01	.01	.01	.01	.01	.004***	.004***	.004**	.003**	.004**	.003**	.001**	.001**	.001	.001	.001*	.001
Lagged Dependent Variable		-.3***	-.31***	-.31***	-.3***	-.3***	-.32***	-.4***	-.37***	-.39***	-.38***	-.39***	-.39***	-.36***	-.33***	-.36***	-.37***	-.36***	-.36***
Decade		.92**	.88**	.89*	.6	.68	.9*	-.14	-.08	-.13	-.08	-.11	-.13	-.03	-.01	-.02	-.01	-.02	-.03
Constant		8.1	7.7	8.1	.57	6.3	4.3	2*	2.7**	1.7	1.8	2.7**	1.4	-.89**	-.74*	-.97**	-1**	-.92**	-1.1**
R^2		.27	.27	.27	.24	.27	.28	.36	.35	.35	.32	.36	.36	.36	.34	.35	.37	.36	.36
N		159	159	159	155	159	159	159	159	159	155	159	159	159	159	159	155	159	159

[1.] Model (1) (7) and (13) are baseline models which are reported in table 2.4. *significant at .1 level; **significant at .05 level; ***significant at .01 level.

Varying Controls

Youth Population

Youth (0-14) population is an important control in the study of education spending. However, the baseline models didn't include this control due to its high collinearity with GDP per capita. Including youth population in the models as a control either separately or together with GDP per capita does not change most of the substantive findings (Table 2.8, Table 2.9 & Table 2.10, model 2&3). The only exception lies in the education spending as percent of GDP model: the positive impacts of trade and regime lose their significance when the youth population control is entered into the model together with GDP per capita (Table 2.9, model 2); when youth population is entered alone, the trade and regime terms are still significant (Table 2.9, model 3). For the other two specifications of education spending (as percent of total government spending and per capita spending), the results remain pretty much the same (Table 2.8& Table 2.10, model 2&3).

Table 2.8 Education Spending as % of Government Spending Model - Robustness Check - Controls

Dependent Variable		Education Spending as % of Government Spending									
Model		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Trade $(log)_{t-1}$	D.	-.4	-.64	-.37	.73	-.33	-.75	-.38	-.43	-.06	-.29
	L.	1.4*	1.3*	1.7**	1.7***	1.4*	.75	1.5*	1.3	1.9**	1.7*
Capital Account $Openness_{t-1}$	D.	-.4	-.2	-.05	-.29	-.44	-.49	-.04	-.39	-.42	-.35
	L.	-.04	.16	.38	-.17	-.03	-.23	-.19	-.04	.15	.03
Trade* Capital $Account_{t-1}$	D.						.002				
	L.						.002				
$Regime_{t-1}$	D.	.54	.26	.5	.83	.59	.68	1.6	1.7*	.51	.63
	L.	-.25	-.66	.07	.25	-.25	-.005	-.64	.72	-.03	-.23
$election_t$	D.	-.14	-.16	-.16	.03		-.14	-.16	-.15	-.14	-.14
Capital Account*$Regime_{t-1}$	D.							-.7			
	L.							.2			
GDP per capita*$Polity_{t-1}$	D.								-.01		
	L.								-.01		
GDP per capita $(log)_{t-1}$	D.	-11	-8		-7.8	-12*	-9.1	-12	-10	-12*	-11
	L.	-1.1*	-3.9***		-1.4**	-1.1	-1.1*	-1.2*	-1.3*	-.95	-.78
Revenue as % of GDP_t	D.	-.09	-.15**	-.14**	.06	-.09	-.1	-.09	-.07	-.1	-.08
	L.	-.001	-.12	-.09	.05	-.002	-.01	.003	.01	-.03	.003
Output Gap_t	D.	-.02	-.01	-.04	-.05	-.02	-.03	-.02	-.03	-.03	-.02
	L.	.01	.03	-.06*	.03	.01	-.01	.01	-.002	.02	.01
Capital Stock as % of GDP_{t-1}	D.	-.02	-.001	.0003	-.01	-.02	-.01	-.02	-.02	-.02	-.02
	L.	.01	.01	.003	.01*	.01	.01	.01	.01*	.01	.01
Government Spending as % of GDP_{t-1}	D.				-32***						
	L.				-7						
Youth Population $(0\text{-}14)_{t-1}$	D.		1.3**	1.6**							
	L.		-.27**	.01							
After '97 Crisis										-1**	
Trend											-.06
Lagged Dependent Variable		-.3***	-.35***	-.36***	-.3***	-.3***	-.31***	-.3***	-.31***	-.29***	-.3***
Decade		.92**	.93**	.42	.33	.91**	1**	.97**	.94**	.76*	1.1**
Constant		8.1	42***	-1.9	15**	7.2	12**	8.5	9.8*	5	122
R^2		.27	.31	.28	.53	.27	.28	.28	.28	.29	.28
N		159	159	159	159	159	159	159	159	159	159

1. Model (1) is the baseline model.

2. Model (2) is the baseline plus the youth population control.

3. Model (3) is the baseline plus the youth population control but excluding GDP per capita.

4. Model (4) examines the effect of government spending as % of GDP.

5. Model (5) examines the effect of excluding election.

6. Model (6) examines whether there is an interaction between trade and capital account openness.

7. Model (7) examines whether there is an interaction between regime and capital account openness.

8. Model (8) examines whether there is an interaction between democracy and GDP per capita.

9. Model (9) examines whether East Asian governments spend less after the financial crisis.

10. Model (10) examines whether adding a trend term would alter the results.

* significant at .1 level **significant at .05 level ***significant at .01 level.

Table 2.9 Education Spending as % of GDP Model - Robustness Check - Controls

Dependent Variable		Education Spending as % of GDP									
Model		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Trade $(log)_{t-1}$	D.	.37	.3	.46	.33	.35	.37	.4	.33	.39	.45
	L.	.27*	.21	.29*	.23*	.27*	.14	.34**	.24	.3*	.44**
Capital Account $Openness_{t-1}$	D.	-.03	-.03	.01	-.03	-.02	-.03	.05	-.02	-.03	.01
	L.	-.03	-.03	-.004	.001	-.03	-.07	-.15	-.02	-.02	.02
Trade* Capital $Account_{t-1}$	D.						.0001				
	L.						.0005				
$Regime_{t-1}$	D.	.27*	.23	.28**	.22	.26*	.31**	.49	.39*	.27*	.33**
	L.	.21**	.15	.26**	.04	.21**	.27**	-.12	.38*	.22**	.22**
$election_t$	D.	.04	.04	.03	.03		.04	.03	.04	.04	.04
Capital Account*$Regime_{t-1}$	D.							-.16			
	L.							.17			
GDP per capita*$Polity_{t-1}$	D.								-.001		
	L.								-.001		
GDP per capita $(log)_{t-1}$	D.	-2.3	-2.8*		-2.7*	-2.2	-1.8	-2.6*	-2.2	-2.4*	-1.9
	L.	-.47***	-.82***		-.28	-.47***	-.48***	-.53***	-.51***	-.45***	-.26
Revenue as % of GDP_t	D.	.05***	.04***	.05***	.03*	.05***	.04***	.05***	.05***	.05***	.05***
	L.	.04***	.04***	.04***	.02	.04***	.04***	.04***	.04***	.04***	.04***
Output Gap_t	D.	-.02**	-.01*	-.02**	-.01*	-.02**	-.02**	-.02**	-.02**	-.02**	-.02**
	L.	.02*	.02**	.004	.01	.02*	.01	.02**	.02*	.02**	.02**
Capital Stock as % of GDP_{t-1}	D.	.0002	.0005	.004	-.003	.001	.002	-.001	.001	.0003	.002
	L.	.004***	.004***	.003**	.003*	.004***	.004**	.004***	.004***	.004***	.007***
Government Spending as % of GDP_{t-1}	D.				3.7***						
	L.				2.2*						
Youth Population $(0\text{-}14)_{t-1}$	D.		-.05	.01							
	L.		-.03	.03*							
After '97 Crisis										-.07	
Trend											-.04**
Lagged Dependent Variable		-.4***	-.51***	-.35***	-.35***	-.4***	-.4***	-.4***	-.4***	-.4***	-.39***
Decade		-.14	-.12	-.2*	.02	-.14	-.13	-.1	-.13	-.15	-.002
Constant		2*	6.7*	-2.7**	.71	2*	2.7**	2.4**	2.2*	1.8	76**
R^2		.36	.37	.34	.43	.36	.37	.38	.37	.36	.39
N		159	159	159	159	159	159	159	159	159	159

1. Model (1) is the baseline model.

2. Model (2) is the baseline plus the youth population control.

3. Model (3) is the baseline plus the youth population control but excluding GDP per capita.

4. Model (4) examines the effect of government spending as % of GDP.

5. Model (5) examines the effect of excluding election.

6. Model (6) examines whether there is an interaction between trade and capital account openness.

7. Model (7) examines whether there is an interaction between regime and capital account openness.

8. Model (8) examines whether there is an interaction between democracy and GDP per capita.

9. Model (9) examines whether East Asian governments spend less after the financial crisis.

10. Model (10) examines whether adding a trend term would alter the results.

* significant at .1 level **significant at .05 level ***significant at .01 level.

Table 2.10 Education Spending per capita Model - Robustness Check - Controls

Dependent Variable		Education Spending per capita (log)									
Model		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Trade $(log)_{t-1}$	D.	.14	.13	.13	.12	.13	.11	.15*	.13	.14	.16*
	L.	.11***	.11**	.09**	.1**	.11***	.06	.15***	.12**	.13***	.16***
Capital Account $Openness_{t-1}$	D.	-.02	-.01	-.02	-.02	-.01	-.03	-.02	-.02	-.02	-.01
	L.	-.01	-.01	-.02	-.01	-.01	-.03	-.07**	-.01	-.01	-.003
Trade* Capital $Account_{t-1}$	D.						.0001				
	L.						.0002*				
$Regime_{t-1}$	D.	.1**	.09*	.09*	.09**	.1**	.11**	.11	.07	.1**	.12**
	L.	.08**	.01*	.05	.05	.08**	.1***	-.08	.07	.09***	.08***
$election_t$	D.	.01	.01	.01	.005		.01	.01	.01	.01	.01
Capital Account*$Regime_{t-1}$	D.							-.01			
	L.							.08**			
GDP per capita*$Polity_{t-1}$	D.								.0005		
	L.								.0001		
GDP per capita $(log)_{t-1}$	D.	-.08	-.05		-.21	-.04	.11	-.22	-.11	-.11	.03
	L.	.19***	.12		.19***	.19***	.19***	.16**	.19***	.2***	.23***
Revenue as % of GDP_t	D.	.01**	.01**	.01**	.01	.01**	.01**	.01***	.01**	.01**	.01***
	L.	.01***	.01**	.01**	.01*	.01***	.01***	.01***	.01***	.01***	.01***
Output Gap_t	D.	.01**	.01***	.01***	.01***	.01**	.01**	.01**	.01**	.01**	.01**
	L.	.001	.002	.004	.001	.001	0	.003	.001	.002	.001
Capital Stock as % of GDP_{t-1}	D.	.0003	.001	.001*	-.0002	.0004	.001	-.0001	.0002	.0003	.001
	L.	.001**	.001**	.001**	.001	.001**	.001*	.001***	.001***	.001**	.002***
Government Spending as % of GDP_{t-1}	D.				.92***						
	L.				.38						
Youth Population $(0\text{-}14)_{t-1}$	D.		.01	.02							
	L.		-.01	-..01**							
After '97 Crisis										-.03	
Trend											-.01**
Lagged Dependent Variable		-.36***	-.37***	-.35***	-.33***	-.36***	-.36***	-.37***	-.36***	-.37***	-.35***
Decade		-.03	-.03	-.01	.003	-.03	-.02	-.01	-.02	-.03	.01
Constant		-.89**	.02	1.2***	-.94**	-.89**	-.61	-.71*	-.89**	-.98**	18**
R^2		.36	.36	.36	.4	.35	.37	.38	.36	.36	.37
N		159	159	159	159	159	159	159	159	159	159

[1.] Model (1) is the baseline model.

[2.] Model (2) is the baseline plus the youth population control.

[3.] Model (3) is the baseline plus the youth population control but excluding GDP per capita.

[4.] Model (4) examines the effect of government spending as % of GDP.

[5.] Model (5) examines the effect of excluding election.

[6.] Model (6) examines whether there is an interaction between trade and capital account openness.

[7.] Model (7) examines whether there is an interaction between regime and capital account openness.

[8.] Model (8) examines whether there is an interaction between democracy and GDP per capita.

[9.] Model (9) examines whether East Asian governments spend less after the financial crisis.

[10.] Model (10) examines whether adding a trend term would alter the results.

* significant at .1 level **significant at .05 level ***significant at .01 level.

Total Government Spending

Another possibly important control missing in the baseline models is total government spending. The proportion governments could devote to education may depend very much on the total resources governments have at their disposal.[68] But entering total government spending as an explanatory variable directly in the model might cause the problem of endogeneity since the independent variables already in the model can explain a good amount of variation in government spending.[69] A better modeling strategy would be instrumental variable approach but good instruments are usually hard to find (Wooldridge, 2001). Keeping these concerns in mind, I entered total government spending as percent of GDP directly in the model as a rough check of the findings (Table 2.8, Table 2.9 & Table 2.10, model 4). Results show government spending is negatively associated with education spending as percent of total government spending but positively associated with education spending as percent of GDP and per capita spending. This is not against intuition. Findings on the globalization variables are pretty much the same; the effect of trade integration is even more significant in the model of education spending as percent of government spending comparing with the baseline. The signs of democracy remain mostly consistent; however, both its short- and long- run effects are no longer significant in education spending as percent of GDP model and the long-run effect of democracy is no longer significant in the per capita spending model. This adds some caution to the finding on democracy even though given the possible implications of

[68] Governments' fiscal constraint is partly controlled by the government revenue variable, which is already in the model. But total government spending is a more direct measure of how much the government actually spends.

[69] The explanatory variables already in the model (except capital stock as % of GDP) can explain 35% of total government spending (Table **2.4**, model 4).

endogeneity in these models, they should not be taken as strong evidence against the finding on democracy.

Interaction Terms

A number of interaction terms have been considered. Kaufman and Segura-Ubiergo found capital account openness compounds the effect of trade on social spending in Latin America (Kaufman and Segura-Ubiergo, 2001). The interaction between trade and capital account openness is positive in all my three specifications of education spending: the effect of trade becomes larger at higher levels of capital account openness; however, only for the per capita spending model, the effect is slightly significant (Table 2.8, Table 2.9 & Table 2.10, model 6). Given that both the finding on capital account openness and democracy are not sensitive to indicators used, I'm also wondering whether the effect of democracy would be the same at different levels of capital account openness. It turns out this interaction term is only significant for the per capita spending model (Table 2.8, Table 2.9 & Table 2.10, model 7).[70] A last interaction term considered is that of GDP per capita and democracy. Two studies have identified different effects of democracy on education achievement for rich and poor countries (Brown, 1999; Baum and Lake, 2003). Again, this interaction term is not significant for all three specifications (Table 2.8, Table 2.9 & Table 2.10, model 8).

1997 Financial Crisis

[70] This interaction term is positive in this model, which suggests the effect of democratization is higher at higher levels of capital account openness.

The spending behavior of East Asian governments might be more constrained after the major financial crisis in 1997. To control for this effect, I added a dummy to the model to distinguish the years before and after the crisis (Table 2.8, Table 2.9 & Table 2.10). As expected, this dummy is negative in all three specifications but only significant in education spending as percent of government spending model.

Trend

Since the stationarity tests show that some variables may be trended in the sample (Table 2.3), controlling for trend might be necessary. Results show the trend variable are indeed significant in two specifications (as % of GDP and per capita spending) but substantive findings on globalization and democracy don't change: the signs and magnitude of the coefficients remain pretty much the same after including the trend; some of coefficients become even more significant. Thus I decide to keep a simpler and also a more conservative model without trend.

Alternative Measure of the Business Cycle

Given that the output gap specification of the business cycle might be sensitive to the value of λ chosen, one might wonder whether a different specification of the business cycle variable would change the model results. The economic growth specification of business cycle shows more variation than the output gap variable, which pays less attention to high-frequency movements. Models that control for business cycle through the economic growth variable does show more significant results (Appendix 2.12, model

2, 4&6); but the substantive findings on globalization and democratization remain the same.

Inequality

The scarcity of data on inequality in the East Asian case makes it impossible to effectively control for this variable. A fixed effect model with limited data seems to suggest inequality is negatively correlated with total government education spending and democracy is positively correlated with it in two of the three specifications. However, none of the variables are significant due to data limitation (Appendix 2.13).

Dummy of 1970s

The bilateral trend graphs between trade and total government education spending indicate their relationship might be different in the 1970s and after (Appendix 2.14). A decade dummy of 1970s is not significant in all three specifications; however, the interaction term between trade and the 1970s decade dummy is negative and slightly significant, which indicates the impacts of trade on education spending is greater in the period after 1970s (Appendix 2.15). The substantive results do not change; however, the magnitudes of the significant coefficients generally increase somewhat; the explanatory powers of all three models also generally improve. But given that results on trade are sensitive to the indicator used, I decide to keep a simpler and more conservative model without the 1970s dummy and its interaction with trade.

Adding/Dropping Country

Even though I have collected data for all eight countries in the study, the estimation sample for the baseline total spending models actually only includes South Korea, Singapore, Indonesia, Malaysia, Philippines and Thailand. Taiwan is excluded from the estimation sample due to missing data on capital account openness; Hong Kong is excluded due to an absence of data on capital stock and polity scores. To get some rough idea on whether my findings could be generalized to Taiwan and Hong Kong, I re-estimate the models including Taiwan and Hong Kong in the estimation sample by slightly changing the model specifications. Changes in estimation sample like these have the danger of confounding sample changes with that of variable effects.[71] Given this caveat, it is comforting to see that there are few changes in the signs and significance of most of the findings on trade integration and all the findings on democracy (Table 2.11, Models 2&3, 7&8, 12&13) even though the magnitude of democracy becomes somewhat smaller (Table 2.11, Models 7&8, 12&13).

In addition, since Singapore has a trade volume two times higher than the regional average[72] and thus might have a big influence on the findings[73], models excluding Singapore and models excluding Singapore but including Taiwan are estimated. Substantive findings eventually do not change; the positive effects of trade and democracy become more significant in all three specifications (Table 2.11, Models 4&5, 9&10, 14&15).

[71] Thanks to Professor Rick Lau's comment.
[72] The regional average is 129 and Singapore has a trade openness of 344.
[73] Residual analysis show Singapore has a larger residual variation than other countries in most models.

Table 2.11 Total Government Education Spending Models - Robustness Check - Sample Variation

		Education Spending as % of Government Spending					Education Spending as % of GDP					Education Spending per capita (log)				
Model		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
sample[1]		(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)
Trade $(\log)_{t-1}$	D.	-.4	-.47	-.2	-.42	-.3	.37	.34	.33	.36	.32	.14	.12	.09	.11	.09
	L.	1.4*	1.1	1.6**	2***	1.7**	.27*	.23*	.31**	.35**	.26*	.11***	.1**	.08*	.12***	.1*
Capital Account Openness_{t-1}	D.	-.4			.02		-.03			-.002		-.02			-.01	
	L.	-.04			.42		-.03			-.005		-.01			-.01	
Regime_{t-1}	D.	.54	1.3**		.68	1.4**	.27*	.41***		.3**	.43***	.1**	.18***		.11**	.19***
	L.	-.25	.02		.81*	.81**	.21**	.21**		.41***	.31***	.08**	.06*		.13***	.07*
Liberty Score_{t-1}	D.			.23					.07**					.03**		
	L.			.2					.07***					.03***		
Election_t	D.	-.14	-.13		-.12	-.09	.04	.03		.03	.03	.01	.01		.003	.01
GDP per capita $(\log)_{t-1}$	D.	-11	-9.6	-4.3	5.1	2.8	-2.3	-2.2	-2***	-1.2	-2	-.08	-.5	-.31	.67	-.5
	L.	-1.1*	-.61	-.21	-.66	-.69	-.47***	-.11	-.06**	-.44***	-.12	.19***	.22***	.16**	.25***	.25***
Revenue as % of GDP_t	D.	-.09	-.09	-.1*	-.27***	-.22***	.05***	.04***	.02**	.03**	.02**	.01**	.01	.002	.01	.003
	L.	-.001	-.03	-.05	-.12**	-.11***	.04***	.02**	.01	.03*	.01	.01***	.001	-.0003	.01**	-.002
Output Gap_t	D.	-.02	-.03	-.04	-.01	-.03	-.02**	-.02**	-.01*	-.02**	-.02**	.01**	.01*	.01***	.01**	.004
	L.	.01	-.01	-.05*	-.05	-.06*	.02*	.01	.01	.01	.003	.001	-.002	.001	-.002	-.005
Capital Stock as % of GDP_{t-1}	D.	-.02	-.02		.02	.01	.0002	-.001		.0002	-.005	.0003	-.001		.002	-.002
	L.	.01	.01		.004	.001	.004***	.001		.003**	.001	.001**	-.001		.001**	-.001*
Lagged Dependent Variable		-.3***	-.3***	-.28***	-.45***	-.39***	-.4***	-.26***	-.3***	-.51***	-.4***	-.36***	-.22***	-.22***	-.43***	-.25***
Decade		.92**	.93**	.71**	.25	.82**	-.14	-.11	-.02	-.22**	-.07	-.03	.01	.02	-.05	.04
Constant		8.1	2.2	-3.7	5.4	1.8	2*	-.08	-.92	2	.07	-.89**	-1.3**	-.93*	-.6	-1.4***
R^2		.27	.26	.23	.43	.38	.36	.23	.31	.38	.3	.36	.22	.2	.37	.23
N		159	185	207	135	161	159	207	213	135	161	159	185	207	135	161

[1.] sample (a) is the baseline sample which includes Indonesia, Korea, Malaysia, Philippines, Singapore, Thailand; sample (b) is the baseline sample plus Taiwan; sample (c) is the baseline sample plus Hong Kong and Taiwan; sample (d) is the baseline sample excluding Singapore; sample (e) is the baseline smaple excluding Singapore but plus Taiwan.

* significant at .1 level **significant at .05 level ***significant at .01 level.

Estimation Method

To examine whether my results are sensitive to the estimation method chosen, I re-estimate the models with generalized linear square (GLS) with heterogeneous errors[74]. Table 2.12 shows a comparison of results (Table 2.12, Model 1 - 6). The largest discrepancy lies in trade integration: its magnitude is much smaller in the GLS estimation in all three specifications of education spending. Results on capital account openness and democracy are mostly consistent across two methods; however, the positive effect of democracy on education spending as % of GDP is no longer significant in the GLS estimation (Table 2.12, Model 4). Given that GLS estimation has a much larger standard error than the OLS estimation with panel corrected standard errors (Table 2.12, Model 3&4), I do not read this as strong evidence against the findings on democracy.

[74] I was unable to specify contemporaneous error correlation due to the fact that my panels are not balanced.

Table 2.12 Total Government Education Spending Models - Robustness Check - Method

Dependent Variable		Education Spending as % of Government Spending		Education Spending as % of GDP		Education Spending per capita(log)	
Method		OLS	GLS	OLS	GLS	OLS	GLS
Model		(1)	(2)	(3)	(4)	(5)	(6)
Trade (log) $_{t-1}$	D.	-.4	-.26	.37	-.24	.14	.04
		(1.4)	(1.2)	(.29)	(1.4)	(.09)	(.09)
	L.	1.4*	.02***	.27*	.01	.11***	.001**
		(.74)	(.01)	(.15)	(.01)	(.04)	(.0003)
Capital Account Openness $_{t-1}$	D.	-.4	-.05	-.03	-.33	-.02	-.01
		(.42)	(.39)	(.11)	(.44)	(.03)	(.03)
	L.	-.04	.23	-.03	-.38	-.01	-.01
		(.29)	(.3)	(.06)	(.33)	(.02)	(.02)
Regime $_{t-1}$	D.	.54	.95	.27*	.84	.1**	.12**
		(.74)	(.77)	(.15)	(.91)	(.05)	(05)
	L.	-.25	.68	.21**	.42	.08**	.09***
		(.47)	(.43)	(.11)	(.52)	(.03)	(.03)
Election$_t$	D.	-.14	-.02	.04	-.07	.01	.01
		(.18)	(.14)	(.04)	(.16)	(.01)	(.01)
GDP per capita (log) $_{t-1}$	D.	-11	-2.9	-2.3	-7	-.08	.15
		(7.2)	(5.7)	(1.5)	(6.3)	(.39)	(.37)
	L.	-1.1*	-.69	-.47***	-2.1**	.19***	.18***
		(.67)	(.72)	(.17)	(.84)	(.07)	(.07)
Revenue as % of GDP $_t$	D.	-.09	-.2***	.05***	-.14**	.01**	.01***
		(.07)	(.05)	(.01)	(.06)	(.004)	(.04)
	L.	-.001	-.06	.04***	.12**	.01***	.01***
		(.06)	(.05)	(.01)	(.05)	(.003)	(.04)
Output Gap $_t$	D.	-.02	-.02	-.02**	-.003	.01**	.005*
		(.04)	(.04)	(.01)	(.04)	(.003)	(.002)
	L.	.01	-.04	.02*	.01	.001	.002
		(.04)	(.04)	(.01)	(.04)	(.003)	(.003)
Capital Stock as % of GDP $_{t-1}$	D.	-.02	-.002	.0002	.004	.0003	.001
		(.03)	(.02)	(.005)	(.02)	(.001)	(.001)
	L.	.01	.002	.004***	.01*	.001**	.001**
		(.01)	(.01)	(.001)	(.01)	(.0005)	(.0004)
Lagged Dependent Variable		-.3***	-.35***	-.4***	-.6**	-.36***	-.37***
		(.06)	(.05)	(.07)	(.3)	(.06)	(.06)
Decade		.92**	.6	-.14	.38	-.03	-.02
		(.45)	(.4)	(.1)	(.45)	(.03)	(.03)
Constant		8.1	6.6	2*	15**	-.89**	-.21
		(5.3)	(6.2)	(1.2)	(7.4)	(.42)	(.43)
R^2		.27	NA	.36	NA	.36	NA
N		159	159	159	159	159	159

[1.] Panel corrected standard errors are used with OLS estimation. Heteregeneous panels are specified for the GLS estimation.

* significant at .1 level **significant at .05 level ***significant at .01 level.

2.3.3 Summary

Various robustness checks in this section, as summarized in Table 2.13, demonstrate that two findings are the strongest in this section: firstly, capital account openness has no effect on total government education spending. This finding is consistent across all three specifications of government education spending; it is also insensitive to all kinds of changes in the model specification. Secondly, democracy improves education spending per capita; this finding is also insensitive to all kinds of model changes. Moreover, democracy seems to improve the proportion of GDP devoted to education; however, this finding is less robust since it is somewhat sensitive to controls included in the model and the estimation method chosen. Democracy seems to have no effect on education spending as percent of total government spending. This finding is quite robust except that sample variation might produce a different result.

The finding on the positive role of trade integration in improving education spending is less robust since it is sensitive to the trade indicator chosen and the magnitude of the coefficient changes quite a bit under other estimation methods.

Table 2.13 Total Government Education Spending Models: Summary of Robustness Checks

	Total Government Education Spending		
	as % of Total Government Spending	as % of GDP	Spending per capita (log)
Trade Integration			
Baseline	+	+	+
Varying Trade Integration Indicator	mixed	mixed	mixed
Youth Population Control	+	mixed	+
Spending Control	+	+	+
Adding/Dropping Countries	mixed	+	+
Varying Estimation Method	+*	-*	+ *
Capital Account Openness			
Baseline	-	-	-
Varying Capital Account Openness Indicator	-	-	-
Youth Population Control	-	-	-
Spending Control	-	-	-
Adding/Dropping Countries	-	-	-
Varying Estimation Method	-	-	-
Democracy			
Baseline	-	+	+
Varying Democracy Indicator	-	+	+
Youth Population Control	-	mixed	+
Spending Control	-	-	+
Adding/Dropping Countries	mixed	+	+
Varying Estimation Method	-	-	+

[1.] "+" indicates a significant positive effect, "-" indicates a null-effect and "(-)" indicates a significant negative effect.

"NA" indicates this check is not applicable to this model;

"mixed" refers to a different effect from the baseline for at least two (or 50%, whichever is smaller) models of this check.

* The coefficient of the long-run impact is much smaller in the GLS estimation.

2.4 Spending at Different Levels Model Results

2.4.1 Model Results

Results for spending at primary/secondary/tertiary levels are shown in Table 2.14. Coefficients on country dummies are not shown for clarity of presentation. Due to less data availability and the problem of missing data,[75] the number of cases in these models is much smaller than that of the total spending models. Thus explanatory variables that don't have a significant contribution to the models are left out to increase the efficiency of estimation. Table 2.15 displays in a more intuitive way the meaning of the coefficients (calculation based on formulas 2.4).

<u>Explanatory Power</u>

The explanatory variables could account for 27% to 50% of the variations in spending at primary/secondary/tertiary levels. The fits are reasonable. It seems my explanatory variables explain primary and secondary spending better than tertiary spending: the R^2 s for spending at the first two levels are generally higher than those of tertiary spending models.

[75] Data for spending at different levels are only available from 1971 to 1996 while data for aggregate spending covers 1971 to 2003; what compounds less data availability for spending at different level models is the problem of missing data in countries such as Indonesia.

Table 2.14 Current Education Expenditure at Different Level Model Results

		Primary Spending			Secondary Spending			Tertiary Spending		
Model		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Dependent Variable		as % of education spending	as % of GDP	per student as % of GDP per capita	as % of education spending	as % of GDP	per student as % of GDP per capita	as % of education spending	as % of GDP (log)	per student as % of GDP per capita (log)
Trade (log) $_{t-1}$	D.	5.5	-.21	1.9	-9.2	-.25	.76	-2.4	.16	.37
		(5.1)	(.29)	(1.8)	(5.8)	(.24)	(3.9)	(4.6)	(.29)	(.47)
	L.	2.8	-.19	-.57	-4.2	-.38**	-3.5	-3.6	.07	.1
		(2.8)	(.17)	(.93)	(3.1)	(.16)	(2.2)	(2.6)	(.17)	(.24)
Capital Account Openness $_{t-1}$	D.	1.4	.03	.8	2.6	.12	2.7**	-.59	-.03	-.09
		(1.2)	(.11)	(.83)	(2.0)	(.11)	(1.3)	(1.7)	(.1)	(.16)
	L.	1.8	.03	-.76	3.4*	.08	-.28	1.7	-.02	.03
		(1.4)	(.11)	(.53)	(2.1)	(.1)	(1.0)	(1.5)	(.09)	(.13)
Regime $_{t-1}$	D.	-2.8	.1	-.05	-4.8	.12	1.2	-3.1**	.01	.14
		(4.6)	(.16)	(1.2)	(3.6)	(.15)	(2.1)	(1.5)	(.12)	(.19)
	L.	-2.6	.02	1.4**	2.5	.2**	2.1**	-5.3***	-.15	.07
		(2.0)	(.12)	(.56)	(2.5)	(.1)	(.86)	(1.6)	(.11)	(.15)
GDP per capita (log) $_{t-1}$	D.	-24**	-1.3	-6.4	98***	2.2**	-13	-20*	-2***	-1.1
		(10)	(.87)	(5.3)	(19)	(.89)	(10)	(11)	(.74)	(.65)
	L.	-9.6***	-.6***	-1.9**	4.3	-.45***	-3.6***	7.9***	.27**	-.3*
		(3)	(.2)	(.81)	(3.2)	(.17)	(1.2)	(2.3)	(.13)	(.17)
Revenue as % of GDP $_{t}$	D.		.06***	.26***		.06***	.33**			.01
			(.01)	(.08)		(.01)	(.14)			(.02)
	L.		.03***	.13*		.05***	.19			.01
			(.01)	(.07)		(.01)	(.13)			(.02)
Output Gap $_{t}$	D.				-.06			.13	-.002	
					(.17)			(.13)	(.01)	
	L.				-.33**			.32***	.01**	
					(.16)			(.11)	(.01)	
Capital Stock as % of GDP $_{t-1}$	D.		.004	-.01	.18**	.01**	-.1***			
			(.003)	(.02)	(.07)	(.004)	(.03)			
	L.		.003**	.02***	.01	.003***	.03***			
			(.001)	(.01)	(.03)	(.001)	(.01)			
Lagged Dependent Variable		-.63***	-.67***	-.44***	-.74***	-.4***	-.43***	-.53***	-.37***	-.4***
		(.15)	(.13)	(.08)	(.15)	(.14)	(.13)	(.11)	(.09)	(.14)
Decade					-3.3**					
					(1.5)					
Constant		88***	5.6***	15***	-11	3.7***	48***	-41***	-2.8***	3.3*
		(25)	(1.6)	(5.7)	(26)	(1.1)	(16)	(10)	(.85)	(1.8)
R^2		.42	.5	.41	.46	.46	.3	.36	.33	.27
N		72	70	77	72	70	69	80	80	67

1. All Models are estimated through OLS with panel corrected standard errors. D. refers to a differenced term of the explanatory variable and L. refers to a lagged term. In brackets are panel corrected standard errors.

2. Country Dummies are not shown for clarity of presentation. F tests indicate country dummies are significant in all the models

3. The residuals from model (1), (6), (7) and (9) still have slight panel heterogeneity after PCSEs are used. Autocorrelation of the model residuals are examined. The residuals of Malaysia in model (2) have slight autocorrelation. (See Appendix 2.16)

*significant at .1 level; ** significant at .05 level; ***significant at .01 level.

Table 2.15 Current Education Expenditure at Different Levels - Interpretation of Results

		Primary Spending			Secondary Spending			Tertiary Spending		
Model		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Dependent Variable	Impacts	as % of education spending	as % of GDP	per student as % of GDP per capita	as % of education spending	as % of GDP	per student as % of GDP per capita	as % of education spending	as % of GDP (log)	per student as % of GDP per capita (log)
Trade (log) $_{t-1}$	short run	5.5	-.21	1.9	-9.2	-.25	.76	-2.4	.16	.37
	long run	4.7	-.28	-1.3	-5.7	-.95**	-8.1	-6.8	.19	.25
	total impact	10	-.49	.6	-15	-.95**	-7.3	-9.2	.35	.62
Capital Account Openness $_{t-1}$	short run	1.4	.03	.8	2.6	.12	2.7**	-.59	-.03	-.09
	long run	2.9	.04	-1.7	4.6*	.2	-.65	3.2	-.05	.08
	total impact	2.9	.07	-.9	4.6*	.32	2.7**	2.6	-.08	-.01
Regime $_{t-1}$	short run	-2.8	.1	-.05	-4.8	.12	1.2	-3.1**	.01	.14
	long run	-4.4	.03	3.2**	3.4	.5**	4.9**	-10***	-.41	.18
	total impact	-7.2	.13	3.2**	-1.4	.5**	4.9**	-13**	-.4	.32
GDP per capita (log) $_{t-1}$	short run	-24**	-1.3	-6.4	98***	2.2**	-13	-20*	-2***	-1.1
	long run	-16.3***	-.9***	-4.3**	5.8	-1.1***	-8.4***	15***	.73**	-.75*
	total impact	-40**	-.9***	-4.3**	98***	1.1**	-8.4***	-5*	-1.3**	-.75*
Revenue as % of GDP $_{t}$	short run		.06***	.26***		.06***	.33**			.01
	long run		.04***	.3*		.1***	.44			.03
	total impact		.1***	.56*		.16***	.33**			.04
Output Gap $_{t}$	short run				-.06			.13	-.002	
	long run				-.45**			.6***	.03**	
	total impact				-.45**			.6***	.03***	
Capital Stock as % of GDP $_{t-1}$	short run		.004	-.01	.18**	.01**	-.1***			
	long run		..004**	.05***	.01	.001***	.07***			
	total impact		.004**	.05***	.18**	.011**	-.03***			
Lagged Dependent Variable		-.63***	-.67***	-.44***	-.74***	-.4***	-.43***	-.53***	-.37***	-.4***
Decade					-3.3**					
Constant		88***	5.6***	15***	-11	3.7***	48***	-41***	-2.8***	3.3*
R^2		.42	.5	.41	.46	.46	.3	.36	.33	.27
N		72	70	77	72	70	69	80	80	67

Note: Total impact is a summation of the significant short and long run impacts. If short and long run impacts have different level of level of significance, to be conservative, the lower level of significance is assigned to the total impact. *Significant at .1 level; **significant at .05 level; ***significant at .01 level.

Control Variables

We will first look at the results for the control variables. GDP per capita has a uniformly negative total impact on primary education spending, which is significant for all three specifications.[76] On the other hand, the overall impacts of GDP per capita on secondary spending are positive and significant for two of the three specifications (as % of total education spending and as % of GDP).[77] For tertiary spending, the overall impacts of GDP per capita are negative; the effect is significant at .05 level for tertiary spending as % of GDP; the other two effects are significant at .1 level. Overall, the results are consistent with the theoretical expectation that richer countries devote a smaller proportion of their resources to primary education and tertiary spending; on the other hand, as countries become richer in East Asia, they tend to devote a large proportion of their resources to secondary education.

East Asian governments are also very much constrained by their fiscal capability when they make spending decisions on primary and secondary education. The overall impacts of government revenue are positive and significant for two of the three specifications of primary/secondary spending (as % of GDP and per student spending as % of GDP per

[76] One unit increase of log GDP per capita would decrease primary spending by about 40% of total education spending and 1% of GDP; it would also decrease primary spending per student by about 4% of GDP per capita. For example, if the poorest country in the sample, Indonesia, increases its GDP per capita by 25% (from $2454 to $3068), its primary spending would decrease by 9% relative to total government spending, .2% relative to GDP, and per student spending would decrease by 1% relative to GDP per capita (a 10% decrease). These effects are quite significant.

[77] One unit increase of log GDP per capita would increase secondary spending by 98% relative to total education spending, and by 1.1% relative to GDP. For example, if Thailand, the low middle income country in the sample, increases its GDP per capita by 20% (from $4052 to $4862), its secondary spending would increase by 18% relative to total education spending (a 90% increase) and by .2% relative to GDP(a 27% increase). On the other hand, the effect of GDP per capita on per student secondary spending as % of GDP per capita is negative. This could possibly be caused by the increasing number of students at the secondary level in richer countries; or richer countries still devotes a lower proportion of GDP per capita to secondary spending than poorer countries and most of the money goes to tertiary spending.

capita)[78]. However, tertiary spending seems to be less constrained: the total effect of revenue on tertiary spending per student as % of GDP per capita is positive but not significant.

Regarding the role of business cycle, there is no clear pro- or counter- cyclical spending pattern shown in these models. The impact of the output gap variable on secondary spending as % of total education spending is negative and significant; however, it produces positive and significant effects on two specifications of tertiary spending (as % of total education spending and as % of GDP).

Capital intensity of the economy seems to encourage East Asian government to invest in primary and secondary education: the coefficients for capital stock as % of GDP are positive and significant for two of the specifications of primary and secondary spending.[79]

Globalization

Now I present results for the substantive explanatory variables. In the aggregate spending models, I initially found that trade has a positive impact on total education spending, but this finding was not robust. Results from the spending level models seem to partly

[78] The total impacts of 1% increase in revenue relative to GDP are about .1% increase of primary spending relative to GDP, about 1% increase per student spending relative to GDP per capita. For secondary spending, 1% increase in revenue relative to GDP would increase about .2% of secondary spending relative to GDP and about .3% per student spending relative to GDP per capita.

[79] The average capital stock is about 210% of GDP in the sample. A 10% increase in capital stock (from 210% to 231%), would increase primary spending by 6% (from 1.2% to 1.28% of GDP); it would also increase per student primary spending by about 10% (from 11% to 12% of GDP per capita). The effects are even more significant for secondary spending. A 10% increase of capital stock (from 210% to 231%) would improve secondary spending by 13% relative to total education spending (from 30% to 34%); it would also increase secondary spending by 22% relative to GDP (from .09% to .11%).

confirm this conclusion.[80] Trade integration has no significant impact on spending at the primary and tertiary levels; none of the coefficients are significant. But it seems to have a negative impact on secondary spending: the coefficients are mostly negative for all three specifications of secondary spending; the long term impact of trade on secondary spending as % of GDP is significant at .05 level. One log increase in trade would reduce secondary spending by 1% relative to GDP. For a country like Malaysia, with a mean trade level of 137 and secondary spending level of 1.85 relative to GDP, a log increase of trade (to 372, a 172% increase) would reduce its secondary spending to .85% of GDP (a 54% decrease).

Capital account openness has consistently been found in the previous chapter to have no significant effect on total education spending. However, results from spending level models are somewhat different. The total impacts of capital account openness on primary and secondary spending are mostly positive; two coefficients of the secondary spending models are significant: capital account openness has a significant short-term impact on per student secondary spending as % of GDP per capita as well as a less significant long-term impact on secondary spending as % of total education spending. One point increase of capital account openness will increase secondary spending by about 5% relative to total education spending; it will also lead to a 3% increase of per student secondary spending relative to GDP per capita. Given that countries in the sample spend on average 30% of their total education spending on secondary level and per student secondary spending is about 14% of GDP per capita, one point increase of capital account openness

[80] I also estimated the total education spending model only including data before 1997, the period when spending data at different levels are available, the significance of the trade variable also disappears. Such result is consistent with those of the spending at different level models.

on a 0-4 scale is associated with about 25% increase in secondary spending resources. This is a quite significant effect. On the other hand, none of the specification of tertiary spending is significantly affected by capital account openness; the direct of the total impacts are negative in two out of three specifications.

Democratization

The most robust finding of the total education spending models is that democracies devote more resources to education than non-democracies. However, a more important question is perhaps where the resources are allocated and who they benefit. I have hypothesized that democracies in East Asia would have different spending priorities from non-democracies. Results from the spending level models confirm my hypothesis. The total impacts of democracy are positive for two specifications of primary spending (as % of GDP and per student spending as % of GDP per capita). The latter impact is significant at .05 level: democracies spend 3% more of their GDP per capita on primary education than non-democracies[81]. Given that the regional average per student primary spending is about 11% of GDP per capita, democracy increases per student primary spending by about 27%.

The evidence for the positive role of democracy is even stronger for secondary spending. In two of the three specifications (as % of GDP and per student spending as % of GDP per capita), democracy has a significant positive effect. The models show a transition to democracy in East Asia would increase secondary spending by about .5% relative to GDP

[81] This effect is realized in approximately 9 years.

and improve per student secondary spending by 5% relative to GDP per capita[82]. The regional averages of secondary spending are 1% of GDP and 14% of GDP per capita; the increases under democracy – almost 50% - are remarkable.

At the tertiary level, democracy is negatively associated with two specifications of tertiary spending (as % of government spending and as % of GDP); the first negative association is significant at .05 level: democracies devotes 13% less of their total education spending to the tertiary level[83]. The regional average on tertiary spending is 18% of total education spending; this means democracy would lead to a 72% decrease. The effect of democracy on per student tertiary spending is positive but insignificant.

2.4.2 Robustness Check

Similar to the aggregate spending model section, the following robustness checks are conducted carefully to examine the validity of the findings from the spending level models: 1) applying alternative measures of globalization and democracy; 2) including a number of different controls in the model; 3) cross-validating the results by adding and/or dropping individual countries from the sample; 4) employing different estimation method.

Alternative Measures of Globalization and Democracy

Two other specifications of trade integration – trade excluding the effect of country size (trade residual) and a policy indicator of trade (current account openness) are used in

[82] This effect is realized in approximately 8 years.
[83] This effect is realized in approximately 7 years.

combination with two other specifications of capital account openness – foreign direct investment and private capital flow (gross) to examine the sensitivity of the findings on globalization. A total of seven models – six new plus the original baseline model – are compared and contrasted for each specification of the dependent variables. Table 2.16, Table 2.17 & Table 2.18 show the results.

Trade

The insignificance of trade integration remains very much consistent across all models of primary and tertiary spending; however, different indicators of trade integration sometimes produce different signs (Table 2.16 & Table 2.18). The conclusion that trade reduces secondary spending seems to be strengthened. Trade integration starts to have a significant long-run negative effect on secondary spending as % of total education spending when the policy indicator is entered into the model (Table 2.17, Model 5-7). The significant negative impact of trade on secondary spending as % of GDP turns out to be consistent regardless of the indicator put in the model (Table 2.17, Model 8-14). Trade also has a slightly significant negative effect on per student secondary spending as % of GDP per capita after country size is taken into consideration (Table 2.17, Model 16).

Capital Account Openness

The positive role of capital account openness in improving primary spending is not significant for the majority of the specifications; the insignificance hold for alternative indicators such as foreign direct investment and private capital flow (Table 2.16, Model 1-21). On the other hand, capital account openness seems to increase spending at the

secondary level: most of the specifications are positive and significant[84]; this seems to be the effect of foreign direct investment: while the coefficients of foreign direct investment are significant in some specifications, none of the coefficients of private capital flow are (Table 2.17, Model 1-21). At the tertiary level, capital account openness is not significant for all models; however, foreign direct investment seems to significantly discourage tertiary spending in all specifications; private capital flow again has no significant effect at all (Table 2.18, Model 1-21).

[84] The only exception is model 21, which produces a negative effect of capital account openness on secondary spending.

Table 2.16 Current Education Expenditure at the Primary Level - Robustness Check - Alternative Measures of Globalization

Dependent Variable		Primary Spending as % of Total Education Spending							Primary Spending as % of GDP							Primary Spending per student as % of GDP per capita						
Model		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)
Trade $(\log)_{t-1}$	D.	5.5		9	8.1				-.21		-.2	-.49				1.9		.83	.66			
	L.	2.8		1.3	2.5				-.19		-.17	-.33*				-.57		-1.2	-1.3			
Trade Residual_{t-1}	D.		5.8							-.21							2.5					
	L.		3.5							-.23							.16					
Current Account Openness_{t-1}	D.					-.57	.4	.01					-.13	-.15	-.05					-.15	-.09	.01
	L.					-1.7	-1.2	-.33					-.18	-.22*	-.17					-.33	-.32	.01
Capital Account Openness_{t-1}	D.	1.4	1.4					1.3	.03	.03					-.01	.8	.41					.64
	L.	1.8	1.8					2.4*	.03	.04					.01	-.76	-1.3**					-.77
Foreign Direct Investment $(\log)_{t-1}$	D.			-.67		-.75					-.03		-.04					-.09		.01		
	L.			.59		.25					.06		.06					-.13		-.06		
Private Capital Flow $(\log)_{t-1}$	D.				-.06		.27					.05		.03					.26		.24	
	L.				-1.3		-.48					.17**		.11					-.02		-.04	
Regime_{t-1}	D.	-2.8	-2.4	-2.5	-2.3	-3.2	-3	-3.3	.1	.08	.18	.18	.19*	.18	.12	-.05	.1	-.16	-.16	-.25	-.19	-.17
	L.	-2.6	-2.2	-3.6*	-3.5*	-3.7*	-3.6*	-2.8	.02	-.003	.07	.07	.11	.13	.08	1.4**	1.7***	1*	.85*	1.3**	1.2**	1.4**
GDP per capita $(\log)_{t-1}$	D.	-24**	-28**	-28**	-25**	-20*	-19*	-20**	-1.3	-1	-3***	-2.3**	-3.2***	-2.7***	-1.8**	-6.4	-11*	-2.1	-2.4	-5	-5.3	-7.3
	L.	-9.6***	-12***	-7.9**	-7.3**	-6.6***	-6.3**	-8.4***	-.6***	-.44*	-1***	-.93***	-1***	-.91***	-.67***	-1.9**	-2.6**	-1.3*	-1.3**	-2**	-2**	-2**
Revenue as % of GDP_t	D.								.06***	.06***	.04***	.04***	.04***	.05***	.06***	.26***	.24***	.23***	.22***	.27***	.25***	.26***
	L.								.03***	.03***	.04***	.03**	.04***	.03***	.04***	.13*	.12*	.06	.05	.08	.08	.12*
Output Gap_t	D.																					
	L.																					
Capital Stock as % of GDP_{t-1}	D.								.004	.004	0	.001	-.001	-.001	.002	-.01	-.03	-.001	.001	-.004	-.004	-.01
	L.								.003**	.003**	.005***	.004***	.005***	.004***	.003**	.02***	.03***	.02**	.02**	.01**	.01**	.02***
Lagged Dependent Variable		-.63***	-.66***	-.65***	-.68***	-.63***	-.64***	-.61***	-.67***	-.67***	-.96***	-.92***	-.91***	-.76***	-.64***	-.44***	-.43***	-.29***	-.29***	-.28***	-.27***	-.43***
Decade																						
Constant		88***	128***	88***	81***	96***	92***	93***	5.6***	3.2*	9.3***	9.1***	9.7***	8.9***	6.5***	15***	23**	16**	17**	18**	18**	19***
R^2		.42	.42	.42	.39	.4	.37	.4	.5	.51	.57	.56	.58	.61	.51	.41	.41	.32	.32	.31	.32	.4
N		72	72	62	62	62	62	72	70	70	62	62	62	66	70	77	76	70	70	70	70	77

Note: Model (1) (8) and (15) are baseline models which are reported in table 2.12. *significant at .1 level; **significant at .05 level; ***significant at .01 level.

Table 2.17 Current Education Expenditure at the Secondary Level - Robustness Check - Alternative Measures of Globalization

Dependent Variable		Secondary Spending as % of Total Education Spending							Secondary Spending as % of GDP							Secondary Spending per student as % of GDP per capita						
Model		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)
Trade $(\log)_{t-1}$	D.	-9.2		-10	-11*				-.25		-.2	-.38				.76		-2.9	-1.1			
	L.	-4.2		-4.2	-5.7				-.38**		-.31*	-.42**				-3.5		-4.8**	-3.3			
Trade Residual_{t-1}	D.		-8.5							-.24							.61					
	L.		-3.6							-.39**							-3.5*					
Current Account Openness_{t-1}	D.					-2.8	-3.5	-4.1					-1	-.13	-.1					-.37	.15	-.04
	L.					-6.4**	-7.5***	-5.5**					-.34***	-.41***	-.28**					-.51	.37	..69
Capital Account Openness_{t-1}	D.	2.6	2.6					2.7	.12	.13					.06	2.7**	2.8**					.95
	L.	3.4*	3.3*					3.7**	.08	.08					.04	-.28	-.08					-2.2**
Foreign Direct Investment $(\log)_{t-1}$	D.			.8		.47					.06**		.04					.74*		.58		
	L.			.62		.61					.1**		.08**					.93*		.6		
Private Capital Flow $(\log)_{t-1}$	D.				.51		.28					.01		-.03					.17		-.26	
	L.				2.1		1.8					.11		.04					-.22		-1.4	
Regime_{t-1}	D.	-4.8	-4.9	-4	-3.6	-4.9	-4.8	-5.3	.12	.09	.08	.1	.12	.13	.16	1.2	1.1	.3	1.3	.66	.88	.97
	L.	2.5	2.3	1.7	2.1	2.8	3.5	3.6	.2**	.17	.2*	.2*	.3***	.33***	.32***	2.1**	2**	1.5	2.2**	2.1*	1.8	1.9
GDP per capita $(\log)_{t-1}$	D.	98***	101***	84***	98***	78***	88***	87***	2.2**	2.3**	1.2	2**	.66	1.2	1.1	-13	-12	-18*	-15	-28**	-21**	-22**
	L.	4.3	5.9	-2.7	-2.9	-1.4	-1.2	4.7	-.45***	-.22	-.67***	-.56***	-.79***	-.71***	-.63***	-3.6***	-1.8	-4.1***	-3.6**	-4.4**	-2.6	-3.8**
Revenue as % of GDP_t	D.								.06***	.06***	.06***	.06***	.06***	.07***	.06***	.33**	.33**	.33**	.32**	.32**	.27*	.21
	L.								.05***	.05***	.05***	.05***	.06***	.06***	.05***	.19	.2	.15	.2	.17	.23*	.14
Output Gap_t	D.	-.06	-.07	.03	.02	.09	.09	-.02														
	L.	-.33**	-.34**	-.19	-.28	-.13	-.21	-.28*														
Capital Stock as % of GDP_{t-1}	D.	.18**	.18**	.17**	.19**	.15*	.16**	.15**	.01**	.01**	.01*	.01*	.004	.004	.003	-.1***	-.1***	-.08**	-.1***	-.11***	-.11***	-.12***
	L.	.01	.02	.05	.06*	.07*	.07**	.02	.003***	.004***	.005***	.005***	.005***	.005***	.004***	.03***	.03***	.03**	.03*	.02	.01	.02**
Lagged Dependent Variable		-.74***	-.74***	-.75***	-.78***	-.88***	-.93***	-.85***	-.4***	-.42***	-.47***	-.5***	-.38***	-.5***	-.4***	-.43***	-.44***	-.51***	-.4***	-.38**	-.36**	-.38***
Decade		-3.3**	-3.2**	-.84	-.97	-2.6	-2.9*	-4.5***														
Constant		-11	-48	57	62	73	76**	6.7	3.7***	.01	5.7***	5.3***	7.4***	7.2***	5.8***	48***	6.1	60***	47**	35**	19	27**
R^2		.46	.45	.44	.45	.46	.47	.47	.46	.47	.46	.44	.5	.48	.46	.3	.31	.3	.26	.22	.23	.28
N		72	72	62	62	62	62	72	70	70	62	62	62	62	70	69	69	64	64	64	64	69

Note: Model (1) (8) and (15) are baseline models which are reported in table 2.12. *significant at .1 level; **significant at .05 level; ***significant at .01 level.

Table 2.18 Current Education Expenditure at the Tertiary Level - Robustness Check - Alternative Measures of Globalization

Dependent Variable		Tertiary Spending as % of Total Education Spending							Tertiary Spending as % of GDP (log)							Tertiary Spending per student as % of GDP per capita (log)						
Model		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)
Trade $(\log)_{t-1}$	D.	-2.4		-2.8	-2				.16		.1	.1				.37		.66	.53			
	L.	-3.6		-1.8	-2.3				.07		.08	.01				.1		.39**	.23			
Trade Residual$_{t-1}$	D.		-1.9							.13							.37					
	L.		-3.3							.01							.01					
Current Account Openness$_{t-1}$	D.					-1.7	-1.8	-.04					.13	.1	.14					-.12	-.19	-.16
	L.					-.96	-.09	-.47					.03	.07	.03					.1**	-.03	-.02
Capital Account Openness$_{t-1}$	D.	-.59	-.55					-.87	-.03	-.05					-.11	-.09	-.07					-.002
	L.	1.7	1.7					1.1	-.02	-.05					-.06	.03	.06					.09
Foreign Direct Investment $(\log)_{t-1}$	D.			-.91*		-.93*					-.05		-.05					-.09***		-.1***		
	L.			-1.4**		-1.3*					-.08*		-.08*					-.11*		-.13**		
Private Capital Flow $(\log)_{t-1}$	D.				.87		.66					.07		.07					-.003		.05	
	L.				.56		.24					.06		.06					.002		.14	
Regime$_{t-1}$	D.	-3.1**	-3.1**	-2.2*	-3.2**	-2.2*	-3.3**	-3**	.01	-.03	.05	-.02	.05	-.02	-.04	.14	.14	.09	.01	.14	.03	.14
	L.	-5.3***	-5.4***	-5.8***	-6.1***	-5.5***	-5.8***	-4.7***	-.15	-.16	-.14	-.17	-.14	-.16	-.17	.07	.06	.08	-.002	.05	.02	.1
GDP per capita $(\log)_{t-1}$	D.	-20*	-18	-7.5	-19	-9.2	-19	-21*	-2***	-2.2*	-2.6*	-3.2**	-2.6*	-3.3**	-2.3**	-1.1	-1.1	-.51	-1	.31	-.96	-.88
	L.	7.9***	9.6***	11***	9.5***	10***	8.6***	6.3***	.27**	.21	.21	.08	.21	.05	.19	-.3*	-.32	-.19	-.28*	-.002	-.24	-.28
Revenue as % of GDP$_t$	D.															.01	.01	.01	.01	-.004	.01	.01
	L.															.01	.02	.03	.03	.01	.01	.01
Output Gap$_t$	D.	.13	.13	.12	.06	.11	.04	.09	-.002	.0002	.01	.01	.01	.01	.001							
	L.	.32***	.31***	.25**	.26**	.24*	.25*	.29**	.01**	.02**	.02**	.02**	.02**	.02**	.02**							
Capital Stock as % of GDP$_{t-1}$	D.									-.0004	-.002	-.002	-.002	-.003	-.001							
	L.									.001	.001*	.001	.001	.001	.001							
Lagged Dependent Variable		-.53***	-.53***	-.56***	-.57***	-.55***	-.56***	-.51***	-.37***	-.4***	-.39***	-.42***	-.38***	-.42***	-.41***	-.4***	-.41***	-.59**	-.61**	-.5***	-.58***	-.38***
Decade																						
Constant		-41***	-79***	-74***	-62***	-83***	-68***	-49***	-2.8***	-2	-2.3	-1.2	-2.5	-.12	-2.2*	3.3*	3.8*	.91	2.5	.52	3*	3.7**
R^2		.36	.36	.37	.35	.37	.35	.35	.33	.34	.36	.35	.37	.35	.34	.27	.27	.36	.31	.34	.3	.27
N		80	80	70	70	70	70	80	80	80	70	70	70	70	80	67	66	61	61	61	61	67

Note: Model (1) (8) and (15) are baseline models which are reported in table 2.12. *significant at .1 level; **significant at .05 level; ***significant at .01 level.

Democracy

Table 2.19, Table 2.20 & Table 2.21 present the results for models with alternative indicators of democracy. In the baseline models (Table 2.14), democracy has been found to significantly increase primary spending per student as % of GDP per capita; this finding proves to be quite insensitive to alternative measures of democracy: all of the democracy indicators except one are positive and significant (Table 2.19, Model 13-18).[85] Some of the democracy indicators turn out to be significant in the other two specifications of primary spending (Table 2.19, Model 5, 6, 9, 11&12). The stronger finding that democracy devotes more GDP and GDP per capita to secondary spending is quite robust: all but one democracy indicator are positive and significant (Table 2.20, Model 7-18).[86] On the other hand, democracy consistently devotes a smaller proportion of government education spending to tertiary education: all of the democracy indicators remain negative and significant (Table 2.21, Model 1-6). The null-effect of democracy on the other two specifications of tertiary spending is also quite stable in different specifications (Table 2.21, Model 7-18).

[85] The insignificant democracy indicator is polyarchy, which relies its coding on election results.
[86] The insignificant democracy indicator in these two models are aclp2, another dichotomous coding of democracy.

Table 2.19 Current Education Expenditure at the Primary Level - Robustness Check - Alternative Measures of Democracy

Dependent Variable		Primary Spending as % of Total Education Spending						Primary Spending as % of GDP						Primary Spending per student as % of GDP per capita					
Model		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
Trade $(\log)_{t-1}$	D.	5.5	3.8	5.6	2.4	5.7	4.6	-.21	-.16	-.13	-.1	-.12	-.15	1.9	1.4	2.3	2.5	2.3	2.8*
	L.	2.8	4.1	3.4	3.3	4.5*	1.9	-.19	-.24	-.11	-.09	-.06	-.12	-.57	-.41	-.15	-.03	-.19	.39
Capital Account Openness_{t-1}	D.	1.4	2.1*	1.7	2.4*	1.8	2	.03	.02	.04	.06	.03	.06	.8	.82	.66	1.2	.76	.53
	L.	1.8	3.4**	2.6*	3.9***	3.3**	3.6**	.03	0	.05	.08	.05	.09	-.76	-.64	-.91	-.49	-.67	-1.2*
Regime_{t-1}	D.	-2.8						.1						-.05					
	L.	-2.6						.02						1.4**					
ACLP Regime_{t-1}	D.		-1.4						.03						-.36				
	L.		1.2						-.11						1.2**				
Polity Score_{t-1}	D.			.15						.03**						.1			
	L.			-.06						.01						.11**			
Liberty Score_{t-1}	D.				-1.8						.01						.1		
	L.				.15						.05						.39*		
Polyarchy Score_{t-1}	D.					.2**						.01***						.02	
	L.					.08						.02**						.03	
Size of Winset_{t-1}	D.						1.7						.25**						2**
	L.						.59						.15						1.9***
Democracy Residual_{t-1}	D.						.62**						.05***						.2**
	L.						-.15						.003						.002
GDP per capita $(\log)_{t-1}$	D.	-24**	-27***	-28***	-20**	-32***	-28***	-1.3	-.95	-1.8**	-1.6**	-1.8**	-1.9**	-6.4	-6.2	-8	-5.4	-4.8	.23***
	L.	-9.6***	-14***	-11***	-13***	-13***	-12***	-.6***	-.43**	-.63***	-.65***	-.68***	-..69***	-1.9**	-1.7**	-1.7**	-1.4*	-1.6*	.13*
Revenue as % of GDP_t	D.							.06***	.05***	.06***	.05***	.06***	.05***	.26***	.25***	.25***	.22***	.26***	-.03
	L.							.03***	.03***	.03***	.03***	.04***	.04***	.13*	.1	.12*	.09	.12*	.02***
Output Gap_t	D.																		
	L.																		
Capital Stock as % of GDP_{t-1}	D.							.004	.005	.002	.002	.002	.001	-.01	-.01	-.02	-.01	-.005	-.03
	L.							.003**	.002**	.002*	.002*	.002*	.002*	.02***	.02***	.02**	.02**	.02**	.01
Lagged Dependent Variable		-.63***	-.71***	-.65***	-.6***	-.65***	-.64***	-.67***	-.64***	-.62***	-.67***	-.62***	-.65***	-.44***	-.44***	-.42***	-.41***	-.36***	-.43***
Decade																			
Constant		88***	115***	99***	124***	108***	105***	5.6***	4.6***	5.3***	5.2***	5.5***	5.4***	15***	13***	14***	10	13**	10*
R^2		.42	.41	.41	.4	.44	.47	.5	.51	.54	.53	.54	.56	.41	.4	.4	.39	.37	.44
N		72	72	72	78	72	72	70	70	70	68	70	70	77	77	77	75	77	77

Note: Model (1) (7) and (13) are baseline models which are reported in table 2.12. *significant at .1 level; **significant at .05 level; ***significant at .01 level.

Table 2.20 Current Education Expenditure at the Secondary Level - Robustness Check - Alternative Measures of Democracy

Dependent Variable		Secondary Spending as % of Total Education Spending						Secondary Spending as % of GDP						Secondary Spending per student as % of GDP per capita					
Model		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
Trade $(\log)_{t-1}$	D.	-9.2	-11*	-9.1	-10*	-9.4*	-9	-.25	-.3	-.21	-.1	-.2	-.14	.76	.53	1.4	2.3	2.8	2.2
	L.	-4.2	-5.6*	-4.9	-6.6	-5.4*	-5.9*	-.38**	-.46***	-.32*	-.37**	-.32*	-.26	-3.5	-3.9*	-3.2	-1.9	-1.8	-1.1
Capital Account Openness_{t-1}	D.	2.6	2.3	2.4	2	2.2	2.3	.12	.11	.14	.12	.11	.13	2.7**	3**	2.7**	3.3**	2.4**	1.7
	L.	3.4*	3	3.1	2.5	2.3	3	.08	.06	.09	.08	.03	.07	-.28	.22	-.51	-.27	-.82	-1.5
Regime_{t-1}	D.	-4.8						.12						1.2					
	L.	2.5						.2**						2.1**					
ACLP Regime_{t-1}	D.		-3.3						.04						.41				
	L.		.16						.01						1.5				
Polity Score_{t-1}	D.			-.27						.01						-.14			
	L.			.13						.02**						.2***			
Liberty Score_{t-1}	D.				-.28						.13**						.88		
	L.				-.16						.04						.98***		
Polyarchy Score_{t-1}	D.					-.21**						-.003						-.11*	
	L.					.01						.01*						.09***	
Size of Winset_{t-1}	D.						-.66						.18						5.8
	L.						97						.2*						4.7**
Democracy Residual_{t-1}	D.						-.33						.02						.38
	L.						-.02						.01						-.16
GDP per capita $(\log)_{t-1}$	D.	98***	100***	101***	101***	103***	102***	2.2**	2.5***	2**	2.3**	2.5***	1.9**	-13	-10	-17*	-11	-12	-14
	L.	4.3	4.7	3.8	4.1	4.9*	3.9	-.45***	-.21	-.45***	-.2	-.39**	-.47***	-3.6***	-2.9**	-3.3***	-3.2**	-4.1***	-4***
Revenue as % of GDP_t	D.							.06***	.05***	.06***	.05***	.06***	.06***	.33**	.33**	.3**	.28**	.34***	.32**
	L.							.05***	.04***	.05***	.05***	.05***	.05***	.19	.2	.19	.21*	.27**	.28**
Output Gap_t	D.	-.06	.01	-.05	.03	.03	-.01												
	L.	-.33**	-.29*	-.29*	-.28*	-.32**	-.26												
Capital Stock as % of GDP_{t-1}	D.	.18**	.22***	.2***	.23***	.22***	.22***	.01**	.01***	.01*	.01***	.01***	.01*	-.1***	-.08**	-.11***	-.09***	-.09***	-.1***
	L.	.01	.02	.02	.02	.01	.02	.003***	.003**	.003**	.002	.003**	.003**	.03***	.03***	.03**	.02**	.03**	.03***
Lagged Dependent Variable		-.74***	-.73***	-.71***	-.67***	-.62***	-.7***	-.4***	-.46***	-.4***	-.41***	-.41***	-.38***	-.43***	-.49***	-.49***	-.52***	-.41***	-.49***
Decade		-3.3**	-2.3	-2.6*	-1.4	-2.4	-2.3												
Constant		-11	-6	-3.4	-5.6	-11	-3.1	3.7***	2.3**	3.7***	1.9**	3.1***	3.2***	48***	43***	48***	33**	42***	23**
R^2		.46	.44	.46	.43	.48	.46	.46	.43	.46	.48	.47	.47	.3	.28	.33	.33	.37	.38
N		72	72	72	69	72	72	70	70	70	68	70	70	69	69	69	69	69	69

Note: Model (1) (7) and (13) are baseline models which are reported in table 2.12. *significant at .1 level; **significant at .05 level; ***significant at .01 level.

Table 2.21 Current Education Expenditure at the Tertiary Level - Robustness Check - Alternative Measures of Democracy

Dependent Variable		Tertiary Spending as % of Total Education Spending						Tertiary Spending as % of GDP						Tertiary Spending per student as % of GDP per capita					
Model		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
Trade $(\log)_{t-1}$	D.	-2.4	-1.8	-2.5	-4.5	-4.4	-2.1	.16	.23	.16	.2	.09	.2	.37	.43	.41	.48	.39	.51
	L.	-3.6	-2.6	-2.7	-2.8	-5.1*	-3	.07	.09	.11	.09	.02	.06	.1	.11	.09	.12	.06	.18
Capital Account Openness_{t-1}	D.	-.59	-.58	-.56	.08	.12	-.58	-.03	-.04	-.02	.03	-.01	-.02	-.09	-.1	-.03	-.06	-.02	-.05
	L.	1.7	1.4	1.5	2.6	3**	1.4	-.02	-.05	-.02	.07	.01	-.01	.03	.02	.06	.02	.07	.02
Regime_{t-1}	D.	-3.1**						.01						.14					
	L.	-5.3***						-.15						.07					
ACLP Regime_{t-1}	D.		-2.6*						.02						.12				
	L.		-4.1***						-.16						.07				
Polity Score_{t-1}	D.			-.39***						-.004						-.02			
	L.			-.37***						-.01						-.005			
Liberty Score_{t-1}	D.				-1.5**						-.01						.02		
	L.				-.72						.02						-.02		
Polyarchy Score_{t-1}	D.					-.1*						-.004						-.01**	
	L.					-.18***						-.006						-.005	
Size of Winset_{t-1}	D.						-1.5*						.06						-.19
	L.						-1.9***						-.003						-.09
Democracy Residual_{t-1}	D.						-.44***						-.01						-.06***
	L.						-.43***						-.01						0
GDP per capita $(\log)_{t-1}$	D.	-20*	-8.8	-9	-8.3	-13	-9.6	-2***	-1.6**	-1.7**	-1.7***	-1.7**	-1.8**	-1.1	-1.1	-.85	-.8	-.72	-1*
	L.	7.9***	7.4***	7.4***	4.5***	7.8***	7.6***	.27**	.3**	.21*	.09	.29**	.24**	-.3*	-.31*	-.22	-.22*	-.17	-.21
Revenue as % of GDP_t	D.													.01	.01	.003	.02	.001	.005
	L.													.01	.02	.01	.02	.01	.01
Output Gap_t	D.	.13	.03	.01	-.01	.02	.04	-.002	-.005	-.01	-.002	-.01	-.002						
	L.	.32***	.12	.16	.16	.22**	.16	.01**	.01	.01	.01**	.01	.01						
Capital Stock as % of GDP_{t-1}	D.																		
	L.																		
Lagged Dependent Variable		-.53***	-.53***	-.53***	-.44***	-.53***	-.52***	-.37***	-.39***	-.36***	-.31***	-.39***	-.35***	-.4***	-.41***	-.44***	-.43***	-.45***	-.47***
Decade																			
Constant		-41***	-40**	-43***	-27***	-38***	-41***	-2.8***	-3.1***	-2.5***	-1.5**	-3.1***	-2.5***	3.3*	3.3*	2.6	2.3	2.6	2.5
R^2		.36	.35	.37	.32	.35	.38	.33	.34	.32	.31	.33	.34	.27	.27	.28	.28	.3	.34
N		80	80	80	86	80	80	80	80	80	86	80	80	67	67	67	72	67	67

Note: Model (1) (7) and (13) are baseline models which are reported in table 2.12. *significant at .1 level; **significant at .05 level; ***significant at .01 level.

Varying Controls

Youth Population (0-14)

As previously stated, a larger youth population may pressure government to spend more on primary and secondary education. However, I was not able to include this control in the baseline models due to problem of multicollinearity. In this section, models with youth population control and models with youth population control but excluding GDP per capita are estimated (Table 2.22, Model 2&3, 11&12, 18&19; Table 2.23, Model 2&3, 8&9, 15&16). The youth population is not significant in most of the models; however, it has a significant positive relation with primary and secondary spending in three models excluding GDP per capita as a control (Table 2.22, Model 3&19; Table 2.23, Model 16).

Trade integration is consistently insignificant in primary spending models controlling for the youth population (Table 2.22; Model 2 & 3); yet, the significant negative impact of trade on secondary spending as % of GDP goes away in one out of two models controlling for the youth population; on the other hand, trade starts to have a negative impact on secondary spending per student as % of GDP per capita in one of the models (Table 2.23, Model 8&9, 15&16). The significant impact of capital account openness in promoting secondary education goes away in three out of the four models (Table 2.23, Model 2, 3, 15). On the other hand, the finding on the positive role of democracy in improving primary and secondary spending proves to be more robust: the coefficients remain significant in four out of six models (Table 2.22, Model 18&19; Table 2.23, Model 15&16).

Total Education Spending as % of GDP

Considering that the amount of resources governments allocate to each level of education might very much depend on the total educational resources available, total government education spending might be an important control for my models. However, including this variable potentially causes the problem of endogeneity: other explanatory variables in the model could explain 36% variation in total education spending.[87] Constrained by the difficulties to find good instruments, I entered education spending as % of GDP directly in the model as a control to get an rough idea how the results might change (Table 2.22, Model 4, 13&20; Table 2.23, Model 4, 10&17; Table 2.24, Model 2, 7&13). I will have more confidence in my findings if the model results prove to be stable.

Consistent with my expectations, education spending as % of GDP is positive and significant in most of the models (Table 2.22, Model 13&20; Table 2.23, Model 10&17; Table 2.24, Model 7&13).[88] Findings on trade integration remain pretty much the same comparing with the baseline models; however, one originally significant coefficients of capital account openness becomes insignificant (Table 2.23, Model 4). The finding that democracy increases primary and secondary spending while decreasing that of tertiary again is more robust: the signs and significance of democracy remain pretty much the same after controlling for total educational resources available: only one out of four originally significant coefficients lose its significance, in the model of secondary

[87] Education spending as % of GDP is one of my specifications for aggregate spending models.
[88] These are the models with as % of GDP and per student spending as % of GDP per capita specification.

spending as % of GDP (Table 2.22, Model 20; Table 2.23, Model 17; Table 2.24, Model 2&7).

Other Controls

I also checked whether including the controls that were dropped from the baseline models would change my findings (Table 2.22, Model 5-9, 14-16, 21-23; Table 2.23, Model 5-6, 11-13, 18-20; Table 2.24, Model 3-5, 8-11, 14-17). It is comforting to see the results remain pretty much the same. Interaction terms are not considered for these spending level models due to limited data availability.

Table 2.22 Current Education Expenditure at the Primary Level - Robustness Check - Controls

Dependent Variable		Primary Spending as % of Total Education Spending									Primary Spending as % of GDP							Primary Spending per student as % of GDP per capita						
Model		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)
Trade $(log)_{t-1}$	D.	5.5	6	4.1	2.7	5.8	5.5	4.7	6	5	-.21	-.27	-.24	-.16	-.2	-.26	-.22	1.9	2	1.9	1.7	1.9	1.7	1.3
	L.	2.8	3	.04	1.7	2.9	2.7	3	2.8	3.3	-.19	-.21	-.35*	-.05	-.19	-.18	-.15	-.57	-.54	-.81	-.81	-.44	-.4	-1.3
Capital Account $Openness_{t-1}$	D.	1.4	1.2	1.2	1	1.2	1.4	1.4	1.2	1.7	.03	.04	.03	.05	.02	.04	.03	.8	.76	.74	1	.49	.99	.9
	L.	1.8	1.5	1.5	1.8	1.3	1.8	2.1	1.6	2.4	.03	.06	.03	.1	.03	.07	.02	-.76	-.79	-.66	-.31	-.76	-.37	-.67
$Regime_{t-1}$	D.	-2.8	-2.8	-4.8	-2.7	-2.1	-2.8	-2.8	-2.7	-2.7	.1	.09	-.01	-.02	.1	.05	.1	-.05	-.03	-.17	-.54	-.04	-.45	-.14
	L.	-2.6	-2.5	-3.8*	-3.3*	-3.2	-2.6	-2.8	-2.4	-2.6	.02	-.01	-.11	-.08	.02	.05	.07	1.4**	1.4**	1.2**	1**	1.4**	1.9***	1.7***
$election_t$							-.06								.004							.24		
GDP per capita $(log)_{t-1}$	D.	-24**	-24**		-36***	-27**	-24**	-27***	-23*	-35**	-1.3	-1.2		-1*	-1.3	-1.5*	-1.5*	-6.4	-6.4		-4.9	-7.6	-7.7	-1.9
	L.	-9.6***	-7.3		-8.3***	-11***	-9.6***	-9.3***	-9.4***	-7.9*	-.6***	-.77**		-.32**	-.59***	-.45**	-.72***	-1.9**	-1.8		-.58	-1.9**	-.7	-1
Revenue as % of GDP_t	D.							.1			.06***	.05***	.06***	.01	.06***	.05***	.06***	.26***	.27***	.28***	.1	.25***	.24***	.21***
	L.							-.18			.03***	.03**	.03**	-.002	.03***	.03**	.04***	.13*	.13*	.15**	.04	.11	.1	.22***
Output Gap_t	D.								.06								-.01							-.06
	L.								-.08								.004							-.06
Capital Stock as % of GDP_{t-1}	D.									-.04	.004	.005	.01***	.001	.004	.003	.001	-.01	-.01	-.0003	-.02	-.01	-.03	-.003
	L.									-.02	.003**	.002	.001	.0003	.003**	.002*	.003**	.02***	.02***	.02***	.01	.02***	.02**	.01
Youth Population $(0\text{-}14)_{t-1}$	D.		.48	.23								.01	-.03						.02	.07				
	L.		.18	.52***								-.02	.02						.02	.16*				
Education Spending as % of GDP_{t-1}	D.				-1.1									.33***							1.1***			
	L.				-1.8**									.19***							.47			
Lagged Dependent Variable		-.63***	-.62***	-.54***	-.68***	-.64***	-.63***	-.67***	-.62***	-.64***	-.67***	-.71***	-.54***	-.72***	-.67***	-.7***	-.7***	-.44***	-.44***	-.38***	-.43***	-.43***	-.49***	-.49***
Decade						1.5										-.11							-.98	
Constant		88***	62	-2.8	91***	101***	88***	89***	86***	75**	5.6***	8.1**	.37	3.1***		4.5**	6.4***	15***	13	-7.2	9.3	15**	5.9	14*
R^2		.42	.42	.37	.45	.42	.42	.41	.43	.43	.5	.51	.45	.75	.5	.51	.53	.41	.41	.39	.49	.42	.42	.45
N		72	72	72	72	72	72	70	72	72	70	70	70	70	70	70	70	77	77	77	77	77	77	75

1. Model (1), (10) and (17) are the baseline models as reported in table 2.12.

2. Model (2)&(3), (11)&(12) and (18)&(19) examine the effect of youth population control.

3. Model (4), (13) & (20) examine the effect of total education spending as of GDP.

4. Model (5)-(9), (14)-(16) and (21)-(23) examine the effects of controls not included in the baseline models.

* significant at .1 level **significant at .05 level ***significant at .01 level.

Table 2.23 Current Education Expenditure at the Secondary Level - Robustness Check - Controls

Dependent Variable		Secondary Spending as % of Total Education Spending						Secondary Spending as % of GDP							Secondary Spending per student as % of GDP per capita						
Model		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
Trade $(log)_{t-1}$	D.	-9.2	-9.2	-7.7	-9.1	-9.1	-9.9*	-.25	-.27	-.12	-.17	-.25	-.27	-.25	.76	.39	.59	.06	.97	-.37	-3.4
	L.	-4.2	-4.6	-2.1	-4.3	-4.1	-5.1	-.38**	-.38**	.02	-.3**	-.36**	-.37**	-.34**	-3.5	-3.3	-4*	-4.3*	-3.7	-3.4	-5.7**
Capital Account $Openness_{t-1}$	D.	2.6	2.4	1.3	2.5	1.9	2.7	.12	.13	.1	.13	.09	.13	.13	2.7**	2.2	2.4*	3**	2.1	3**	3.4***
	L.	3.4*	3.3	1.4	3.2	3.6*	3.6*	.08	.09	.04	.11	.09	.1	.07	-.28	-.4	-.11	.48	-.25	.49	1
$Regime_{t-1}$	D.	-4.8	-5.7	-1.2	-5	-4.6	-4	.12	.11	.09	-.03	.13	.09	.11	1.2	1.3	1.2	.46	1.3	.3	.97
	L.	2.5	2.6	3.8	2.6	2.5	3	.2**	.18	.16	.07	.21**	.21**	.23**	2.1**	2.3**	1.9*	1.5*	2.1**	2.6**	1.8**
$election_t$						.61						.03							.53		
GDP per capita $(log)_{t-1}$	D.	98***	96***		94***	94***	103***	2.2**	2.3**		2.7***	2**	2.1**	2.1**	-13	-16		-9.5	-15	-15	-.69
	L.	4.3	11		4.6	4.1	.97	-.45***	-.57**		-.19	-.45***	-.37*	-.52***	-3.6***	-1.1		-2.1	-3.3***	-1.7	-2
Revenue as % of GDP_t	D.						.16	.06***	.06***	.06***	.02*	.06***	.06***	.06***	.33**	.35**	.39***	.14	.28**	.31**	.26**
	L.						.16	.05***	.05***	.05***	.02**	.05***	.05***	.05***	.19	.27**	.28**	.13	.14	.16	.29**
Output Gap_t	D.	-.06	-.08	.06	-.07	-.04	-.1							-.01							-.02
	L.	-.33**	-.38**	-.06	-.3*	-.32**	-.32*							.002							-.03
Capital Stock as % of GDP_{t-1}	D.	.18**	.15**	-.1*	.18**	.19**	.19**	.01**	.01**	.001	.01**	.01**	.01*	.01	-.1***	-.11***	-.07***	-.1***	-.1***	-.11***	-.04
	L.	.01	.02	.02	.02	.01	.03	.003***	.003***	.002	.002**	.003***	.003**	.004**	.03***	.03**	.03***	.02**	.03**	.02**	.01
Youth Population $(0\text{-}14)_{t-1}$	D.		-1.3	-2.7					.02	-.12						-.78	-.45				
	L.		.43	.05					-.01	.02						.23	.32*				
Education Spending as % of GDP_{t-1}	D.				-.88						.24***							1.4**			
	L.				-.44						.17***							.29			
Lagged Dependent Variable		-.74***	-.8***	-.53***	-.76***	-.73***	-.72***	-.4***	-.42***	-.4***	-.66***	-.38***	-.43***	-.42***	-.43***	-.39***	-.37***	-.46***	-.4***	-.51***	-.5***
Decade		-3.3**	-4**	-1	-4**	-3.2**	-2.4						-.05							-1.5	
Constant		-11	-83	19	-11	-10	16	3.7***	5.3*	-.23	1.6	3.7***	3.5**	4.1***	48***	15	2.7	29**	46***	23	34**
R^2		.46	.46	.31	.46	.46	.47	.46	.46	.4	.63	.47	.46	.47	.3	.32	.29	.35	.32	.32	.35
N		72	72	72	72	72	70	70	70	70	70	70	70	70	69	69	71	69	69	69	66

1. Model (1), (7) and (14) are the baseline models as reported in table 2.12.

2. Model (2)&(3), (8)&(9) and (15)&(16) examine the effect of youth population control.

3. Model (4), (10) & (17) examine the effect of total education spending as of GDP.

4. Model (5)-(6), (11)-(13) and (18)-(20) examine the effects of controls not included in the baseline models.

* significant at .1 level **significant at .05 level ***significant at .01 level.

Table 2.24 Current Education Expenditure at the Tertiary Level - Robustness Check - Controls

Dependent Variable		Tertiary Spending as % of Total Education Spending					Tertiary Spending as % of GDP (Log)						Tertiary Spending per student as % of GDP per capita (Log)					
Model		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
Trade $(log)_{t-1}$	D.	-2.4	-1.1	-2.4	-1.2	-2.1	.16	.11	.16	.19	.11	.16	.37	.47	.37	.37	.42	.64
	L.	-3.6	-2.9	-3.6	-3.6	-2.4	.07	.12	.07	.08	.001	.07	.1	-.07	.1	.1	.05	.04
Capital Account $Openness_{t-1}$	D.	-.59	-.32	-.53	-.63	-.73	-.03	-.03	-.04	-.04	-.01	-.06	-.09	-.19	-.1	-.09	.05	-.2
	L.	1.7	1.8	1.7	1.3	1.3	-.02	.04	-.02	-.05	.02	-.06	.03	.08	.03	.03	.2	-.11
$Regime_{t-1}$	D.	-3.1**	-4**	-3.1**	-3.2**	-3.5**	.01	-.19***	.01	.02	.01	-.03	.14	.09	.15	.14	.23	.2
	L.	-5.3***	-5.2***	-5.3***	-5.4***	-4.8***	-.15	-.22***	-.15	-.18	-.13	-.15	.07	.07	.07	.07	.29*	.18
$election_t$				-.05					.01						.02			
GDP per capita $(log)_{t-1}$	D.	-20*	-14	-20	-20*	-36*	-2***	-.98*	-2.1***	-2.1***	-2**	-2.3*	-1.1	-.16	-1.1	-1.1*	-.62	-2.5**
	L.	7.9***	7.2***	7.9***	8***	7.6***	.27**	.27***	.27**	.28**	.19	.19	-.3*	-.27	-.3*	-.31	-.61***	-.65***
Revenue as % of GDP_t	D.				-.34						.01		.01	-.03	.01	.01	.001	.02
	L.				-.01						.02		.01	.01	.01	.02	.04*	.03*
Output Gap_t	D.	.13	.14	.13	.14	.1	-.002	.004	-.002	-.002	-.001	-.001					-.01	
	L.	.32***	.34***	.32***	.34***	.35***	.01**	.01**	.01**	.01**	.02**	.02**					0	
Capital Stock as % of GDP_{t-1}	D.					-.08						-.001						-.01
	L.					-.002						.001						.002
Youth Population $(0\text{-}14)_{t-1}$	D.																	
	L.																	
Education Spending as % of GDP_{t-1}	D.		.71					.26***						.3***				
	L.		1.4					.22***						.05				
Lagged Dependent Variable		-.53***	-.58***	-.53***	-.52***	-.57***	-.37***	-.6***	-.38***	-.37***	-.4***	-.4***	-.4***	-.39***	-.39***	-.4***	-.43***	-.46***
Decade										.16*						.003		
Constant		-41***	-40***	-44***	-42***	-44***	-2.8***	-4.2***	-2.8***	-2.8***	-2.2**	-2.1*	3.3*	3.5*	3.3*	3.3	5.1***	6.8***
R^2		.36	.39	.36	.38	.37	.33	.57	.33	.35	.35	.34	.27	.4	.27	.27	.33	.31
N		80	80	80	78	80	80	80	80	80	78	80	67	67	67	67	65	67

1. Model (1), (6) and (12) are the baseline models as reported in table 2.12.

2. Model (2), (7) & (13) examine the effect of total education spending as of GDP.

3. Model (3)-(5), (8)-(11) and (14)-(17) examine the effects of controls not included in the baseline models.

* significant at .1 level **significant at .05 level ***significant at .01 level.

Adding/Dropping Countries

Comparing with the aggregate spending models, the missing data problem is much more serious in the spending level models for two additional reasons: 1) Indonesia is excluded from the estimation of almost all the models due to data nonavailability; 2) countries such as Philippines have only a few data points. The latter data limitation also causes potential problem for error correction model which shouldn't include countries with such short time span.[89]

To see whether my finding is sensitive to sample variation, I estimate each spending level model with four different samples by slightly changing model specification (Table 2.25, Table 2.26 & Table 2.27). Sample (a) is the baseline sample that produces the findings for the baseline models. It includes Indonesia, Korea, Malaysia, Philippines, Singapore, and Thailand. Sample (b) is the baseline sample excluding the countries with limited data points for that model. Sample (c) is the baseline sample plus Taiwan and sample (d) is the baseline sample plus Taiwan and Hong Kong. Again, this way of checking the findings has the potential problem of confounding sample change with that of variable, but a consistent finding will increase the confidence in its validity.

The results on trade integration and capital account openness remain pretty much consistent across all four samples (the majority of the coefficients do not change their significance or signs); also insensitive to the change in samples is the finding that democracy increases secondary spending while decreasing that of tertiary spending. The positive effect of democracy on primary spending per student is no longer significant

[89] Thanks to the comment by Alex Segura-Ubiergo.

when Taiwan and Hong Kong are included. However, it is hard to tell whether this change is due to change in sample or in model specification.

Table 2.25 Current Education Expenditure at the Primary Level - Robustness Check - Sample Variation

		Primary Spending as % of Total Education Spending				Primary Spending as % of GDP				Primary Spending per student as % of GDP per capita			
Model		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
sample[1]		(a)	(b)	(c)	(d)	(a)	(b)	(c)	(d)	(a)	(b)	(c)	(d)
Trade $(\log)_{t-1}$	D.	5.5	5.3	7.3	5.7	-.21	-.2	-.04	.12	1.9	2	.55	1.7
	L.	2.8	3.1	-3.4*	-3.2	-.19	-.16	-.32**	-.18	-.57	-.69	-.81	-.37
Capital Account Openness_{t-1}	D.	1.4	1.3			.03	.01			.8	.14		
	L.	1.8	1.8			.03	.003			-.76	-.15**		
Regime_{t-1}	D.	-2.8	-2.6	-1.7		.1	.11	.03	.04	-.05	-.14	1	
	L.	-2.6	-2.4	-2.3		.02	.04	-.11	.02	1.4**	1.1*	.68	
Liberty Score_{t-1}	D.				-.19								.34
	L.				-.25								.15
Election_t	D.												
GDP per capita $(\log)_{t-1}$	D.	-24**	-28**	-19**	-17**	-1.3	-1.5	-1.1	-1.8***	-6.4	-7.8	-10**	-6**
	L.	-9.6***	-9.9***	-1.4	-2.2	-.6***	-.66***	.03	-.08	-1.9**	-1.9*	.69	.74**
Revenue as % of GDP_t	D.					.06***	.06***	.03***	.02*	.26***	.27***	.17**	.1
	L.					.03***	.03**	.003	0	.13*	.12*	-.03	-.04
Output Gap_t	D.												
	L.												
Capital Stock as % of GDP_{t-1}	D.					.004	.004	.01		-.01	-.001	-.02	
	L.					.003**	.003**	.0004		.02***	.03***	.001	
Lagged Dependent Variable		-.63***	-.64***	-.37***	-.31***	-.67***	-.69***	-.49***	-.44***	-.44***	-.52***	-.25***	-.21***
Decade													
Constant		88***	89***	46***	50***	5.6***	6.1***	1.9**	2.3***	15***	21**	1.6	-2
R^2		.42	.42	.25	.22	.5	.48	.36	.35	.41	.44	.28	.24
N		72	66	99	104	70	64	97	103	77	69	104	111

1. sample (a) is the baseline sample which includes Indonesia, Korea, Malaysia, Philippines, Singapore, Thailand; sample (b) is the baseline sample excluding Philippines; sample (c) is the baseline sample plus Taiwan; sample (d) is the baseline sample plus Hong Kong and Taiwan.

* significant at .1 level **significant at .05 level ***significant at .01 level.

Table 2.26 Current Education Expenditure at the Secondary Level - Robustness Check - Sample Variation

		Secondary Spending as % of Total Education Spending				Secondary Spending as % of GDP				Secondary Spending per student as % of GDP per capita			
Model		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
sample[1]		(a)	(b)	(c)	(d)	(a)	(b)	(c)	(d)	(a)	(b)	(c)	(d)
Trade $(\log)_{t-1}$	D.	-9.2	-10*	-8.2	-9	-.25	-.29	-.3	-.11	.76	1	-2.1	-.23
	L.	-4.2	-4.4	-1.4	-2.2	-.38**	-.36**	-.39***	-.26*	-3.5	-2.7	-1.7	-.47
Capital Account Openness_{t-1}	D.	2.6	2.6			.12	.1			2.7**	2.6**		
	L.	3.4*	3.5			.08	.05			-.28	-.06		
Regime_{t-1}	D.	-4.8	-5	-.6		.12	.12	.06		1.2	1.7	1.1	
	L.	2.5	2.4	2.2		.2**	.22**	-.01		2.1**	2.9**	1.5**	
Liberty Score_{t-1}	D.				-.21				.05**				.44
	L.				-.07				.01				.39
Election_t	D.												
GDP per capita $(\log)_{t-1}$	D.	98***	98***	62***	32***	2.2**	2.2**	1.2*	-.16	-13	-15	-26***	-.94
	L.	4.3	4.4	-4.3**	-.07	-.45***	-.54***	.06	.1	-3.6***	-5.2***	-.28	.1
Revenue as % of GDP_t	D.					.06***	.06***	.03***	.02***	.33**	.34**	.19*	.18*
	L.					.05***	.05***	.02***	.02***	.19	.22	-.02	.03
Output Gap_t	D.	-.06	-.06	-.03	.04								
	L.	-.33**	-.29*	-.17	-.14								
Capital Stock as % of GDP_{t-1}	D.	.18**	.18**	.11*		.01**	.01**	.01**		-.1***	-.1***	-.12***	
	L.	.01	.02	.04**		.003***	.004**	.002*		.03***	.03**	.001	
Lagged Dependent Variable		-.74***	-.74***	-.5***	-.31***	-.4***	-.43***	-.48***	-.38***	-.43***	-.41***	-.22**	-.14
Decade		-3.3**	-3.4**	.5	.63								
Constant		-11	-11	52***	15	3.7***	4.7***	.48	.49	48***	55***	11	.01
R^2		.46	.44	.36	.29	.46	.46	.32	.28	.3	.3	.19	.1
N		72	66	98	103	70	64	97	103	69	61	96	103

[1.] sample (a) is the baseline sample which includes Indonesia, Korea, Malaysia, Philippines, Singapore, Thailand; sample (b) is the baseline sample excluding Philippines; sample (c) is the baseline sample plus Taiwan; sample (d) is the baseline sample plus Hong Kong and Taiwan.

* significant at .1 level **significant at .05 level ***significant at .01 level.

Table 2.27 Current Education Expenditure at the Tertiary Level - Robustness Check - Sample Variation

		Tertiary Spending as % of Total Education Spending				Tertiary Spending as % of GDP (Log)				Tertiary Spending per student as % of GDP per capita (Log)			
Model		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
sample[1]		(a)	(b)	(c)	(d)	(a)	(b)	(c)	(d)	(a)	(#)	(c)	(d)
Trade $(log)_{t-1}$	D.	-2.4	-1.7	-1.2	-3.6	.16	.27	.04	.02	.37	.77	.11	.16
	L.	-3.6	-3.8	1	.59	.07	.05	-.02	-.02	.1	.09	.2	.13
Capital Account $Openness_{t-1}$	D.	-.59	-.6			-.03	-.03			-.09	.13		
	L.	1.7	1.6			-.02	-.03			.03	.3*		
$Regime_{t-1}$	D.	-3.1**	-3**	-3**		.01	.02	.1		.14	.21	.08	
	L.	-5.3***	-5.4***	-3.8***		-.15	-.15	-.13*		.07	.19	-.02	
Liberty $Score_{t-1}$	D.				-1.1**				.001				-.02
	L.				-.87*				-.01				-.04
$Election_t$	D.												
GDP per capita $(log)_{t-1}$	D.	-20*	-21*	-18**	-7.6	-2***	-2.1***	-2.2***	-1.8***	-1.1	.12	-1.6***	-1.3**
	L.	7.9***	8***	4.6***	3.3***	.27**	.27**	.3***	.21**	-.3*	-.49**	-.1	-.05
Revenue as % of GDP_t	D.									.01	-.02	.0004	.01
	L.									.01	.02	-.01	0
Output Gap_t	D.	.13	.16	.07	-.03	-.002	0	-.001	-.002				
	L.	.32***	.34***	.22**	.09	.01**	.02***	.01*	.01				
Capital Stock as % of GDP_{t-1}	D.												
	L.												
Lagged Dependent Variable		-.53***	-.52***	-.46***	-.4***	-.37***	-.34***	-.36***	-.33***	-.4***	-.41***	-.32***	-.36***
Decade													
Constant		-41***	-42***	-36***	-23***	-2.8***	-2.7***	-2.6***	-2.2***	3.3*	3.8*	1	.86
R^2		.36	.36	.3	.28	.33	.33	.33	.29	.27	.35	.27	.3
N		80	77	106	111	80	77	106	111	67	47	94	98

1. Excluding model (10), sample (a) is the baseline sample which includes Indonesia, Korea, Malaysia, Philippines, Singapore, Thailand; sample (b) is the baseline sample excluding Philippines; sample (c) is the baseline sample plus Taiwan; sample (d) is the baseline sample plus Hong Kong and Taiwan. Sample (#) is the baseline sample excluding Malaysia, Indonesia and Philippines.

* significant at .1 level **significant at .05 level ***significant at .01 level.

Estimation Method

Statistical results may also be sensitive to the estimation method chosen. To check this possibility, I re-estimate all the spending level models by fixed effects and GLS (Table 2.28, Table 2.29 & Table 2.30).

The insignificance of the trade integration variable is pretty stable across all three estimation methods for all the primary and tertiary spending models. However, the significant negative impact of trade on secondary spending as % of GDP goes away. Moreover, the magnitude of the long-run equilibrium relation coefficient is much smaller in the fixed effect and GLS estimation than the OLS estimation with PCSEs (Table 2.28, Table 2.29 & Table 2.30). I'm not sure why this is the case. The short run effect coefficients are more or less on the same scale.

Results on capital account openness seem to be sensitive to the estimation method chosen. Some of the coefficients for the secondary spending models change their significance depending on the estimation method (Table 2.29, Model 2, 8&9)

Findings on democracy remain consistent regardless of the estimation method: the significance, signs and magnitude of the variables are all quite stable for all the models (Table 2.28, Table 2.29 & Table 2.30).

Table 2.28 Current Education Expenditure at the Primary Level - Robustness Check - Estimation Method

		Primary Spending as % of Total Education Spending			Primary Spending as % of GDP			Primary Spending per student as % of GDP per capita		
Method[1]		ols	fe	gls	ols	fe	gls	ols	fe	gls
Model		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Trade (log) $_{t-1}$	D.	5.5	5.3	4.3	-.21	-.09	.05	1.9	2.2	1.2
		(5.1)	(5.8)	(4.3)	(.29)	(.35)	(.26)	(1.8)	(2)	(1.7)
	L.	2.8	.01	.01	-.19	.0001	.001	-.57	.002	.01
		(2.8)	(.02)	(.01)	(.17)	(.001)	(.001)	(.93)	(.01)	(.005)
Capital Account Openness $_{t-1}$	D.	1.4	1.3	1.5	.03	.001	-.01	.8	.62	.5
		(1.2)	(2.1)	(1.2)	(.11)	(.12)	(.11)	(.83)	(.87)	(.73)
	L.	1.8	1.8	2	.03	-.03	-.13	-.76	-1	-.92*
		(1.4)	(2.3)	(1.4)	(.11)	(.14)	(.12)	(.53)	(.6)	(.5)
Regime $_{t-1}$	D.	-2.8	-3.1	-3.6	.1	.11	.07	-.05	-.04	-.11
		(4.6)	(3.7)	(4.5)	(.16)	(.2)	(.16)	(1.2)	(1.3)	(1.2)
	L.	-2.6	-2.8	-3.3*	.02	.05	.04	1.4**	1.5**	1.7***
		(2.0)	(1.9)	(2)	(.12)	(.13)	(.11)	(.56)	(.63)	(.55)
GDP per capita (log) $_{t-1}$	D.	-24**	-22*	-13	-1.3	-1.7	-1.5**	-6.4	-7.6	-5.8
		(10)	(12)	(8)	(.87)	(1)	(.76)	(5.3)	(6.3)	(5)
	L.	-9.6***	-8.2***	-8.1***	-.6***	-.66***	-.55***	-1.9**	-2.2**	-2**
		(3)	(2.9)	(2.2)	(.2)	(.24)	(.16)	(.81)	(1.1)	(.8)
Revenue as % of GDP $_{t}$	D.				.06***	.06***	.05***	.26***	.26**	.17**
					(.01)	(.02)	(.01)	(.08)	(.1)	(.07)
	L.				.03***	.03**	.03***	.13*	.13	.11*
					(.01)	(.01)	(.01)	(.07)	(.08)	(.06)
Output Gap $_{t}$	D.									
	L.									
Capital Stock as % of GDP $_{t-1}$	D.				.004	.002	.002	-.01	-.02	-.02
					(.003)	(.004)	(.003)	(.02)	(.03)	(.02)
	L.				.003**	.003*	.002**	.02***	.02**	.01**
					(.001)	(.002)	(.001)	(.01)	(.01)	(.01)
Lagged Dependent Variable		-.63***	-.6***	-.61***	-.67***	-.63***	-.57***	-.44***	-.43***	-.4***
		(.13)	(.13)	(.11)	(.13)	(.14)	(.11)	(.08)	(.1)	(.08)
Decade										
Constant		88***	93***	101***	5.6***	5.6***	4.5***	15***	18**	15***
		(25)	(27)	(23)	(1.6)	(1.8)	(1.2)	(5.7)	(7.7)	(5.5)
R^2		.42	.4	NA	.5	.49	NA	.41	.39	NA
N		72	72	72	70	70	70	77	77	77

[1.] Panel corrected standard errors are used with OLS estimation. Heterogeneous panels are specified for the GLS estimation. "fe" refers to fixed effect estimation.

* significant at .1 level **significant at .05 level ***significant at .01 level.

Table 2.29 Current Education Expenditure at Secondary Level - Robustness Check – Estimation Method

		Secondary Spending as % of Total Education Spending			Secondary Spending as % of GDP			Secondary Spending per student as % of GDP per capita		
Method[1]		ols	fe	gls	ols	fe	gls	ols	fe	gls
Model		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Trade (log) $_{t-1}$	D.	-9.2	-9.6	-6.6	-.25	-.16	-.12	.76	1.9	4
		(5.8)	(6.5)	(5.3)	(.24)	(.31)	(.24)	(3.9)	(4.2)	(2.9)
	L.	-4.2	-.03	-.02	-.38**	-.001	-.0004	-3.5	-.01	.01
		(3.1)	(.02)	(.02)	(.16)	(.001)	(.001)	(2.2)	(.02)	(.01)
Capital Account Openness $_{t-1}$	D.	2.6	2.9	2.9	.12	.12	.13	2.7**	1.8	1.3
		(2.0)	(2.3)	(1.9)	(.11)	(.11)	(.11)	(1.3)	(1.8)	(1)
	L.	3.4*	4.6	3.9*	.08	.05	.03	-.28	-1.2	-2.3***
		(2.1)	(2.9)	(2.2)	(.1)	(.13)	(.12)	(1.0)	(1.3)	(.76)
Regime $_{t-1}$	D.	-4.8	-5.1	-3.9	.12	.15	.14	1.2	1.2	1.4
		(3.6)	(4.1)	(3.7)	(.15)	(.19)	(.16)	(2.1)	(2.4)	(2.2)
	L.	2.5	3	3.6	.2**	.27**	.23**	2.1**	2.3*	2.9***
		(2.5)	(2.5)	(2.2)	(.1)	(.12)	(.1)	(.86)	(1.2)	(.93)
GDP per capita (log) $_{t-1}$	D.	98***	84***	78***	2.2**	1.2	.86	-13	-22	-17**
		(19)	(24)	(20)	(.89)	(.93)	(.78)	(10)	(13)	(8.1)
	L.	4.3	3.5	3.8	-.45***	-.6***	-.44***	-3.6***	-4*	-4.3***
		(3.2)	(4.6)	(3.3)	(.17)	(.21)	(.16)	(1.2)	(2.2)	(1.2)
Revenue as % of GDP $_{t}$	D.				.06***	.06***	.05***	.33**	.28	.3***
					(.01)	(.02)	(.01)	(.14)	(.19)	(.1)
	L.				.05***	.05***	.04***	.19	.17	.27***
					(.01)	(.01)	(.01)	(.13)	(.17)	(.09)
Output Gap $_{t}$	D.	-.06	-.06	-.07						
		(.17)	(.19)	(.14)						
	L.	-.33**	-.26	-.4**						
		(.16)	(.19)	(.16)						
Capital Stock as % of GDP $_{t-1}$	D.	.18**	.12	.11*	.01**	.003	.002	-.1***	-.12**	-.1***
		(.07)	(.09)	(.07)	(.004)	(.004)	(.003)	(.03)	(.05)	(.03)
	L.	.01	.02	-.003	.003***	.003**	.002**	.03***	.03	.02**
		(.03)	(.04)	(.03)	(.001)	(.002)	(.001)	(.01)	(.02)	(.01)
Lagged Dependent Variable		-.74***	-.76***	-.69***	-.4***	-.34**	-.3**	-.43***	-.37**	-.33***
		(.15)	(.16)	(.13)	(.14)	(.16)	(.13)	(.13)	(.16)	(.1)
Decade		-3.3**	-3.8*	-3.2**						
		(1.5)	(2.2)	(1.6)						
Constant		-11	-22	-23	3.7***	3.8**	2.8**	48***	36**	37***
		(26)	(35)	(27)	(1.1)	(1.4)	(1.1)	(16)	(16)	(9.3)
R^2		.46	.45	NA	.46	.42	NA	.3	.26	NA
N		72	72	72	70	70	70	69	69	69

[1.] Panel corrected standard errors are used with OLS estimation. Heteregeneous panels are specified for the GLS estimation. "fe" refers to fixed effect estimation.

* significant at .1 level **significant at .05 level ***significant at .01 level.

Table 2.30 Current Education Expenditure at Tertiary Level - Robustness Check - Estimation Method

		Tertiary Spending as % of Total Education Spending			Tertiary Spending as % of GDP			Tertiary Spending per student as % of GDP per capita		
Method[1]		ols	fe	gls	ols	fe	gls	ols	fe	gls
Model		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Trade (log) $_{t-1}$	D.	-2.4	-1	-1	.16	.27	.27	.37	.51	-.09
		(4.6)	(5.4)	(3.9)	(.29)	(.34)	(.29)	(.47)	(.47)	(.36)
	L.	-3.6	.002	.02	.07	.002	.002	.1	.003*	.002
		(2.6)	(.02)	(.02)	(.17)	(.001)	(.001)	(.24)	(.002)	(.001)
Capital Account Openness $_{t-1}$	D.	-.59	-.81	-.87	-.03	-.06	-.07	-.09	-.13	-.14
		(1.7)	(1.9)	(1.7)	(.1)	(.12)	(.09)	(.16)	(.23)	(.15)
	L.	1.7	.93	.55	-.02	-.12	-.14	.03	-.06	-.002
		(1.5)	(2.1)	(1.7)	(.09)	(.13)	(.1)	(.13)	(.13)	(.1)
Regime $_{t-1}$	D.	-3.1**	-3.1	-2.6*	.01	.01	.04	.14	.18	.22
		(1.5)	(2.4)	(1.4)	(.12)	(.15)	(.12)	(.19)	(.29)	(.18)
	L.	-5.3***	-4.6**	-3.5**	-.15	-.11	-.08	.07	.17	.13
		(1.6)	(2.1)	(1.4)	(.11)	(.13)	(.11)	(.15)	(.16)	(.11)
GDP per capita (log) $_{t-1}$	D.	-20*	-20	-19**	-2***	-1.8**	-1.5**	-1.1	-1.2	-1.6***
		(11)	(14)	(9.6)	(.74)	(.86)	(.7)	(.65)	(.91)	(.57)
	L.	7.9***	6***	4.2***	.27**	.22*	.18	-.3*	-.44**	-.37**
		(2.3)	(2.2)	(1.6)	(.13)	(.13)	(.11)	(.17)	(.21)	(.16)
Revenue as % of GDP $_{t}$	D.							.01	.003	.01
								(.02)	(.03)	(.02)
	L.							.01	.02	.01
								(.02)	(.02)	(.02)
Output Gap $_{t}$	D.	.13	.08	.06	-.002	-.004	-.01			
		(.13)	(.15)	(.11)	(.01)	(.01)	(.01)			
	L.	.32***	.28**	.22**	.01**	.01	.01			
		(.11)	(.13)	(.09)	(.01)	(.01)	(.01)			
Capital Stock as % of GDP $_{t-1}$	D.									
	L.									
Lagged Dependent Variable		-.53***	-.51***	-.55***	-.37***	-.37***	-.35***	-.4***	-.42***	-.33***
		(.11)	(.11)	(.1)	(.09)	(.09)	(.08)	(.14)	(.11)	(.1)
Decade										
Constant		-41***	-44***	-25**	-2.8***	-2*	-1.8**	3.3*	4.6**	4***
		(10)	(16)	(12)	(.85)	(1.1)	(.87)	(1.8)	(1.8)	(1.4)
R^2		.36	.31	NA	.33	.31	NA	.27	.29	NA
N		80	80	80	80	80	80	67	67	67

[1.] Panel corrected standard errors are used with OLS estimation. Heterogeneous panels are specified for the GLS estimation. "fe" refers to fixed effect estimation.

* significant at .1 level **significant at .05 level ***significant at .01 level.

2.4.3 Summary

Table 2.31 summarizes various robustness checks in this section. The checks add confidence to the finding that democracy increases per student secondary spending as % of GDP per capita while decreasing the proportion East Asian governments devote to tertiary spending. Democracy also increases primary spending per student as % of GDP per capita but this finding is less robust in that it is somewhat sensitive to sample changes. Consistently, democracies in East Asia also seem to devote a larger proportion of their GDP to secondary education but this result looks sensitive to controls entered into the model.

Trade integration remains consistently insignificant in almost all the models except secondary spending as % of GDP; however, the magnitude of the trade variable in these models varies depending on the estimation method chosen and alternative trade indicators tend to produce different effects. Secondary spending as % of GDP is originally found to be negatively associated with trade, but this significant result is changeable depending on controls in the model and its magnitude also varies with the estimation method chosen.

The finding in the baseline models that capital account openness increases secondary spending (as percent of total education spending and per student spending as percent of GDP per capita) is not robust. This finding is very sensitive to alternative indicators of capital account openness, controls in the model, countries in the sample and the type of estimation method. On the other hand, the insignificant associations between capital

account openness and primary/tertiary spending prove to be quite robust, insensitive to almost all changes in the model except a few.

Table 2.31 Current Education Spending at Different Levels: Summary of Robustness Checks

	Primary Spending			Secondary Spending			Tertiary Spending		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	as % of education spending	as % of GDP	per student as % of GDP per capita	as % of education spending	as % of GDP	per student as % of GDP per capita	as % of education spending	as % of GDP (log)	per student as % of GDP per capita (log)
Trade									
Baseline	-	-	-	-	(-)	-	-	-	-
Varing Trade Integration Indicator	-	mixed	-	mixed	(-)	mixed	-	-	mixed
Youth Population Control	-	mixed	-	-	mixed	-	NA	NA	NA
Spending Control	-	-	-	-	(-)	(-)	-	-	-
Adding/Dropping Countries	-	-	-	-	(-)	-	-	-	-
Varying Estimation Method	-*	-*	-*	-*	-*	-*	-*	-*	-*
Capital Account Openness									
Baseline	-	-	-	+	-	+	-	-	-
Varing Capital Account Openness Indicator	-	-	-	mixed	mixed	mixed	mixed	mixed	mixed
Youth Population Control	-	-	-	-	-	mixed	NA	NA	NA
Spending Control	-	-	-	-	-	+	-	-	-
Adding/Dropping Countries	-	-	(-)	-	-	+	-	-	+
Varying Estimation Method	-	-	-	mixed	-	mixed	-	-	-
Democracy									
Baseline	-	-	+	-	+	+	(-)	-	-
Varing Democracy Indicator	mixed	mixed	+	-	+	+	(-)	-	mixed
Youth Population Control	mixed	-	+	-	-	+	NA	NA	NA
Spending Control	(-)	-	+	-	-	+	(-)	(-)	-
Adding/Dropping Countries	-	-	mixed	-	+	+	(-)	-	-
Varying Estimation Method	-	-	+	-	+	+	(-)	-	-

1. "+" indicates a significant positive effect, "-" indicates a null-effect and "(-)" indicates a significant negative effect. "NA" indicates this check is not applicable to this model; "mixed" refers to a different effect from the baseline for at least two (or 50%, whichever is smaller) models of this check.

* The coefficient of the long-run impact is much smaller in the GLS estimation.

2.5 Conclusion

The substantive findings of this chapter are summarized in Table 2.32, which shows the effects of trade integration, capital account openness and democracy on total government education spending and spending at different levels respectively. A star indicates a robust finding that has passed all robustness checks or all except one.

Table 2.32 Summary of Findings in Chapter 1 & 2

	Total Government Education Spending	Government Current Education Expenditure		
		Primary Level	Secondary Level	Tertiary Level
Trade Integration	positive (as % of total government spending, as % of GDP, per student)	no-effect* (as % of total education spending, per student as % of GDP per capita) no-effect (as % of GDP)	no-effect (as % of total education spending, per student as % of GDP per capita) negative (as % of GDP)	no-effect* (as % of total education spending, as % of GDP) no-effect (per student as % of GDP per capita)
Capital Account Openness	no-effect* (as % of total government spending, as % of GDP, per student)	no-effect* (as % of GDP, as % of total education spending, per student as % of GDP per capita)	no-effect* (as % of GDP) positive (as % of education spending, per student as % of GDP per capita)	no-effect* (as % of total education spending, as % of GDP) no-effect (per student as % of GDP per capita)
Democracy	positive* (per student) positive (as % of GDP) no-effect* (as % of total government spending)	positive* (per student as % of GDP per capita) no-effect * (as % of GDP) no-effect (as % of education spending)	positive* (per student as % of GDP per capita) positive (as % of GDP) no-effect* (as % of education spending)	negative* (as % of education spending) no-effect* (as % of GDP, per student as % of GDP per capita)

*indicates a pretty robust finding which have passed all the robustness checks.

As can be seen from Table 2.32, the evidence tilts toward a null-effect of the globalization variables on education spending in East Asia. Trade integration initially produces a long-run positive effect on total government education spending however this effect is not a robust one.[90] Findings from the disaggregate spending models seem to confirm this observation. Trade integration has no effects on all the specifications of spending at primary, secondary and tertiary levels except one, and half of the null-effects prove to be robust findings. I initially hypothesized a positive effect of trade on total education spending: this hypothesis is thus rejected. I also hypothesized that trade would produce a positive effect on primary and secondary education spending and a null-effect on tertiary spending, the first half of this hypothesis is rejected while the second half is confirmed. My finding on the null-effect of trade integration is not surprising given the existing literature, which sees mixed results on the impacts of trade integration: positive (Dion, 2005; Avelion, Brown and Hunter, 2005; Huber, Mustillo and Stephens), negative (Rudra and Haggard, 2003) as well as insignificant relationships (Brown, 2004; Kaufman and Segura-Ubiergo, 2001) have been reported.

The current literature provides stronger evidence for a null-effect of capital account openness on government education spending (Rudra and Haggard, 2005; Avelino, Brown and Hunter, 2005; Huber, Mustillo and Stepens, 2004). One study found a positive effect of capital account openness on total education and health spending (Kaufman and Segura-Ubiergo, 2001) and one study finds a negative effect of foreign direct investment on primary education spending (Hecock, 2006). My study seems to add evidence to the

[90] The trade variable in the total government education spending models loses its significance when a policy indicator of trade integration is used; the magnitude of the long-run impact of the trade variable also becomes much smaller in other estimation methods;

null-effect finding: capital account openness consistently has no effect on all specifications of total government education spending and most of the specifications on spending at different levels; these findings also prove to be quite robust. I initially hypothesized a positive effect of capital account openness on total education spending, this hypothesis is thus rejected; I also hypothesized capital account openness would produce a positive effect on primary and secondary education spending and a null-effect on tertiary spending, the first half of this hypothesis is rejected while the second half is tentatively confirmed.

For the effects of democracy, I have hypothesized in East Asia there is a positive association between democratic regimes and total government education spending; I also hypothesized there is a positive relation between democratic regime and primary/secondary spending but no relationship between democratic regime and tertiary spending. My findings seem to support most of my hypotheses. Democracy is positively associated with two specifications of total government education spending (as percent of GDP and per student spending) (in both short and long run), one specification of primary spending (per student as percent of GDP per capita) and two specifications of secondary spending (per student as percent of GDP per capita and as percent of GDP) (in the long run). Contrary to my hypothesis of a non-relationship, democratic regimes in East Asia also significantly reduce the proportion of education spending governments devote to tertiary education (in both short and long run). The short-run effect of democracy is probably through the calculation of politicians while the long-run effect through the mobilization of interest groups. Most of the findings are robust: democracy consistently

increases total spending per capita, primary and secondary per student spending as percent of GDP per capita while decreases tertiary spending as percent of total education spending. Table 2.33 summarizes the effects of democracy on education spending.

Table 2.33 Effects of Democracy on Education Spending in East Asia

	Regional average	Democracy
Total Education Spending		
as % of government spending	15%	- (*)
as % of GDP	3%	+.5%
per capita spending	$243	+$91(*)
Primary Spending		
as % of education spending	41%	-
as % of GDP	1.2%	- (*)
per student as % of GDP per capita	11%	+3% (*)
Secondary Spending		
as % of education spending	30%	- (*)
as % of GDP	0.9%	+.5%
per student as % of GDP per capita	14%	+5% (*)
Tertiary Spending		
as % of education spending	18%	-13% (*)
as % of GDP	0.5%	- (*)
per student as % of GDP per capita	47%	- (*)

Note: "-" indicates an insignificant effect. * indicates a robust finding.

This finding that East Asian democratic governments devote more of their national resources to education, especially to the primary and secondary level while at the same time allocating less of their government resources to the tertiary level is somewhat surprising since education in this region has been placed at a strategic position by democratic and authoritarian governments alike for reasons such as economic

development and national integration. However, when viewed in a comparative context, the progressive role of democracy in promoting education spending is consistent with findings in Latin America, Africa and developing countries in general (Ames, 1987; Kaufman and Segura-Ubiergo, 2001;Brown, 2004; Avelino, Brown and Hunter, 2005; Stasavage, 2005; Dion, 2005;). At the disaggregate level, my finding that democracy increases primary and secondary spending in East Asia is also consistent with similar findings in Latin America and Africa (Brown, 2004; Brown and Hunter, 2004a; Stasavage, 2005).

I have been very conservative in this study to only highlight findings that are robust to various changes in model specification. By doing so, I might make the mistake of discarding significant findings but I have more confidence in the validity of the findings I do present. The reason for my caution lies very much in my data limitation. As already stated in the robustness check section of this chapter, obtaining data on key variables such as capital account openness and capital stock for Taiwan and Hong Kong would greatly increase the number of cases available for estimation; unfortunately, I was not able to do so. Moreover, the missing data problem is even more serious for the spending level models, for which I have to limit the number of controls in the model to increase the efficiency of estimation. Thirdly, government education spending in the spending level models is approximated by current expenditure only. Even though such approximation is reasonable for most countries in the sample since current expenditure composes more than 80% of total spending on average, one wonders whether adding capital expenditure

to the data would change the results. But currently, I am not aware of any data on capital expenditure at different levels.

The difficulties of properly measuring trade integration and capital account openness is widely known in the literature (Eichengreen, 2001). My study is no exception. A policy indicator of trade usually produces quite different results from the trade intensity indicator. Meanwhile, while my findings suggests a null-effect of capital account openness on all the education spending variables, they also suggest a more nuanced policy indicator might help us better distinguish the effects of foreign direct investment and private capital flow: foreign direct investment seems to increase secondary spending but decrease that of tertiary; however, private capital flow consistently has no effect on spending at all three levels.[91] Of course, since my data on foreign direct investment and private capital flow contains more missing values than the policy indicator, the conclusion drawn here is no more than a first guess. [92]

Last but not least, I may not properly control for variables such as youth population and spending constraints of the government[93] in both the aggregate and disaggregate spending models due to possible problems of endogeneity. Entering them directly into the models produces some rough idea how the findings might change. Given the possible

[91] The Quinn indicator used in the study includes both dimensions.
[92] One study has studied the effects of both foreign direct investment and capital flows on government education spending in middle income countries (Dion, 2005). However, it found foreign direct investment has no effect on education spending while capital flows have a positive effect.
[93] Given how much governments could spend in each category might very much depend on how much they could spend in total, for the total education spending models, I need to control for total government spending. For the disaggregate spending models, I need to control for total education spending.

importance of these controls, my findings would be improved by adopting better modeling strategy, which is likely to involve finding good instruments for these controls.

Chapter 3 Globalization, Democratization and Education Participation, Attainment and Gender Equity in East Asia (1971-2003)

Chapter 2 has examined the relationship between globalization, democratization and government education spending in East Asia. My hypotheses on the positive effects of democratization on total education spending and spending at the primary and the secondary levels are verified. The most robust finding from chapter 2 is the progressive role of democracy in this region: democracies in East Asia have a higher per capita education spending than non-democracies; moreover, they also have a higher per student spending as percent of GDP per capita at the primary and secondary levels while reducing allocation to tertiary education. On the impacts of globalization on education spending, I have hypothesized a positive relationship and I also expect increasing globalization to improve government spending at the primary and secondary level. Chapter 2 finds a less certain relationship for these hypotheses since some of the results are sensitive to model specifications; however, the evidence tilts toward a null-relationship between globalization and education spending at both aggregate and disaggregate levels.

Are the impacts of globalization and democratization the same for education outcome indicators in East Asia? We know from the literature the relationship between education spending and outcome is not clear (Reinikka and Svensson, 2004; Gupta, Verhoeven and Tiongsn, 2002; Checchi, 2003; Hanushek & Kinko, 2000)[94]. Do democratic governments in East Asia, which devote more resources to education than non-democracies, also

[94] For a discussion of the literature, see section 1.2.1 of chapter 1.

perform better on education outcome indicators such as participation, attainment and gender equity? In other words, do democracies in the end really deliver better education services for ordinary citizens in this region? Similarly, what are the impacts of globalization on education outcomes? Does the null-effect of globalization on education spending also hold for education outcomes?

Three hypotheses on these questions have already been developed in section 1.3 of Chapter 1.

HG_3: The more open East Asian countries' economies are to the global market, the better educated their citizens at all three levels of education.

HG_4: The more open East Asian countries' economies are to the global market, the higher gender equity in education.

HD_3: Democratic governments have better education outcomes than non-democratic governments in East Asia.

This chapter employs the statistical method to test these hypotheses. Section 3.1 describes data and variables; section 3.2 specifies the model; section 3.3 reports model results; the robustness of the findings is examined in section 3.4; section 3.5 offers the conclusion.

3.1 Data and Variables

Countries and Studying Period

The countries and studying period in this chapter is the same as described in section 2.1, chapter 2.

Education Outcomes

Three measures of education outcomes are studied in this chapter: participation, attainment and gender equity.

Participation

Measurements of participation can give a sense of how well citizens are able to participate in the education system of their country. These measures summarize government provision of education (opportunities available to citizens) as well as household participation behavior (actual participation behavior). *Gross School Enrollment Ratios at Primary, Secondary and Tertiary Levels* are measurements for participation in this study. The gross school enrollment is expressed as a ratio of the number of students enrolled at a certain level over the number of children in the country's school-age group at that level. Scores over 100 result from counting children above the official school age at that level.[95] Data on participation are obtained from UNESCO yearbook, various years.[96] Appendix 3.1 provides descriptive statistics of the education outcome variables. Appendix 3.2 displays their time trends.

[95] A more accurate measure for participation is net school enrollment ratio which excludes children enrolled at a certain level but above the official school age. For reasons not using net school enrollments, see chapter 1 section 1.4.1.
[96] Please refer to Appendix 1.8 in the introduction for a list of variable names and data sources.

Hypothesis G_3 would indicate an increase in gross school enrollment at the primary and secondary level as the economy of East Asian countries become more integrated into the global market. The "diffusion effect" would indicate school enrollment at the tertiary level would improve as well since there will be better and larger population to be educated from the previous level.

HG_{3p}: The more open East Asian countries' economies are to the global market, the high gross school enrollment at all three levels of education.

Regarding the impact of democracy, hypothesis D_3 indicates a positive relation between democratic governments and gross school enrollment at all three levels of education.

HD_{3p}: There is a positive relationship between democratic governments and gross school enrollments in East Asia at all three levels of education.

Education Attainment

Education attainment reflects the efficiency and quality of a country's education system. The measurement developed by Barro and Lee—the percentage of the population who has successfully completed a given level of schooling is "a straightforward way to show the population's attainment of skills and knowledge associated with a particular level of education". It has been used in many previous studies (Barro and Lee, 2000). This study borrows six indicators from Barro and Lee to measure education attainment of a nation: average years of school for the total population; average years of school for male;

average years of school for female; % of population with primary school attained; % of population with secondary school attained and % of population with post-secondary school attained. To correspond better to the age structure of the labor force in East Asian countries, all these indicators are based on population aged 15 and up[97].

Hypothesis G_3 predicts a general increase of average years of school for East Asian countries as they open their markets more to the global economy. It also predicts an increase of attainment level at all three levels of education.

HG_{3a1}: The more open East Asian countries' economies are to the global market, the more years their citizens spend in school, regardless of gender.
HG_{3a2}: The more open East Asian countries' economies are to the global market, the higher the percent of population that attain primary, secondary and post-secondary education.

Hypothesis D_3 indicates a positive relationship between average years of school and democratic governments in East Asia. In a similar vein, it indicates that democratic governments have a positive impact on the percent of population that attain all three levels of education.

HD_{3a1}: There is a positive relationship between democratic governments and average years of school in East Asian countries.

[97] Barro and Lee have data constructed for two different age groups, over age 15 and over age 25.

HD_{3a2}: There is a positive relationship between democratic governments and the percent of population that attain primary, secondary and tertiary level of education in East Asian countries.

Gender Equity

A last measure of government education provision is gender equity. Women's education has gained increasing importance due to its special role in public health, birth control and economic development. Two measures of gender equity are studied: *ratio of girls to boys in primary and secondary education and ratio of girls' average year of schooling versus that of boys*. The data on the first indicator is obtained from *World Development Indicators*. The second indicator is constructed based on data from Barro and Lee. For both indicators, a ratio of 1 indicates gender equity.

Hypothesis G_4 predicts an increase of gender equity for East Asian countries as they integrate more into the global market.

HG_4: The more open East Asian countries' economies are to the global market, the higher gender equity in their education system.

Regarding the impact of democracy, hypothesis D_4 indicates a positive relation between gender equity and democratic governments.

HD_{4p}: There is a positive relationship between democratic governments and gender equity in the education systems of East Asian countries.

Table 3.1 summarizes hypothesized effects of globalization and education on education outcome indicators.

Table 3.1 Hypothesized Effects of Globalization and Democratization

	Globalization	Democratization
Gross School Enrollment		
Primary	+	+
Secondary	+	+
Tertiary	+	+
Education Attainment		
% of Population with Primary School Attained	+	+
% of Population with Secondary School Attained	+	+
% of Population with Post-secodary School Attained	+	+
Average Years of School, Total	+	+
Average Years of School, Male	+	+
Average Years of School, Female	+	+
Gender Equity		
Ratio of Girls to Boys in Primary and Secondary School	+	+
Ratio of Average Years in School, Girls to Boys	+	+

Globalization and Democratization

The globalization variables (trade and capital account openness) and democracy are operationalized the same way as described in section 2.1, chapter 2.

Economic Controls

Three economic controls are included: GDP per capita, capital intensity of the economy and degree of urbanization.

GDP per capita: The positive role of GDP per capita in improving gross enrollments and gender equity has been documented in a number of studies (Rudra and Haggard, 2005; Brown, 2004 & 1999; Baum and Lake, 2003 & 2001). Controlling for GDP per capita is helpful to distinguish the qualitative differences between the wealthy countries and the poor ones in terms of providing education to their citizens. A positive sign is expected between GDP per capita and all outcome indicators. This variable is operationalized the same way as described in section 2.1, chapter 2.

Ratio of Capital Stock to GDP: For similar reasons mentioned in section 2.1, chapter 2, the educational achievements of a country may also be a function of the skill intensity of its economy. It is expected that the higher the skill intensity of the economy, the higher percent of population participating and attaining the secondary and tertiary education. Average years of school, regardless of gender is also expected to be positively associated with the skill intensity of the economy.

Urbanization: Literacy, enrollments and school completion rates are in general higher in urban regions across countries and over time since schools are easier to access in urban areas. However, entering urbanization in my model has possible implications for the estimates since it is correlated with another important control - *GDP per capita*: the simple Pearson correlation between the two variables is .87. Due to its high explanatory power, models with urbanization are presented first.[98] To increase confidence in the validity of the findings though, models without urbanization are also estimated and differences in results are reported, if any.

[98] Urbanization alone could explain about 10% of the variation in most of the models.

Controls of Educational Spending

Given the possible positive effects of education spending on education outcomes (Gupta, Verhoeven and Tiongsn, 2002; Checchi, 2003), controlling for education spending is potentially important for my model. However, entering this variable directly into the models might have the problem of endogeneity[99]. Lacking good instruments, models without the education spending control are presented first, but models with education spending are also estimated later in the robustness check section. Differences in results are reported, if any.

Demographical Controls

Population ages 0-14: a large proportion of young population makes it harder for the enrollment rate to expand at the primary and secondary level (Mingat & Tan, 1992). However, due to its high colinearity with the GDP per capita variable, models are first presented without controlling for this variable. However, models controlling for the youth population are estimated later in the robustness check section and differences are reported, if any.

Lagged primary gross enrollment rates and lagged % of population with primary education attained: the diffusion theory suggests demographical variables alone could explain most of the variations of school expansion and the relationship should be positive (Meyer, Ramirez, Rubinson and Boli-Bennett, 1977; Meyer, Ramirez, Soysal, 1992).

[99] Results from the spending models suggest the explanatory variables in the outcome models could already explain a large variation in spending.

School enrollments and attainments, these authors argue, is a function of the available population to be educated - both from the previous level and from the same age-group not in school. Lagged gross primary school enrollments can be used to approximately control for population available to be educated at the second level. Similarly, lagged secondary gross school enrollments can be used to approximately control for population available to be educated at the tertiary level.[100] However, including these controls in the model decrease significantly the data points available for estimation[101]. So I did not include these controls in the baseline models; but when checking for the robustness of the findings, models with these controls are estimated and differences in results are reported, if any.

Lagged secondary gross enrollment rates and lagged % of population with secondary education attained: for similar reasons as mentioned above, in the robustness check section, lagged secondary gross school enrollments are controlled for in the gross tertiary school enrollment model and lagged % of population with secondary education attained are controlled for in the % of population with tertiary education attained models.

Country and Decade Dummies

Country and decade dummies are included in all models of education outcomes for the same reason as mentioned in section 2.1, chapter 2.

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[100] I was not able to control for "the same age-group not in school" due to data unavailability. An approximation of "the same age-group not in school" is one minus net school enrollment at certain age level. However, the missing data problem is too serious for this variable to be a useful control in the model.
[101] This problem is more serious for the attainment models than for the gross school enrollment models. Including lagged gross primary school enrollment decreases the data points for gross secondary school enrollment models from 152 to 137 (a 10% reduction); including lagged % of population with primary school attained decreases the data points for % of population with secondary education attained from 35 to 29 (a 17% reduction).

3.2 Model Specification

Data have been collected for the same eight countries in my sample from 1971-2003 as in the spending models. However, the education outcome variables can be grouped into two sets depending on their data structure. The first set of variables includes gross enrollment ratios at primary/secondary/tertiary levels and ratio of boys to girls in primary and secondary school. This set of variables has typical annual time-series cross-sectional data as described by Beck and Katz (Beck & Katz, 1995, 1996, 2001). The second set of variables composes of ratio of girls' average years of school to that of boys, average years of school (total/male/female), and % of population with primary/secondary/post-secondary education attained. The data for this set of variables is only available every five year. Thus this set of variables has much fewer cases and the data is less dominated by time. Given the rather different data structure of these two sets of variables, two modeling strategies have been adopted accordingly.

Since the first set of variables has typical annual time-series cross-sectional data for 8 countries and 33 years, I start with the stationary tests.[102] Individual Augmented Dicky-Fuller tests have been applied to individual time series for gross enrollment ratios at primary/secondary/tertiary levels and ratio of boys to girls in primary and secondary school.[103] The results indicate panel non-stationarity for all variables in this set (see Table 3.2). We have known from section 2.2, chapter 2 that the independent variables (trade, capital account openness, GDP per capita, urbanization and capital stock as % of GDP)

[102] For a discussion of the data structure of the time-series cross-sectional data and the importance of stationarity test, see section 2.2, chapter 2.
[103] I was unable to apply the panel stationarity tests due to too many gaps (missing values) in the data.

are not panel stationary either[104]. I applied to this set of variables the error correction model, which is relatively robust to non-stationarity.[105] The models are then estimated by OLS with panel corrected standard errors. Similar to the spending models, country dummies are included in the model to control for unit heterogeneity; also included are decade dummies to better isolate the effects of democratization. To increase confidence in the direction of causality from X to Y, X s in the model are lagged one year.

Table 3.2 Education Outcome Models: Stationarity Test

	Individual Country Series Unit Root Test [1]								
Variables	hk	ind	kor	mal	phl	sin	tha	taw	group [2]
gelprim	I(0)	I(0)	I(1)	I(1)	I(1)	I(1)	I(1)	I(1)	I(1)
gelsec	I(1)	I(1)	I(0)	I(1)	I(1)	I(0), td	I(2)	I(0), td	I(2)
gelter	I(1)	I(1)*	I(1)	I(1), t	I(1)	I(1)	I(1),d	I(2)	I(2)
gpi	I(1)	I(1)	I(0), d	I(1)	I(1)	I(1)	9#	I(1)	I(1)

[1.] Augmented Dicky-Fuller tests are applied to individual country series. For example, the first cell refers to the Dicky-Fuller test result of the gelprim variable for Hong Kong.

[2.] Group results refer to the highest order of integration among all the countries in the panel.

*Stationary at .1 level. Other test results without notation are stationary at .05 level.

# indicates only 9 observations are available for this series. No DF test is conducted.

Note: I(0) indicates the series is stationary by itself; I(1) indicates the series is stationary after differencing once; I(2) indicates the series is stationary after differencing twice; t indicates trend, d indicates drift.

Below is the model I estimate for this set of variables:

$$\Delta Y_{it} = \alpha - \phi Y_{i,t-1} + \beta_k \Delta X_{i,t-1} + \beta_j X_{i,t-2} + \chi U + \delta T + \varepsilon_{it} \qquad (3.1)$$

Similar to equation 2.5, Y_{it} represents an education outcome indicator for country i at time t (Y_{it} represents gross school enrollment rates at primary, secondary and tertiary level, and ratio of boys to girls in primary and secondary education respectively); Δ is

[104] For the test results, see table 2.3, chapter 2.

[105] For a discussion and derivation of the error correction model, see section 2.2, chapter 2.

the first difference operator; X is a vector of explanatory variables to be estimated which includes trade, capital account openness, democracy, GDP per capita, urbanization, and capital intensity of the economy; U is a vector of country dummies; T is the decade dummy; ε_{it} is a random error. β_k measures the short term impact of ΔX_t on ΔY_t; $\gamma = \beta j / \phi$ measures the long-run equilibrium relationship between X and Y; ϕ is the yearly adjustment rate. Tertiary school enrollment has been logged to achieve normality since it is highly skewed[106].

For the second set of variables which only have data at every five-year interval, stationarity and serial correlation is much less of a concern. With eight countries and seven data points of each country, the data exhibits more characteristics of panel data, which are likely to have unit heterogeneity, error panel heteroskedasticity and error contemporaneous correlation (Beck and Katz, 2001; Wooldridge, 2002).[107] A model that accounts for panel unit heterogeneity is the fixed effects model:

$$y_{it} = x_{it}\beta + c_i + u_{it} \quad i = 1, \cdots, n \quad t = 1, \cdots, T \tag{3.2}$$

Where y_{it} stands for the dependent variable y for country i at time t; x_{it} stands for a vector of explanatory variables to be estimated; c_i represents any unobserved country effects; u_{it} is the error term. This model allows c_i to be arbitrarily correlated with x_{it} (Wooldridge, 2002), which is a reasonable assumption for my data since the level of

[106] See Appendix 3.3 for the effects of transformation on gross tertiary school enrollment.
[107] For a mathematical representation of characteristics of panel data, see section 2.2, chapter 2.

trade in a country, say, Singapore, might be well correlated with some factors unique to Singapore.

The fixed effects model is estimated by removing the unobserved country effects c_i from the model. From equation 3.2, we have:

$$\bar{y}_i = \bar{x}_i\beta + c_i + \bar{u}_i \quad i = 1, \cdots, n \tag{3.3}$$

where $\bar{y}_i = (\sum_{t=1}^{T} y_{it})/T$, $\bar{x}_i = (\sum_{t=1}^{T} x_{it})/T$, $\bar{u}_i = (\sum_{t=1}^{T} u_{it})/T$,

Subtracting equation 3.3 from equation 3.2 for each t gives the transformed fixed effects estimation equation:

$$y_{it} - \bar{y}_i = (x_{it} - \bar{x}_i)\beta + u_{it} - \bar{u}_i \quad i = 1, \cdots, n \quad t = 1, \cdots, T \tag{3.4}$$

This equation then can be estimated through OLS (Wooldridge, 2002). Given that all the independent variables have some variations for at least one country in my sample, the OLS estimator is consistent.[108]

[108] If the expectation of the error term is equal to 0 ($E(u_{it} \mid x_i, c_i) = 0$), the OLS estimator is unbiased. For some of my models, examination of residuals shows this assumption is not satisfied. The models are re-estimated using least square dummy variable with panel corrected standard errors and GLS. Differences are reported, if any.

To better assess causality, each independent variable is lagged one year in the model.[109] A decade dummy has also been added to each model to better isolate the effects of democratization. The final model is given by:

$$y_{it} = x_{i,t-1}\beta + c_i + T + u_{i,t-1} \quad i = 1, \cdots, n \quad t = 1, \cdots, T \tag{3.5}$$

where y_{it} represents, respectively: 1) ratio of average years of school, girls to boys; 2) average years of school, total; 3) average years of school, male; 4) average years of school, female; 5) % of population with primary school attained; 6) % of population with secondary school attained; 7) % of population with high school attained. $x_{i,t-1}$ represents the lagged independent variables to be estimated which include trade, capital account openness, democracy, GDP per capita, urbanization, youth population, education spending and other control variables. c_i is the unobserved country effects. T is the decade dummy. $u_{i,t-1}$ is an error term.

[109] Criticisms have been made on imposing a uniform lag structure which may cause biased estimates and wrong inferences (Plumper, Troeger and Manow, 2005). However, I don't have much choice given the very limited number of cases for this set of variables.

3.3 Model Results

3.3.1 Results

Table 3.3 summarizes the baseline model results for gross school enrollment, education attainment and gender parity. Controls of demography and education spending are not included in these baseline models due to concerns of collinenarity and endogeneity respectively. A smaller number of explanatory variables could also improve the efficiency of estimation given the very limited number of total cases available for these models. However, models with demographical and spending controls are estimated and discussed later in the robustness check section. For ease of reading, the meaning of the coefficients are translated and summarized in Table 3.4.

Table 3.3 Education Outcome Model Results: School Enrollment, Education Attainment and Gender Parity

		Gross School Enrollment			Education Attainment						Gender Parity Ratio	
Model		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
					% of Population that Attain			Average Years of School				
Dependent Variable		primary Level	Secondary Level	Tertiary Level (log)	Primary School	Seconday School	Teritary School	Total	male	Female	Girls to Boys in Primary&Secondary School	Average Years of School, Girls to Boys
Trade (log) $_t$	D.	3.3	-1.4	-.07							-.67	
		(3.7)	(2.5)	(.11)							(1.3)	
	L.	2.7	.2	-.05	4.8	-.1	-1	.18	.16	.2	1.5*	.01
		(1.7)	(1.5)	(.07)	(6.8)	(4.1)	(2.0)	(.27)	(.28)	(.31)	(.83)	(.04)
Capital Account Openness $_t$	D.	.39	1	.02							.44	
		(1.0)	(.79)	(.03)							(.60)	
	L.	.8	.98	.02	-.89	1.2	.5	-.04	-.04	-.04	.7	.003
		(.88)	(.65)	(.03)	(3.4)	(2.0)	(.99)	(.13)	(.14)	(.15)	(.44)	(.02)
Regime $_t$	D.	.92	1.2	-.08							.06	
		(1.6)	(1.2)	(.06)							(.79)	
	L.	.58	4***	-.07	-3	.62	2.4*	.3*	.56***	.04	-.92	-.08***
		(1.1)	(.79)	(.05)	(4.1)	(2.5)	(1.2)	(.16)	(.17)	(.19)	(.91)	(.02)
GDP per capita (log) $_t$	D.	19	1.8	-.37							1.3	
		(16)	(13)	(.51)							(3.2)	
	L.	-.15	8.1***	.22**	6.5	-1.7	3.6**	1***	.93***	1.1***	2.8**	.09**
		(2.4)	(2.0)	(.10)	(5.9)	(3.5)	(1.7)	(.23)	(.24)	(.27)	(1.2)	(.03)
Urbanization$_t$	D.	.56	3.3***	.08**							.95	
		(1.1)	(.91)	(.04)							(.61)	
	L.	-.05	-.14*	.003	-.74**	.5**	.27***	.06***	.05***	.08***	.11*	.004**
		(.10)	(.08)	(.003)	(.32)	(.19)	(.09)	(.01)	(.01)	(.01)	(.06)	(.002)
Capital Stock as % of GDP $_t$	D.	.08	.02	-.0004								
		(.05)	(.04)	(.002)								
	L.	.01	-.003	.0004								
		(.02)	(.02)	(.001)								
Lagged Dependent Variable		-.23***	-.28***	-.14**							-.62***	
		(.05)	(.05)	(.06)							(.07)	
Decade		-2.2*	-1.6*	-.03	-2.8	2.4	-1.4	-.02	-.12	.08	-1.4***	.03
		(1.4)	(.92)	(.03)	(4.1)	(2.5)	(1.2)	(.16)	(.17)	(.19)	(.45)	(.02)
Constant		8.6	-61***	-1.7*	5.5	17	-32**	-6.3***	-4.3**	-8.3***	10	-.16
		(17)	(13)	(1.0)	(47)	(29)	(14)	(1.9)	(1.9)	(2.1)	(8.3)	(.27)
R^2		.23	.36	.2	.56	.72	.84	.95	.94	.95	.37	.78
N		157	152	121	35	35	35	35	35	35	72	35

Note: D. refers to a difference term of the explanatory variable and L refers to a lagged term. All explanatory variables in model (1) - (3) & (10) are lagged one year already. Model (1)-(3) & (10) are estimated using OLS with PCSE; model (4)-(9) &(11) are estimated through fixed effects. The residuals of model (1) - (5), (7) - (8) & (10) exhibit panel heterogeneous variances; the residuals in different panels from model (4) - (9) &(11) have different means from each other. The residuals for Korea in model (1) - (3) have slight serial correlation; so do the residuals for Malaysia in model (1) and residuals for Singapore in model (10). (See appendix 3.4)

*significant at .1 level; ** significant at .05 level; ***significant at .01 level.

Table 3.4 Education Outcome Models: Interpretation of Results

		Gross School Enrollment			Education Attainment						Gender Parity Ratio	
	Model	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	Impacts	Primary Level	Secondary Level	Tertiary Level (log)	% of Population with Primary Education Attained	% of Population with Secondary Education Attained	% of Population with post-secondary education Attained	Average Years of School, Total	Average Years of School, Male	Average Years of School, Female	Ratio of Girls to Boys in Primary&Secondary School	Ratio of Average Years of School, Girls to Boys
Trade (log) $_t$	short run	3.3	-1.4	-.07							-.67	
	long run	12	.71	-.36	4.8	-.1	-1	.18	.16	.2	2.4*	.01
	total[1]	15	-.69	-.43	4.8	-.1	-1	.18	.16	.2	2.4*	.01
Capital Account Openness $_t$	short run	.39	1	.02							.44	
	long run	3.5	3.5	.14	-.89	1.2	.5	-.04	-.04	-.04	1.1	.002
	total	3.9	4.5	.16	-.89	1.2	.5	-.04	-.04	-.04	1.5	.002
Regime $_t$	short run	.92	1.2	-.08							.06	
	long run	2.5	14***	-.5	-3	.62	2.4*	.3*	.56***	.04	-1.5	-.08***
	total	3.4	14***	-.58	-3	.62	2.4*	.3*	.56***	.04	-1.4	-.08***
GDP per capita (log) $_t$	short run	19	1.8	-.37							1.3	
	long run	-.85	29***	1.6**	6.5	-1.7	3.6**	1***	.93***	1.1***	4.5**	.09**
	total	18	29***	1.6**	6.5	-1.7	3.6**	1***	.93***	1.1***	4.5**	.09**
Urbanization$_t$	short run	.56	3.3***	.08**							.95	
	long run	-.22	-.5*	.02	-.74**	.5**	.27***	.06***	.05***	.08***	.18*	.004**
	total	.34	2.8*	.08**	-.74**	.5**	.27***	.06***	.05***	.08***	.18*	.004**
Capital Stock as % of GDP $_t$	short run	.08	.02	-.0004								
	long run	.04	-.01	.003								
	total	.12	.01	.003								
Lagged Dependent Variable		-.23***	-.28***	-.14**							-.62***	
Decade		-2.2*	-1.6*	-.03	-2.8	2.4	-1.4	-.02	-.12	.08	-1.4***	.03
Constant		8.6	-61***	-1.7*	5.5	17	-32**	-6.3***	-4.3**	-8.3***	10	-.16
R^2		.23	.36	.2	.56	.72	.84	.95	.94	.95	.37	.78
N		157	152	121	35	35	35	35	35	35	72	35

[1]Total impact is a summation of the significant short and long run impacts. If short and long run impacts have different level of level of significance, to be conservative, the lower level of significance is assigned to the total impact. *significant at .1 level; **significant at .05 level; ***significant at .01 level.

Explanatory Power of the Models

The R^2 s for the gross school enrollment models range from .2 to .36. These are reasonable fits. The R^2 for secondary school enrollment is the highest ($R^2 = .36$), followed by gross primary school enrollment ($R^2 = .23$); the R^2 for tertiary enrollment is the lowest ($R^2 = .2$).

The education attainment models could explain about 56% to 95% variation of the corresponding attainment indicators. These are very good fits. But given the smaller number of cases available for estimation, caution needs to be cast when interpreting the very high R^2. The fits for the three models of average years of school (total/male/female) are the best: R^2 is as high as .95. The attainment models explain % of population with post-secondary education attained the best ($R^2 = .84$) while explaining % of population with primary education attained the poorest ($R^2 = .56$); the R^2 for % of population with secondary education attained is in between ($R^2 = .72$). It is not surprising % of population with primary education attained is less constrained by economic and political variables in the model since primary education became compulsory in most of the East Asian countries during the study period.[110]

[110] A nine year compulsory education has been launched in Hong Kong since 1970s; in South Korea, primary education become compulsory since 1945; in Taiwan, both primary and secondary education became compulsory in 1968; in Philippines, a free compulsory primary education system was installed as early as 1898 and in Thailand, as early as 1921; in Indonesia, a 6-year primary compulsory education was implemented in 1984; primary school fees were abolished in Malaysia as early as 1965. Though in Singapore, primary education didn't become compulsory in law until 2003.

The R^2 for the two specifications of gender parity ratio is .37 and .78 respectively. The model on ratio of average years of school (girls to boys) has a much higher R^2, probably due to a much smaller number of cases. But both fits are reasonable.

Control Variables

In accordance with theoretical expectations, richer countries are in a better position to provide education, especially of higher level, to their citizens. The signs of GDP per capita are mostly positive and significant across all the education outcome models. GDP per capita doesn't have a significant impact on primary school enrollment; however, a log GDP per capita increase would increase secondary school enrollment by about 29% in approximately 12 years[111] and increase log tertiary school enrollment by 1.6 in approximately 20 years[112]. GDP per capita is also positively associated with better education attainment: average years of schooling improves by about 1 year regardless of gender when there is one log increase in GDP per capita; moreover, about 4% more of population attain post-secondary education.[113] Improvement in GDP per capita is associated with more gender equity at school as well: one log increase of GDP per capita would increase ratio of girls to boys in primary and secondary school by 4.5% in

[111] The adjustment rate for the secondary school enrollment model is .28. 1% increase in log GDP per capita has no significant impact on secondary gross school enrollment the following year; however, in the third year, secondary gross school enrollment would increase by 29*.28=8.1%, in the fourth year by (29-8.1)*.28=5.9%, etc. All the effects will be realized in approximately the twelfth year.

[112] In a country like Indonesia with an average gross tertiary school enrollment of 8.2% and GDP per capita of $2454, a log increase of log GDP per capita to $6670 (a 170% increase) will lead gross tertiary school enrollment to 41% (a 400% increase). The adjustment rate for the log tertiary school enrollment model is .14. 1% increase in log GDP per capita has no significant impact on tertiary school enrollment the following year; however, in the third year, tertiary gross school enrollment would increase by 1.6*.14=.22, in the fourth year by (1.6-.22)*.14=.19, etc. All the effects will be realized in approximately the twentieth year.

[113] For a country like Indonesia, these improvements in education attainment take place when its GDP per capita increases from $2454 to $6670 (a 170% increase).

approximately 3 years[114] and increase ratio of girls' average schooling to that of boys by .1%.

Also as expected, countries that are more urbanized have higher school enrollment, percent of population that achieved secondary and post-secondary education and gender equity: almost all the coefficients of urbanization in the models are positive and significant. A 10% increase in urban population relative to total would increase secondary gross school enrollment by 30% and log tertiary gross enrollment by 1 unit the next year. Education attainment is also higher in more urbanized areas: a 10% increase in urban population would mean about 1 more year in school for the total population, regardless of gender; in addition, about 1% more people attain secondary education and 3% more people attain post-secondary education. Urbanization would also increase gender equity slightly: it is significant in both specifications of gender equity.

Contrary to my expectation, capital intensity of the economy doesn't have significant impacts on gross school enrollment and education attainment. For gender equity models, it is positive and significant for ratio of average years of school, girls to boys but not significant for the other specification. Thus I dropped capital intensity of the economy from gender equity and education attainment models to improve efficiency of estimation.[115]

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[114] The adjustment rate for this model is .62. In the next year following one log GDP per capita increase, there is no increase in ratio of girls to boys in primary and secondary school. However, in the third year, this ratio will increase by 4.5*.62=2.8%, by (4.5-2.8)*.62=1.1% in the fourth year, by (4.5-2.8-1.1)*.62=.4% in the fifth year etc. Almost all the effects are realized in the fifth year.

[115] Cases for these models are only about a half or less comparing with gross school enrollment models.

Trade

Now we turn to the variables of interest in the model. The impacts of trade are not significant for almost all of the education outcome indicators except one. Trade seems to improve primary gross school enrollment while decreasing that of secondary and tertiary, but none of the coefficients are significant. Quite consistent with the impacts of trade on gross school enrollment, it is positively associated with percent of population with primary school attained while negatively associated with percent of population with secondary and tertiary school attained but none of the effects reach statistical significance. Trade also seems to improve the population's average number of years in school, regardless of gender. This is probably due to higher school enrollment and attainment ratio at the primary level but again no effects are significant. The impacts of trade on gender equity are positive for both specifications; the coefficient for ratio of girls to boys in primary and secondary school is slightly significant: one log increase in trade increases the ratio of girls to boys in primary and secondary school by 1.6%.

Capital Account Openness

The impacts of capital account openness are not significant for all education outcome models. Capital account openness seems to be positively associated with gross school enrollment at all levels, % of population with secondary and post-secondary education attained, and gender equity but none of the coefficients are significant. Surprisingly, the associations between capital account openness and three specifications of average years in school are negative, which seem to be against findings on other education outcome indicators but the effects are not significant either.

Democracy

Democracy is positively associated with gross school enrollment at primary and secondary level and attainment at the secondary and tertiary level; it is also positively associated with the population's average years of school, regardless of gender. Two of the coefficients are highly significant: democracy significantly improves secondary enrollment and male's average years of school. A transition to democracy has no immediate effect on gross secondary enrollment the next year; however, it gradually increases secondary school enrollment by 14% in approximately 14 years.[116] Males in democracy also on average have one more year schooling than their counterparts in non-democracies. The positive impacts of democracy on % of population with post-secondary education attained and total populations' average years of school are significant at .1 level: the population with post-secondary education attained is 2% more in democracies than non-democracies; people living under democracy also have on average about four month more schooling than those living under non-democracies.

On the other hand, democracy is negatively associated with gender equity in both specifications. Consistent with the finding on attainment which indicates democracies in East Asia improve males' schooling more than that of female, the negative impact of democracy on the ratio of girls' average years of school to that of boys is highly significant. However democracy's impact on the ratio of girls to boys in primary and secondary school is negative but not significant. It seems the benefit of democracy in

[116] The adjustment rate for this model is .28. A transition to democracy will increase secondary enrollment the third year by 14*.28=3.9%, the fourth year by (14-3.9)*.28=2.8%, etc. All the effects will be realized in approximately the 14th year.

improving education in East Asia goes more to the boys than the girls. This finding is not surprising given that it may take a long time to correct entrenched gender bias even as women's movements are mobilized under democracy.

3.3.2 Robustness Check

Similar robustness checks applied to the spending models are conducted in this chapter to examine the validity of findings in the outcome models: 1) employing alternative measures of globalization and democracy; 2) varying controls in the model; 3) cross-validating the results by adding/dropping countries from the sample; 4) and applying different method of estimation.

Alternative Measures of Globalization and Democracy

Trade

Table 3.5, Table 3.6, Table 3.7 & Table 3.8 shows that trade consistently has no significant impact on the education outcome indicators in most of the models with alternative measures of globalization. Trade integration seems to have a significant positive impact on % of population with secondary school attained, average years of school (total/male/female) and gender equity when the country size effect is excluded: the trade residual variable is significant in these models (Table 3.6, Model 7; Table 3.7, Model 2, 7&12; Table 3.8, model 2&7). However, consistent with the behavior of the trade integration variable in the spending models, the sign of trade integration usually flips when the policy indicator is put in the model: trade now increases school enrollment and attainment at the tertiary level instead of primary level; it also deteriorates gender

equity instead of improving it (Table 3.5, Model 3, 5, 10, 13&15; Table 3.6, Model 3, 5, 13, 15; Table 3.7, Model 3, 5, 8, 13&15; Table 3.8, Model 3,5, 8&10); most of the effects are not significant though.

Table 3.5 Gross School Enrollment Models - Robustness Checks- Alternative Measures of Globalization

		Gross School Enrollment, Primary					Gross School Enrollment, Secondary					Gross School Enrollment, Tertiary (log)				
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
Trade (log) $_t$	D.	3.3			2.2		-1.4			.08		-.07			.003	
	L.	2.7			2.6		.2			3.9**		-.05			-.05	
Trade Residual$_t$	D.		2.6					-1.9					-.04			
	L.		2.3					1.5					-.04			
Current Account Openness$_t$	D.			-.22		-.43			.83		.42			.05		.03
	L.			.28		-.31			-.04		.13			.02		.03**
Capital Account Openness$_t$	D.	.39	.45	.61			1	1	.17			.02	.02	-.05		
	L.	.8	.98	.85			.98	1	1.3			.02	.02	-.02		
Foreign Direct Investment (log)$_t$	D.				.65	.71*				-.17	-.15				.003	.004
	L.				1.2**	1.2**				-.73*	-.67*				-.01	-.01
Private Capital Flow (log)$_t$	D.				.07	.37				.03	.13				.01	-.01
	L.				.27	.9				.51	.98*				-.01	-.04
Regime$_t$	D.	.92	.94	.92	-.68	-.99	1.2	1.2	1.6	2*	2.1*	-.08	-.08	-.09	-.07	-.07
	L.	.58	.41	.79	-.85	-.71	4***	4***	3.9***	4.4***	4.1***	-.07	-.07	-.1**	-.08*	-.08*
GDP per capita (log) $_t$	D.	19	18	26*	12	16	1.8	3.1	4.4	4.2	10	-.37	-.38	-.57	-.58	-.7
	L.	-.15	-1	.24	-3.8*	-4.2**	8.1***	7.5***	8.8***	4.1**	4.5**	.22**	.23**	.23**	.18	.25**
Urbanization$_t$	D.	.56	.61	1.1	.28	.4	3.3***	3.3***	3.7***	1.7**	2.7***	.08**	.08**	.1**	.08*	.11***
	L.	-.05	-.03	-.09	.07	.1	-.14*	-.14	-.16**	-.13	-.15	.003	.002	.003	.005	.002
Capital Stock as % of GDP $_t$	D.	.08	.08	.1*	.1**	.11**	.02	.02	.03	.02	.04	-.0004	-.0004	-.001	-.001	-.001
	L.	.01	.01	.02	.01	.01	-.003	-.003	0	0	.01	.0004	.0004	.0002	.001	.0004
Lagged Dependent Variable		-.23***	-.24***	-.23***	-.36***	-.34***	-.28***	-.28***	-.28***	-.27***	-.26***	-.14**	-.14**	-.15**	-.19***	-.19***
Decade		-2.2*	-2.3*	-2	-2.1**	-1.9*	-1.6*	-1.6*	-1.5*	.14	.34	-.03	-.03	-.03	.02	-.004
Constant		8.6	29	19	46**	59***	-61***	-48***	-60***	-38***	-29**	-1.7*	-1.7**	-2.1**	-.85	-1.6**
R^2		.23	.23	.22	.35	.35	.36	.36	.36	.31	.28	.2	.2	.21	.26	.28
N		157	155	157	133	133	152	152	152	127	127	121	119	121	110	110

[1]. The models are estimated through OLS with PCSE. D. refers to a difference term of the explanatory variable and L refers to a lagged term. All explanatory variables are lagged one year already.

*significant at .1 level; ** significant at .05 level; ***significant at .01 level.

Table 3.6 Education Attainment Models - Robustness Checks- Alternative Measures of Globalization

		% of Population with Primary School Attained					% of Population with Secondary School Attained					% of Population with High School Attained				
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
Trade (log) $_t$	D.															
	L.	4.8			-9.5**		-.1			7.4**		-1			-1.3	
Trade Residual$_t$	D.															
	L.		3					6.5*					-1.5			
Current Account Openness$_t$	D.															
	L.			-.66		-1.4			-1.2		-.73			.56		.86*
Capital Account Openness$_t$	D.															
	L.	-.89	-.63	.88			1.2	-.73	2.4			.5	.7	-.29		
Foreign Direct Investment (log)$_t$	D.															
	L.				.81	1.2				.44	.72				-.12	-.41
Private Capital Flow (log)$_t$	D.															
	L.				4.3**	4.3*				-.26	.79				-.5	-1.1
Regime$_t$	D.															
	L.	-3	-2.8	-2.4	-6.4**	-7.3**	.62	-.15	.76	2.3	1.9	2.4*	2.5**	2.2*	1.2	1.7
GDP per capita (log) $_t$	D.															
	L.	6.5	3.6	7.8	2.3	1.8	-1.7	-10*	-.83	-8.7*	-10*	3.6**	5.3*	3*	6.6**	7.5**
Urbanization$_t$	D.															
	L.	-.74**	-.74**	-.77**	-.42*	-.43	.5**	.58***	.53***	.23	.48**	.27***	.26**	.27***	.32**	.19
Capital Stock as % of GDP $_t$	D.															
	L.															
Lagged Dependent Variable																
Decade		-2.8	-1.9	-2.8	4.2	2.4	2.4	3.6	1.7	2	3	-1.4	-1.8	-1.2	-1.8	-1.7
Constant		5.5	52	16	75	46	17	88**	11	60	93**	-32**	-51**	-32**	-57**	-67***
R^2		.56	.55	.55	.7	.63	.72	.76	.74	.7	.6	.84	.85	.85	.82	.85
N		35	35	35	25	25	35	35	35	25	25	35	35	35	25	25

[1]. All the models are fixed effects model estimated through OLS

*significant at .1 level; ** significant at .05 level; ***significant at .01 level.

Table 3.7 Education Attainment Models (Average Years of School) - Robustness Checks- Alternative Measures of Globalization

		Average Years of School, Total					Average Years of School, Male					Average Years of School, Female				
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
Trade (log) $_t$	D.															
	L.	.18			.06		.16			.14		.2			-.03	
Trade Residual$_t$	D.															
	L.		.56**					.4*					.72***			
Current Account Openness$_t$	D.															
	L.			-.08		-.04			-.02		.03			-.14*		-.12*
Capital Account Openness$_t$	D.															
	L.	-.04	-.16	.08			-.04	-.12	.01			-.04	-.21	.14		
Foreign Direct Investment (log)$_t$	D.															
	L.				.08	.1				.11	.1				.05	.09
Private Capital Flow (log)$_t$	D.															
	L.				.05	.08				.03	.02				.08	.14
Regime$_t$	D.															
	L.	.3*	.26*	.33**	.17	.15	.56***	.53***	.58***	.41**	.43**	.04	-.02	.08	-.07	-.14
GDP per capita (log) $_t$	D.															
	L.	1***	.34	1.1***	.87**	.83**	.93***	.44	.97***	.84**	.86**	1.1***	.22	1.2***	.91**	.08**
Urbanization$_t$	D.															
	L.	.06***	.07***	.07***	.04***	.05***	.05***	.06***	.05***	.03*	.02	.08***	.09***	.08***	.06***	.07***
Capital Stock as % of GDP $_t$	D.															
	L.															
Lagged Dependent Variable																
Decade		-.02	.09	-.06	.23	.23	-.12	-.04	-.12	.11	.14	.08	.23	.01	.35*	.32*
Constant		-6.3***	.34	-6.2***	-3.9	-3.4	-4.3**	.57	-4**	-2.5	-2.1	-8.3***	.19	-8.4***	-5.2*	-4.8*
R^2		.95	.97	.96	.96	.96	.94	.95	.94	.94	.94	.95	.97	.96	.95	.96
N		35	35	35	25	25	35	35	35	25	25	35	35	35	25	25

[1]. All the models are fixed effects model estimated through OLS

*significant at .1 level; ** signficant at .05 level; ***signficant at .01 level.

Table 3.8 Gender Parity Models - Robustness Check- Alternative Measures of Globalization

		Ratio of Girls to Boys in Primary & Secondary School					Ratio of Average Years of School, Girls to Boys				
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Trade (log) $_t$	D.	-.67			-.14						
	L.	1.5*			1.4*		.01			-.02	
Trade Residual$_t$	D.		-.86								
	L.		1.4*					.07**			
Current Account Openness$_t$	D.			.32		.08					
	L.			-.5*		-.8**			-.02**		-.03***
Capital Account Openness$_t$	D.	.44	.44	.36							
	L.	.7	.69	1.6***			.002	-.02	.03		
Foreign Direct Investment (log)$_t$	D.				-.31	-.24					
	L.				-.46	-.16				-.01	.002
Private Capital Flow (log)$_t$	D.				.38	.56					
	L.				1.2***	1.7***				.02	.03**
Regime$_t$	D.	.06	.05	.1	-.4	-1.6					
	L.	-.92	-.88	-1.5*	-1.7*	-3.1***	-.08***	-.09***	-.08***	-.07**	-.09***
GDP per capita (log) $_t$	D.	1.3	1.7	.54	5	1.2					
	L.	2.8**	2.2**	2.1**	2.9**	.86	.09**	-.001	.11***	.04	.01
Urbanization$_t$	D.	.95	.9	.53	.8	-.2					
	L.	.11*	.1	.16**	.2***	.33***	.004**	.005***	.005***	.01*	.01***
Capital Stock as % of GDP $_t$	D.										
	L.										
Lagged Dependent Variable		-.62***	-.61***	-.62***	-.71***	-.7***					
Decade		-1.4***	-1.4***	-1.2**	-1.7***	-1.4**	.03	.04*	.01	.04	.03
Constant		10	24***	21***	30***	53***	-.16	.66	-.24	.31	.37
R^2		.37	.37	.38	.39	.4	.78	.82	.84	.65	.82
N		72	72	72	70	70	35	35	35	25	25

[1]. Models (1) through (5) are estimated through OLS with PCSE. D. refers to a difference term of the explanatory variable and L refers to a lagged term. All explanatory variables are lagged one year already.

[2]. Models (6) - (10) are fixed effects model estimated through OLS

*significant at .1 level; ** significant at .05 level; ***significant at .01 level.

Capital Account Openness

Capital account openness also consistently has no significant impact on education outcome indicators in most of the models when alternative measures of foreign direct investment and private capital flows are entered into the model (Table 3.5, Table 3.6, Table 3.7 & Table 3.8). However, these two indicators seem to tell a more nuanced story than that told by the policy indicator which quantifies policies on both: participation and attainment at the primary and secondary level are in general positively associated with these two indicators while that at the tertiary level is negatively associated with them (Table 3.5, Table 3.6)[117]. Average years of school regardless of gender are positively associated with both indicators, probably due to more school participation at primary or/and secondary level (Table 3.7). The effects of these two indicators are different for gender equity: more foreign direct investment worsens gender equity whereas more private capital flow increases gender equity significantly (Table 3.8). However, since most of the coefficients are not significant, no clear conclusion on the direction of the impacts can be drawn.

Democracy

Table 3.9, Table 3.10, Table 3.11 & Table 3.12 summarizes education outcome models with alternative measures of democracy. Most of the findings on democracy are not sensitive to the indicator chosen. Democracy is always positively associated with primary school enrollment. Its positive impact on secondary school enrollment remains significant

[117] The only exception is the impact of foreign direct investment on secondary gross school enrollment, which is negative.

for indicators that focus on institutional constraints.[118] Democracy is also always negatively associated with tertiary school enrollment and two of the specifications are even significant (Table 3.9).

For education attainment indicators, the most robust finding is the positive effect of democracy on percent of population with post-secondary school attained: the effect is significant across all specifications of democracy. However, the impacts of democracy on percent of population with secondary school attained have mixed signs (Table 3.10). The positive associations between democracy and average years of school (total/male) are also quite constant across various specifications but the effects are not always significant. On the other hand, the effects of democracy on female's average years of school have mixed signs (Table 3.11).

The negative impact of democracy on gender equity proves to be quite robust across specifications of democracy: the impact is significant for all the models on ratio of average years of school (girls to boys) and three models on ratio of girls to boys in primary and secondary school (Table 3.12).

[118] The positive impacts of democracy on secondary school enrollment are no longer significant when I use indicators that don't emphasize the institutional constraint dimension of democracy. One of them is the Freedom House liberty score which valorizes citizens' civil and political rights; the other is polyarchy, which focuses on voter turnout and the fraction of small parties in the parliament.

Table 3.9 Gross School Enrollment Models - Robustness Check - Alternative Measures of Democracy

Dependent Variable		Gross Enrollment, Primary						Gross Enrollment, Secondary						Gross Enrollment, Tertiary (log)					
Model		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
Trade (log)$_t$	D.	3.3	3.5	3.5	3.5	3.2	3.7	-1.4	-1.3	-.92	-.94	-.91	-1.1	-.07	-.06	-.08	-.09	-.09	-.09
	L.	2.7	2.8	2.6	2.2	3.6**	2.4	.2	2.2	2.2	2	2.7*	2.6*	-.05	-.05	-.06	-.08	-.07	-.06
Capital Account Openness$_t$	D.	.39	.43	.45	-.21	.48	.48	1	1.1	1.1	.61	1.2	1.1	.02	.01	.02	.01	.02	.02
	L.	.8	.87	.95	.25	.83	1	.98	.92	.95	.37	.54	.97	.02	.01	.02	.02	.03	.02
Regime$_t$	D.	.92						1.2						-.08					
	L.	.58						4***						-.07					
ACLP Regime$_t$	D.		1.2						.58						-.07				
	L.		.98						1.9**						-.11**				
Polity Score$_t$	D.			.22*						.12						-.004			
	L.			.1						.2***						-.007*			
Liberty Score$_t$	D.				.77						-.21						0		
	L.				.25						.21						-.02		
Polyarchy Score$_t$	D.					.03						-.13*						-.002	
	L.					.14***						.02						-.002	
Size of Winset$_t$	D.						1.4*						-.19						.01
	L.						.76						.29						-.01
Democracy Residual$_t$	D.						.32**						.12						.002
	L.						.09						.34***						-.01
GDP per capita (log)$_t$	D.	19	20	20	23*	23	20	1.8	1.9	4.3	7.7	4.1	2	-.37	-.35	-.42	-.4	-.4	-.36
	L.	-.15	.14	.29	-1.9	.65	.32	8.1***	6.3***	7.3***	2.7	5.2***	7.9***	.22**	.23**	.19**	.19*	.2***	.21**
Urbanization$_t$	D.	.56	.75	.53	.4	1.3	.56	3.3***	2.4***	2.5***	1.5*	2**	2.6***	.08**	.07*	.07**	.07*	.09**	.08**
	L.	-.05	-.06	-.09	.04	-.13	-.09	-.14*	-.13	-.16*	-.07	-.09	-.16*	.003	.004	.004	.002	.003	.004
Capital Stock as % of GDP$_t$	D.	.08	.08	.08	.09**	.09*	.08	.02	.03	.03	.04	.02	.03	-.0004	-.0005	-.001	-.0004	-.0005	-.001
	L.	.01	.01	.01	.01	.01	.01	-.003	-.002	-.003	-.004	.002	-.005	.0004	.0005	.0003	.0004	.0003	.0004
Lagged Dependent Variable		-.23***	-.24***	-.22***	-.22***	-.23***	-.22***	-.28***	-.23***	-.24***	-.13***	-.2***	-.25***	-.14**	-.17**	-.14**	-.13**	-.12*	-.15**
Decade	D.	-2.2*	-2.3*	-2.2*	-1.4	-2.9**	-2.2*	-1.6*	-.52	-.8	.57	-.43	-1	-.03	-.01	-.03	-.03	-.04	-.03
Constant	L.	8.6	6.6	6.3	22	1.1	5	-61***	-50***	-56***	-22	-44***	-58***	-1.7*	-1.8*	-1.6	-1.2	-1.4	-1.7
R^2		.23	.23	.24	.28	.26	.25	.36	.31	.32	.2	.32	.34	.2	.22	.21	.2	.19	.21
N		157	157	157	154	157	157	152	152	152	149	152	152	121	121	121	121	121	121

Note: D. refers to a difference term of the explanatory variable and L refers to a lagged term. All explanatory variables are lagged one year already. The models are estimated through OLS with PCSEs..

*significant at .1 level; ** signficant at .05 level; ***signficant at .01 level.

Table 3.10 Education Attainment Models - Robustness Check - Alternative Measures of Democracy

Dependent Variable		% of Population with Primary School Attained						% of Population with Secondary School Attained						% of Population with Post-Secondary School Attained					
Model		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
Trade (log)$_t$	D.																		
	L.	4.8	3.7	3.3	4.5	4.7	3	-.1	1.1	1.3	-1.1	-1.1	.89	-1	-1.3	-.98	1.8	.28	-.76
Capital Account Openness$_t$	D.																		
	L.	-.89	-.45	-.81	-.14	-1.6	-.62	1.2	1.6	2	1.4	2.9*	2.3	.5	-.31	-.42	-.02	-.76	-.54
Regime$_t$	D.																		
	L.	-3						.62						2.4*					
ACLP Regime$_t$	D.																		
	L.		.59						-4.1*						3.8***				
Polity Score$_t$	D.																		
	L.			.16						-.33**						.19**			
Liberty Score$_t$	D.																		
	L.				2.5						-2.1**						1.3***		
Polyarchy Score$_t$	D.																		
	L.					.23						-.34***						.16***	
Size of Winset$_t$	D.																		
	L.						1.3						-1.5						.87
Democracy Residual$_t$	D.																		
	L.						.05						-.44						.25*
GDP per capita (log)$_t$	D.																		
	L.	6.5	7.3	7.4	9.6	7.1	6.8	-1.7	-1.9	-2.1	-7*	-1.6	-2.7	3.6**	3**	3.1*	5.7***	2.9*	3.4*
Urbanization$_t$	D.																		
	L.	-.74**	-.86***	-.86***	-1**	-.9***	-.84**	.5**	.59***	.55***	.56***	.61***	.57***	.27***	.28***	.33***	.21**	.31***	.32***
Capital Stock as % of GDP$_t$	D.																		
	L.																		
Lagged Dependent Variable																			
Decade	D.	-2.8	-3.7	-3.7	-4.7	-4.2	-3.5	2.4	2.6	2.6	4.4**	3.4*	2.8	-1.4	-.72	-.74	-1.3	-1.1	-.82
Constant	L.	5.5	7.6	9.9	-17	8.1	12	17	8.3	9.2	71**	14	18	-32**	-25**	-28**	-66***	31**	-33**
R^2		.56	.55	.55	.51	.58	.55	.72	.76	.77	.73	.84	.77	.84	.88	.85	.9	.88	.85
N		35	35	35	34	35	35	35	35	35	34	35	35	35	35	35	34	35	35

Note: D. refers to a difference term of the explanatory variable and L refers to a lagged term. All explanatory variables are lagged one year already. The models are estimated through OLS with PCSEs..

*significant at .1 level; ** signficant at .05 level; ***signficant at .01 level.

Table 3.11 Education Attainment Models (Average Years of School) - Robustness Check - Alternative Measures of Democracy

Dependent Variable		Average Years of School, Total						Average Years of School, Male						Average Years of School, Female					
Model		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
Trade (log)$_t$	D.																		
	L.	.18	.24	.26	.45	.26	.27	.16	.26	.28	.63	.34	.33	.2	.23	.24	.28	.2	.22
Capital Account Openness$_t$	D.																		
	L.	-.04	-.1	-.1	.01	-.08	-.1	-.04	-.17	-.17	.003	-.14	-.2	-.04	-.04	-.02	.01	-.02	-.005
Regime$_t$	D.																		
	L.	.3*						.56***						.04					
ACLP Regime$_t$	D.																		
	L.		.11						.28						-.06				
Polity Score$_t$	D.																		
	L.			.003						.01						-.01			
Liberty Score$_t$	D.																		
	L.				.11*						.17**						.04		
Polyarchy Score$_t$	D.																		
	L.					-.001						.002						-.004	
Size of Winset$_t$	D.																		
	L.						-.001						.02						-.03
Democracy Residual$_t$	D.																		
	L.						.005						.03						-.02
GDP per capita (log)$_t$	D.																		
	L.	1***	.94***	.94***	1***	.94***	.96***	.93***	.78***	.79**	1***	.78**	.87***	1.1***	1.1***	1.1***	1***	1.1***	1***
Urbanization$_t$	D.																		
	L.	.06***	.07***	.08***	.04***	.08***	.07***	.05***	.07***	.07***	.03*	.07***	.07***	.08***	.08***	.08***	.06***	.08***	.08***
Capital Stock as % of GDP$_t$	D.																		
	L.																		
Lagged Dependent Variable																			
Decade	D.	-.02	.07	.07	.12	.07	.06	-.12	.05	.04	.03	.04	.02	.08	.09	.09	.21	.1	.11
Constant	L.	-6.3***	-6.2***	-6.4***	-7.2***	-6.4***	-6.5***	-4.3**	-3.9*	-4.2*	-6.9**	-4.5*	-5*	-8.3***	-8.4***	-8.5***	-7.6***	-8.3***	-8.1***
R^2		.95	.95	.95	.94	.95	.95	.94	.92	.92	.91	.91	.92	.95	.95	.95	.94	.95	.95
N		35	35	35	34	35	35	35	35	35	34	35	35	35	35	35	34	35	35

Note: D. refers to a difference term of the explanatory variable and L refers to a lagged term. All explanatory variables are lagged one year already. The models are estimated through OLS with PCSEs..

*significant at .1 level; ** signficant at .05 level; ***signficant at .01 level.

Table 3.12 Gender Equity Models - Robustness Check - Alternative Measures of Democracy

Dependent Variable		Ratio of Girls to Boys in Primary&Secondary School						Ratio of Average Years of School, Girls to Boys					
Model		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Trade (log)$_t$	D.	-.67	-.1	-.84	-1.9	-2	.63						
	L.	1.5*	1.3*	1.2	-.19	-1	-.28	.01	.01	.003	-.07*	-.02	-.01
Capital Account Openness$_t$	D.	.44	.42	.44	.35	.05	.47						
	L.	.7	.65	.75*	.66*	.47	.86**	.002	.02	.03	.01	.03	.04*
Regime$_t$	D.	.06											
	L.	-.92						-.08***					
ACLP Regime$_t$	D.		.67										
	L.		-1.1						-.07***				
Polity Score$_t$	D.			.01									
	L.			-.1						-.004**			
Liberty Score$_t$	D.				.39								
	L.				-.79***						-.03***		
Polyarchy Score$_t$	D.					-.12***							
	L.					-.21***						-.002*	
Size of Winset$_t$	D.						1.3**						
	L.						.41						-.01
Democracy Residual$_t$	D.						-.05						
	L.						-.44***						-.01***
GDP per capita (log)$_t$	D.	1.3	1.9	1.6	-.49	3	6.2**						
	L.	2.8**	2.6**	2.3*	.76	1.9	.56	.09**	.11***	.11***	.04	.11***	.08**
Urbanization$_t$	D.	.95	.88	.91	.18	.6	.72						
	L.	.11*	.13*	.14**	.19***	.39***	.31***	.004**	.003	.002	.004*	.002	.002
Capital Stock as % of GDP$_t$	D.												
	L.												
Lagged Dependent Variable		-.62***	-.63***	-.63***	-.63***	-.84***	-.75***						
Decade	D.	-1.4***	-1.3***	-1.4***	-.8**	-.99**	-1.5***	.03	.001	.002	.03	.01	.01
Constant	L.	10	12	14	48***	30***	31***	-.16	-.29	-.23	.65*	-.15	.02
R^2		.37	.38	.38	.4	.48	.43	.78	.76	.73	.68	.71	.78
N		72	72	72	83	72	72	35	35	35	34	35	35

Note: D. refers to a difference term of the explanatory variable and L refers to a lagged term. All explanatory variables are lagged one year already. The models are estimated through OLS with PCSEs..

*significant at .1 level; ** signficant at .05 level; ***signficant at .01 level.

Varying Controls

Demographical Controls

Two demographical controls have been considered during the modeling process. One is the percentage of youth population (0-14): a larger youth population might make the expansion of enrollment at the primary and secondary level more difficult. However, this control was not included in the baseline models since it is highly correlated with GDP per capita. Entering youth population as a control in the primary and secondary gross enrollment models doesn't change the substantive findings of the model: the total impact of the youth population variable is negative but not significant in both models (Table 3.13, Model 2&7).

Education enrollment and attainment at the secondary and tertiary level may also be a function of population available to be educated from the previous level. However, this control is not entered into the baseline models due to possible problem of endogeneity[119]. Lacking good instruments, I entered enrollment and attainment from the previous year directly into the secondary and tertiary enrollment and attainments models accordingly to get a rough idea how the results would change. This technique is not satisfying from a methodological point of view, but a more or less invariant result would add confidence to my findings. Gross school enrollment and attainment at the primary level significantly affect school enrollment and attainment at the secondary level and the relationships are positive as expected (Table 3.13, Model 8; Table 3.14, Model 7). However, enrollment and attainment at the secondary level doesn't have a significant impact on enrollment and

[119] This is because the explanatory variables in the model could already explain 23% and 36% of variation in primary and secondary gross school enrollment respectively.

attainment at the tertiary level; the sign of the impact is positive as expected though (Table 3.13, Model 13; Table 3.14, Model 13).

Including these controls in the model doesn't change most of the substantive results. Some findings on democracy do change slightly: democracy now has a significant negative impact on tertiary enrollment comparing with a null-effect before. Moreover, the impact of democracy is significant for % of population with secondary school attained but not significant for % of population with post-secondary school attained whereas before its impact is significant for the latter instead for the former.

Education Spending

Education outcomes such as school enrollment, attainment and gender equity might be a function of fiscal resources available. However, education spending can't be controlled properly in the baseline models due to possible problem of endogeneity. Lacking good instruments, models which directly control for education spending could provide us some rough ideas what influence this variable might have.

Total education spending as percent of GDP has a positive impact on almost all education outcome indicators except one indicator on gender equity; however, only the coefficients for average years of school (total) and average years of school (female) are significant at .1 level; other coefficients are not significant (Table 3.13, Model 3, 9&14; Table 3.14, Model, 2, 8&14; Table 3.15, Model 2, 7&12; Table 3.16, Model 2&6). Most of the substantive findings remain pretty much the same; however, democracy now has a

significant negative impact on tertiary gross enrollment after controlling for education spending.

Spending at correspondent levels is probably a better control for enrollment and attainment at different levels. However, too few cases are left for estimation if I use these controls instead of total spending for the attainment models. For school enrollment models, primary and tertiary spending as percent of GDP are positively associated with primary and tertiary gross school enrollment respectively and the relationships are highly significant. Secondary spending as percent of GDP is negatively associated with secondary school enrollment but the relationship is not significant. The substantive findings on globalization and democracy do not change though with these controls (Table 3.13, Model 4, 10&15).

Urbanization

Urbanization is included in the baseline models due to its high explanatory power in most models. However, since urbanization has a rather high correlation with GDP per capita, models without urbanization have been estimated to check how sensitive the results are to its inclusion (Table 3.13, Model 5, 11&16; Table 3.14, Model 3, 9&15; Table 3.15, Model 3, 8&13; Table 3.16, Model 3&7). Dropping urbanization from the models improves the significance of trade and capital account openness in most of the models: trade now has a significant positive impact on primary and secondary gross school enrollment; capital account openness has a significant negative impact on % of population with primary school attained and a positive impact on % of population with

secondary and post secondary school attained and average years of school (total/male/female). However, dropping urbanization from the model doesn't affect the substantive findings on democracy: besides its positive effects on secondary school enrollment, percent of population with post-secondary school attained and average years of school (total/male/female), democracy now has additional negative effects on gross tertiary enrollment and percent of population with primary school attained and additional positive effect on average years of school (female).

Table 3.13 Gross School Enrollment Models - Robustness Check – Varying Controls

		Primary Gross Enrollment					Secondary Gross Enrollment						Tertiary Gross Enrollment (Log)				
Model		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Trade $(\log)_{t-1}$	D.	3.3	2.6	2.9	4	3.3	-1.4	-1.7	-3.5	-1.3	1.5	-1.6	-.07	-.01	-.06	.17	-.09
	L.	2.7	2.5	2.4	6	3.2**	.2	1.9	1.6	1.7	4.1	4.2***	-.05	-.07	-.07	-.02	-.03
Capital Account Openness_{t-1}	D.	.39	.42	.37	1.6	.26	1	1	.38	.99	1.1	.56	.02	.01	.02	.12*	.02
	L.	.8	1	.81	2.1	.58	.98	1	.57	.98	1.7	.1	.02	.02	.02	.08	.02
Regime_{t-1}	D.	.92	.88	.89	2.5	.84	1.2	1.2	2	1.3	-2.4	.83	-.08	-.07	-.09	-.04	-.07
	L.	.58	.63	.5	-2	.24	4***	4.1***	3.6***	3.8***	5.9***	1.9**	-.07	-.08*	-.09**	-.06	-.09**
GDP per capita $(\log)_{t-1}$	D.	19	18	19	10	16	1.8	.9	1.9	2.4	4.3	-5.4	-.37	-.52	-.25	-.65	-.04
	L.	-.15	1	-.03	.54	-.76	8.1***	8.5***	5***	8.3***	9**	4.2***	.22**	.17	.23**	.18	.13
$\text{Urbanization}_{t-1}$	D.	.56	.56	.65	.45		3.3***	3.2***	2**	3.4***	.85		.08**	.09**	.09**	.02	
	L.	-.05	-.07	-.05	.25		-.14*	-.15**	-.06	-.12	-.22**		.003	.003	.003	.01**	
Capital Stock as % of GDP_{t-1}	D.	.08	.07	.07	.09	.07	.02	.01	.02	.02	.03	.0003	-.0004	-.001	0	-.004	.001
	L.	.01	.01	.01	-.04	.01	-.003	-.002	-.01	-.01	.02	-.003	.0004	.001	0	-.003**	.001
% of Youth Population $(0\text{-}14)_{t-1}$	D.		-1.2					-.55									
	L.		.07					.02									
Lagged Primary Gross Enrollment_{t-1}	D.								-.09								
	L.								.08***								
Lagged Secondary Gross Enrollment_{t-1}	D.													.002			
	L.													.003			
Primary Spending as % of GDP_t	D.				5.8***												
	L.				8.8***												
Secondary Spending as % of GDP_t	D.										-1.7						
	L.										-1.1						
Tertiary Spending as % of GDP_t	D.															.12*	
	L.															.26***	
Education Spending as % of GDP_t	D.			.62						.44					.04		
	L.			.16						.44					.03		
Lagged Dependent Variable		-.23***	-.25***	-.23***	-.56***	-.22***	-.28***	-.28***	-.24***	-.29***	-.34***	-.25***	-.14**	-.2***	-.15**	-.05	-.12**
Decade		-2.2*	-2.1	-2.2	.7	-2.1	-1.6*	-1.5*	-.92	-1.4	-4.4**	-.66	-.03	-.004	-.02	-.06	-.003
Constant		8.6	-1.8	14	-21	11	-61***	-65***	-43**	-61***	-63***	-47***	-1.7*	-1.3	-1.8*	-2.2*	-.93
R^2		.23	.23	.23	.31	.23	.36	.37	.32	.37	.54	.28	.2	.28	.22	.35	.17
N		157	157	157	70	157	152	152	137	151	69	152	121	114	121	61	121

Note: Model (1), (6)&(12) are the baseline models reported in table 3.2. Model (2)&(7) examines the effect of youth population; model (8)&(13) examines the effect of population to be educated from the previous level; Model (3)&(4), (9)&(10), (14)&(15) examine the effect of education spending; model (5), (11)&(16) examine the effect of urbanization.
All models are estimated through OLS with PCSE. *significant at .1 level; ** significant at .05 level; ***significant at .01 level.

Table 3.14 Education Attainment Models - Robustness Check – Varying Controls

	% of Population with Primary Education Attained					% of Population with Secondary Education Attained							% of Population with Post-secondary Education Attained					
Model	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(12)	(13)	(14)	(15)	(16)	(17)
Trade $(log)_{t-1}$	4.8	4.6	7.7	4.2	4.5	-.1	.27	-.24	-2	.43	-1.2	-4.8	-1	-1	-1.2	-2.1	-1.3	-.7
Capital Account $Openness_{t-1}$	-.89	-.98	-5.3*	-1.5	-1.4	1.2	.76	1.2	4.2**	1.7	.84	5.5	.5	.81	.43	2.1**	.19	.61
$Regime_{t-1}$	-3	-3.5	-7.3*	-3.8	-3.8	.62	5.6**	.29	3.5	1.4	.29	3.2	2.4*	1.5	2.1	4***	2*	2.5**
GDP per capita $(log)_{t-1}$	6.5	6.6	-1.6	4.4	5	-1.7	-8.6**	-1.7	3.7	.12	-4.2	1.7	3.6**	5.3**	3.6**	6.6***	2.5*	4.3**
$Urbanization_{t-1}$	-.74**	-.75**		-.73**	-.71**	.5**	.63***	.48**		.49**	.42	.81***	.27***	.2	.27***		.28***	.29***
Capital Stock as % of GDP_{t-1}					-.01						.03							-.01
% of Youth Population $(0\text{-}14)_{t-1}$																		
Lagged Primary Gross $Enrollment_{t-1}$							.39***											
Lagged Secondary Gross $Enrollment_{t-1}$														.07				
Education Spending as % of GDP_t		.87						.61							.63			
Decade	-2.8	-2.6	-2.4			2.4	2.5	2.6	2.1		2.9	-4.9	-1.4	-1.8	-1.3	-1.6		-1.6
Constant	5.5	3.7	37	26	20	17	50	16	-4.2	-.99	40	-19	-32**	-45**	-33**	-44***	-21*	-39**
R^2	.56	.56	.45	.55	.55	.72	.8	.73	.64	.71	.74	.96	.84	.85	.85	.78	.83	.85
N	35	35	35	35	35	35	29	35	35	35	35	16	35	29	35	35	35	35

Note: Model (1), (6) &(12) are baseline models reported in table 3.2. Model (7)&(13) examine the effect of population available to be educated from the previous level; model (2), (8)&(14) examine the effect of education spending; model (3), (9) & (15) examine the effect of urbanization; model (4), (10)&(16) examine the effect of decade; model (5), (11)&(17) examine the effect of capital intensity of the economy. All models are estimated through OLS with fixed effects.

*significant at .1 level; ** significant at .05 level; ***significant at .01 level.

Table 3.15 Education Attainment Models (Average Years of School) - Robustness Check – Varying Controls

	Average Years of School, Total					Average Years of School, Male					Average Years of School, Female				
Model	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
Trade $(log)_{t-1}$	.18	.15	-.08	.17	.22	.16	.11	-.04	.13	.21	.2	.19	-.1	.22	.19
Capital Account $Openness_{t-1}$	-.04	-.05	.35**	-.04	-.02	-.04	-.08	.27*	-.07	-.05	-.04	-.03	.42**	-.02	-.04
$Regime_{t-1}$	.3*	.23	.68***	.29*	.31*	.56***	.46***	.86***	.52***	.54***	.04	-.01	.49*	.06	.04
GDP per capita $(log)_{t-1}$	1***	1***	1.7***	1***	1.1***	.93***	.86***	1.5***	.84***	.98***	1.1***	1.2***	2***	1.2***	1.1***
$Urbanization_{t-1}$	.06***	.06***		.07***	.07***	.05***	.05***		.05***	.06***	.08***	.08***		.08***	.08***
Capital Stock as % of GDP_{t-1}					-.001					-.002					.0003
% of Youth Population $(0\text{-}14)_{t-1}$															
Lagged Primary Gross $Enrollment_{t-1}$															
Lagged Secondary Gross $Enrollment_{t-1}$															
Education Spending as % of GDP_t		.14*					.12					.16*			
Decade	-.02		-.06		-.04	-.12		-.15			.08		.04		.08
Constant	-6.3***	-6.7***	-9.1***	-6.2***	-7.2***	-4.3**	-3.9**	-6.6**	-3.4**	-4.8**	-8.3***	-9.5***	-12***	-8.9***	-8.1***
R^2	.95	.96	.9	.95	.96	.94	.95	.9	.94	.94	.95	.96	.89	.95	.95
N	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35

Note: Model (1), (6) &(11) are baseline models reported in table 3.2. Model (2), (7)&(12) examine the effect of education spending;model (3), (8) & (13) examine the effect of urbanization; model (4), (9)&(14) examine the effect of decade; model (5), (10)&(15) examine the effect of capital intensity of the economy. All models are estimated through OLS with fixed effects.
*significant at .1 level; ** significant at .05 level; ***significant at .01 level.

Table 3.16 Gender Parity in Education Models - Robustness Check – Varying Controls

		Ratio of Girls to Boys in Primary & Secondary School				Ratio of Average Years of School, Girls to Boys				
Model		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Trade $(log)_t$	D.	-.67	-.01	-.14	-.31					
	L.	1.5*	2.3**	2.5***	1.3	.01	.02	-.003	.02	-.01
Capital Account $Openness_t$	D.	.44	.96	.45	.44					
	L.	.7	.35	.62	.9	.002	.01	.03	.01	-.004
$Regime_t$	D.	.06	-.31	.62	.45					
	L.	-.92	-1.5	-.62	-1.3	-.08***	-.08***	-.06**	-.08***	-.09***
GDP per capita $(log)_t$	D.	1.3	-2.4	1.1	-.39					
	L.	2.8**	1.3	3.2***	3.5*	.09**	.11***	.13***	.11***	.04
$Urbanization_t$	D.	.95	.29		1.1					
	L.	.11*	.21***		.18**	.004**	.004**		.004**	.003
Capital Stock as % of GDP_t	D.				-.004					
	L.				-.01					.001**
Education Spending as % of GDP_t	D.		-1.3***							
	L.		-1.2***				0			
Lagged Dependent Variable		-.62***	-.7***	-.53***	-.64***					
Decade		-1.4***	-1.6***	-1***	-2.6**	.03		.02		.04
Constant		10	24**	3.5	28**	-.16	-.35	-.33	-.35	.25
R^2		.37	.45	.35	.38	.78	.77	.74	.77	.82
N		72	72	72	72	35	35	35	35	35

1. Model (1) & (5) are the baseline models reported in table 3.2. Model (2) & (6) examine the effect of education spending; model (3)&(7) examine the effect of urbanization. Model (4) & (8) examine the effect of urbanization; model (9) examines the effect of decade.

2. Model (1)-(4) are estimated through OLS with PCSEs; models (5)-(9) are estimated through OLS with Fixed effects.

3. All explanatory variables except education spending in model (1)-(4) are already lagged one year.

*significant at .1 level; ** signficant at .05 level; ***significant at .01 level.

Adding/Dropping Countries

For similar reasons mentioned in Chapter 2, Taiwan and Hong Kong are not in the estimation sample of the baseline models due to lack of data on key variables such as capital account openness, regime and capital intensity of the economy. It is comforting to see including Taiwan and/or Hong Kong in the model doesn't change most of the findings on democracy (Table 3.17, Table 3.18 & Table 3.19). There are two exceptions: 1) democracy now has a significant negative impact on tertiary gross school enrollment (Table 3.17, model 10&11); 2) it now has a positive impact on ratio of average years of school (boys to girls) instead of a negative impact before; moreover, its negative impact on ratio of girls to boys in primary and secondary school becomes significant (Table 3.19, model 2&3, 6&7). Including Taiwan and Hong Kong in the estimation sample doesn't change substantive findings on trade. One change is trade now has a significant positive impact on secondary gross school enrollment instead of a null-significant effect before.

Since Singapore has a much higher level of trade and urbanization than other countries in the estimation sample for the baseline models, I also estimated models with Singapore excluded from the sample. The results remain pretty much the same. One exception is the impact of democracy on gender equity: whereas democracy has a significant negative impact on ratio of girls' average years of school to boys in the baseline models, it now has a significant positive impact.

Table 3.17 Gross School Enrollment Models - Robustness Check - Sample Variation

		Gross School Enrollment, Primary				Gross School Enrollment, Secondary				Gross School Enrollment, Tertiary (log)			
Model		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
sample[1]		(a)	(b)	(c)	(d)	(a)	(b)	(c)	(d)	(a)	(b)	(c)	(d)
Trade $(\log)_{t-1}$	D.	3.3	3.6	3.4	2.9	-1.4	-1.3	-1.5	-2.1	-.07	-.06	-.07	-.05
	L.	2.7	2.8*	1.9	.98	.2	4.2***	2.6**	.81	-.05	-.03	-.04	.03
Capital Account Openness_{t-1}	D.	.39			.45	1			.42	.02			.01
	L.	.8			1.1	.98			.66	.02			-.003
Regime_{t-1}	D.	.92	.95		1.1	1.2	.39		1.3	-.08	-.08		-.08
	L.	.58	.43		.57	4***	1.9***		2.7***	-.07	-.09**		-.06
Liberty Score_t	D.			.67				-.31				-.003	
	L.			.27				.1				-.03**	
GDP per capita $(\log)_{t-1}$	D.	19	15	.83	30**	1.8	4.8	1.1	11	-.37	-.22	-.31	-.14
	L.	-.15	-.12	-1.4	-.02	8.1***	3.2***	1	3.9**	.22**	.14**	.13**	.13
$\text{Urbanization}_{t-1}$	D.	.56	.79	.7	.3	3.3***	.58	.76*	2.1**	.08**	.05**	.02	.06
	L.	-.05	-.03	.04	-.13	-.14*	-.15*	-.03	-.18**	.003	.003	.003**	.01*
Capital Stock as % of GDP_{t-1}	D.	.08	.06		.09**	.02	.04		.04	-.0004	.0003		.001
	L.	.01	.01		-.02	-.003	.02		-.001	.0004	.001		.001
Lagged Dependent Variable		-.23***	-.23***	-.2***	-.19***	-.28***	-.21***	-.13***	-.13***	-.14**	-.13**	-.1**	-.17**
Decade		-2.2*	-1.7	-1.2	-1.8	-1.6*	-.39	.3	.13	-.03	-.004	-.02	-.05
Constant		8.6	11	20*	8.5	-61***	-21*	-6.9	-20	-1.7*	-.95	-.77	-1.2
R^2		.23	.22	.26	.26	.36	.3	.18	.29	.2	.2	.18	.23
N		157	179	199	133	152	174	191	128	121	143	160	105

1. sample (a) is the baseline sample which includes Indonesia, Korea, Malaysia, Philippines, Singapore, Thailand; sample (b) is the baseline sample plus Taiwan; sample (c) is the baseline sample plus Taiwan & Hong Kong; sample (d) is the baseline sample excluding Singapore.

Note: All models are estimated through OLS with PCSEs. * significant at .1 level **significant at .05 level ***significant at .01 level.

Table 3.18 Education Attainment Models - Robustness Check - Sample Variation

		% of Population with Primary School Attained				% of Population with Secondary School Attained				% of Population with High School Attained				Average Years of School, Total				Average Years of School, Male				Average Years of School, Female			
Model		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
sample[1]		(a)	(b)	(c)	(d)	(a)	(b)	(c)	(d)	(a)	(b)	(c)	(d)	(a)	(b)	(c)	(d)	(a)	(b)	(c)	(d)	(a)	(b)	(c)	(d)
Trade (log)$_t$	D.																								
	L.	4.8	5.2	5	11	-.1	.4	-.27	-2.1	-1	-1.2	1.6	.06	.18	.23	.52**	.37	.16	.28	.72**	.27	.2	.17	.31	.48
Capital Account Openness$_t$	D.																								
	L.	-.89			-2	1.2			1.5	.5			.02	-.04			-.11	-.04			-.05	-.04			-.17
Regime$_t$	D.																								
	L.	-3	-3.2		-1.5	.62	.67		-.1	2.4*	2.3**		2.4*	.3*	.24*		.29*	.56***	.43**		.55***	.04	.05		.03
Liberty Score$_t$	D.																								
	L.			1.6				-1.3*				1.2***				.08				.12*				.04	
GDP per capita (log)$_t$	D.																								
	L.	6.5	4	5.5	2.9	-1.7	-.14	-4.9	-.67	3.6**	4****	5.5***	2.4	1***	1***	.86***	.84**	.93***	.95***	.73**	.9***	1.1***	1.1***	1***	.76**
Urbanization$_t$	D.																								
	L.	-.74**	-.69***	-.83***	-.4	.5**	.5**	.51***	.37	.27***	.27***	.21***	.34**	.06***	.07***	.05***	.07***	.05***	.06***	.04***	.05***	.08***	.08***	.06***	.09***
Capital Stock as % of GDP$_t$	D.																								
	L.																								
Lagged Dependent Variable																									
Decade		-2.8	-2.9	-4.7	-9**	2.4	2.4	4.5**	5*	-1.4	-.97	-1.1	-1.8	-.02	-.08	.1	-.05	-.12	-.2	.01	-.13	.08	.05	.2	.04
Constant		5.5	21	11	-2.5	17	4.3	53*	23	-32**	-34**	-63***	-25	-6.3***	-6.9***	-6.3***	-5.1***	-4.3**	-5.2**	-5.1*	-3.9*	-8.3***	-8.7***	-7.6***	-6.1***
R^2		.56	.54	.48	.69	.72	.7	.65	.77	.84	.84	.9	.85	.95	.95	.94	.96	.94	.92	.88	.95	.95	.95	.94	.96
N		35	40	38	30	35	40	38	30	35	40	38	30	35	40	38	30	35	40	38	30	35	40	38	30

1. sample (a) is the baseline sample which includes Indonesia, Korea, Malaysia, Philippines, Singapore, Thailand; sample (b) is the baseline sample plus Taiwan; sample (c) is the baseline sample plus Taiwan & Hong Kong; sample (d) is the baseline sample excluding Singapore.

Note: All models are estimated through OLS with fixed effects. * significant at .1 level **significant at .05 level ***significant at .01 level.

Table 3.19 Gender Equity in Education Models - Robustness Check - Sample Variation

		Ratio of Girls to Boys in Primary & Secondary School				Ratio of Average Years of School, Girls to Boys			
Model		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
sample[1]		(a)	(b)	(c)	(d)	(a)	(b)	(c)	(d)
Trade $(\log)_t$	D.	-.67	-.08	-1.5	.23				
	L.	1.5*	2.3***	1.4**	1.7**	.01	.23	.52**	.37
Capital Account Openness_t	D.	.44			38				
	L.	.7			.68	.002			-.11
Regime_t	D.	.06	.2		.59				
	L.	-.92	-1.3***		-.65	-.08***	.24*		.29*
Liberty Score_t	D.			-.01					
	L.			-.4***				.08	
GDP per capita $(\log)_t$	D.	1.3	.5	1.1	1.7				
	L.	2.8**	3***	2.4***	4***	.09**	1***	.86***	.84**
Urbanization_t	D.	.95	.1	-.03	.98				
	L.	.11*	.11**	.07***	.002	.004**	.07***	.05***	.07***
Capital Stock as % of GDP_t	D.								
	L.								
Lagged Dependent Variable		-.62***	-.53***	-.48***	-.6***				
Decade		-1.4***	-.001	-.85***	-.71	.03	-.08	.1	-.05
Constant		10	-.01	15***	14	-.16	-6.9***	-6.3***	-5.1**
R^2		.37	.35	.34	.37	.78	.95	.94	.96
N		72	98	108	60	35	40	38	30

1. sample (a) is the baseline sample which includes Indonesia, Korea, Malaysia, Philippines, Singapore, Thailand; sample (b) is the baseline sample plus Taiwan; sample (c) is the baseline sample plus Taiwan & Hong Kong; sample (d) is the baseline sample excluding Singapore.

Note: Model (1)-(4) are estimated through OLS with PCSEs; model (5)-(8) are estimated through OLS with fixed effects. All explanatory variables in model (1)-(3) are already lagged one year.

* significant at .1 level **significant at .05 level ***significant at .01 level.

Estimation Method

To see whether my models are sensitive to the estimation method chosen, I re-estimate baseline models (1) – (3) & (10) using GLS and fixed effects and models (4) – (9)& (12) using OLS with panel corrected standard errors and GLS. The findings remain pretty much the same. Three differences stand out: 1) the scale of the trade coefficient becomes much smaller in some models (Table 3.20, Model 2&3, 5&6, 8&9) and trade no longer has a positive impact on ratio of girls to boys in primary and secondary school; 2) the effect of democracy on improving % of population with post-secondary school attained becomes more significant; 3) democracy now has a significant negative impact on tertiary school enrollment (Table 3.20, Table 3.21, Table 3.22 & Table 3.23).

Table 3.20 Gross School Enrollment Models - Robustness Check - Estimation Method

		Primary Gross School Enrollment			Secondary Gross School Enrollment			Tertiary Gross Scool Enrollment (log)		
Model		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Method[1]		OLS*	GLS	FE	OLS*	GLS	FE	OLS*	GLS	FE
Trade $(\log)_{t-1}$	D.	3.3	2.3	3.1	-1.4	-1.6	-1.1	-.07	-.04	-.07
	L.	2.7	.01	.02	.2	.02	.02**	-.05	-.0003	-.0003
Capital Account Openness_{t-1}	D.	.39	.43	.37	1	.83	1	.02	.02	.01
	L.	.8	1.3**	.81	.98	1.1*	.84	.02	.01	.02
Regime_{t-1}	D.	.92	2.3	1.3	1.2	2.1**	1.5	-.08	-.07	-.09
	L.	.58	1.1	.96	4***	3.7***	4.1***	-.07	-.09**	-.08*
GDP per capita $(\log)_{t-1}$	D.	19	22**	23	1.8	8.4	3	-.37	-.52	-.44
	L.	-.15	.43	-.23	8.1***	6.3***	7.4***	.22**	.22**	.23**
$\text{Urbanization}_{t-1}$	D.	.56	.56	.64	3.3***	2.8***	3.2***	.08**	.06*	.08*
	L.	-.05	-.13	-.05	-.14*	-.18**	-.13	.003	.002	.003
Capital Stock as % of GDP_{t-1}	D.	.08	.09**	.09*	.02	.03	.02	-.0004	-.001	-.001
	L.	.01	.01	.01	-.003	-.01	-.01	.0004	.001	.0003
Lagged Dependent Variable		-.23***	-.2***	-.22***	-.28***	-.19***	-.26***	-.14**	-.16***	-.15***
Decade		-2.2*	-1.5	-2.1*	-1.6*	-.65	-1.4	-.03	-.01	-.03
Constant		8.6	17	20	-61***	-41***	-46***	-1.7*	-1.4**	-1.7**
R^2		.23		.2	.36		.35	.2		.13
N		157	157	157	152	152	152	121	121	121

[1.] OLS* is OLS estimation with Panel Corrected Standard Errors; GLS is the GLS estimation correcting for panel heterogeneity; FE is the fixed effect estimation.

* significant at .1 level **significant at .05 level ***significant at .01 level.

Table 3.21 Education Attainment Models - Robustness Check - Estimation Method

		% of Population with Primary Education Attained			% of Population with Secondary Education Attained			% of Population with post-secondary education Attained		
Model		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Method[1]		FE	OLS*	GLS	FE	OLS*	GLS	FE	OLS*	GLS
Trade (log)$_t$	D.									
	L.	4.8	4.8*	1.6	-.1	-.1	-2.1	-1	-1	-2
Capital Account Openness$_t$	D.									
	L.	-.89	-.89	-.94	1.2	1.2	.62	.5	.5	.78
Regime$_t$	D.									
	L.	-3	-3	-6.7***	.62	.62	2.1*	2.4*	2.4**	3.1***
GDP per capita (log)$_t$	D.									
	L.	6.5	6.5***	4	-1.7	-1.7	-1.5	3.6**	3.6**	4***
Urbanization$_t$	D.									
	L.	-.74**	-.74***	-.64***	.5**	.5**	.69***	.27***	.27***	.21***
Capital Stock as % of GDP$_t$	D.									
	L.									
Lagged Dependent Variable										
Decade		-2.8	-2.8*	2	2.4	2.4	1.2	-1.4	-1.4***	-.9
Constant		5.5	21	52**	17	-2	-9	-32**	-52	-45***
R^2		.56	.9		.72	.96		.84	.96	
N		35	35	35	35	35	35	35	35	35

[1.] OLS* is OLS estimation with Panel Corrected Standard Errors; GLS is the GLS estimation correcting for panel heterogeneity; FE is the fixed effect estimation.

* significant at .1 level **significant at .05 level ***significant at .01 level.

Table 3.22 Education Attainment Models (Average Years of School) - Robustness Check - Estimation Method

		Average Years of School, Total			Average Years of School, Male			Average Years of School, Female		
Model		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Method[1]		FE	OLS*	GLS	FE	OLS*	GLS	FE	OLS*	GLS
Trade $(\log)_t$	D.									
	L.	.18	.18	.06	.16	.16	.14	.2	.2	.06
Capital Account Openness_t	D.									
	L.	-.04	-.04	.04	-.04	-.04	.02	-.04	-.04	.02
Regime_t	D.									
	L.	.3*	.3***	.32***	.56***	.56***	.61***	.04	.04	-.01
GDP per capita $(\log)_t$	D.									
	L.	1***	1***	1***	.93***	.93***	.93***	1.1***	1.1***	1.2***
Urbanization_t	D.									
	L.	.06***	.06***	.06***	.05***	.05***	.05***	.08***	.08***	.08***
Capital Stock as % of GDP_t	D.									
	L.									
Lagged Dependent Variable										
Decade		-.02	-.02	.04	-.12	-.12	-.12	.08	.08	.14
Constant		-6.3***	-11***	-10***	-4.3**	-8.2***	-8***	-8.3***	-14***	-14***
R^2		.95	.99		.94	.99		.95	.99	
N		35	35	35	35	35	35	35	35	35

[1.] OLS* is OLS estimation with Panel Corrected Standard Errors; GLS is the GLS estimation correcting for panel heterogeneity; FE is the fixed effect estimation.

* significant at .1 level **significant at .05 level ***significant at .01 level.

Table 3.23 Gender Equity in Education Models - Robustness Check - Estimation Method

		Ratio of Girls to Boys in Primary & Secondary School			Ratio of Average Years of School, Girls to Boys		
Model		(1)	(2)	(3)	(4)	(5)	(6)
Method[1]		OLS*	GLS	FE	FE	OLS*	GLS
Trade $(log)_{t-1}$	D.	-0.67	-0.33	-1.1			
	L.	1.5*	0.01	0.01	0.01	0.01	0.01
Capital Account $Openness_{t-1}$	D.	0.44	0.69	0.49			
	L.	0.7	1.2*	1	0.002	0.003	0.01
$Regime_{t-1}$	D.	0.06	0.36	0.19			
	L.	-0.92	0.48	-0.87	-.08***	-.08***	-.08***
GDP per capita $(log)_{t-1}$	D.	1.3	4.4	1.7			
	L.	2.8**	5.2***	2.8	.09**	.09**	.1***
$Urbanization_{t-1}$	D.	0.95	1.8**	1.1			
	L.	.11*	-0.04	0.1	.004**	.004**	.003***
Capital Stock as % of GDP_{t-1}	D.						
	L.						
Lagged Dependent Variable		-.62***	-.55***	-.62***			
Decade		-1.4***	-1.5*	-1.4	0.03	0.03	.02*
Constant		10	-1.4	26	-0.16	-.49*	-.52**
R^2		0.37		0.35	0.78	0.94	
N		72	72	72	35	35	35

1. OLS* is OLS estimation with Panel Corrected Standard Errors; GLS is the GLS estimation correcting for panel heterogeneity; FE is the fixed effect estimation.

2. All explanatory variables in model (1)-(3) are already lagged one year.

* significant at .1 level **significant at .05 level ***significant at .01 level.

3.3.3 Summary

Table 3.24 summarizes various robustness checks in this section. Several conclusions can be drawn:

(1) The evidence tilts toward a null-effect of trade integration on all the education outcome indicators. Trade has a significant positive relation on ratio of girls to boys in primary and secondary school in the baseline models however this finding is sensitive to trade indicator used and the estimation method chosen. Trade has a positive effect on primary and secondary school enrollment in some models but this effect is not significant most of the time.

(2) Capital account openness consistently has no effect on all the education outcome indicators except a few models not controlling for urbanization. Disaggregating the effects of capital account openness into foreign direct investment and private capital flow seems to tell us a better story of the direction of the impacts than using an aggregate policy indicator alone: both foreign direct investment and private capital flow encourages enrollment and attainment at the primary and secondary level while discourages those at the tertiary level; foreign direct investment worsens gender equity while gross capital flows improves it. However, such conclusion is just tentative given the missing data problem is more serious for the education outcome models.

(3) Four conclusions can be drawn on the impacts of democracy:

Democracy consistently has no impact on primary school enrollment but a significant positive impact on secondary gross school enrollment. This finding is insensitive to all

changes in the model except one. It is unclear what effects democracy has on tertiary school enrollment since different model specifications produce different results.

It is a pretty robust finding that democracy improves percent of population with post-secondary education attained. This result has passed all robustness checks except two (one controlling for population to be educated and the other controlling for spending). Democracy seems to reduce percent of population with primary school attained while increasing percent of population with secondary school attained but this result is only true in some model specifications.

The finding is pretty consistent that democracy increases male's average years of school but has no effect on that of female. These two results have passed all the robustness checks except one. Democracy also seems to improve the total population's average years of school but this result is sensitive to three changes in model specification (democracy indicator used, spending control and sample variation).

Democracy seems to have no effect on ratio of girls to boys in primary and secondary school. However different democracy indicator has produced mixed results. The effect also becomes negative when Taiwan and Hong Kong are added to the sample. The effect of democracy on ratio of average years of school, girls to boys is negative in most model specifications but this result is sensitive to sample changes.

Table 3.24 Education Outcome Models: Summary of Robustness Checks

	Gross School Enrollment			% of Population That Attained			Average Years of School			Gender Equity	
	Primary	Secondary	Tertiary	Primary school	Secondary school	Post-secondary School	Total	Male	Female	Ratio of girls to boys in primary&secondary school	Ratio of average years of school, girls to boys
Trade Integration											
Baseline	-	-	-	-	-	-	-	-	-	+	-
Varying Trade Specification	-	-	-	-	mixed	-	-	-	mixed	mixed	mixed
Youth Population Control	-	-	NA	NA	NA	NA	NA	NA	NA	NA	NA
Control for Population to be Educated	NA	-	-	NA	-	-	NA	NA	NA	NA	NA
Education Spending Control	-	-	-	-	-	-	-	-	-	+	-
Dropping Urbanization	+	+	-	-	-	-	-	-	-	+	-
Including Taiwan &HK in the sample	mixed	+	-	-	-	-	mixed	mixed	-	+	mixed
Excluding Singapore from the sample	-	-	-	-	-	-	-	-	-	+	-
Varing Estimation Method	-*	mixed*	-*	mixed	-	-	-	-	-	-	-
Capital Account Openness											
Baseline	-	-	-	-	-	-	-	-	-	-	-
Varying Capital Account Specification	mixed	mixed	-	-	-	-	-	-	-	mixed	-
Youth Population Control	-	-	NA	NA	NA	NA	NA	NA	NA	NA	NA
Control for Population to be Educated	NA	-	-	NA	-	-	NA	NA	NA	NA	NA
Education Spending Control	-	-	mixed	-	-	-	-	-	-	-	-
Dropping Urbanization	-	-	-	(-)	+	+	+	+	+	-	-
Excluding Singapore from the sample	-	-	-	-	-	-	-	-	-	-	-
Varing Estimation Method	mixed	-	mixed	-	-	-	-	-	-	mixed	-
Democracy											
Baseline	-	+	-	-	-	+	+	+	-	-	(-)
Varying Democracy Specification	mixed	+	mixed	-	+	+	-	-	-	mixed	(-)
Youth Population Control	-	+	NA	NA	NA	NA	NA	NA	NA	NA	NA
Control for Population to be Educated	NA	+	(-)	NA	+	-	NA	NA	NA	NA	NA
Education Spending Control	-	+	mixed	-	-	mixed	-	+	-	-	(-)
Dropping Urbanization	-	+	(-)	(-)	-	+	+	+	+	-	(-)
Including Taiwan &HK in the sample	-	mixed	(-)	-	mixed	+	mixed	+	-	(-)	mixed
Excluding Singapore from the sample	-	+	-	-	-	+	+	+	-	-	+
Varing Estimation Method	-	+	(-)	mixed	mixed	+	+	+	-	-	(-)

Note: "+" indicates a significant positive effect, "-" indicates a null-effect and "(-)" indicates a significant negative effect. "NA" indicates this check is not applicable to this model.
"mixed" indicates a different effect from the baseline for at least two (or 50%, whichever is smaller) models of this check. "* "indicates a coefficient much smaller in scale.

3.4 Conclusion

Table 3.25 summarizes findings in this chapter. I hypothesized a positive relationship between democratic regime and education outcomes in East Asia: findings from this chapter tend to support my hypotheses. The most important findings from this chapter indicate that to some extent democracies do deliver better education to their citizens in East Asia: secondary gross school enrollment is higher in democracies; so is the male's average years of school. These findings are robust. Democracy also seems to have a higher proportion of the population with post-secondary education attained and a higher average years of school for the total population, yet these findings are less robust. In general, these findings on the positive role of democracy in improving enrollment and attainment at the secondary level and above are consistent with findings in chapter 2 that democracies spend more on education, in particular at the primary and secondary level. Increase in education resources at the primary and secondary level probably help to improve school access and quality at these two levels. On the other hand, the finding on the positive role of democracy in improving secondary school enrollment is consistent with a number of literature in global samples (Lake and Baum, 2001; Baum and Lake, 2003; Rudra and Haggard, 2005).

Table 3.25 Summary of Findings in Chapter 3

	Gross School Enrollment			% of Population That Attained			Average Years of School			Gender Equity	
	Primary	Secondary	Tertiary	Primary school	Secondary school	Post-secondary School	Total	Male	Female	Ratio of girls to boys in primary&secondary school	Ratio of average years of school, girls to boys
Trade Integration	-	-	-*	-*	-*	-*	-*	-*	-*	+	-
Capital Account Openness	-	-*	-	-*	-*	-*	-*	-*	-*	-	-*
Democracy	-*	+*	-	-	-	+	+	+*	-*	-	(-)

Note: "+" indicates a significant positive effect, "-" indicates a null-effect and "(-)" indicates a significant negative effect. "*" indicates a robust finding which has passed all robustness checks or all except one.

However, it is less clear what effects democracy has on gender equity in education. Neither of the finding on gender equity is robust. It seems that democracy improves male's average years in school but not that of female's, but democracy has no significant effect on the ratio of girls to boys in primary and secondary school. It might be the case that males benefit more from the expansion of education opportunities than females in East Asia, especially at the tertiary education level. This is not surprising since gender bias is not easily corrected even under democracy. Table 3.26 details the impacts of democracy on the education outcome indicators.

Table 3.26 Effects of Democracy on Education Outcomes in East Asia

	Regional Average	Democracy
Gross School Enrollment		
primary level	102%	- (*)
secondary level	63%	+14% (*)
Tertiary Level	22%	-
% of Populatin That Attained		
primary school	40%	-
secondary school	32%	-
post-secondary school	8.3%	+2%
Average Years of School		
total	6.5	+.3
male	7.1	+1 (*)
female	5.8	- (*)
Gender Parity Ratio		
girls to boys in primary&secondary school	95%	-
average years of school, girls to boys	0.8	-.08

Note: "-" indicates an insignificant effect. * indicates a robust finding.

For the globalization variables - trade and capital account openness, I initially hypothesized a positive relation between them and education enrollment/attainment at all three levels of education respectively. I also hypothesized a positive relation between them and average years of school of the population and gender equity respectively, but the evidence tilts toward a null-effect of these two variables on all the education outcome indicators. Almost all the coefficients are insignificant and most of the insignificant findings are robust. Trade is found to have a positive impact on ratio of girls to boys in primary and secondary school but this result is sensitive to the estimation method chosen; alternative trade measures also provide mixed effects. These null-effect findings on trade and capital account openness are consistent with the finding in chapter 2 that globalization variables have no robust significant impact on total education spending and education spending at various levels. The “efficiency” and “human capital” motives might cancel each other when East Asian governments face the global market. Financial investors also probably do not look beyond macro-economic indicators such as inflation when making investment decisions.

Results from this chapter would improve if more data on education outcome indicators were available. Net school enrollment is a better indicator than gross school enrollment when measuring participation but the data is sparse. The data on education attainment is only available every five years. These data problems are compounded by limited data on education spending at corresponding levels and missing data on key variables for Taiwan and Hong Kong. In addition, controlling for variables such as education spending and population available to be educated from the previous level causes potential problem of endogeneity. All this poses great challenge to modeling and I have been quite

conservative in only presenting the results that are insensitive to various changes in model specifications. Better data and more proper modeling strategy in the future should provide more accurate findings.

Chapter 4 Globalization, Democratization and Government Education Provision in Taiwan

Chapter 4 through 7 employs the comparative case study method to explore in-depth the impacts of globalization and democratization on government education provision in specific national and historical contexts. The four cases are Taiwan, Singapore, Malaysia and Thailand[120]. Guiding the case studies are two sets of questions:

1) How does integration into the global market affect government education provision? In particular, the statistical study finds no robust relationship between economic globalization and government education provision, evaluated from both spending and outcome indicators. Why is this the case? What are other possible impacts of economic globalization on government education provision that are not captured by the statistical study? What are the causal mechanisms behind these effects, if any?
2) What are the effects of democratic transition on government education provision? In particular, the statistical study finds that democratic governments spend more on education per student in general; it also finds democratic governments tend to have a higher primary and secondary per student spending as percent of GDP per capita while reducing spending on tertiary education; in addition, democratic governments have a higher secondary gross school enrollment. What are the causal mechanisms behind these findings? Moreover, what other impacts might democratization have on government education provision?

[120] For reasons to choose these four cases, please refer to section 1.4.2 in chapter 1.

This chapter studies these two sets of questions in Taiwan. The study period starts from 1949, when the Chinese Nationalist Party and its followers fled to Taiwan after losing all the major battles with the Communist Party on the mainland, and covers until present.

I argue that despite the statistical finding that globalization has no robust significant effects on education spending and outcomes, integration into the global market has profoundly affected government education provision in Taiwan. Education development and planning didn't rank high on the agenda of the Taiwanese government until it started to adopt an export-oriented policy in the 1960s. Since then, the Taiwanese government has played a very active role in constantly updating its education system to satisfy the needs of its open economy. Pressure from the global market acted as a stimulus for reform. Further integration into the global market and competition from the second tier of industrializing countries in the 1980s aroused a new round of industrial and education upgrading measures in Taiwan. The 1990s saw more profound changes of the education system as Taiwan faced "double competition" from both developing and developed countries and strived to remain competitive in the global knowledge economy.

On the political front, democratic transition in Taiwan was associated with liberalization measures to free the education system from the tight control of the state, greater education spending, legislation to protect education spending, and reform measures to correct the pro-elite spending under the authoritarian regime. While civil society has been the main force to push these reforms, electoral competition has also played a limited role.

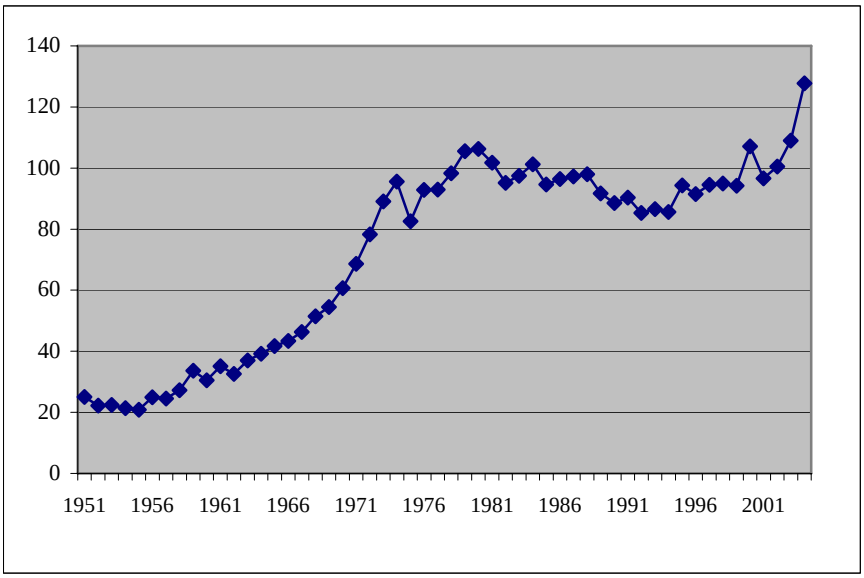
This chapter will proceed as follows. Section 4.1 discusses the impacts of globalization on government education provision in Taiwan. Section 4.2 elaborates on the effects of democratic transition. Section 4.3 concludes.

4.1 Globalization and Government Education Provision in Taiwan

4.1.1 Globalization in Taiwan: An Overview

Figure 4.1 shows the evolution of the trade intensity ratio (the sum of import and export as percent of GDP) – a standard measure of trade openness in Taiwan from 1951-2003. We can see that Taiwan's economy was relatively closed in early 1950s, with a trade intensity ratio of about 25%. However, the ratio started to rise significantly in early 1960s, reached a high of 100% by the end of 1970s and fluctuated around that level until late 1990s. The twenty first century saw a further integration of Taiwan's economy into the global market: the trade intensity ratio reached a new high of 128% in 2004.

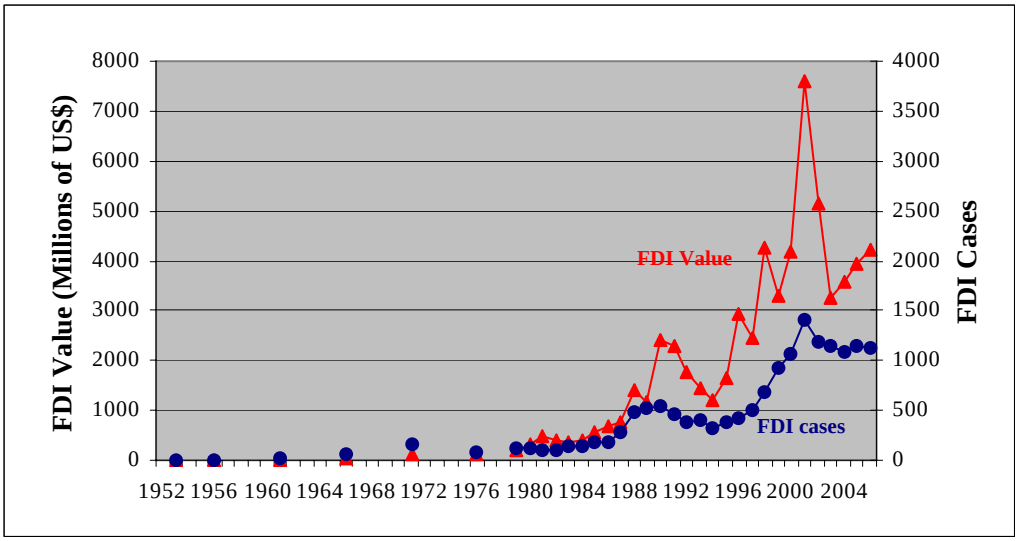
Figure 4.1 Taiwan: Trade Intensity Ratio (1951-2004)



Source: Penn Table 6.2.

The integration of the Taiwanese economy into the global capital market took place later than trade integration. As can be seen from Figure 4.2, foreign direct investment didn't increase significantly in Taiwan until middle 1980s. The number and amount of foreign direct investment continued to rise after 1980s and reached the highest in 2000[121]. Figure 4.3 shows outward investment also started to grow in late 1980s and continued to increase until Taiwan was hit by the Asian financial crisis in 1997.

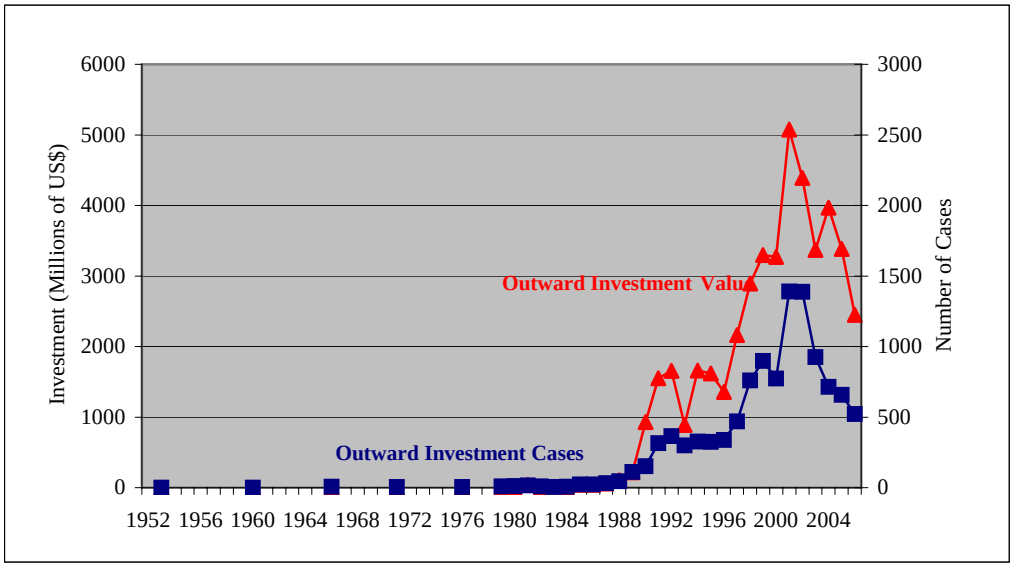
Figure 4.2 Taiwan: Foreign Direct Investment (1952-2005)



Source: Taiwan Statistical Data Book, Council for Economic Planning and Development, Taiwan

[121] Due to data limitation, I couldn't find a relative measure of capital account openness to describe more accurately the integration of the Taiwanese economy to the global market.

Figure 4.3 Taiwan: Outward Investment (1952-2005)



Source: Taiwan Statistical Data Book, Council for Economic Planning and Development, Taiwan

Structural data revealed the changing nature of the open economy in Taiwan. Table 4.1 shows the successful industrialization of the Taiwanese economy in the 1980s and the increasing importance of the service industry since the 1990s. By 2005, service industry already composed as high as 74 percent of GDP while industry contributed 25 percent and agriculture just 2 percent. The employment structure reflected similar sectoral change trends. Table 4.1 also shows a successful structural upgrading of the Taiwanese economy in the 1980s. The share of chemical and heavy industry grew steadily within the manufacturing sector and overtook the share of light industry in 1990. The same structural upgrading took place in the exporting sector at around the same time. The technological upgrading of the Taiwanese economy was also reflected in its import structure: the importing share of capital goods decreases significantly in the 1980s. Table 4.2 demonstrates the increasing technological and capital intensity and decreasing labor intensity of the Taiwanese exports since the 1980s.

Table 4.1 Evolution of Taiwanese Economic Structure: 1970-2003

	1960	1970	1980	1990	2000	2005
1. Industrial Structure (% of GDP)						
Agriculture	28.5	15.5	7.7	4.2	2.1	1.8
Industry	26.9	36.8	45.7	41.2	32.4	24.6
Service	44.6	47.7	46.6	54.6	65.5	73.6
2. Employment Structure (% of Total Employed Person)						
Agriculture	50.2	36.7	19.5	12.8	7.8	5.9
Industry	20.5	28	42.5	40.8	37.2	35.8
Service	29.3	35.3	38	46.3	55	58.3
3. Trade (% of GDP)						
Exports	9.9	25.9	46.8	40.8	46.2	54.7
Imports	18	26.7	46.7	33.3	43.7	52.6
4. Breakdown of Manufacturing Industry (% of Total Manufacturing Output)						
Heavy and Chemical Industry	24	34.3	46.2	55.9	71.5**	74.7
Light Industry	76	65.7*	53.8	44.1	28.5	25.3
5. Export Structure (% of Total Exports)						
Agricultural	12	8.6	3.6	0.7	0.2	0.2
Processed Agricultural Products	55.7	12.8	5.6	3.8	1.2	1.1
Industrial Products	32.3	78.6	90.8	95.5	98.6	98.7
I. Heavy and Chemical Products	10.2	26.6	35.6	46.7	64.3**	65.1
II. Other Industrial Products	89.8	73.4	64.4	53.3	23.9	32.3
6. Import Structure (% of Total Imports)						
Capital Equipment	27.9	32.3	23.4	17.5	28	19.7
Agricultural and Industrial Raw Materials	64	62.8	70.8	70.4	64.1	71.7
Consumer Goods	8.1	4.9	5.8	12	9.5	8.6

* 1972 figure ** 1998 figure

Source: Chou, 2001; Taiwan Statistical Data Book, Various Issues; Taiwan Statistical Yearbook, Various Issues.

Table 4.2 Export Commodities by Intensity of Input Factor for Taiwan, 1982–1997

	Degree of Labor Intensity			*Degree of Capital Intensity*			*Degree of Technology Intensity*		
	High	*Med*	*Low*	*High*	*Med*	*Low*	*High*	*Med*	*Low*
1982	47.2	30.8	21.9	26.9	45.4	27.6	18.3	32.6	49.1
1985	45.9	35.6	18.5	24.5	48.7	26.8	18.8	33.6	47.6
1990	41	38.3	20.7	28.9	50.5	20.5	26.7	38.6	34.7
1995	36.4	40.6	23	31.9	56.5	11.6	36.5	41.4	22
1997	34.9	43.1	22.1	30.3	60.6	9.1	39.7	41.1	19.2

Source: Cheng, 2001.

4.1.2 Globalization, Industrial Strategy and Government Education Provision

I have so far identified two major characteristics of Taiwan's integration into the global market: 1) Taiwan started to increase its trade dependence on the global market in the 1960s; 2) despite a relatively stable trade intensity ratio since 1970s, the nature of Taiwan's open economy changed in the 1980s, which saw a structural upgrading from

labor-intensive to more capital- and technology- intensive; Taiwan's integration into the global capital market has also deepened since the 1980s. In this section, I argue that these features of globalization in Taiwan had significant effects on its government education provision. As the transition from an industrialization strategy of import substitution to export promotion increased Taiwan's dependence on global trade, planners in Taiwan started to attach great importance to education planning and provision so that the manpower needs of the open economy could be satisfied. Education access was expanded and emphasis was put on science, technological and vocational education.

Increasing integration into the global market and industrial upgrading in the 1980s was a conscious strategy of the Taiwanese government in response to rising domestic labor costs, trade disputes with its partners and greater competition from the second tier developing countries. These changes in turn pressured the Taiwanese government to upgrade the quality of its education provision. Fundamental education reforms have been further initiated in recent years as Taiwan faced more fierce competition in the global knowledge economy and strived to stay ahead with adequate manpower. Below I detail these effects of globalization on government education provision in Taiwan.

Import Substitution and Education Provision as Nation Building (1949-60)

Globalization changed the priority the Taiwanese government attached to education. Education provision was not ranked high on the development agenda of the Taiwanese government until the 1960s, when the Taiwanese economy started to integrate into the global market. The priority of economic development in the 1950s was increasing the productivity of the agricultural sector and creating employment opportunities for the

surplus labors. The industrialization strategy was based on labor-intensive import substitution, with high tariff protection and various measures of exchange control (Taiwan, CEPD: 2007a). Even though regulations were established to encourage foreign direct investment, the amount was very limited (Taiwan, CEPD: 2007a).

During this period of limited integration into the global market, faced with uncertainty and tensions in the political environment, the Nationalist government mainly used the education system to cultivate "national spirit" of the Taiwanese people and the provision of primary education was the priority (Hsieh et al. 1999; Ashton, Green, James and Sung, 1999). It resisted increase in secondary and tertiary spending despite social demands; there was also no overall strategy on vocational training (Ashton, Green, James and Sung, 1999). The manpower needs of the economy were mainly filled by the primary education system left by the Japanese and the refugees from the mainland, most of which were highly educated elites: administrators, technicians and doctors (Ashton, Green, James and Sung, 1999; Zhen et al. 1983).

Labor-intensive Export Promotion and the Start of Education Planning (1961-80)

However, the integration of the Taiwanese economy into the global market changed the priority that the government attached to education. The integration was associated with the start of education planning in Taiwan and several profound changes of the education system. After a brief period of import substitution in the 1950s, the Taiwanese government introduced outward-oriented policies in the early 1960s in light of its small domestic markets, limited resources and the discontinuation of U.S. economic aid.

Private entrepreneurs were encouraged to develop small and medium business, and therefore to explore domestic and foreign markets (Lin, 1998; Kuo, 1991). Export promotion of labor-intensive industries such as textiles was accompanied by import substitution of heavy and chemical industries such as steel, petroleum and chemical industries and shipbuilding (Taiwan: CEPD, 2007a).

This transition to a more open economy soon put strains on the Taiwanese education system. With foreign exports increased by almost 36% of GDP and the share of heavy and chemical industry almost doubled between 1960 and 1980, there grew an increasing demand for labor with basic and medium level skills. On one hand, the export sector felt an urgent need to improve production technology and quality, and therefore the skill level of its workers in order to be competitive in the global market; on the other hand, various government construction projects were projected to need about 64, 000 technicians and engineers, 84% of which were junior level (Zhen et al. 1983).

These skill needs of the open economy put pressures for change on the education system which mainly focused on nation-building. The Taiwanese government started to play an active role to adapt its education system to these skill needs. Since 1965, government education provision has been deemed critical to national development in Taiwan and begun to be guided by Manpower Development Plans (MDP hereafter) (Taiwan, CEPD: 1980). The first integrated manpower plan showed that there was an increasingly acute shortage of skilled workers and the higher education system was skewed towards the arts and humanities. The first manpower plan and the education plan ("A Preliminary Draft of

the Long-range Educational Plan 1964-82”) both emphasized the development of science and technology education and promoted vocational education over that of academic to satisfy the needs of the growing open economy. The third manpower plan promoted the full utilization of women workers and their education (Ashton, Green, James and Sung, 1999).

Corresponding with the manpower development plans, several profound changes of government education provision were made in this period. Firstly, compulsory education was extended from 6 to 9 years in the First MDP to provide labor with basic and medium skills. Secondly, there was a shift of emphasis from general to vocational education based on the recommendation of manpower development plans to meet the projected demand of technicians and engineers. In 1968, the Ministry of Education (MOE hereafter) established a separate department responsible for vocational education and training; all vocational schools at the junior high level were abolished and vocational schools were unified at the senior high level. The MOE also purposefully set a ratio of 3 versus 7 for the quantity of students in senior academic and vocational schools in 1980 to ensure that there was enough supply of junior level engineers. The priority of vocational education was given to cultivating industrial and marine/aquaculture manpower based on the needs of the Taiwanese industries (Zhen et al. 1983).

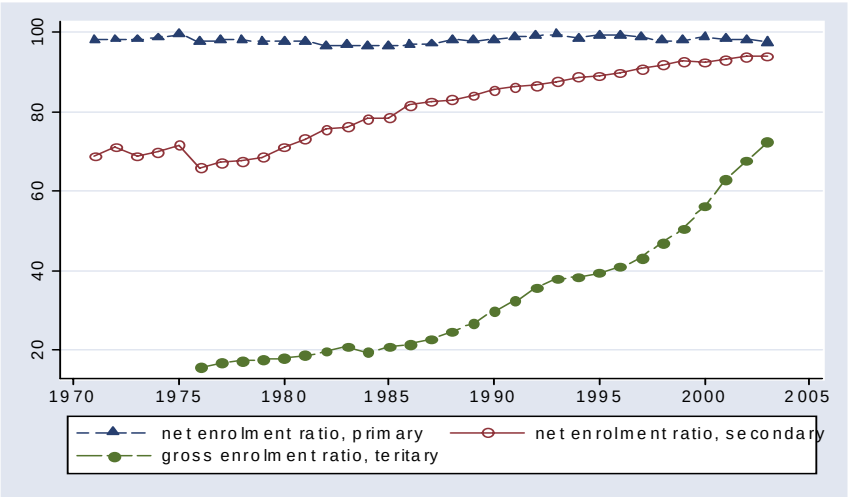
Thirdly, the expansion and structure of tertiary education was also tailored to the economic needs of this period. The MOE expanded 5-year junior college to produce medium-level technicians according to the recommendation of the Stanford Report

(Wang Ru-Jer, 2003). In addition, to ensure most students would actually go for vocational schools in a society highly valuing academic advancement, the MOE limited the opportunities to enter colleges and universities. From the Fourth MDP (1972), the rate of increase of student enrollments in colleges and universities was stipulated not to exceed 5% a year. In the Fifth MDP (1977), this rate was lowered to 3% (Woo, 1991). Emphasis was placed on expanding engineering and natural science departments at the college and university level since the Third MDP (Zhen et al. 1983; Law, 1994).

The enrollment data showed the rapid expansion of secondary education in this period. As can be seen from Figure 4.4, net secondary enrollment already increased to about 75% by the end of 1970s; on the other hand, enrollment at the tertiary level grew very slowly due to the purposeful control of the government. Vocational schools expanded rapidly as set by the government policy. Figure 4.5 shows by the early 1980s, the proportion of vocational students at the senior high level reached the planned 70%. The cultivation of technological power also increased as desired, as can be seen in Figure 4.6. By the end of 1980s, the average years of school of the total population (aged 15 and over) increased to 7.6 years comparing with only 3.9 years in 1960 (Table 4.3), making Taiwan one of the leaders in education in the East Asia region[122].

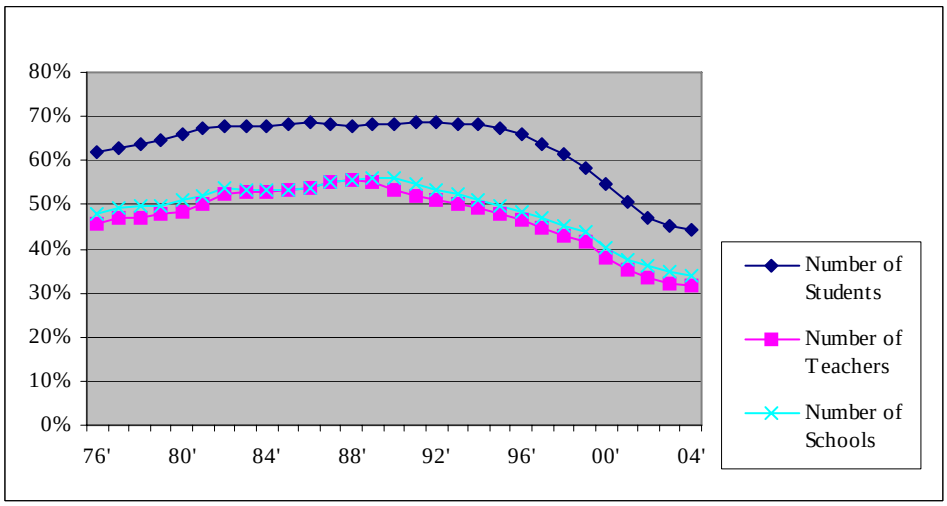
[122] In 1980, the average years of school was 7.6 years in Taiwan, 6.8 years in South Korea, 5.5 in Singapore, 5.1 in Malaysia and 4 in Thailand.

Figure 4.4 Taiwan: School Enrollment Ratios (1970-2003)



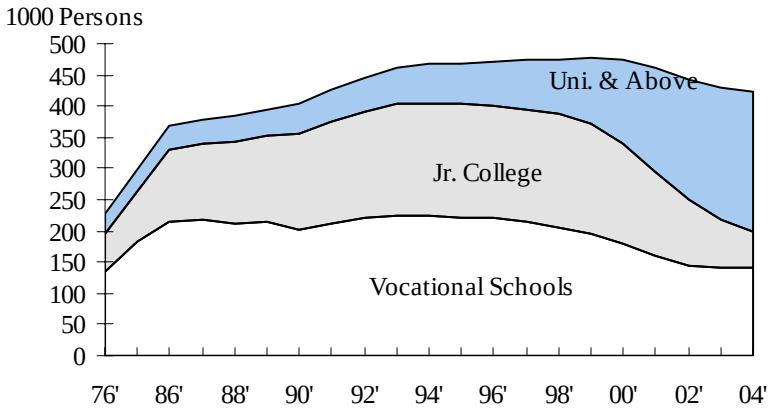
Source: Author's database.

Figure 4.5 Taiwan: Vocational Students as % of Total Students – Senior High Level



Source: Ministry of Education, Taiwan

Figure 4.6 Taiwan: Cultivation of Industrial Technology Manpower (Number of Students)



Source: Ministry of Education, Taiwan

Table 4.3 Taiwan: Education Attainment (1960-2000)

Year	Population over age 15 (1000s)	Highest level attained							Average Years of School
		No Schooling	First level		Second Level		Post-Secondary		
			Total	Complete	Total	Complete	Total	Complete	
		(Percentage of the population aged 15 and over)							
1960	5840	37.3	42.6	15.3	16.3	3.5	3.8	1.7	3.87
1965	6962	31.9	42.7	16.0	21.0	10.4	4.4	1.6	4.61
1970	8858	26.6	38.9	16.2	28.8	7.4	5.8	1.8	5.31
1975	10449	19.6	40.3	21.6	33.5	19.5	6.5	1.9	6.41
1980	12095	15.7	35.6	30.9	38.8	22.3	9.9	3.6	7.61
1985	13566	13.8	31.9	20.5	43.1	17.3	11.2	4.3	7.62
1990	14843	12.4	29.6	16.6	43.8	18.7	14.2	5.0	7.98
1995	16242	11.1	27.0	15.2	45.2	19.3	16.7	5.9	8.37
2000	17773	10.0	24.2	13.6	46.2	19.7	19.6	6.9	8.76

Source: Barro & Lee, 2000

Total government education spending in this period in general increased to finance the expansion of education. As can be seen from Table 4.4, education spending already increased to about 18% of total government spending in 1980, comparing with only 15% in 1960. However, most of these increases seemed to go to the tertiary level: tertiary spending increased about 12% during this period; the proportion of primary spending

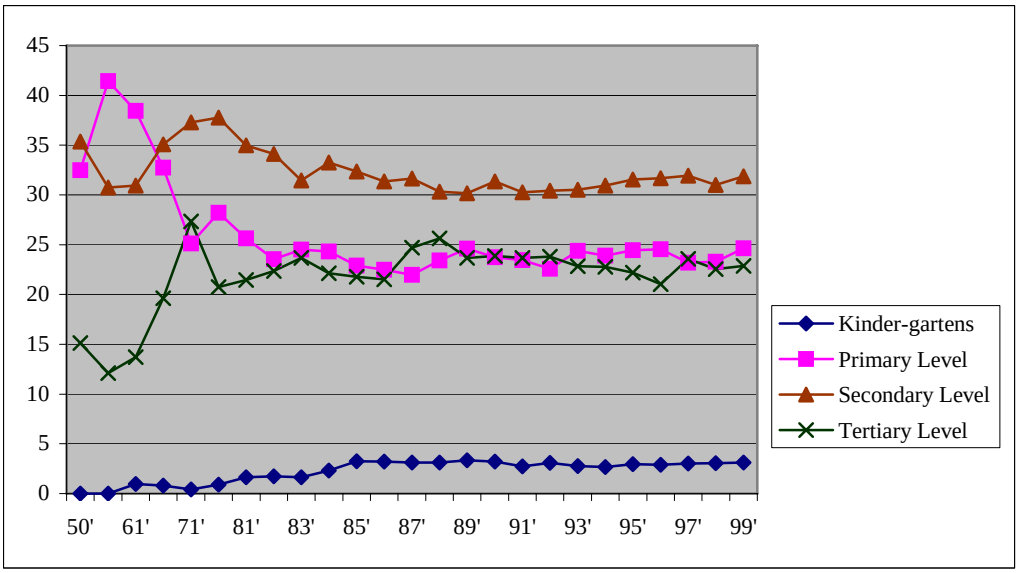
decreased significantly, by about 15%, as shown in Figure 4.7[123]. By early 1980s, the share of primary, secondary and tertiary spending stabilized around 25%, 30% and 25% of total education spending respectively.

Table 4.4 Taiwan: General Government: Spending Structure (as % of Total Government Spending)

	Operational	Defense	Education, Science &Culture	Economic Development	Social Welfare	Debt	Miscellaneous
1950	21.2	45.6	6.7	13.8	4.9	3.9	0.9
1960	12.6	48.3	14.6	12.7	6.5	2.7	2.7
1970	12.6	35.1	17.6	15.5	10.4	7	1.8
1980	9.7	24.2	17.5	33.5	11.8	2.1	1.2
1990	10.8	16	20.4	22.8	16.8	12.3	0.9
1994	11.3	16.8	20	24.5	18.3	8.5	0.6

Source: Zheng & Tong, 1996

Figure 4.7 Taiwan: Education Spending at Different Levels (As % of Total Education Spending, General Government)



Source: Ministry of Education, Taiwan.

[123] The dramatic increase of tertiary spending in this period seemed to be inconsistent with the priority the government attached to secondary education. Such pro-tertiary spending pattern could largely be explained by the authoritarian feature of the Taiwanese state during this period, a point I will discuss later in section 4.2.

Global Competition, Further Internationalization, Industrial Upgrading and Education Upgrading (1981-90)

Further integration into the global market in the 1980s and increasing competition from the second tier of industrializing countries stimulated industrial upgrading and a new round of education upgrading in Taiwan. Like the previous period, the Taiwanese government played an active role in both industrial and education upgrading. Facing greater competition from the second tier of developing countries such as Malaysia and Thailand, Hsich Science Industrial Park was established as early as 1980s to stimulate technological upgrading (Taiwan, CEPD: 2007a). In 1984, electronic products already became the number one exports instead of textiles (Kuo, 1991).

A major policy reform of internationalization and industrial upgrading took place in the middle 1980s, as the Taiwanese government faced rising domestic labor costs due to a significant rise in per capita income, the appreciation of NT$ and frequent trade disputes with its major trading partners for its expanding trade surpluses. In this reform, the government concentrated its efforts on trade liberalization, the lifting of foreign exchange controls and the deregulation of the financial sector (Chou, 2001).[124] One significant consequence of the liberalization measures was the increase in foreign direct investment, as already shown in section 1.4.1. These foreign investments which focused on electronics and chemical industries greatly facilitated the industrial upgrading of the

[124] The average effective tariff burden decreased significantly by 1987; further reductions of tariff and import controls were made by 1994 when the Taiwanese government took large liberalization measures in an effort to join WTO. In 1997, the effective tariff burden already reached a low of 3.4%, comparing with 7% in 1987; except for a few categories such as weaponry, transport equipment, mineral products, processed food and animal products, import controls and licenses are largely eliminated by 1997 (Chen Tun-Jen, 2001). The foreign exchange market was opened up in 1986 (Chu, 2001), followed by the revision of banking law and abolishment of interest rates control in 1989 (Chou, 2001).

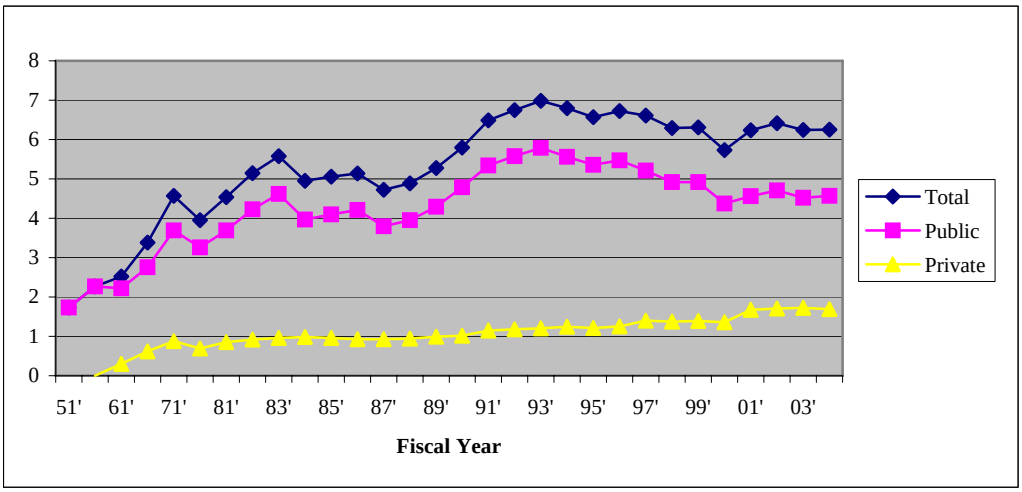
Taiwanese economy. Growing outward investment since 1980s, another consequence of the liberalization measures, also promoted the upgrading of the Taiwanese economy through exporting of skill and technology intensive products such as machinery (Kuo, 1991).

In this initial period of industrial upgrading in response to global competitive pressure, government education provision was also adjusted accordingly. The government MDP (1980) predicted an increasing demand for manpower in the manufacturing and the service sector, especially those of technology-intensive nature, and a greater demand for manpower at the senior level and above. Thus basic government education policy in this period focused on: 1) better implementation of the 9-year compulsory education scheme; 2) updating the quality of vocational education; 3) expanding the supply of science and technological manpower (Taiwan: CEPD, 1980). The MDP in 1986 also started to realize the undersupply of academic education at the senior high level and of tertiary education. In this plan, education expenditure was expected to increase to about 7% of GNP and the science and engineering enrollment in the tertiary sector should reach 50% (Taiwan: CEPD, 1986).

Figure 4.4 showed secondary enrollment increased to 85% in 1990, comparing with only 71% in 1980; tertiary enrollment also started to rise significantly in late 1980s, reaching almost 30% in 1990, comparing with just 20% in 1980, a reflection partly of the changing economic needs of higher-level manpower and partly of the social needs as democratic transition took place, a point which I would address later in section 4.2. This period saw

an expansion of technical colleges to supply better-quality vocational power (Lin, 2000). Manpower cultivation in fields such as mechanical engineering, architecture, shipbuilding, computer, electronic engineering was emphasized at all levels of education. Education spending increased from about 4% to 5% of GNP (Figure 4.8), again reflecting both expansion due to economic needs and democratic pressure.

Figure 4.8 Taiwan: General Government Education Expenditure as % of GNP (1951-2005)



Source: Ministry of Education, Taiwan

Global Competition, Knowledge Economy, Expansion of High-tech Export and Education Reform (1991- now)

More fierce global competition in the 1990s stimulated more profound changes of the Taiwanese education system. With increasing global competition in this period, industrial upgrading and corresponding education reform became key strategies for the Taiwanese government to compete in the global knowledge economy.

In 1991, the Executive Yuan passed *the Statute for Upgrading Industries* to replace the existing *Statute for Encouraging Investment*. The most significant feature of this statute

was the reduction on industry-specific investment incentives and the emphasis on encouraging research and development in general (Wang and Mai, 2001). In 1995, the Executive Yuan approved the plan to develop Taiwan as an Asia-Pacific Regional Operations Center, which aimed to stimulate further economic growth and industrial upgrading by promoting trade and investment liberalization and establishing necessary legal framework for a computerized society (Chou, 2001). The newest development plan of Taiwan is to build a “Green Silicon Island”, on the basis of a new knowledge economy, a sustainable environment and a just new society, as announced by president Lien Chan in his 2004 inauguration speech (Taiwan, CEPD: 2007b).

The government’s preference for industrial upgrading was also shared by the private sector. As Taiwan strived to become an important producer of information technology and a financial center, it was the general feeling among the Taiwanese entrepreneurs that to survive in the global market, they had to introduce innovative products and services and also diversified into a wide-range of high value-added activities as their relatively small- and medium- sized enterprises faced double pressure from both the large, high-tech companies in the developed countries and the low labor cost ones in the developing countries, a pressure which was more acute after the 1997 financial crisis (Berger and Lester, 2005).

The new economic needs put new strains on the Taiwanese education system. In recent MDPs, the planning authorities cautioned against the lack of qualified manpower in areas such as languages, information and communications technology, and research and

development and the lack of innovative capacity among students (Taiwan, CEPD: 1997).[125] The most recent MDP predicted there would be "a yearly shortage of about 50, 000 high-level researchers, developers, specialized professionals, and managers." (Taiwan, CEPD: 2005)[126] The education system in place couldn't well produce students with these manpower needs. Abilities of innovation are hard to cultivate under an exam-oriented, centrally controlled system; in addition, enrollments at senior high school and tertiary level need to be expanded to produce high-level manpower with research and development capabilities.

Fundamental reform measures have been initiated in this period to ensure these new manpower needs could be met and Taiwan could survive in the competitive global knowledge economy. Firstly, there is a significant move-away from a subject-based, rote learning system to a student-centered, competency-based one. The *Education Reform Action Plan* published by the MOE in 1998 re-emphasized the importance of improving education quality and promoting life-long learning in an open, knowledge-based and democratic society. In practice, the recent curriculum changes for primary and junior high schools reflect an increasing emphasis on cultivating innovative and flexible abilities and transitional skills (English, Information and Communication Technology and Global Outlook). The *Guidelines for a Nine-year Joint Curricula Plan*, promulgated in 2003, aims to develop the students' abilities in ten key areas: individuality, creativity, life learning, communication, respecting others and teamwork, culture sensitivity and global outlook, information processing, curiosity and research ability, independent and critical

[125] Taiwan, CEPD: Manpower Development for Crossing the Millennium (1997) & The Second Manpower Development Plan in the New Century (2005-2008).
[126] Taiwan, CEPD: The Second Manpower Development Plan in the New Century (2005-2008).

thinking, which are deemed critical for the students to excel in the knowledge economy[127].

Secondly, the Taiwanese government put a special emphasis on the teaching of English and information and communication technology (ICT) given their special importance in the global knowledge economy. English was originally only offered from the junior high school level in Taiwan. As the government attempted to promote Taiwan as an Asian-Pacific learning center, some local governments granted permission for English to be taught at primary schools as early as 1993. In 1998, nearly half of the Taiwan's primary schools offered English on a voluntary basis. The central government began to provide compulsory English classes to grade five students since 2001 and compelled schools to provide English classes to grade three students by 2005 (Chen, Shu-Chiao, 2006; Law, 2004). Meanwhile, the government designed ICT master plans and also invested a lot in improving ICT infrastructure and teaching. The working teachers are required to use ICT for about 20% of preparation and class time; new teachers must have a minimum level of ICT proficiency before joining the profession (Law, 2004)[128].

Thirdly, enrollment in tertiary education has been greatly expanded to facilitate industrial upgrading. The MOE adjusted the student ratio of senior high schools over senior vocational schools from 3:7 to 5:5 in its 1995 report so more students could have the opportunity to receive tertiary education (Lin, 2000). In 1996, in *Establishment Standard*

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[127] Taiwan: The Ministry of Education, 2006. The document is online at http://www.edu.tw/EDU_WEB/EDU_MGT/EJE/EDU5147002/9CC/9CC.html, accessed May 6, 2007.
[128] The government expected the use of ICT to promote the changes from a text-book based system to a more interactive and student-centered one with multiple learning sources (Law, 2004).

for Universities and Colleges promulgated by the MOE, technical colleges with certain scale and good performances were allowed to upgrade to universities.

A fourth change was that the Taiwanese government adopted a more neo-liberal approach to education provision, especially at the tertiary level (Mok, 2002). The competitive pressure from the global market, coupled with economic downturn after the 1997 financial crisis, forced the Taiwanese government to create a more efficient education system. The rapid expansion of tertiary enrollment since late 1980s added to the urgency to diversify higher education opportunities. The MOE started to allow the private schools to play a greater role in creating opportunities for higher learning, where the state used to have tight control. More than two thirds of the college students have been admitted to these private institutions since 1990s. In its most recent *University Law* (2005), the MOE acknowledged the important status of private universities in providing education. In addition, under the new governing philosophy, the MOE has attempted to devolve more financial power and responsibility to the universities. Public universities used to have almost no autonomy in managing their revenue and budget. Since 1995, the MOE encouraged universities to set up their own operation fund and also gave them more autonomy in managing funds from non-state resources. In 1998, a bill titled “Regulation of Operation Fund for National Universities” was passed in the Taiwanese legislature. Based on this new bill, the MOE started to provide only 80% of the budget to the national universities in 1998; the universities had to raise the rest of the 20% by themselves (Mok, 2002). Another measure by the MOE to further reduce the state’s financial burden of funding universities is to raise tuition, which met strong opposition from the university

presidents and students. To meet all these financial challenges, the universities started to be more pro-market in their research and teaching activities and cooperated more with the private sectors, a tendency which the MOE supported. [129] Accompanying these changes in provision and funding, the MOE also gave much more autonomy and academic freedom to university professors.

Consistent with these government policies, gross school enrollment ratio at the tertiary level increased from 30% in 1990 to a high of 72% in 2003 (Figure 4.4); the proportion of vocational students also decreased below the desired level of 50%, as shown in Figure 4.5. However, the spending share of the tertiary level didn't increase significantly, reflecting the government's neo-liberal approach to tertiary expansion in this period.

4.1.3 Globalization and Government Education Provision: the Policy Linkages

In the above section, I have demonstrated that globalization profoundly changed the preferences of the Taiwanese government regarding education provision[130]. I have also shown that in response to competition from the global market, the Taiwanese government constantly upgraded its education system to the changing manpower demands of the Taiwanese economy that needs to re-position itself in order to survive in the global market. In addition, spending, enrollment and other data indicate that government education policies based on the economic needs were implemented quite well in practice.

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[129] "Japanese, Korean Higher Education Model for Taiwan: Minister", *Central News Agency*, Taipei, May 17, 2005. "Education Minister Outlines New Approaches", *Central News Agency*, Taipei, May 27, 2005

[130] I have also shown how globalization also affected the preference of the private sector in recent periods regarding labor skill supply. However, due to the limitation of my research, I have no information what role the private sector played in pushing for education policy changes.

A critical question to ask then, is how the matching between economic demand and education supply was actually accomplished.

First and foremost, I have shown that the Taiwanese state played a very active role in this process of education upgrading. Education planning has ranked high on the development agenda and been guided by government MDPs since Taiwan adopted an outward-oriented policy in early 1960s. Secondly, various institutional linkages within the state bureaucracy ensured the match between education supply and economic demand.

Figure 4.9 shows the education policy making process in Taiwan before democratic transition in late 1980s. We can see that Ministry of Education, a centralized institution responsible for education at all levels, was subordinated under Council for Economic Planning and Development (CEPD hereafter), which was responsible for making overall development policy. This government structure ensured education provision could serve the needs of national economic development.

More specifically, planners in the department responsible for making Manpower Development Plan under CEPD usually had specific targets for employment level (usually keep unemployment at 3 or 4%) and employment distribution among sectors (agriculture, industry, service). Then they calculated projections of occupational needs for various levels of education based on projected growth by industrial sector. To achieve the economic goals, the planners then set specific enrollment ratios between senior high schools, senior vocational schools and junior college; the plan would also set enrollment

quotas and establish an index for total expenditure on education as proportion of GNP. Based on the Manpower Development Plan, the Ministry of Education would set fees and enrollment levels for the specific schools, both public and private, at all levels (Woo, 1991). The Manpower Development Plans are usually implemented well since the planning process mobilizes various key government sectors (Budget, Finance, Demography, Education, Labor etc.) into discussion and negotiation on key issues; unlike many other government plans, these plans are carried out according to a strict timetable with deadlines; specific agencies were made responsible and other agencies were required to oversee them (Woo, 1991; Zhen et al. 1983).

There are, in addition, other mechanisms in Taiwan which assist matching education supply and economic demand. One important institution is the National Youth Commission, which monitors the flow of highly qualified manpower on to the labor market, influencing its education and training (Green, Ashton, James and Sung, 1999).

A major characteristic of this policy making process during the authoritarian period was its high degree of centralization and the exclusion of the private sector and the union[131] (Ashton, Green, James and Sung, 1999). Despite an overall well implementation of the MDPs, the match couldn't be said perfect. A number of studies pointed out the problem of graduate unemployment, especially among the highly educated. Moreover, graduates often have to accept employment in which their duties, status and salaries are incompatible with their educational background (Green, Ashton, James and Sung, 1999).

[131] However, the academics are well incorporated into the policy making process. Part of the reasons, argues Ashton, Green, James and Sung (1999), is that governments would like to mitigate the academics' criticism to the government.

As Taiwan entered the democratic transition period, local governments, schools and local representatives started to be incorporated in the policy making process through channels such as public hearing, as demonstrated in Figure 4.9b (Rau, 1998). CEPD also becomes a consulting partner for the MOE instead of a dominating role before. Bills are submitted to the Executive Yuan for review, which then submitted to the legislature for approval. This implies a more diversified policy making process, whose implication is yet to be evaluated. The still prevalent graduate unemployment phenomenon in Taiwan showed the limitations of this match but it might disappear as Taiwan further upgraded its economy (Wang, Ru-jer, 2003).

Figure 4.9 Taiwan: The Process of Policy Making During the Centralized Period (1950-79)

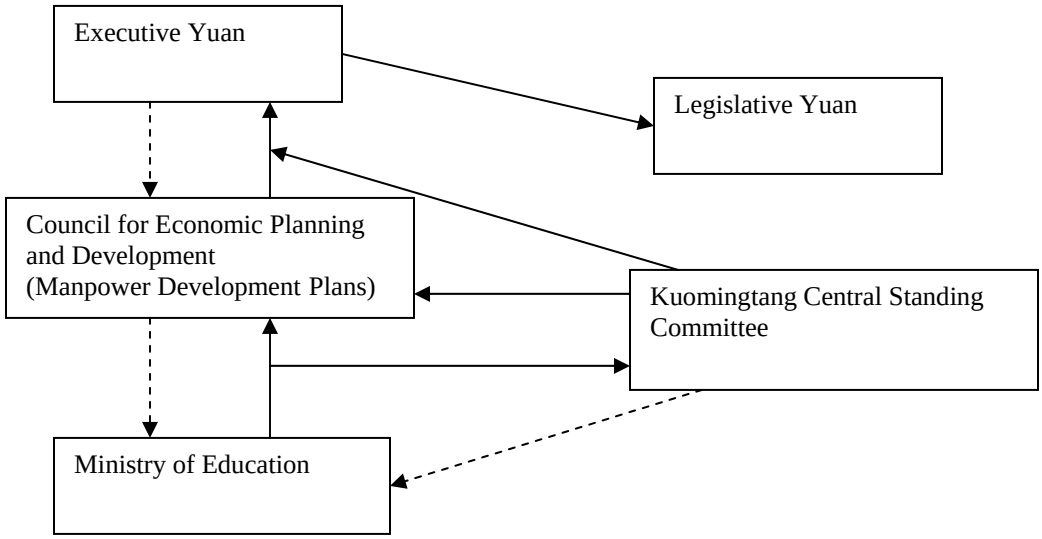
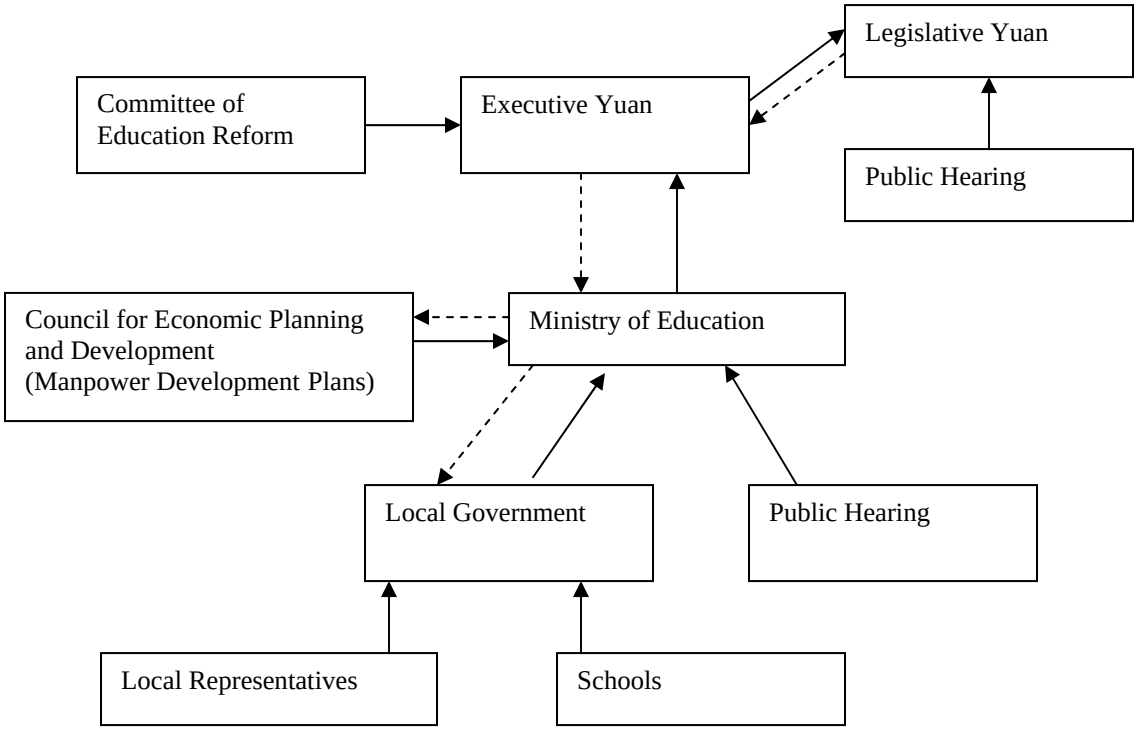


Figure 4.9B Taiwan: The Process of Policy Making During the Democratization Period (1990- Now)



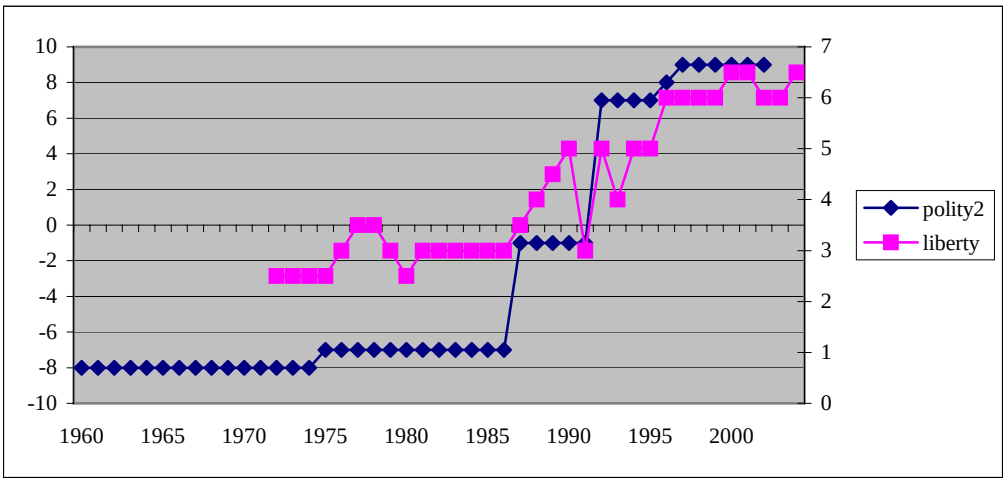
Source: Technical Education and Vocational Research Center at National Taiwan Normal University, obtained from Rau, 1998

4.2 Democratization and Government Education Provision in Taiwan

4.2.1 Democratization in Taiwan: An Overview

Figure 4.10 shows the evolution of standard measures for democracy – the Polity score and the Freedom House liberty score for Taiwan. Both scores exhibit similar trends. We can see that roughly three periods can be identified: an authoritarian period with very low polity score (-8 and –7 on a scale of –10 to 10 where –10 represents the most undemocratic regime) before 1986[132], followed by a democratic transition period between 1987 and 1991 with a polity score of –1; the period after 1992 is a democratic period with a polity score progressing from 7 to 9.

Figure 4.10 Democratization in Taiwan



Source: Polity IV and Freedom House

The authoritarian period between 1949 and 1986 in Taiwan was marked by one party rule of the Chinese Nationalist Party (KMT hereafter), who fled to Taiwan with about two million refugees after losing all major battles with the Chinese Communist Party on the mainland. During this period, the KMT government ruled Taiwan with Martial Law, with

[132] The cutoff point here is the same with the statistical study. Regimes scored 6 or higher are characterized as democratic.

the stated goal of being vigilant against Communist infiltration and preparing to retake the mainland. It forced about 37,000 Taiwanese people out of the government sector. Civil liberties and political rights were severely restricted; no political dissidents were allowed and an estimate of tens of thousands of people was executed for violating the laws of the KMT. Meanwhile, to co-opt the elites and the masses, the KMT government set up several insurance programs for laborers, farmers, public officials and military service men; it also implemented land-reform and local self-governance so as to avoid clashes between the Mainlanders (*Wai Shengren*[133]) and the Taiwanese (*Ben Shenren*[134]). Despite the KMT's efforts, criticisms mounted about its policies, even from the KMT members (Aspalter, 2001, Schafferer, 2003)[135].

The period of political liberalization was introduced by late President Chiang Ching-kuo in the late 1970s. In 1986, the KMT regime accepted the formation of an opposition party (Democratic Progressive Party, DPP hereafter) and the martial law was lifted in 1987. Former president Lee Teng-hui continued the reform process after the death of Chiang Ching-kuo. In 1988, he promised constitutional reforms within three years and invited the opposition parties for dialogues. 1989 saw the promulgation of the *Civic Organization Law*, which set the rules for the formation of new parties. All the tenured members in the legislature Yuan and National Assembly representing the Mainland were forced to resign in 1991 based on new constitutional amendments (Schafferer, 2003).

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[133] This phrase literally means people who came from outside of Taiwan.
[134] This phrase literally means people who came from Taiwan.
[135] In 1960, Chen Lei became the first KMT official to break away from the party. He attempted to form an opposition with other social and political elites. Chen was framed and charged with harboring a communist agent and sentenced to 10 years in prison. Although there was no meaningful oppositions for many years, there were several intellectuals openly criticising the KMT government. One of them was Taiwan National University Professor Peng Ming-ming, who was sentenced to eight years in prison for his pamphlet advocating Taiwan independence.

1992 began a more democratic period in Taiwan's history. For the first time, all the legislators were elected directly from Taiwan in the second legislative election. In 1995, President Lee Teng-hui publicly apologized for the Nationalist's brutality during the "2-28 Incident"[136] and a monument was dedicated to its victims. The first direct presidential election was conducted in 1996 and Lee Teng-hui became the first popularly elected president in Taiwan. The 2000 presidential election marked the end of the KMT one-party rule in Taiwan: the election was won by the Opposition candidate Chen Shui-Bian from the Democratic Progressive Party (DPP hereafter), who was re-elected in 2004.

4.2.2 Democratization and Education Reform

Democratization in Taiwan was associated with profound changes in government education provision. The recent round of education reform was a governmental response to the social education reform movement that dated back to as early as 1980s. The reform movement was successful in putting education reform on the agenda of political

[136] Taiwan was first populated by the Austronesian peoples. It was colonized by the Spanish and then the Dutch in the 17th century. Zheng Chenggong (Koxinga), a *Ming* Loyalist of China, took Taiwan back from the Dutch in 1662. The *Qing* dynasty of China conquered Taiwan in 1683. It was forced to cede Taiwan to the Japanese after the first Sino-Japanese War (1894-1985). During WWII, the United States reached an agreement with Chiang Kai-shek, then the head of the Chinese government and the Chairman of Chinese Nationalist Party (KMT hereafter) providing that Taiwan would be returned to China after the war. This agreement was confirmed in the Potsdam Declaration of July 1945. Soon afterward, Chiang Kai-shek appointed a committee headed by Chen Yi to take over the island's administration. However, it soon appeared to the people of Taiwan that Chen and his commissioners only came to "loot the island". Chen Yi promoted the so-called "State Socialism" on the island, which was in essence a way to secure the regime's interests by tightening existing monopolies. One of the strictly controlled goods was tobacco. On Feb. 28th, 1947, an old woman who had sold a few packs of cigarettes without a license in the street market was savagely beaten by an agent of the Monopoly Bureau. This triggered a violent confrontation between the Taiwanese people and the Nationalists from the Mainland. For several weeks, the rebels controlled much of the island; however, feigning negotiations, the Nationalist soon assembled a large military force that attacked Taiwan, massacring over 10,000 people and imprisoning thousands of others. The killing was both random and premeditated as local elites and educated Taiwanese were sought and disposed of. This incident came to known as "2-28 incident", which left many Taiwanese with a deep-seated bitterness to the mainlanders. Chiang Kai-shek fully endorsed Chen Yi's actions and said that the leaders of riots were Communists and people spoiled by the Japanese (Aspalter, 2001, Schafferer, 2003).

candidates and developed into a social movement which included all strata of the Taiwanese society in the middle 1990s. Given the popularity of the reform movement, education reform quickly became a salient issue in elections and electoral competition maintained the momentum of the reform.

Education Reform as a Social Movement

The recent education reform in Taiwan was a governmental response to a social movement that successfully mobilized all strata of society and put the reform on the agenda of political candidates. The prelude of this reform movement was a series of university student movements fighting for academic freedom and the autonomy of universities in the 1980s.[137] However, it was not until after the political liberalization in 1987 and 1988 that the education reform movement developed into a social movement that incorporated various strata of the Taiwanese society.[138] Between 1987 and 1993, not only university students, but professors, teachers in elementary and high schools, parents, housewives, educators and researchers started to form their own education reform groups and collaborated with each other (Xue, 1996). [139]

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[137] Students first protested in Taiwan National University (TNU hereafter) from 1983 to 1985. They were dissatisfied with the tight control of the government on student leader election and student publication. They strongly demanded democratic rights and freedom of speech from the school authorities (Lin, 1989). Many education reform associations were formed during this time period; professors also began to join the seminars and protests organized by the students. Members of associations such as "Love of Freedom (自由之愛)" started to reflect the Taiwanese education system as a whole and appealed to the legislature for fundamental law change. They also realized that the reform of the education system cannot be carried out without fundamental changes of the political system (Xue, 1996).

[138] Education reform movement was one of the various social movements active at that time. These movements covered issue areas such as labors' rights, farmer's rights, environmental protection, women's rights and human rights.

[139] Various education groups flourished during this period which included *"Housewives' Union", "University Education Reform Advocating Group", "Promoting Teacher's Rights Group", "The Humanistic Education Foundation", "Zhenduo Study Association", "Taiwan Professor Association", "Taiwan Teacher's Association*" (Xue, 1996).

The civil education reform groups began to build connections with the legislators and the movement entered a period of pushing for reform through legislation as Taiwan saw the emergence of two-party competition in the late 1980s.[140] 1994 was a landmark year for the education reform movement[141]. More than two hundred civil groups of all nature (women, labor, religious etc.) held various activities advocating education reform on April 10th and joined a parade. A *Declaration on Four Points of Education Reform* was sent to the Taiwanese legislature afterwards; the groups also formed an *April 10th Alliance on Education Reform* to coordinate further action (Xue, 1996)[142].

The various education reform organizations can be roughly grouped into three kinds that concentrated their efforts on university autonomy, primary and secondary school reform and teachers' human rights respectively (Xue, 1996).[143] Despite their different emphasis

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[140] The 1989 legislative and county/township magistrate election marked the beginning of two-party competition in Taiwan. Bills and drafts discussed in the legislature during this period included *Amendment of the University Law (大學法修正案), Rules Establishing Parents Association (傢長會設置辦法), Amendment on Normal University Law (師範教育法修正案), Teachers' Act (Draft)(教師法草案), Comments on Constitutional Amendment (民間團體教育憲改意見書).* In 1988 and 1989, various education groups held the first and the second non-governmental conference on education reform, which marked the start of their collaboration. In 1991, shocked by a series of students' suicides, the educational groups for the first time formed an alliance pressuring the government to liberalize the supply of higher education.

[141] In 1994, *Cheng Society (澄社)* and the *Humanistic Education Foundation (人本教育基金會)* held the first large-scale academic conference on education reform in January that included scholars and researchers from a variety of backgrounds. The conference participants can be grouped into four types: 1) scholars specializing in Education; 2) scholars specializing in fields other than education; 3) researchers affiliated with the educational movement; 4) researchers affiliated with the MOE (Xue, 1996).

[142] A number of protests also took place in this year against tuition increase and state control of the private schools.

[143] The first kind included groups such as "*University Education Reform Advocating Group(大學教育改革促進會)*", which promoted autonomy of universities and academic freedom. Associations of the second kind are *"Housewives' Union (主婦聯盟)", "Zhenduo Study Association(振鐸學會)" and "The Humanistic Education Foundation (人本教育基金會)".* These groups worried about the exam-centered system, the fierce academic advancement competition and the pressure it placed on students. They called for curriculum renovation, small class teaching and expanding education opportunities through establishing more schools. "*Teacher's Human Rights Advocating Group(教師人權促進會)*" represented the last kind. It fought for teacher's academic freedom and other rights such as participating in school governance (Xue, 1996).

of issue area, the groups shared a similar reform theme, that is to liberalize the Taiwanese education system from the tight control of the state. Another major demand of the groups was to protect education spending and distribute the resources more equally.

Early reform demands in the 1980s were mostly ignored by the Taiwanese government and the MOE. However, as the political system became more open and the influence of the reform movement increasingly grew, they responded more positively to the movement demands.[144] When the movement organizations had unprecedented successful mobilization of the Taiwanese society in 1994 and also put education reform on the policy agenda of political candidates, the government began to initiate education reforms (Xue, 1996). A Commission on Education Reform (CER hereafter) was formed in early 1994 to identify problems in the education system and make policy recommendations[145]. A summary report was published two years later by the CER (Xue, 1996; Law, 2004).

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[144] Generally speaking, the MOE responded relatively quickly to economic demands such as giving more subsidies to private school students or canceling limitations on student loans; demands that relate to disempowering the state's control on the education system met with much more resistance from the MOE. The MOE only agreed to a lot of structural reforms such as ensuring the autonomy of the university, changing the university principal selection method from appointment to teacher election, ensuring the openness of teacher hiring and evaluation, and allowing multiple channels of teacher education, after the reform groups won the sympathy of legislators and successfully pushed relevant bills through the legislature.

[145] In early 1994, Kuo, Wei-Pan (郭為潘), Minister of the MOE at that time, proposed to President Lee Teng-hui (李登輝) and Head of the Executive Yuan, Lien Chan (連戰), to form a Commission on Education Reform (CER hereafter) based on the Japanese model. In September, the CER, headed by Lee Yuan-tseh (李遠哲), the President of Academia Sinica and formed by thirty other members, started its operation. It held many public hearings, seminars and workshops and consulted many stakeholders (students, parents, teachers) to identify problems and solicit policy recommendations. During the two years' operation of the CER, the civil education groups were still active in articulating education problems (Law, 2004).

Electoral Competition and Education Reform

The reform movement was also successful in politicizing education reform and thus gaining more political support for it. At the end of 1994, the reform groups passed along their education reform bills[146] to three Taipei Mayor election candidates; two of them responded and one of them, DPP candidate Chen Shui-Bian was fully in favor of the bill (Ho, 2006). Education reform thus appeared for the first time on the policy platform of candidates for important political positions. Since then, the pressure of electoral competition forced political candidates from major parties to incorporate education reform in their policy agenda. In both 2000 and 2004 presidential elections, education reform was highlighted as a relatively important policy issue. Candidates also became very attentive to education grievances and issues. Giving education subsidies and supporting interest group protests became popular measures for the candidates to win support[147]. Although comparing with the issues of national security or the economy, education reform was relatively minor and candidates generally have indistinguishable positions supporting the demands of the education reform groups[148], the incorporation of education reform into their platform can be said to have kept the momentum of the reform.

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[146] Due to the limitation of my research, I don't have information on the specific contents of these bills. But it is highly likely that these reform bills included the demands of the April 10th education reform coalition, requesting improving the investment and quality of compulsory education, removing the state's quota in senior high and tertiary enrollment, modernizing education and establishing education basic law (Xue, 1996).

[147] Before the 2000 election, parents of junior high school students were unhappy since they found out they had to pay extra school fees due to the downsizing of the Taiwan provincial government. KMT president immediately stepped into the dispute to order "proper handling" of the issue. Meanwhile, another candidate James Song, blamed the problem on the central government's improper distribution of the financial resources and promised to fully subsidize the expense if elected.

[148] For presidential candidates' positions on education reform, see their policy platform, which is available from *Taiwan Government Information Office*, 2006. Candidates generally support positions advocated by the education reform groups, whose demands include expanding preschool education or giving subsidies, improving the quality of compulsory education, loosening the control of state, expanding university education opportunities and promoting multi-cultural education.

4.2.3 Democratization and Changes in Government Education Provision

Thus the recent education reform in Taiwan is a result of collective efforts of different civil groups, together with help from the legislators and compromise from the government. The *Education Reform Action Plan*, made by the Executive Council and the MOE in 1998, reinforced most of the concerns of the 1996 CER report, which shared many reform demands of the civil organizations[149]. Although it might still be too early to evaluate some of the reform measures, the Taiwanese education system was fundamentally changed today comparing with the pre-democratization period. I will focus on two kinds of changes here: 1) a more liberalized education system and 2) greater education spending, better protection of education spending and a more equal distribution of education resources.

Democratization and Education Liberalization

The Taiwanese state used to tightly control its education system. The supply of education was centralized. Enrollment opportunities at various levels were based strictly on the Manpower Development Plans. The establishment of private schools needed the approval of the MOE and private schools had little liberty in either deciding their own structure or setting their tuition level. The state also monopolized in supplying teachers, textbooks

[149] The first recommendation of the report was to free the education system from the state's control. The report emphasized the decentralization of the education system, more autonomy for schools at all levels, promotion of private schools with high autonomy and academic freedom for teachers. To reduce the pressure for academic advancement, the report also suggested that the state should not control the enrollment opportunities at the senior high school level and the government should promote changes in societal values on academic advancement (CER, 1996).

and approving diplomas.[150] Moreover, the education system was used by the state as a tool of political indoctrination and ideological control. When the KMT government relocated to Taiwan in 1949, it replaced the Japanese education system with a system of Sinolization (Zhong, 1988; Xue, 1996; Lee, 2004). Schools were restructured based on the Chinese system, Japanese teachers were replaced by the Chinese ones and Mandarin education was strengthened. However, the system slighted purposely the teaching of Taiwanese culture, language, geography, art and music. The textbooks were also filled with Han-centrism and they were heavily gender-biased. Emphasized in this system were the teachings of traditional Chinese Confucianism, which valued and cultivated obedience to authority, and *Three Principles of the People (or san-min zhu-yi)*, the founding principles of the KMT. Communism and any leftist ideas were strictly forbidden before the 1980s. The intrusion of the party into the schools further strengthened the KMT's control of the education system. KMT had agencies at all levels of school to monitor the thinking of teachers and students; at the university level, it established branches on campus to recruit young students; any executive position in academic institutions was hard to obtain if one were not a KMT member; the compulsory military training at the senior high level (four hours a week) was also reinforcing the ideology of KMT. [151]

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[150] The state monopolized in managing normal universities and schools before democratization. Since 1968, based on the instruction of President Chiang, the MOE centralized the textbook market and the National Institute for Compilation and Translation became the only legal supplier of textbooks. The *Diploma Conferring Law* stipulated that all diplomas needed the approval of the MOE (Xue, 1996).

[151] Due to this heavy political and ideological control of schools in Taiwan, scholars argue the influence of education on democratization is quite limited (Yang, Yirong, 1994).

Such tightly controlled system was greatly liberalized after democratization. Firstly, there is a comprehensive legal system in place now to protect the neutrality and plurality of education (Law, 2002). The movements for university autonomy, for teachers' rights and the rights of indigenous people resulted the enactment of *University Law* (1993), the *Teachers Law* (promulgated in 1995 and amended in 2000 and 2003) and the *Education Act on Indigenous People* (1997) respectively. The *Education Fundamental Act* (1999) protected the neutrality of education from either politics or religion (Article 6)[152]. It also ensures the participation rights of teachers and parents in the education system (Article 2). Also protected by the *Education Fundamental Act* are people's rights to establish private schools (Article 7) and professional autonomy of teachers (Article 8). More laws are being added to this system. Examples of recently promulgated laws are *Gender Equity Act* (2004) and *Private School Law* (2005).

The reduction of political indoctrination and ideological control of the Taiwanese education system is best represented by the changes in its moral education. Moral education, whose aim was to indoctrinate the students with Chinese traditional Confucianism and the founding principles of the KMT, used to be incorporated into the school curriculum at every grade level. As the education system was gradually reformed under the pressure of the civil groups, the MOE promulgated new curriculum guidelines in middle 1990s[153]. In these new curriculums, the ideological content of moral education

[152] Article 6 stipulates that "Education shall be based on the principle of impartiality. Schools may not engage in promotional activities for any specific political groups or religious beliefs, nor shall education governing authorities or schools force school administrative personnel, teachers or students to participate in any political groups or religious activities".

[153] The MOE promulgated *the Curriculum guidelines for Morality and Health* in Elementary Schools (1993), and *the Curriculum Guidelines for Civics and Morality* for junior high schools (1994).

was gradually placed by process values (decision-making, critical thinking and communicate skills) and democratic values. In 2004, moral education classes were fully eliminated from the time-tabled curriculum of the primary school and junior high school level following the promulgation of *Guidelines for a Nine-year Joint Curricula Plan*.[154] The Guidelines also required incorporating Human Rights Education and Gender Education, which were both taboo under the authoritarian period, into the school curriculum (Lee, 2004). Before 1997, private schools were forbidden to be established in areas such as religious education, teacher education, art and sports education, which were regarded as central to the political and ideological control of the authoritarian state. In 1997, the *Private School Act* began to permit individuals, private entities, and the community to establish educational institutions of every type except military and police academies (Mok, 2002).

Another important change to pluralize education was the introduction of Taiwan languages and studies into the once Sino-centric curriculum. As many social groups pressed for the legalization of Taiwanese languages and cultures in the school curriculum in late 1980s and early 1990s, their demands were taken up by candidates running for top posts in the local governments. County governments such as Ilan, Taipei, Pingtung started to offer courses on Taiwanese studies and languages after these candidates had won elections. Many governments also started to collect relevant teaching materials (Law, 2002). Under the pressure of both social groups and the local governments, the MOE gradually made policy changes. The MOE formulated the Local-Language-in-

[154] Instead of a unique subject, moral education can now be implemented through learning areas such as Social Studies, Comprehensive Activities, and Language Classes.

Education policy in 1993, which required the teaching of Taiwanese languages, culture and history in primary schools.[155] This policy was formally implemented nation-wide in 1997 (Chen, Shu-Chiao, 2006). From 2001-02, students in primary schools are required to choose one or two lessons of one Taiwanese language a week, and students in junior high schools can take Taiwanese language as electives (Law, 2002).

Secondly, the Taiwanese state also starts to loosen its control over the textbook market. I have mentioned that the textbook market used to be monopolized by the state under the authoritarian period since textbooks were important tools for the KMT to exert political and ideological control over the students. In the authoritarian period, textbooks could only be complied by the National Institute of Compilation and Translation (NICT) and they needed to be published and distributed by the designated distributors. In the early 1980s, the MOE partially liberalized the textbook market, allowing non-governmental publishers to compile and publish textbooks of 11 subjects for senior high school. But these books still needed to be screened, reviewed and approved by the NICT. Moreover, six subjects that were politically sensitive (including *Chinese language, History, Geography, Civics, the Three People's Principles and Military Training*) continued to be compiled and published by the NICT. From the 1990s, under the influence of the education reform movement, the MOE began to open the textbook market further to the private sector. It began to allow the private publishers to compile and publish textbooks for the primary schools in 1996, textbooks of non-examination subject of junior high students in 1998; it also started to allow private publishers to compile the six sensitive

[155] Another similar policy change was the promulgation of *Curriculum Guidelines for Knowing Taiwanese Society in Grade 7* in 1994.

senior high school subjects in 1999 (Law, 2002). The NITC's monopoly to produce moral education books was ended in 2003 (Lee, 2004). However, the MOE still maintains control of the textbook market over two critical stages: the prescription of the curriculum that the textbooks need to be assessed against and the final approval of the textbooks (Law, 2002).

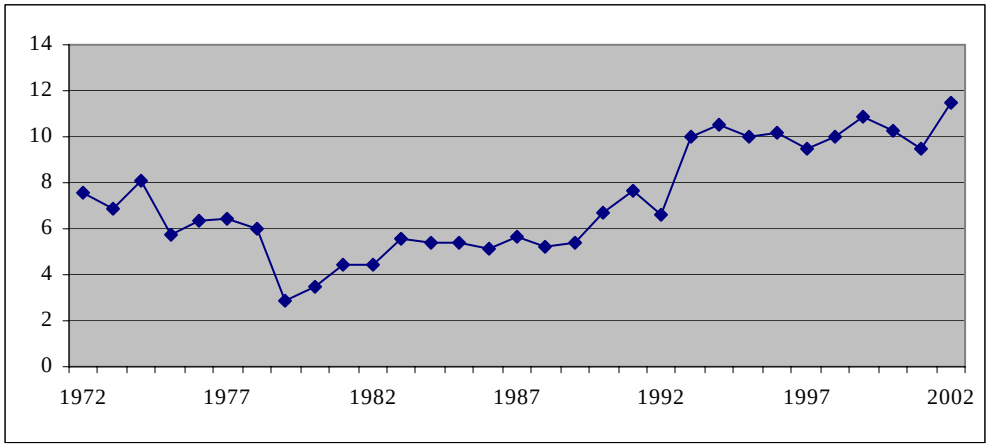
Thirdly, the power of education officials and school principals are much reduced comparing with the pre-reform period. On one hand, the monopoly of the MOE and the local education bureau over the appointment of university presidents and school principals has been broken. The university presidents now have to be elected by faculty members; from 2000, all public school principals have to go through a written exam and get approval from a selection committee, which must comprise at least one-fifth parents and representatives of teachers, school administrators and experts (Law, 2002). On the other hand, new laws have returned some once highly centralized power to teachers and parents. After the enactment of the *Teacher's Law* in 1995, teachers have been allowed to form their own associations at school, local and national levels. These teachers' associations serve as both teachers' professional bodies and labor unions. In particular, the National Teachers' Association has the right to participate in the making of policies concerning teachers' affairs as listed in the *Teacher's Law*. Teachers also have more power of personnel decision which were formerly exclusive to the principal. In accordance with the new *University Law*, tertiary schools can establish their own university council to deal with the recruitment, promotion and dismissal of teachers (Mok, 2002).

Democratization and Education Spending

First of all, democratization in Taiwan was associated with greater central government education spending. As can be seen from Figure 4.11, education spending increased from only 5.6% of total central government spending in 1987 to about 10% in 1993 and stabilized around that level since then. The magnitude of the change was remarkable. It was the Taiwanese legislature that pushed for more central government education spending in 1989 (Chen, Lizhu, 2000; Huang and Ding, 1999). Although the Constitution long stipulated a minimum spending of education, science and culture for all levels of government in Taiwan[156], the central government has never reached the spending minimal as stipulated by the constitution[157]. As the general political environment gradually relaxed, in 1989, the legislators[158] strongly opposed that the central government violated the spending minimal stipulated by the constitution. In response, the central government increased education, science and culture spending to the amount set by the constitution in 1990 for the first time (Chen, Lizhu, 2000; Huang and Ding, 1999).

[156] Article 164 of the Taiwanese Constitution stipulated that "expenditures of educational programs, scientific studies and cultural service shall not be, in respect of the central government, no less than 15 percent of the total national budget; in respect of each province, not less than 25 percent of the total provincial budget; and in respect of each municipality or *hsien*, no less than 35 percent of the total municipal or *hsien* budget". Education, science and cultural spending already composed about 47% of the county and municipal government's budget in the early 1970s, as a result of the rapid expansion of primary and junior high education in the 1960s and 1970s. The provincial government also reached the constitutional minimal spending in 1980 mainly due to a deduction of provincial revenue after the third change in financing laws delimiting fiscal responsibilities between the central and the local governments.
[157] Some authors argue this is because the central government devoted most resources to defense spending (Zhu and Ye, 1994).
[158] Due to the limitation of my research, I have no information on the names of these legislators or the bills they proposed.

Figure 4.11 Taiwan: Education Spending as % of Total Government Spending (Central Government)



Source: Ministry of Education, Taiwan

Secondly, new legislations have also been successfully pushed through by the reform groups and sympathetic legislators to protect education spending in the democratic period. In the late 1990s, article 164 of the constitution which stipulated a minimum spending on science, education and culture was abolished upon recommendation by officials in the executive branch such as the Ministry of Finance (MOF hereafter) and the Directorate-general of Budget, Accounting and Statistics, the Executive Yuan (DBAS hereafter) for reasons of inefficiency and waste (Chen, 2000; Huang and Ding, 1999).[159] The abolition of article 164 met with strong opposition from the educational reform groups. On September 27th, they organized a protest titled "Walk for Education" to show

[159] They argued that besides inefficiency and waste, a guaranteed budget for the MOE is very unfair to other government branches that need to write up detailed budget plans for money. There are only a few countries in the world such as Brazil, Panama, and Paraguay with similar constitutional provisions for education spending. Secondly, the government could always find ways to get around the constitutional provision. On one hand, to keep the education, science and culture spending from increasing too fast, the central government tried to limit the size of government budget by not including expenditure such as construction projects into the total budget; on the other hand, education subsidies from the central government were counted again at the county level and thus caused the problem of "double counting" the same education expenditure twice. It was also difficult for the central government to monitor how the education subsidies were actually spent at the local level since they were included in the total revenue of the local governments. Thirdly, they argued that the education expenditure increase in these years was usually used to finance improving school facilities and equipment but little was done to improve the "software" of education (teaching method, curriculum renovation etc.). Officials from the DBAS argued that they would definitely support education spending if there were good budget proposals so there should be no worries for education spending cut (Chen, 2000; Huang and Ding, 1999).

their disappointment with the abolition of article 164 (Chen, 2000; Huang and Ding, 1999).

Besides initiating wide societal discussions on restructuring education finance, civil groups also sought to guarantee education spending through new legislation in response to the abolition of article 164. The downsizing of the Taiwan provincial government in 1999 instilled a further sense of urgency into the education finance reform since the educational and fiscal responsibilities of the central and the local governments needed to be redefined[160]. When the parents of junior high school students in several areas of Taiwan found out they had to pay more school fees in the fall of 1999, they were quite disappointed. Education reformers such as Wu Le-feng, managing director of *the Humanistic Education Foundation*, criticized that "education is not prioritized, and is sacrificed most easily at the local level".[161] President Lee Tenghhui later stepped in to refund the extra fees paid by the parents, seen as a clever political move before the 2000 presidential election. However, education reformers such as Shih Ying, commented Lee's

[160] There are three distinct levels of government in the ROC. The central level consists of the presidency, the five Yuan (Executive, Legislative, Judicial, Examination, and Control), and the National Assembly (國民大會). The provincial/special municipality level consists of the Taiwan and Fuchien provincial governments and the governments and councils of the two special municipalities (直轄市) of Taipei and Kaohsiung. The local level consists of five provincial municipalities (省轄市) and 16 county governments, along with the governments of their subordinate cities. The constitutional amendment of July 23, 1997, downsized the provincial government, placing the Taiwan and Fuchien administrations under the central government with councils nominated by the premier and appointed by the president (http://www.gio.gov.tw/taiwan-website/5-gp/brief/info04_3.html, information accessed July 1, 2007). Based on the education financing structure before the downsizing of the provincial government, the local government was mainly responsible for the primary education, the provincial government the secondary education and the central government the tertiary education and various education subsidies.

[161] *Taipei Times*, Wednesday, Sep 15, 1999, p.4

promise was providing only a temporary resolution to a long-term problem concerning the shrinkage of education budgets.[162]

In response to all these societal demands, various bill drafts were introduced into the legislature that covered a wide-range of topics such as the definition of education spending, the ways to guarantee education spending, the division of responsibility between the central and the local governments in providing education, how the central and local government should allocate their education spending in a transparent and fair way, and the autonomy of schools to allocate their education spending[163]. As a result, two laws were passed to ensure the priority of education spending in government budget. Article Five of the *Education Fundamental Act*, promulgated in 1999, stipulates that

> "Governments of all levels shall provide liberal budgets for education and practice with rational allocation and utilization of educational resources. Education in remote or special areas should be their priority of grants and assistances. Budget for education shall be guaranteed. Specific means of compiling and guaranteeing education budget shall be regulated separately".

To implement this article, the MOE drafted the *Compilation and Administration of Education Expenditures Act*, which was promulgated in 2000 by the president. Article three of this act re-established an education spending minimal for all levels of the government:

> "The aggregated education expenditures of governments of all levels shall be no less than 21.5% of average net annual revenue over the previous three years of the budgeting year."

This act also emphasized that expenditures for compulsory education, remote and special areas should be prioritized and education expenditure for aboriginal peoples, the

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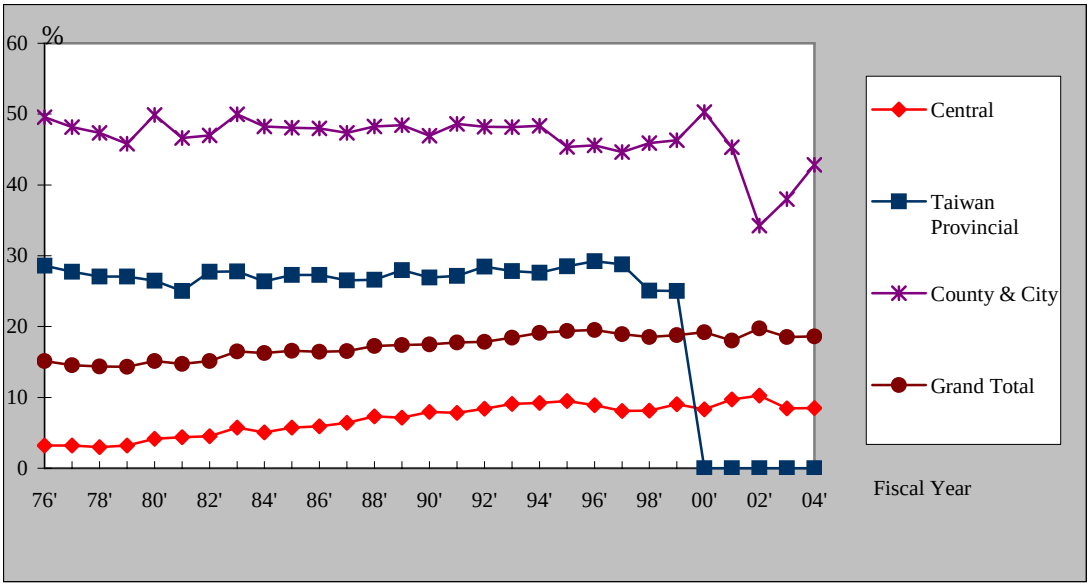
[162] *Taipei Times*, Thursday, Sep 16, 1999, p.1

[163] In Taiwan, the government education financing system used to be centralized: regardless of source, governments collect all kinds of revenues into the national treasury and then distribute them. Education revenues and expenditure at schools are in the hands of the accountants who usually are not specialized in educational affairs. Such system on one hand constraints the school executives to abuse school resources but on the other hand, limits the autonomy of schools to carry out educational activities and reforms; schools also have no motivation to generate revenue since incomes have to be submitted to the central.

physically or mentally challenged, and other disadvantaged groups should be guaranteed (Article Four, Five and Six).

Expenditure data seemed to show that these acts were implemented quite well in practice: as we have seen from Figure 4.12, total government expenditure fluctuated around 20% of government budget in recent years.

Figure 4.12 Taiwan: Education Expenditure as % of Total Government Spending (by Levels of Government)



Source: Ministry of Education, Taiwan.

Thirdly, democratization in Taiwan was also associated with a partial correction of spending inequalities under the authoritarian period. Three kinds of government education spending inequalities have been identified by the education reform organizations: 1) the government devoted more resources to university education than to compulsory education; 2) investment in academic education was favored by the government over vocational education; 3) private education received little subsidies from the government compared with public education (Xue, 1996). As can be seen from Table

4.5, before democratization, per student spending at the university level was around 8 and 5 times that of primary and junior level respectively; per student spending at the academic schools was 2 times that of the vocational schools. Table 4.6 shows the funding inequality between public and private schools. Even though public universities enroll only about 40% of the students, they receive 74% of the total university budget. The same allocation pattern exists at the vocational schools: private senior vocational schools receive only 40% of the budget while enrolling 60% of the students; private junior colleges enroll about 77% of the students while receiving only 60% of the budget. Due to this funding inequality, per student expenditure in public schools is usually two to four times that of private schools. The cost difference directly affects the quality difference: private schools have a much higher student teacher ratio than public schools and their students are less popular in the job market.[164]

Table 4.7 further shows students in private universities pay a much higher tuition than their counterparts in public universities.[165] This means students who can get into public schools benefit twice – from a better education (due to high per student expenditure in public schools) and a cheaper one, especially in disciplines with higher unit costs such as natural science or engineering, which requires money to buy equipment and labs (Woo, 1991).

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[164] In 1995, graduates from private junior colleges on average received NT$5,500 less than their counterparts in the public schools (*China Times*, 95/6/29). Also, according to graduate surveys conducted by *the National Youth Commission*, graduates from private colleges and universities are twice likely to be unemployed than those from public schools and it also took them longer to find employment.

[165] Students in public schools only pay about 7% of their tuition while students in private schools have to pay around 50% (Woo, 1991).

Table 4.5 Taiwan: Education Spending per student at Different Levels (1950s - 2005, NT$1,000)

	1970s	1980-87	88-97	98-05	ratio(98-05)/1970s
primary	4.4	12.4	42.8	88.1	19.9
junior high	6.3	18.2	51.8	93.0	14.8
senior high	19.9	44.5	115.1	151.4	7.6
senior vocational	11.7	26.4	63.6	95.9	8.2
junior college	18.4	44.8	75.4	35.3	1.9
university	34.7	97.2	197.4	213.9	6.2
ratio(university/primary)	7.9	7.9	4.6	2.4	
ratio (university/junior high)	5.5	5.3	3.8	2.3	
ratio (senior high/vocational)	1.7	1.7	1.8	1.6	
ratio (unversity/junior college)	1.9	2.2	2.6	6.1	

Source: The entry refers to the average spending during the specified time period;
author's own calculation based on data from Ministry of Education, Taiwan, 2006

Table 4.6 Taiwan: Proportion of Private Schools and Students at Different Levels of Education and Their Budget (1988)

	Private Schools as % of total	Private students as % of total	Private Budget as % of total
Elementary Schools	1.25	1.1	1.3
Junior High Schools	0.77	4.2	0.8
Senior High Schools	39.85	24.3	39.8
Senior Vocational Schools	40.92	60.5	40.9
Junior Colleges	57.35	76.5	57.4
Universities and Colleges	26.38	59.8	26.4
Total	19.71	15.1	19.7

Source: Woo, 1991

Table 4.7 Taiwan: Per Student Tuition in Public and Private Universities

Year	Private University	Public University	Private/Public
1974	$9,150	$2,500	3.66
1980	$27,716	$10,863	2.50
1990	$56,702	$18,814	3.01

Source: Zhu & Ye, 1994

These spending inequalities reflected the elite-orientation of the education system under the authoritarian period. Given the strict control of enrollment in public universities and senior high academic schools, it is students coming from wealthy families that are more likely to go to the best academic schools and public universities as they can better afford

extra exam tutoring, fees and opportunity foregone to make money. Table 4.8 shows college students are much more likely to come from rich families.

Table 4.8 Taiwan: Relationship between Family Income and Students Education Achievement

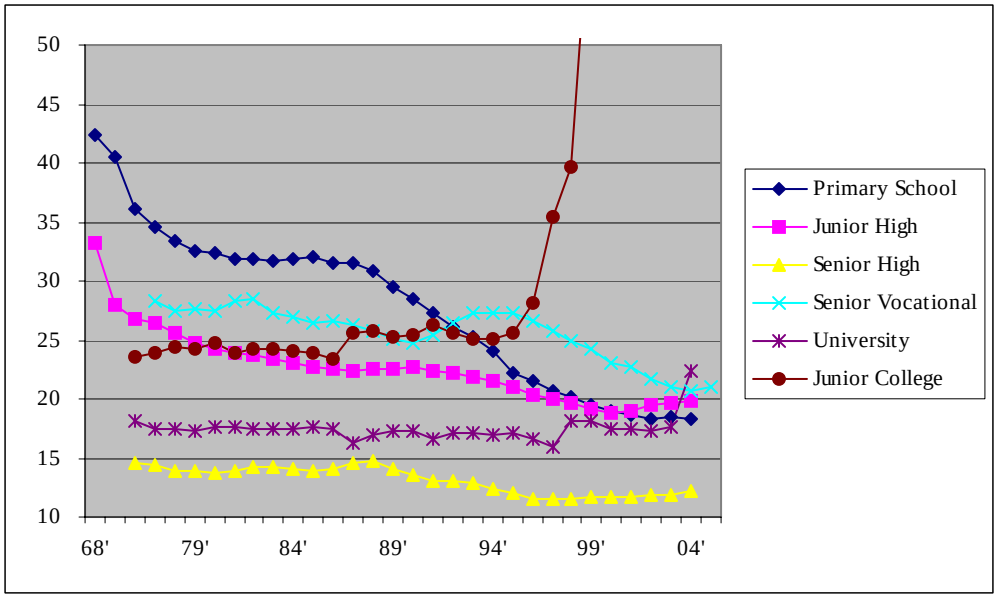
		the Decile Distribution of Students' Family Income									
	total	1	2	3	4	5	6	7	8	9	10
Year: 1973											
average income ($10, 000)	29.6	9.9	15.6	18.8	21.6	24.3	27.4	31.1	36.2	43.6	67.4
primary school	100	6.6	10.6	11.3	11.6	12.2	11.1	10.8	9.5	8.7	7.6
junior high school	100	5.4	9.5	9.8	10.5	12	11.3	12.2	11.7	10.2	7.7
senior high/vocational	100	3	5.8	7.6	8.1	10.2	12.2	12.4	14.5	14.1	12.2
college and above	100	1	2.8	2.7	4.8	7.3	9.8	10.9	14	18.9	27.7
Year: 1994											
average income ($10, 000)	77	20	36	45.7	54.2	62.5	71.5	82	96.4	118.2	183.3
primary school	100	3.6	8.2	11.5	12.5	11.9	11.9	10.7	10.2	9.4	10.1
junior high school	100	2.7	7.8	11	12.2	12.9	13.2	11.6	10.9	8.6	9.1
senior high/vocational	100	1.7	6	9	11.4	12.2	12.8	12.6	12.6	11.5	10.2
college and above	100	1.2	3.7	5.5	8.3	10.2	9.8	11.6	13.9	17.6	18.2

Source: Zheng & Tong, 1996, Table 7

Table 4.5 shows these spending inequalities are partially corrected as democratic transition took place. The average ratio of university per student spending over that of primary decreased from 7.9 before democratic transition to 4.6 between 1988 and 1997 and to a further low of 2.4 in recent years; the average ratio of university per student spending over that of junior high level exhibited similar pattern and the figure decreased from about 5.3 to 3.8 and to a further low of 2.3 in recent years. A relatively stable primary education budget despite decreasing number of youth population seems to contribute directly to this rapid ratio decrease (see Figure 4.7). The critical question is then why the primary and junior high education budget could remain relatively constant. The decreasing per student expenditure gap between university and compulsory education was directly related to the reform measures pushed by the reform movement. Firstly, it was the consensus of both the civil education reform groups and the MOE that

to improve education quality, small class teaching should be implemented at the primary and secondary education level.[166] The priority of compulsory education funding was protected through various laws and regulations, the most important one being *Compilation and Administration of Education Expenditures Act* described before. This reform measure was implemented well in practice. Figure 4.13 shows that student teacher ratio at the primary and junior high level has decreased dramatically since the late 1980s. Smaller student teacher ratio is usually associated with higher unit cost and thus higher per student expenditure. Secondly, even though university education expanded and the number of students increased rapidly in the late 1990s, the MOE didn't significantly increase its spending at this level and thus per student expenditure at the university level decreased with a relative constant university budget (see Figure 4.7).

Figure 4.13 Taiwan: Student Teacher Ratio at Different Levels (1968-2005)



[166] Civil education groups such as *Zhenduo Association* and *4-10 Education Reform Movement* advocated small class teaching (Xue, 1996). The education reform committee also recommended small class teaching at the primary and secondary education level in its final recommendation to the government (Education Reform Committee, 1996).

Subsidies to private schools also increased due to demands from the private school organizations and reform groups. Comparing with before 1990s, the role of private schools is strengthened by the establishment of Association of Private Universities and Colleges (APUC), which successfully pressured the MOE to increase funding for private institutions from 7% of state subsidy to 18% in late 1990s (Mok, 2002). In the 1998 *Education Reform Action Plan*, the Executive Yuan specified its policies regarding subsidies to private universities. The plan aimed to increase subsidies to private universities to 20% of its current income (Qin, 2005). Table 4.9 shows this policy goal was well implemented in practice.

Table 4.9 Taiwan: The MOE's Subsidies to Private Universities (1995-2001)

Year	MOE's Subsidies to Private Universities (Million NT$)	Adjusted Current Income of Private Universities (Million NT$)	Subsidy Proportion
1995	3557	20771	17.1
1996	3696	22437	16.5
1997	4703	26921	17.5
1998	5571	27376	20.4
1999	9600	31425	20.4
2000	7669	33828	22.7
2001	7656	37990	20.2

Source: Qin, 2005

However, under-investment in vocational schools didn't change significantly after democratization. Both Table 4.5 and Table 4.10 show that per student expenditure is still much higher for academic schools than for vocational schools at both senior high and tertiary level after democratization. Quality at senior vocational schools might be improving given its lower student teacher ratio after 1995, as can be seen in Figure 4.13.[167] This is consistent with the recommendation of the Educational Reform

[167] Most junior colleges were updated to technical universities in late 1990s.

Committee and the Action Plan of the MOE to develop vocational education in the direction of diversification and better quality.

Table 4.10 Taiwan: Per Student Expenditure in Academic and Vocational Schools (NT$1, 000)

	Senior High School			Tertiary Level		
Year	seninor high	senior vocational	ratio (academic/vocational)	university	junior college	ratio (academic/vocational)
76'	14.60	8.38	1.74	27.70	14.62	1.90
77'	16.39	9.91	1.65	31.35	16.75	1.87
78'	21.33	12.80	1.67	33.50	19.66	1.70
79'	27.08	15.62	1.73	46.39	22.61	2.05
80'	33.64	18.77	1.79	61.19	33.57	1.82
81'	41.61	23.10	1.80	79.94	41.02	1.95
82'	40.44	23.20	1.74	95.63	48.23	1.98
83'	41.30	24.17	1.71	83.26	44.76	1.86
84'	44.78	26.61	1.68	89.70	45.80	1.96
85'	48.62	28.62	1.70	97.67	46.16	2.12
86'	51.28	32.10	1.60	119.28	52.84	2.26
87'	54.56	34.98	1.56	151.26	45.61	3.32
88'	64.36	40.33	1.60	146.24	53.77	2.72
89'	87.03	54.25	1.60	165.65	62.87	2.63
90'	94.62	55.14	1.72	195.13	64.12	3.04
91'	110.87	58.70	1.89	212.16	74.10	2.86
92'	120.01	61.37	1.96	211.57	79.35	2.67
93'	124.09	66.38	1.87	207.67	84.90	2.45
94'	127.00	70.36	1.81	205.33	80.14	2.56
95'	149.27	76.92	1.94	201.51	86.64	2.33
96'	158.39	88.90	1.78	230.98	92.45	2.50
97'	147.95	89.32	1.66	212.25	81.58	2.60
98'	156.09	100.24	1.56	207.65	83.65	2.48
99'	158.49	109.74	1.44	183.43	48.71	3.77
00'	152.48	91.75	1.66	258.29	21.80	11.85
01'	146.92	79.71	1.84	236.88	16.53	14.33
02'	146.96	89.84	1.64	197.73	16.11	12.28
03'	147.48	91.85	1.61	199.19	25.04	7.96

Source: Ministry of Education, Taiwan, 2006

Electoral Competition and Education Resources

As shown above, education groups are the main forces that pushed for the changes in government education provision through various means such as protest, initiating societal wide discussion and collaborating with legislators. Electoral competition also played a

limited role in protecting education spending and equalizing education resource distribution.

Education spending started to appear on the policy platform of election candidates as the reform movement successfully politicized education reform during the first Taipei Mayor election. However, comparing with the issues of national security or the economy, education issues were relatively minor. Even though the society was highly mobilized for education reform in 1994 and the government pro-actively responded with Commission on Education Reform, education reform was not a salient issue at all during the 1996 presidential election when the national security of Taiwan was threatened by the missile tests of the PRC government. But comparing with other social issues, education is pretty salient at the national elections. However, in both 2000 and 2004 presidential elections, education reform and spending appeared on the policy platform of the candidates as a relatively important policy issue[168]. In the 2000 election, three presidential candidates out of four (Lien Chan, Chen Shui-bian, James-Soong) promised to give annual subsidies to those attending pre-schools. One candidate, Hsu Hsin-liang, guaranteed education spending would equal to at least 6 percent of GDP. In the 2004 presidential election, the KMT candidate Lien Chan promised to increase education spending from 4% of GNP to 6%, lower the interest of student loan to 0%, waive tuition for kids from low-income families and deduct tax for parents with college students.[169] Presidential candidates also

[168] In the 2000 presidential election, the salient issues are mainland policy, economy, education and social issues such as youth, senior citizens, health and labor (Taiwan Government Information Office, 2006).
[169] Taiwan Government Information Office, 2006.

tend to take measures such as giving subsidies or lowering school fees before election.[170] However, these measures are mostly small in quantity (regarded as "red envelops" during election time) and do not affect education spending at various levels significantly. Politicians have less leeway to manipulate education spending since there exists legal provisions for education spending. But since education spending is a quite sensitive issue that affects many voters, presidential candidates usually would refrain from any education spending cut which will no doubt be unpopular. In this sense, electoral competition played a role in protecting education spending. [171]

Electoral competition also seemed to have played a role in equalizing education resource distribution. In the late 1980s, the selection of the location for the National Chung Cheng University marked the beginning of the fights for educational resources. Local political elites and local representatives in the Legislature Yuan started to request for an equal geographical distribution of higher education institutions in order to "please" their constituencies back home. These concerns for electoral popularity affected politicians at the central level. In the Eleventh National Development Plan, proposed under the order of the new President of the Executive Yuan, Mr. Hao Po-tsun, indicated that twenty-five higher educational institutions would be established, enrollment at tertiary institutions be

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[170] The government provided education subsidies to kindergarten students aged from five to six, which was welcomed by the parents but charged by the opposition as a form of handing out "red envelopes" for the purpose of winning votes.(*China Post*, April 17, 2003; *China Post*, January 29, 2004) On the other hand, during the 2004 campaign, Opposition Candidate Lien Chan promise to donate his salaries and all the government subsidies for the campaign to "those young students who cannot afford their education, to those kids who cannot afford their lunch…". (*China Post*, March 7, 2004).

[171] I don't have data on the issue of education spending in local elections. However, my sense is at the local level, welfare issues such as old age pension are more salient than education. This issue was salient from 1993-2000. Candidates from the DPP tend to promise old age pension increase; due to electoral competition, KMT candidates have to make similar promises (Fell, 2005). However, candidates usually could only carry out these pension increase promises for a short time after winning election due to fiscal constraints (Wang, Shu-Twu, 2003).

expanded and there would be at least one university in each of the main areas of Taiwan in response to the popular concerns about equitable geographical distribution of higher institution (Wang, 1996). In the 2000 presidential election, candidate Chen Shui-bian promised to upgrade the university in Ilan (*Taipei Times*, Thursday, Sep 16, 1999, p.1; *Taipei Times*, May 11, 2000, p.8). However, due to the limitation of my research, I have no information how these promises are implemented in practice.

4.2.4 The Global and the Local Demands of Education Reform

Some of these changes demanded by the education reform movement reinforced the previously mentioned changes required by the global economy. Both the global and the local required a move-away from the text-book and exam centered system to a more flexible, student-centered system of learning. The proposed neo-liberal model of education management reinforced the demand for more school and individual autonomy by the education reform groups. However, tensions also exist between the requirements of the global economy and the local demands of education reform. One tension is the study of English and the study of local languages. Even though the Taiwanese government had made official policies for both to be studied at schools, researches show that the English-in-Education policy was more systematically and thoroughly planned by the central government, and subsequently more vigorously implemented by all parties concerned (e.g. central and local governments, schools, teachers and textbook publishers) than was the local language-in-education policy. Local languages had more logistic difficulties to teach and study: the lack of standardization of local languages, the lack of prior resources and practice and the publishers' reluctance to publish books in local

languages. More importantly, the parties involved have less motivation to learn local languages due to its perceived lower status derived from limited pragmatic and instrumental functions (Chen, Su-Chiao, 2006).

Another tension is that the neo-liberal measures of education management such as charging higher tuition, met with serious oppositions from students, professors and parents. The reform groups resisted any potential danger of education spending cut and their abilities to do so was proved by the new legislation to protect education spending. Pressures from electoral competition also made the politicians to turn away from education spending cut measures that would reduce their popularity.

The increasing opening of political channels, participation and electoral competition does not mean reform measures that redistribute power and resources will be easier since these reforms affect vested interests whose power democracy may not weaken, but strengthen. Beginning in 2003, there was a concerted effort to roll back education reform in Taiwan among school teachers and among professors at the normal colleges (Ho, 2005). The schoolteachers fiercely resisted the increasing job burden caused by the new integrated curriculum, which aimed to promote balanced development of students and cultivated their transnational and democratic skills. The normal college professors sought to restore the unified entrance exam replaced by a plural admission system that weakened their monopoly of teachers' education. Facing these oppositions to education reform, the DPP government had to take a defensive position and stayed with the premises set by the KMT government even though it promised supporters of these policies further reform. Also hard to tackle with are structural inequalities in the education system that are socio-

economically related since the elites are usually concentrated and better organized. Examples of these are different access to learning global skills, unequal funding for public and private schools, and the underinvestment for vocational schools.

Changes are even harder at the social value level. Surveys show that students are not happier after the reform since the pressure for academic advancement is still heavy in the Taiwanese society after measures such as multiple channels to enter universities and "happy learning" have been tried (Lee, 2004)[172]. Creativity and ability to innovate may take a long time to cultivate in a once highly exam-oriented, rote learning system.

4.3 Conclusion

In this chapter, I argued that integration into the global market profoundly affected government education provision in Taiwan. Initial integration changed the priority the government attached to education. The education system mainly served as a tool of nation building between 1949 and 1960, when the Taiwanese government adopted an industrialization strategy of import substitution. It was only when the Taiwanese government started to promote labor-intensive export industries in the 1960s that education provision and planning started to rank high on its development agenda. To be competitive in the global market, the export sector required much manpower with basic and medium skills; so did government construction projects in this period. These needs put strains on the education system which previously focused on nation-building. Since

[172] Research into Family and Life Course Studies by the Institute of Sociology, Academia Sinica showed that junior and senior high school students did not become happier than before the exams. Approximately 85% of 5,400 junior high students in Taipei City, Taipei County and Yilan County were very unhappy and depressed due to academic pressure. Moreover, almost 80% of students in famous high schools were, in addition, going to cramming schools in order to pass exams (Lee, 2004).

then, the Taiwanese government played an active role in constantly updating its education system to match the needs of its out-oriented economy. Significant changes of government education provision in this period included: 1) the extension of compulsory education from six to nine years in 1968; 2) emphasis on vocational education and training; 3) emphasis on the study of science and engineering; 4) limitations placed on senior high school and university enrollment and expansion of five year junior colleges to ensure enough basic and medium level technicians could be produced.

Further integration into the global market and growing competition from the second tier of developing countries in the 1980s stimulated a new round of industrial and education upgrading in Taiwan. Given rising labor costs, trade disputes with its partners and competition from lower-cost developing countries, the Taiwanese government responded with a new policy of further liberalization, internationalization and industrial upgrading. Both foreign direct investment and outward investment increased rapidly after the reform and facilitated industrial upgrading. To match the needs of this round of initial industrial upgrading which required mainly medium-level manpower, government education provision in this period focused on better implementation of the nine-year compulsory education scheme, updating the quality of education at all levels, updating vocational education and continuing emphasizing science and technology education.

Increasing competition in the global market in the 1990s necessitated more profound changes in the education system. Facing competition from high-tech, multinational corporations in the developed countries as well as the low-cost factories in the developing

countries, both the Taiwanese government and the private sector (most of which are small and medium enterprises) felt an urgent need for industrial innovation and diversification into a wide-range of high-value added industries. In recent government documents, the Taiwanese government strived to build Taiwan as a regional leader of information technology and finance center, competitive in the global economy. However, Taiwan faced a shortage of high-level researchers, developers and managers. This put new strain on the education system. In response to these new global pressure and manpower needs, major education reforms have been implemented: 1) enrollment in the tertiary education has been greatly expanded and many junior colleges have been updated to technical universities; 2) there is a shift away from an exam-centered, rote-learning system to a system focusing on innovation, creativity, transnational skills and life learning; 3) the teaching of English and Information and Communication Technology is emphasized; 4) to make the education system more efficient, the government adopted a more neo-liberal approach to education management, especially at the tertiary level.

Education spending and outcome data such as enrollment and attainment show that the government education policies were generally implemented well in practice. Besides an interventionist state, the matching between education supply and national economic needs was accomplished due to strong policy linkages between the Council for Economic Planning and Development (CEPD), the department responsible for national development planning and the Ministry of Education (MOE). During the authoritarian period before 1987, the MOE was subordinated to the CEPD, which played a central role in the policy making of the Taiwanese government. On the other hand, the MOE was a centralized

bureaucracy which had monopoly over education policy making. Such policy making structure determined the relatively easy subordination of education supply to economic demand. The post-democratization period saw a more diversified policy-making structure with additional inputs from local representatives, schools and the private sector. The implication of this more diversified policy making structure is yet to be evaluated.

Democratic transition also profoundly influenced government education provision in Taiwan. Recent education reform was the government's response to an education movement that dated back to the early 1980s. However, it was not until political liberalization in the late 1980s that the education movement developed into a social movement that mobilized all strata of Taiwanese society. The movement reached a climax in 1994, when the April 10th alliance was formed to include more than 200 civil groups and demanded fundamental education reform from the government. Despite different issue emphasis, the education groups all demanded the liberalization of the education system from the tight control of the state. The government responded by forming a Commission on Education Reform, which presented the government a report after wide consultation with the public. The reform movement also successfully gained more political support from legislators and political candidates. Even though education reform was a relatively minor issue at national elections comparing with national security or the economy, the very fact the candidates had it on their platform has maintained the momentum of the reform.

The MOE responded positively to the reform demands after the movement gained the support of the legislators and more so after 1994, when the movement mobilized all strata of the Taiwanese society. The Reform Action Plan published by the MOE in 1998 shared many of the concerns of the civil reform groups and the CER report. Although it might still be early to evaluate most of the reform measures, government education provision changed significantly in the post-democratization period. Two kinds of changes were emphasized in the chapter. First, the education system is much more liberalized comparing with the pre-democratization period. Legislations were in place to protect the neutrality and plurality of the education and the state also loosened its ideological and administrative control over schools and the education market. Second, democratization in Taiwan was associated with greater education spending, new legislation to protect education spending and a relatively more equal distribution of education resources from the elite to the masses. The central government finally reached its spending minimum as stipulated by the constitution in 1991 after strong opposition from the legislators. When article 164 of the constitution which protected a minimum government spending on education, science and culture was abolished in the late 1990s, the education groups protested and pushed forward new legislations to protect education spending. Underinvestment in compulsory education, vocational education and private education during the authoritarian period which showed the elite-orientation of the system has also been partially corrected. The education reform groups played a major role initiating these changes whereas electoral competition had a comparatively limited role.

The finding in this chapter speaks against the statistical finding that globalization does not have a robust significant effect on government education provision. I have shown that

as Taiwan integrated into the global economy, competition from the global market pressured the Taiwanese government to upgrade its education system, particularly in the 1960s, 1980s and 1990s and profound changes in spending, enrollment and education structure took place. One reason for the discrepancy between the findings from the statistical study and the Taiwan case might be that the trade intensity measure can only partly capture the effects of globalization in the 1960s, when Taiwan first opened to the global market by promoting labor-intensive exports and policy makers started to expand education and increase spending. However, this measure, which remained almost constant since 1970s, cannot reflect the effects of globalization in the 1980s and 1990s, when increasing competition in the global market forced Taiwan to further internationalize, update its industry to more capital- and technology- intensive and also update its education system to produce needed manpower. The capital account openness indicator, on the other hand, may better capture the effects of globalization in the 1980s but not its effects in the 1960s.

Findings on the effects of democratic transition in Taiwan corroborated the statistical finding that democratic governments are associated with greater education spending per capita and higher primary and secondary per student spending as percent of GDP per capita. I have shown how education spending has been increased and protected after democratic transition in Taiwan. Moreover, the demands by the education reform movement to protect the spending and update the quality of compulsory education was responded by the MOE: a constant budget proportion devoted to primary and secondary

education despite a decreasing number of enrollments guaranteed a higher per student expenditure at the primary and secondary levels.

Chapter 5 Globalization, Authoritarianism and Government Education Provision in Singapore

This chapter studies how globalization and the authoritarian style of the Singapore government affect its education provision. The study period begins in 1959, when the People's Action Party (PAP hereafter) came to power in Singapore, and covers until present.

I argue that similar to the Taiwan case, integration into the global market has had a profound influence on government education provision in Singapore. The PAP government, led by Lee Kuan Yew, quickly adopted an outward-looking strategy of industrialization after Singapore's separation from Malaysia. However, the vulnerability of the open Singapore economy was soon exposed in the 1970s with fluctuations in the global market given the small size of Singapore and its limited resources. The competitive advantage of the Singaporean economy was also challenged mainly as the second tier of newly industrializing countries entered the global market. In response to these pressures from the global market, the Singapore government since then has been pro-active to constantly update its industries so that its economy could stay ahead in the global competition. Each time, government education provision was adapted accordingly since cultivating adequate manpower was regarded as critical by the government to ensure the success of its industrial upgrading. The close link between economic needs and education provision was achieved through tight state control of both the economy and the education system and the subordination of the latter to the former.

On the political front, unlike the Taiwan case, which saw democratic transition in the late 1980s, the PAP in Singapore has dominated the parliament since the 1968 election and the government remained authoritarian since then. In contrast to the democratizing Taiwan case where the political and social function of the education system has changed from political indoctrination and ideological control to cultivating democratic citizenship, the education system in Singapore constantly serves as a tool of nation-building throughout the authoritarian period. The education system also remains elite-oriented compared with the Taiwanese system where democratic transition is associated with a re-distribution of the educational resources from the elite to the masses. Though a short period of democratic opening before the PAP became dominant was associated with early school expansion and there is some evidence the political leaders still care about electoral success in Singapore, I identify no direct linkages between limited electoral competition and government education provision during the authoritarian period. This is again in contrast with the democratizing Taiwan case where electoral competition played a role in maintaining the momentum of education reform, protecting education spending and equalizing education resources. In addition, education reform was mainly initiated by the central government in authoritarian Singapore instead of the civil groups as in the Taiwan case.

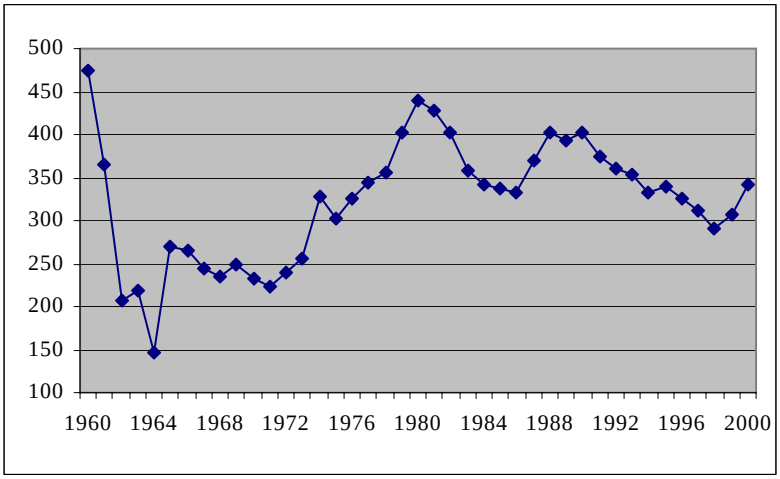
This chapter is structured as follows. Section 5.1 discusses how integration into the global market affects government education provision in Singapore. The continuity of the education system in serving nation-building and the elites in the authoritarian state is investigated in section 5.2. Section 5.3 presents the conclusion.

5.1 Globalization and Changes in Government Education Provision

5.1.1 Globalization in Singapore: An Overview

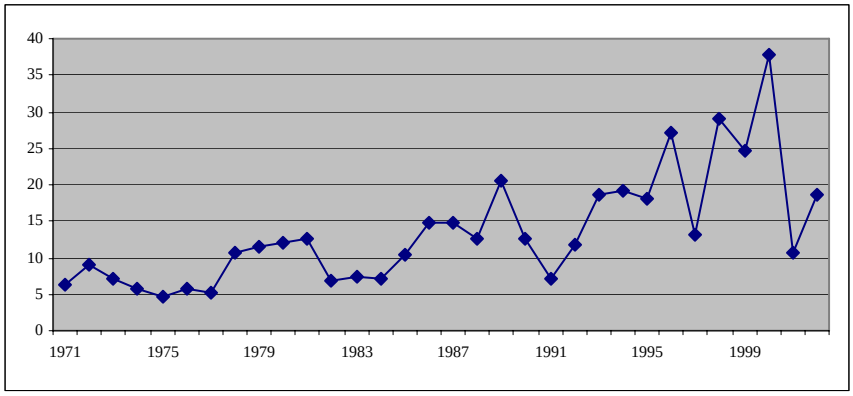
Before the PAP came to power in 1959, Singapore depended heavily on entrepot trade (Cheng, 1991). The initial economic strategy of the PAP government was industrialization through import-substitution. However, separation from Malaysia in 1965 made import-substitution an unviable choice. The PAP government quickly adopted an industrial policy of export promotion (Haggard, 1990). The Singapore economy has maintained its outward-orientation since then. As we can see from Figure 5.1, after a drop between 1960 and 1964, the period of import-substitution, the trade intensity of the Singapore economy (the sum of import and export as % of GDP) increased afterwards, reached a high of 450% of GDP in 1980, and then fluctuated around 350% of GDP. Its capital market was also opened early. Foreign direct investment already composed 5% of GDP in early 1970s, and it fluctuated around 20% at the end of the twentieth century, as shown in Figure 5.2.

Figure 5.1 Trade Intensity Ratio of Singapore (1960-2000)



Source: Penn Table 6.2.

Figure 5.2 Singapore: Foreign Direct Investment as % of GDP (1971-2003)



Source: World Development Indicators.

Some structural data reveals the changing nature of the Singapore economy and its positioning in the global market. Table 5.1 shows the increasing importance of the manufacturing sector in the Singapore economy. Its share rose from about 12% of GDP in 1960 to 28% in 1980 and then fluctuated around that level. The share of the service sector deceased accordingly but still has the highest share of around 65% since 1980. Table 5.2 shows the changing composition of the manufacturing sector. There is a clear pattern of industrial upgrading from labor-intensive to capital- and technology- intensive products. In 1960s, the labor-intensive sectors such as food and beverage, textile and apparel, timber and furniture, paper and printing composed more than 50% of the total manufacturing value; another important sector was metal product. The 1970s and 1980s saw a growing importance of chemical and petroleum products, which were of capital-intensive nature. The share of electronic products, which are technology- intensive, started to rise since 1980s and already composed more than 50% of the manufacturing in 1995. However, the importance of electronics declined somewhat in the new century as new industries like biomedical start to grow in Singapore. Table 5.3 shows the structure evolution of the service sector. What immediately stands out is the increasing importance of the finance sector since 1970s; in contrast, the share of commerce declined from

around 34% of GDP in 1960 to about 14% in 2005. There is also a growing share of the "other" category in recent years, which includes education, healthcare and creative industries[173].

Table 5.1 Singapore GDP by Sector, 1960-2005

Sector	1960	1970	1980	1990	1995	2005
Agricultre	3.6	2.3	1.6	0.4	0.2	0.1
Manufacturing	11.9	20.7	28.9	27.1	26.6	28.4
Services	79.4	71.3	60.5	64.9	64.0	66.0
Others	5.1	5.7	9.0	7.6	9.2	5.5
Total GDP	100.0	100.0	100.0	100.0	100.0	100.0

Source: Hwa, 1991; WDI online 2005

Table 5.2 Singapore Manufacturing by Sector, 1960-2005

Sector	1960	1970	1980	1990	1995	2005
Food & Beverage	33.0	18.4	6.6	4.0	3.2	2.3
Textile & Apparel	3.3	5.2	4.5	3.1	1.2	NA
Timber & Furniture	8.5	5.4	3.1	1.2	0.3	NA
Printing & Paper Products	10.3	3.5	2.6	3.6	3.3	1.3
Chemicals/petroleum	17.6	36.6	41.4	25.0	17.7	31.2
Non-metalic mineral products	3.7	2.3	2.0	1.4	1.8	NA
Basic Metals	1.1	1.9	1.7	1.1	0.6	NA
Metal Products/Machinery	20.6	23.6	36.6	59.0	70.6	53.1
Electronic Products	*3.7*	*7.3*	*16.9*	*39.1*	*51.1*	*36.5*
Biomedical	NA	NA	NA	NA	NA	8.7
Others	2.0	3.1	1.5	1.5	1.3	NA
Total Manufacturing	100.0	100.0	100.0	100.0	100.0	100.0

Source: Kam, 1998; Singapore Department of Statistics, 2006 online data

Table 5.3 Singapore Service by Sector (as % of GDP), 1960-2005

	1960	1971	1980	1990	1995	2005
Electricity, gas and water	2.4	2.4	2.3	2.1	1.7	1.5
Construction	3.5	7.5	6.4	6.3	7.6	3.6
Commerce	34.4	27.1	23.6	21.3	20.0	14.8
Transport and Communications	14	11.0	14.3	14.8	12.1	11.9
Finance	7	14.6	17.2	30.1	29.6	23.4
Others	NA	13.3	6.1	12.4	17.1	16.1
Total Service as % of GDP	NA	75.9	69.9	87.0	87.9	71.4

Source: Hwa, 1991; Asian Development Bank Key Indicators Various Year.

[173] Singapore government budget speech 2006 mentions the importance of new industries. It is downloadable at http://www.mof.gov.sg/budget_2006/budget_speech/subsection3.4.html (accessed Dec. 7, 2006).

5.1.2 Globalization, Industrial Upgrading and Education Upgrading

So far, I have identified two features of globalization in Singapore: 1) the high dependence of the Singapore economy on the global market since late 1960s, and 2) a clear pattern of industrial upgrading of its economy from labor-intensive to capital- and technology- intensive products. I argue that these features of globalization in Singapore have important implications for its government education provision. Given the particular vulnerability of its open economy with small size and limited natural resources, constant industrial upgrading is a conscious strategy of the Singapore government to stay ahead in a global market whose competition becomes increasingly fierce as new developing countries start to enter. At each time of industrial upgrading, the Singapore government also updated its education provision accordingly to provide adequate manpower. In this section, I will show how the PAP government strived to update both its economic structure and education system in response to challenges from the global market and how the close link between economic demand and education supply was achieved.

<u>Labor-intensive Export Promotion and Expanding Basic Education (1965-1978)</u>

As mentioned before, the PAP government quickly adopted a strategy of industrialization through export promotion after separation from Malaysia. Foreign and state firms played a central role in this state-led development given a politically and economically weak entrepreneur class in Singapore (Haggard, 1990). The political elites mainly relied on a strong and stable political system and a low-cost, disciplined workforce[174] to attract foreign capital and multi-national corporations (MNCs hereafter). The export-led

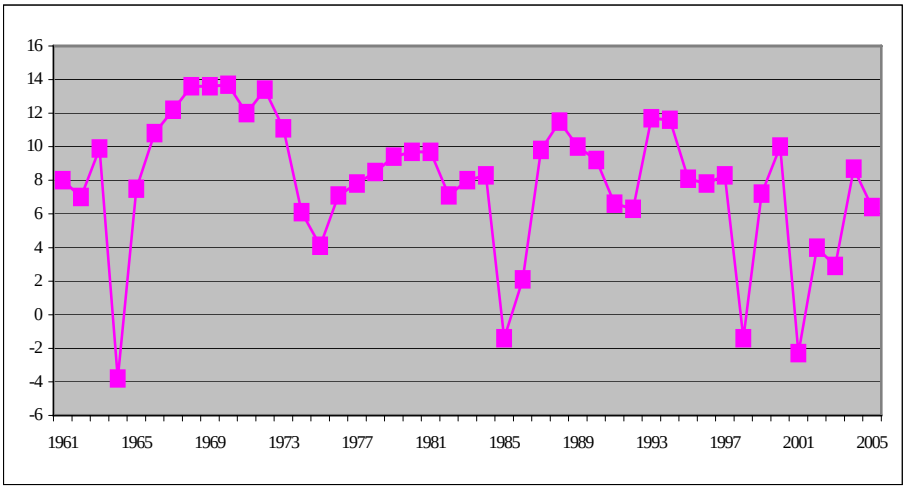
[174] This was achieved through several pro-capital legislations and the newly-established National Trade Union Congress (NTUC hereafter), which was under control of the PAP (Ashton, Green, James and Sung, 1999)

industrialization strategy was supplemented by moves to develop Singapore into a regional and international center. Foreign exchange controls were removed and various financial incentives introduced (Tan, 1997).

Such industrialization strategy was quite successful, as witnessed by the high economic growth rate (Figure 5.3) and the large increase in manufacturing share (Table 5.1) during this period.[175] Foreign direct investment totaled an average of US$.3 billion during this period making Singapore the fifth largest recipient among developing countries (Tan, 1997). This strategy based on labor-intensive industries also proved successful to solve the employment problem in this period, a major task facing the PAP government after a massive influx of immigrants from communist China and neighboring Malaysia in late 1950s and early 1960s. Unemployment rate fell from 6% to 3.3% in 1979 and immigration laws were relaxed to allow an inflow of foreign workers to sustain the accelerating pace of economic growth (Tan, 1997). The employment share of manufacturing increased from 14% in 1957 to 27% in 1977 (Cheng, 1991). Other quickly expanding sectors in this period included construction, transport, tourism and finance.

[175] The Singapore economy had a growth rate of about 13% until hit by the first economic crisis in 1973, after which the growth rate went down around 8%, still remarkable in a comparative perspective.

Figure 5.3 Singapore GDP Growth Rate (2000 Constant Price)



Source: Penn Table 6.2

Given the labor-intensive nature of the Singapore economy at this stage, which required mainly semi-skilled labor, the goal of the education system from 1965 to 1978 was to cultivate basic literacy, numeracy and technical capacity of the population (Gopinathan, 1991; Ashton, Green, James and Sung, 1999). Competition in the global market was still relatively limited to yield pressure on the Singapore economy and its education system. The once communal-based school system was quickly centralized after the PAP came to power, a bilingual system[176] was put in place and school facilities were upgraded (Gopinanthan, 1991). Due to the rapid expansion of schools, universal primary education was achieved at the lower secondary level in the 1970s (Goh and Gopinathan, 2006).

The study of mathematics, science and technical subjects already started to be emphasized and an emphasis on technical courses was introduced during the import-substitution period before separation from Malaysia (Wong, 1993). During this period of

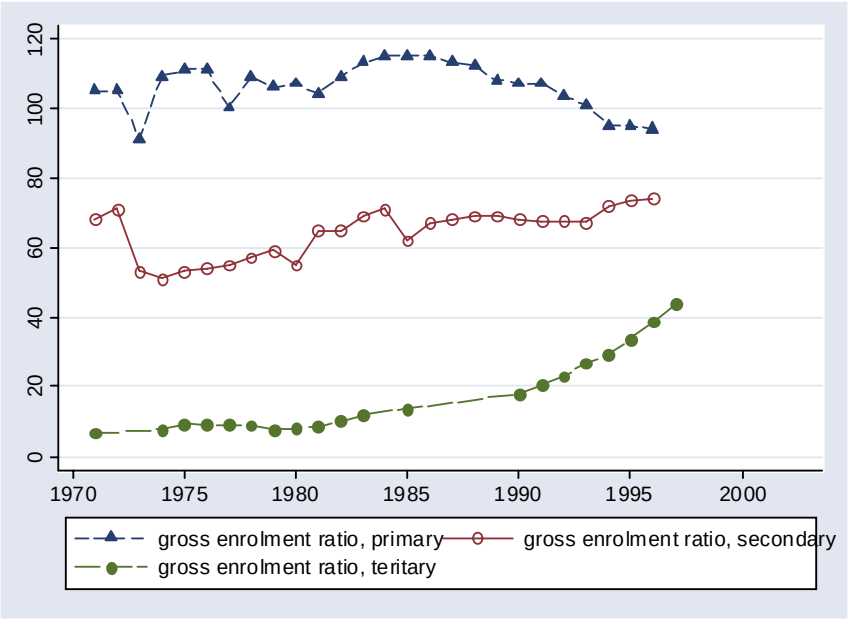
[176] All four main languages in Singapore at that time, English, Chinese, Malay and Tamil were given the status of official languages and are treated equally. Malay was given the status of national language given the special relationship between Malaysia and Singapore at that time. The bilingual policy requires all pupils to learn English and their mother tongue at the same time in school.

labor-intensive export promotion, the government continued to provide basic mathematics and science training. In 1964, the government established secondary vocational schools for the first time, with an enrollment of 4,910 pupils (Goh and Gopinathan, 2006). Meanwhile, the MNCs were relied upon to bring new technical and managerial expertise for the new industries. However, the skill demand of the economy soon went beyond basic literacy. In response, the government established a Technical Education Department responsible for technical education in 1968 given the low enrollment at vocational schools and the population's indifference to "blue-collar work" (Goh and Gopinathan, 2006). From 1969 onwards, all male lower secondary students had to take some technical subjects (Ashton, Green, James and Sung, 1999). Industrial Training Board was also set up in 1973 to prepare workers with basic skills (Tan, 1997).

Figure 5.4 and Table 5.4 show school enrollment and attainment trends of this period. As a result of the governmental efforts to cultivate basic literary and numeric skills of the population, primary school reached universal enrollment in early 1970s and secondary school gross enrollment increased to 60%. The percentage of population with no schooling decreased by 4% between 1965 and 1975. Average years of school increased almost a year, from 4.6 to 5.5 years. Gender equity in school also improved significantly. It almost reached parity by the end of 1970s. In addition, a policy to have one third of the students in the technical stream and the remainder in the academic stream in the upper secondary school was phased in and this ratio has been achieved by 1972 (Tan, 1997). Consistent with government economic strategy in this period, post-primary education expansion remained slow, as evidenced by the poor improvement in secondary and

tertiary education enrollment and attainment rates (Figure 5.4 and Table 5.4). The schools were mostly financed by the state and the financing priority during this period was primary education. In the first year of its independence, the Singapore government allocated 59% of the annual budget on primary education, 27 percent on secondary education and 14 percent on higher education (Goh and Gopinathan, 2006). Total government education spending didn't increase significantly either as percent of total government spending or as percent of GDP during this period; per student spending only increased slightly (Figure 5.5, Figure 5.6 & Figure 5.7).

Figure 5.4 Singapore: School Enrollment Ratios (1972-2000)



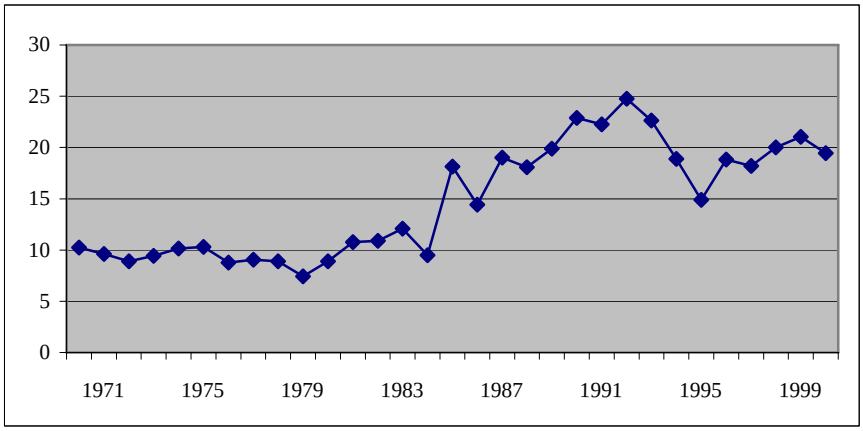
Source: UNESCO Year Book, Various Years.

Table 5.4 Education Attainment in Singapore (1960-2000)

Year	Population over age 15 (1000s)	No Schooling	Highest level attained: First level Total	First level Complete	Second Level Total	Second Level Complete	Post-Secondary Total	Post-Secondary Complete	Average Years of School
		(Percentage of the population aged 15 and over)							
1960	926	46.2	21.3	7.4	32.5	9.4	0.0	0.0	4.30
1965	1059	40.6	25.5	8.9	32.9	8.4	1.0	0.1	4.63
1970	1270	34.5	29.7	10.4	33.9	8.5	1.9	0.6	5.05
1975	1519	28.8	32.8	11.6	35.4	8.8	3.0	1.0	5.49
1980	1760	35.0	23.5	8.5	37.7	9.7	3.9	1.7	5.50
1985	1933	28.2	26.6	10.2	39.8	11.0	5.4	2.4	6.10
1990	2079	23.3	37.6	16.5	34.8	10.0	4.3	1.6	5.96
1995	2201	17.3	40.8	24.3	34.5	9.9	7.3	2.7	6.72
2000	2325	16.4	39.0	23.2	34.6	9.9	10.0	3.7	7.05

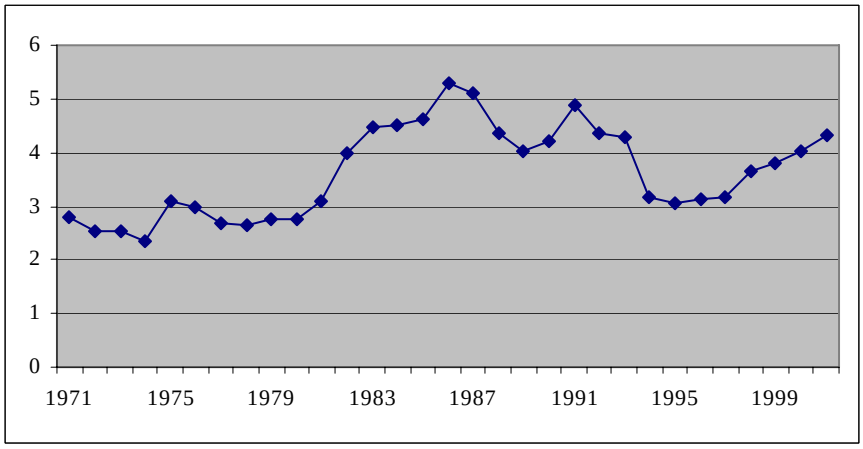
Source: Barro and Lee, 2001.

Figure 5.5 Singapore: Education Spending as % of Total Government Spending



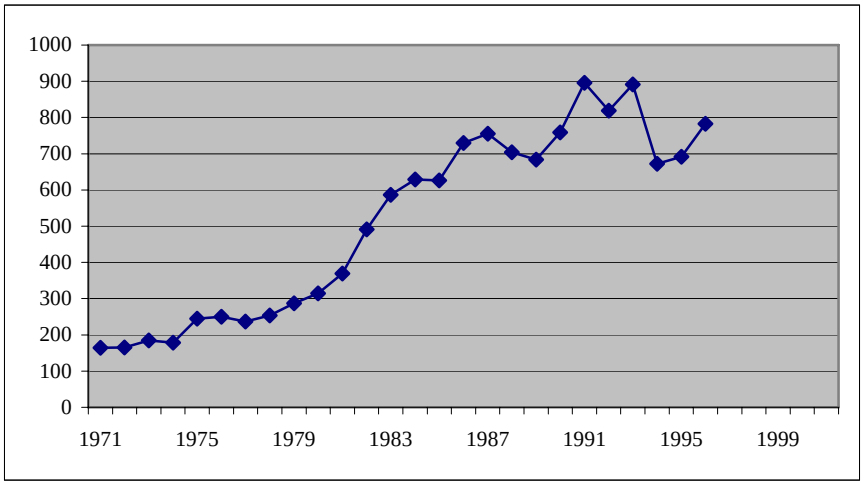
Source: Author's database.

Figure 5.6 Singapore: Education Spending as % of GDP



Source: Author's Database.

Figure 5.7 Singapore: Education Spending per capita (PPP measure, constant US$)



Source: Author's Database.

The Second Industrial Revolution and the New Education System (1979-1985)

Nevertheless, the volatility of the global market and its increasing competition soon pressured the Singapore government to make active efforts to update its industrial structure and education system so as to remain competitive in the world economy. Unfortunately the economic recession in 1985 temporarily halted these efforts.

The PAP government's efforts for industrial upgrading could actually be traced back to the early 1970s. At that time in Singapore, full labor employment was already achieved and the labor costs were rising. Facing competition from the second tier of newly industrializing countries such as Malaysia and Indonesia, the increased protectionism in the developed world and a decline in domestic labor supply arising from the government's family plan program, the PAP government decided to shift its economic emphasis from employment creation to the establishment of industries with higher technology content, using higher labor skills and leading to higher labor productivity

(Cheng, 1991; Tan, 1997). An initial strategy of the government was to force firms, MNCs in particular, to create more skilled positions and adopt more technology- and capital- intensive production through wage increases (Haggard, 1990). National Wage Council (NWC hereafter) was created in 1971 to steer wage increase, which was accelerated in 1973. However, the PAP government didn't push this policy too far at that time fearing that the possible withdrawal of MNCs under this policy to lower-cost countries would exacerbate the unemployment problem due to the leave of the British military (Ashton, Green, James and Sung, 1999). The upgrading process was further delayed by the two oil crises and the resultant worldwide recession.

The industrial upgrading in Singapore thus didn't fully start until 1979, when the NWC recommended an average 20% wage increase as part of a policy called "Second Industrial Revolution" (SIR hereafter). In 1981, the content of SIR was incorporated into the government's Ten Year Economic Development Plan (Haggard, 1990). Besides wage increase, the government adopted a number of other measures to encourage industrial upgrading. Existing industries were encouraged to reallocate through the persuasion of PAP activists. A levy, called the *Skills Development Fund*, was imposed on low-valued production to discourage companies from continuing in this area. This fund was then used for developing workers' skill and employers' ability to train. The government also hastened the process to technology-intensive industries by intervening in a number of areas such as establishing technological institutes with MNCs (Ashton, Green, James and Sung, 1999). It also targeted specific industries to provide support as well as provided tax incentives for R&D, atomization and computerization (Haggard, 1990). Consistent with

previous history, the government still favored MNCs instead of local enterprises during the SIR.

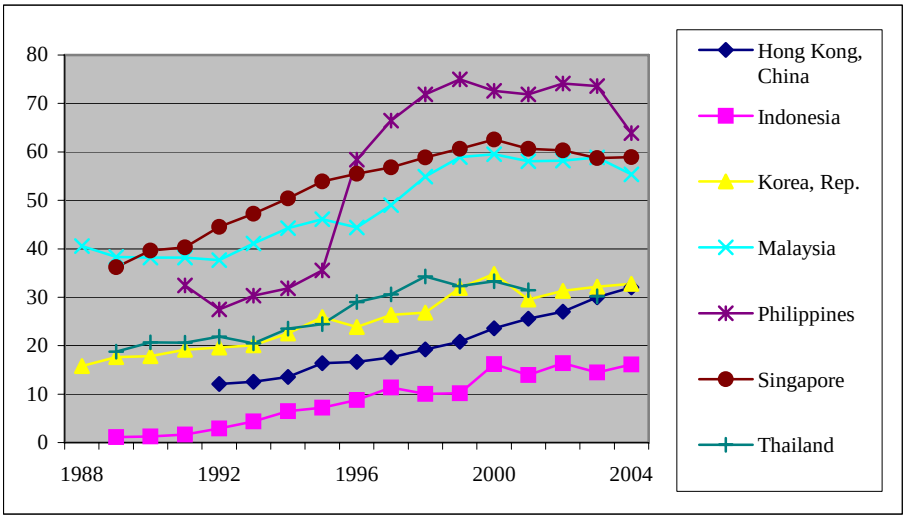
The “wage correction” policy proved to be a failure in promoting industrial upgrading. Foreign investment went down by 40% in this period and some MNCs moved to Malaysia and Thailand. There was little evidence MNCs increased their R&D activity in Singapore during this period (Ashton, Green, James and Sung, 1999). The government had to go back to a restrictive labor policy when the Singapore economy experienced recession in 1985 facing complaints from the private sector (Haggard, 1990). Nevertheless, the government’s efforts to upgrade industry can be said somewhat effective as witnessed by the changing composition of the manufacturing sector and the increasing share of high value-added finance sector, already shown in section 5.1.1 (Table 5.1 and Table 5.3). High-tech exports already composed 36% in Singapore by the end of 1990s, one of the highest in East Asia (see Figure 5.8). Table 5.5 further shows the share of professional and technical employment almost doubled between 1980 and 1990; there also began a significant increase of employment in administrative, managerial and executive occupations.

Table 5.5 Singapore: Employment by Occupation (%), 1921-1990

	1957	1970	1980	1990	1996
Professional and Managers	1.8	2.4	4.8	8.6	15.6*
Technicians and Associate Professionals	5.2	8.6	8.8	15.7	17.6
Clerical Workers	11.4	12.7	15.6	13.1	15.1
Service and Sales Workers	18.2	15.8	12.3	13.8	13.2
Production, Transport and Other Manual Labors	38.5	39.2	40.4	44.5	31

*Author's estimate. Source: Kuo & Low, 2001, Table 2; Ashton, Green, James and Sung, 1999, Table 3.1

Figure 5.8 Singapore in Comparative Perspective: % of High-tech Exports



Source: WDI Indicators.

Accompanying the government's efforts of industrial upgrading was education upgrading. The industrial upgrading, to be effective, required corresponding skills to be in place. The educational level of the population needed to be updated to an intermediate level. The Goh Report in 1979 marked the beginning of the government's efforts to update the education system. The report focused on five problems of the education system: high wastage, low literacy, ineffective bilingualism, variations in school performance and low teacher morale. The attrition rate was quite high in Singapore comparing with countries such as UK, France, Japan and Taiwan (Tan, 1997; Ashton, Green, James and Sung, 1999). Out of 1,000 people entering primary one, on average 206 dropped out of the school 9 years later, without acquiring any useful qualification or skill (Goh and Gopinathan, 2006). Bilingualism proved to be difficult for students given that only 40% of each cohort could reach the minimum level of competency (Tan, 1997; Ashton, Green, James and Sung, 1999). The top-down policy-making approach of the Ministry of Education was complained by teachers and parents as "lacking

communication with local schools”; the moral and status of teachers were also quite low (Goh and Gopinathan, 2006).

To support industrial upgrading and national development, the education system needed to be revamped with emphasis on efficiency and quality (Goh and Gopinathan, 2006). The Goh report recommended a streaming system for the primary and the secondary level. The pupils would be streamed three times at these two levels to different courses of study, based on their performance in a series of tests, mainly language and maths (Kam and Gopinathan, 1999). The principal goal of the streaming system, also called the “New Education System”, was to reduce the wastage by screening out the students who did not have the ability to succeed in academic studies and preparing them for a vocational education; less academically-able students were also identified and given one more year in secondary school so the drop-out rate could be reduced (Ashton, Green, James and Sung, 1999; Gopinathan, 1991). In 1983, all primary school students were offered English as their first language in response to the low enrollment rate at the Chinese-medium schools.

Other developments to improve the efficiency and quality of the education system during this period included the establishment of the Curriculum Development Institute of Singapore (CDIS hereafter) in 1980 and the Schools Council (SC hereafter) in 1981(Kam and Gopinathan, 1999). CDIS centralized teaching materials production while the SC started to involve the school principals into the decision-making process at the Ministry level. The government also formed a Council for Professional and Technical Education to

coordinate all the government agencies involved in education and training (Tan, 1997). The tracking system was accompanied by regular student assessment regulated by the MOE's Research and Testing Division (Goh and Gopinathan, 2006).

Technical education was upgraded accordingly in this period. The Singapore Technical Institute was established in 1981 to conduct more practice-oriented engineering courses leading to degrees awarded by the National University of Singapore. Degree programs in civil, electrical, mechanic, computer and material engineering were introduced into Nanyang Technical institute (Tan, 1997).[177] There was also limited expansion at the tertiary level, at the rate of 3.7 percent annum (Ashton, Green, James and Sung, 1999). Enrollments were increased 20 percent at the National University of Singapore, 40 percent at both the Singapore Polytechnic and Ngee Ann Technical College (*Christian Science Monitor, Jan. 11, 1982*).

Even though the fine arts (music and art) program received much attention in the early 1980s through the provision of Special Art and Music Elective programs in selected secondary schools, the school curriculum in this period was highly geared toward science and technical education based on the needs of the economy. The government's determination to gear education to the nation's economic needs has been graphically illustrated by the remarks of Tony Tan, minister of trade and industry at that time. Speaking at a welcoming convocation for new students at the National University in July

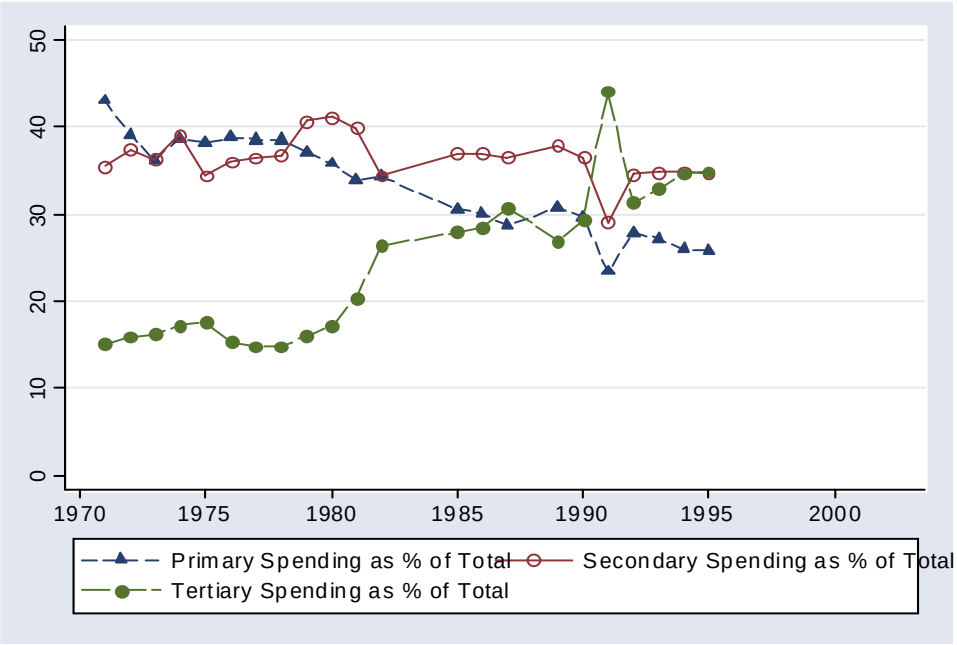
[177] The skills of the non-student labor force was further developed through programs such as BEST, MOST and COSEC, under the guidance of the Vocational and Industrial Training Board (VITB hereafter, established in 1979), as already documented by Ashton, Green, James and Sung (Ashton, Green, James and Sung, 1999). A skill development fund was also set up in this period to facilitate industrial and skill upgrading (Tan, 1997).

1981, Dr. Tan stated: "Singapore today is a young nation, very much in the growth and development phase. Our economy has an insatiable demand for technological and professional manpower…for the present I do not see any escape from the necessity to gear university education to the demands of the market. Much as many may lament the decline of humanistic or liberal education and the ascendancy of professional and technical studies, our priorities do not permit any other course…Students want it, society needs it, and the university should provide it." (*Christian Science Monitor, Jan. 11, 1982*).

The reforms in the 1970s have molded a very structured education system in Singapore based on efficiency, meritocracy and the needs of the economy. Education system upgrading in this period was associated with large increases in education spending. As can be seen from Figure 5.5, Figure 5.6 & Figure 5.7, total government education increased from 7.4% to around 20% of total government spending between 1979 and 1990; it increased by about 2% of GDP, reaching about 4% in 1990; per student spending almost tripled. The contribution of private education expenditure was small comparing with public expenditure. In 1989, private expenditure on education was only .55% of GDP (Goh and Gopinathan, 2006). Consistent with the emphasis on cultivating intermediate level of skills, the allocation priority of the government during this period went to secondary spending, which composed on average 36% of total education spending; allocation to tertiary spending increased mostly at the expense of allocation to primary spending and each of these composed about 30% of total spending (Figure 5.9).

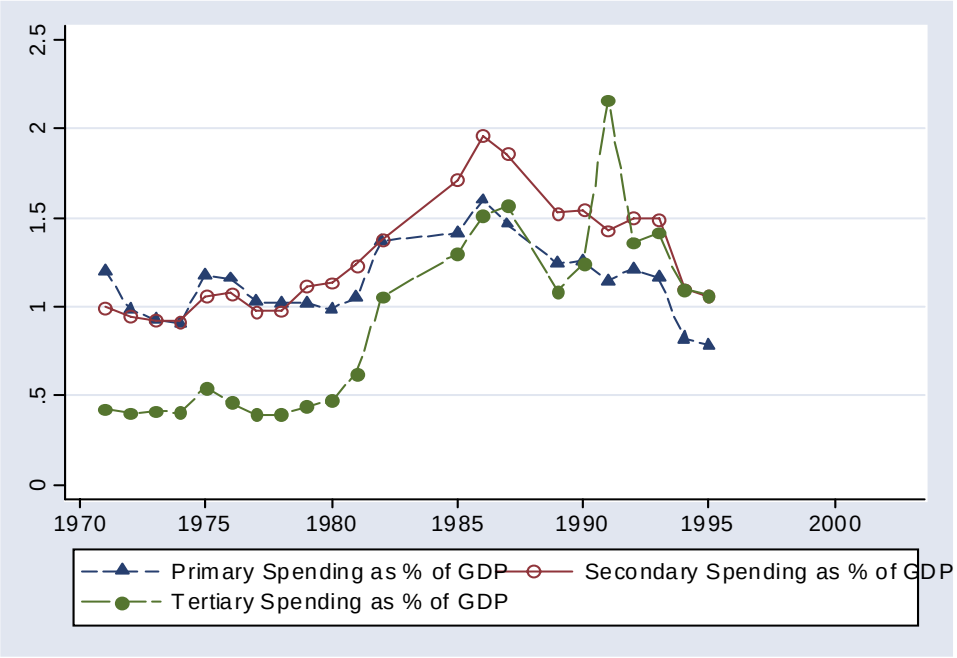
But absolute resources for all levels increased significantly due to an increasing education budget in this period (Figure 5.10 & Figure 5.11).

Figure 5.9 Singapore: Education Spending at Different Levels (as % of Total Education Spending)



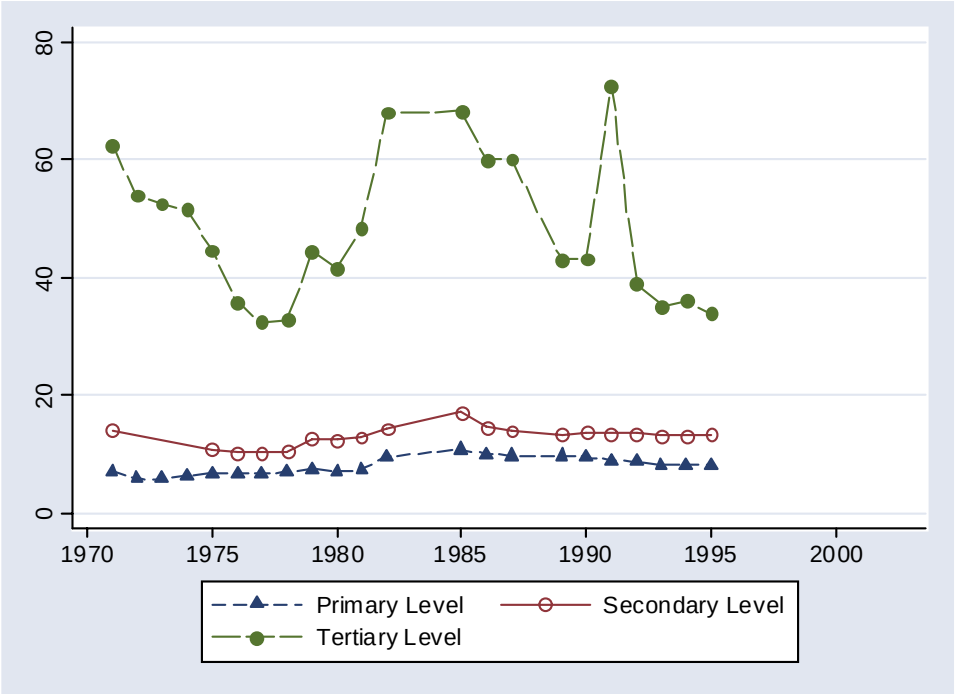
Source: Author's Database.

Figure 5.10 Singapore: Education Spending at Different Levels (as % of GDP)



Source: Author's Database.

Figure 5.11 Singapore: Education Spending per student at Different Levels (as % of GDP per capita)



Source: Author's Database.

Education outcome indicators showed the new school system was effective in expanding participation and improving literacy. Attrition rate was greatly reduced. The attrition rate of the first cohort to be streamed after the Primary School Leaving exams to secondary school was only 6% as against the previous rate of 36% (Tan, 1997). Both gross secondary and tertiary school enrollment increased almost by 10% during this ten year period (Figure 5.4). People with no schooling decreased by 10%. However, average years of school among population aged 15 and over increased only half a year, from 5.5 to 6 years, which was about two years lower than Taiwan at the same time period. This reflected the nature of the streaming system since less academically capable students were selected out for vocational training after primary school.

New Economic Strategy and Education Restructuring Toward A More Flexible System (1990 – present)

The 1985 economic crisis triggered a new period of industrial and education restructuring in Singapore. Global structural decline in two major industries of Singapore, shipbuilding and petroleum, added to the crisis. A special committee set up to review the recession and future policy directions attributed the crisis primarily by the lack of competitiveness in Singapore's manufacturing sector, which over-relied on foreign capital for technological development (Yeung, 1999)[178]. Many foreign companies also moved to lower-wage countries due to rising wages and an incomplete shift to high value-added production in Singapore (Yeung, 1999). These conclusions and pressures from the global market stimulated the Singapore government to change its economic strategy and also reform its education system accordingly.

Strategic Economic Plan: Encouraging Entrepreneurship and Developing A Knowledge-based Economy

Change of economic strategy coincided with that of leadership transition[179]. The new economic vision was made clear in the document of the new leadership - *Next Lap* (Government of Singapore, 1991) and its implication for economic development was later detailed in the *Strategic Economic Plan.* Comparative studies of Singapore with developed countries were carried out and Singapore was envisioned to reach the same

[178] The committee reported that while Singapore's industrial production expanded by an average of 4% per annum between 1981 and 1984, the average of Asian NICs was 10% (Yeung, 1999).
[179] Lee Kuan Yew, who was Singapore's Prime Minister from 1959 to 1990, handed the PAP secretary general position to Goh Chok Tong in 1991.

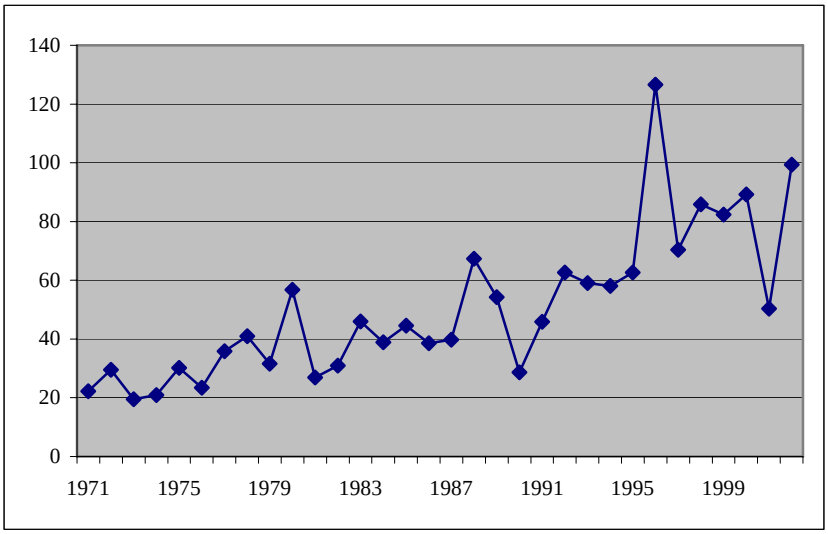
level of living as the Swiss by 2020 or 2030 (Tan, 1997; Ashton, Green, James and Sung, 1999).

The new economic strategy encouraged activism and expansion by small and medium enterprises (SMEs hereafter) and heavy investment in social and physical infrastructure. As MNCs increasingly moved to countries such as Indonesia and Thailand, SMEs were to be relied upon as the innovation source for Singapore. The plan called for specific aid to entrepreneurs and greater consultation by the government with the private sector. Another strategy was to build the external economy of Singapore by investing in developing countries such as China, Indonesia, India and Vietnam as well as developed countries (Trocki, 2006). This was a move to expand the city-state economy in the global market. In particular, the idea was proposed by then the deputy Prime Minister Goh Chok Tong to build a “growth triangle” by bringing together Singapore, Indonesia, and Malaysia on the basis of technical, sectoral and regional division of labor (Yeung, 1999). A last part of the plan was sustaining and building on the manufacturing and service sectors of Singapore, with strong emphasis on technology and innovation (Konstadakopolus, 2004).

Economy gradually recovered in Singapore in the early 1990s under the new economic strategy, as can be seen in Figure 5.3. Total direct investment abroad rose from $16.9 billion in 1990 to $70.6 billion in 1997, more than half of which was in Asia (Trocki, 2006). Figure 5.12 shows the increasing capital flow in Singapore during this period. There was also a rising share of new industries such as the biomedical (Table 5.2).

However, the Asian Economic Crisis in 1997 brought another shock to the Singapore economy. Though not as severely damaged as its neighboring countries, the economic managers in Singapore realized they either became major players or nothing (Trocki, 2006: 176). The plan accelerated to make Singapore a global hub of business, a center of excellence in Research and Development, a provider of high-valued added services such as accounting, law, training and management services, and a knowledge-based economy. To achieve this goal, international business managers were assigned to major executive positions in state-owned enterprises; the financial and telecommunications sectors were liberalized to satisfy the requirements of WTO; investment activities were further encouraged; more transparency of the state-owned enterprises are being negotiated (Trocki, 2006). However, September 11th in 2001 and the SARS epidemic in 2003 exposed again the vulnerability of the Singapore economy in the global market.

Figure 5.12 Singapore: Gross Private Capital Flow as % of GDP



Source: World Development Indicators.

Educational Response: Further Upgrading and Establishing A More Flexible Education System

The new economic strategy, aimed to excel Singapore in the global knowledge-economy, posed great challenges to the education system. The new economy now needs entrepreneurs, project managers, financial analysts and communication specialists instead of just engineers and technicians. The government has to bring the education system in line with these demands. The educational level of the population has to be updated in general[180]. Technical education should be advanced to a higher level. And most importantly, the education system has to cultivate the pupil's ability of creativity, innovation and cooperation, qualities crucial for entrepreneurship. This was not the strength of the Singapore education system in the past. In the early 1990s, there started complaints from the employers that the school system failed to produce students who can think. Accounting firm manager criticized that the skills of Singapore workers lagged behind (*Strait Times, Feb. 29, 1996*). Singapore Computer Company started to recruit talents in countries such as the U.S. due to this reason (*Journal of Commerce, April 15, 1996*). Another complaint was that Singapore lacked risk-taking people to go overseas to invest (*Journal of Commerce, Jan. 7, 1993*)[181].

All of these became the focuses of education upgrading in the new period. At the primary school level, the government introduced a pre-school preparatory program for all five year olds to compensate for the bilingual requirement of the system so that they could have enough exposure to maths and science classes as their counterparts in the developed

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[180] The economic review committee recommended updating the median education level of the population and expanding and improving education at the post-secondary and tertiary levels (Tan, 1997).

[181] Similar news reports that reflected the lack of creativity of Singaporean students: "Singapore is facing a manpower crisis in its burgeoning high-tech industry"(*The Irish Times, Sept. 8, 2000*), "Readers blame the lack of hunger in youths for the education system" (*Strait Times, Feb. 19, 2002*), "Singapore schools needs more creativity"(*Financial Times, Jan. 20, 1997*).

countries (Ashton, Green, James and Sung, 1999). In 1991, the primary school leaving exam was replaced with a placement exam and a vocational track was set up at the secondary school level so each student could have at least a minimum of ten-year education before leaving for work (Kam & Gopinathan, 1999). In 2003, compulsory primary education was introduced to ensure no school-age children would be left out of school. Teacher's education and training was also upgraded accordingly (Kam & Gopinathan, 1999).

Technical education was advanced to teach intermediate and above skills. The Industrial and Vocational Training board was renamed Institute of Technology (ITE hereafter) in 1992 and only accepted students who already finished ten-year basic education. The ITE also offers higher skill content courses so students could proceed to polytechs and universities if they want. The skills transmitted in the education system are also starting to shift from "hard" technical skills to "soft" office and business skills (Ashton, Green, James and Sung, 1999). The government began to tackle seriously the negative perception of vocational and technical education among the population by promoting many successful stories of ITE graduates in newspapers (Goh and Gopinathan, 2006).

Higher education opportunities were also expanded to meet the increasingly knowledge-based economy. The enrollment ratio was set to be 25% for universities, 40% for polytechs and 25% for ITEs by 2000. The distinction between universities and polytechs was kept due to demand from employers since the latter has a narrower focus training students with high and intermediate business and technical capabilities (Ashton, Green,

James and Sung, 1999). Another important motivation for Singapore to expand its tertiary sector is due to its aspiration to become "Boston of the East", a tertiary education provider in the region (*Strait Times, Nov. 25, 2005*). The Economic Development Board would like to have 150, 000 foreign students studying in Singapore by 2012 (*Strait Times, Sept. 6, 2004*). To achieve this goal, the Singapore government boosted cooperation with foreign universities in Australia and the U.S (*The Guardian, Nov. 8, 2005*) and planned to house 10 specialized schools in 5 years (*The Business Times, Jan.21, 2006*). In 2005, Singapore set up its fourth university: Singapore Institute of Management (*Strait Times, April 10, 2005*).

The most difficult reform though, was how to turn a highly competitive system based on exam and meritocracy into one that cultivates the students' ability to think, create and innovate. An initial attempt was *the Excellence Toward Education* reform starting early as 1985. As a response to the 1985 economic crisis, a high-level committee was set up in that year to study the situation and make improvement recommendations. In accordance with these recommendations, the Ministry of Education announced a series of guidelines in 1986. These guidelines emphasized 1) education policy must keep pace with the economy and society; 2) the basics, i.e. languages, science, mathematics and the humanities must be stressed to improve the students' logical thinking and life-long learning; 3) innovation in schools should come from the principals and the teachers instead of the Ministry. In connection with these Ministry guidelines, 12 senior school principals made a study tour in the United States and the United Kingdom, trying to identify the factors critical for a good and effective school. They published a report titled

Excellence Toward Education in 1987. This report introduced a number of reform measures to improve school quality such as establishing independent schools, training school principals and heads of departments, diversifying vocational and industrial training programs and expanding the facilities and intake rate of the tertiary education. The independent school scheme started with three schools in 1988. These schools were given a grant by the government and allowed flexibility to set their own tuition level and teacher salary. They were also given more autonomy to experiment with innovations, which, if successful, were expected by the Ministry to be applied to other schools (Kam and Gopinathan, 1999). In 1994, another category - autonomous schools was set up. These schools could receive ten percent more in annual per capita government grants than non-autonomous schools to allow them to introduce extra programs for students' personal and educational development (Kam and Gopinathan, 1999; Tan, 1998).

More structural changes were made after the *Thinking School, Learning Nation* speech by Prime Minister Goh Chok Tong in 1997, in which he emphasized knowledge, innovation and life-long learning would be crucial for the success of Singapore in the rapidly changing global society and creative thinking, communication skills and habits of independent learning, as well as compassion to learn need to be cultivated in today's pupils (Ministry of Education, 1997). The newest aim of the education system is "to make it flexbile and diverse, to nurture Singaporeans who ask questions and look for answers and to give them a broad-based education" and the newest slogan is "teach less, learn more" (Ministry of Education, 2006).

Many changes have been introduced into the school curriculum. Syllabi and examinations have been revamped to focus more on creative and thinking skills; content has been cut up to 30% in some subjects to allow time for interdisciplinary project and out of school activities. The government also made an effort to improve the standard of English among the Singaporeans. In 2000, “speak good English” campaign was launched to arrest the spread of “Singlish”- a corrupted and ungrammatical form of English reminiscent of the local patois spoken in some former British colonies in Africa and the Caribbean (Mauzy and Milne, 2002). Schools are also much better equipped with computers, internet, educational software and technical assistance with the implementation of the $2 billion Information Master Technology Plan. The government also began to include life science in the curriculum since 2001 as life science has been identified as a niche industry alongside electronics, chemicals and engineering (Koh, 2004).

Various administrative changes have been made to make the education system more flexible. The ways schools are managed and inspected are changed to include both academic and non-academic areas under the “New School Excellence” model. More autonomous schools have been introduced. Another new measure is the establishment of a “cluster of schools”, which is meant to make the education system more responsive to local demands and generate more ideas from the grassroots through devolving management power to cluster superintendents (Sharpe and Gopinathan, 2002). The MOE also started to review the current junior college and upper secondary education system with the aims to provide a more flexible system for the different talents and aspirations of students (Koh, 2004; Gopinathan, 2007). Endowment funds have been set up at the

national universities to diversify their financial resources; comprehensive reviews of the universities have been conducted to strike a balance between accountability and autonomy (Lee and Gopinathan, 2003). In January 2005, the government announced that Singapore's two public universities will be corporatized (Gopinathan, 2007). Teacher training is further upgraded and each teacher is entitled to 100-hours of in-service training per year, paid by the government (Sharpe and Gopinathan, 2002).

Education spending has been expanded in this period to make these educational upgrading possible. It was the consensus among political elites that commitments to education spending needed to be guaranteed and improved if needed (*Strait Times, Nov.11, 1992; Financial Times, Feb. 27, 1993; Financial Times, April. 18, 1994*)[182]. Total government spending has fluctuated around 20% of total government budget and 4% of GDP, pretty high in a comparative context; education spending per capita has reached around $800, a level comparable to the developed countries. Corresponding with the pattern of education upgrading in this period, the allocation to tertiary education increased at the expense of allocation to primary education. Tertiary education and secondary education each composed about 35% of the total educational budget while primary education composed about 25% at the end of twentieth century. Government recurrent expenditure on technical and vocational education per student increased from S$4,883 in 1991 to S$8,018 in 2004. Infrastructure, facilities and technical equipment are consistently upgraded to ensure that they match industrial needs (Goh and Gopinathan,

[182] In 1966, PM Lee Kuan Yee already called for the concentration of government expenditures on areas that would spark economic growth. He said "take education, expenditure on this is a necessity. In a highly urbanized society, our future lies in a well-educated population, trained in the many disciplines and techniques of a modern industrial society." (quoted from Spring, 1998:77)

2006). Another major move of the Singapore government to improve education funding was to set up the Edusave scheme in 1993 (Ministry of Education, 2007)[183]. The government provided an initial $1 billion to the endowment fund. The fund is then invested by governments and the interests earned and generated will be used to finance the contributions, grants and awards given to schools and students. The fund ensures all students could get some help from the government in one way or another.

The gross tertiary school enrollment statistics from UNESCO, though the most recent ones are not available, show a quick increasing trend after 1990. The gross tertiary school enrollment increased from 18% in 1990 to 44% in 1997. Secondary school enrollment also increased somewhat, from about 67% in 1990 to 74% in 1997 (see Figure 5.4). The attainment data shows a quicker progression than the last decade. The population with no schooling decreased from 23% in 1990 to 16% in 2000; those with tertiary education increased from 4.3% in 1990 to 10% in 2000, a quite remarkable progress in just a decade; the average years in school also increased 1 year, from 6 to 7 years (see Table 5.4). All these statistics seemed to suggest government reforms to update the general education level of the population during this period could be said effective. However, the policy changes to make the system more flexible are harder and take a longer time to be evaluated. Some studies show teachers are comfortable with the changes which are regarded as professionally challenging and exciting even though they need corresponding support from the top (Wettasinghe, 2002; Vidovich and O'Donoghne, 2003). Nevertheless, Vidovich and O'Donoghne have shown parents are relatively resistant to

[183] Information about the Edusave is obtained from http://www.moe.gov.sg/corporate/edusave_factsheet.pdf, accesses April 22, 2007.

the changes which might decrease their children's scores in national standard exams (Vidovich and O'Donoghne, 2003); school administrators are also hesitant to make the changes that reduce their power (Tan, 1998).

5.1.3 The Policy Linkages between the Economic Demand and the Education Supply

Section 5.1.2 has detailed how the Singapore government constantly upgraded its education system to match its industrial needs in response to challenges from the global market. We have seen that similar to the Taiwan case, the Singapore state has taken a lead in restructuring the economic as well as the education system. On one hand, the state has been a strategic player in guiding the upgrading of the economy in response to pressures from the global market; on the other hand, the state also actively ensures its education supply could match the perceived changing skill needs of the economy. The newly industrializing position of Singapore enabled its political leaders to learn from the advanced countries what skills are important as they designed strategic industrial policy for each stage (Ashton, Green, James and Sung, 1999). Similar to the Taiwan case, the enrollment and attainment data showed the state's policies were implemented quite well in practice. Ritchie (2005) has demonstrated how multinational corporations like Seagate move its more technologically advanced processes back to Singapore due to its competitiveness in skilled labor and R&D capability in the region. The crucial question is then besides the strategic role of the state, what are the policy linkages that enabled this close match between the needs of the economy and the provision of corresponding skills by the education system in Singapore.

Firstly, as already suggested by Ashton, Green, James and Sung (1999), the organization of government departments in Singapore ensured the close linkage of economic demand and the education supply. The Ministry of Education (MOE hereafter) is subordinated to the Ministry of Trade and Industry (MIT hereafter), which is a powerful ministry responsible for realizing the government's vision of development and ensuring the economy is geared to the demands of the international market. Such organizational structure makes sure that the requirements of the economy are also taken into account when decisions on education policy and resource allocation are made.

The extensive channels of communication existing among different government departments also facilitate the coordination of supply of education with that of industry demands (Ashton, Green, James and Sung, 1999; Riche, 2005). The MIT compiles information on the skill and education demand of the economy, with help from agencies such as the Investment Board, which helps to identify the future skill requirement of foreign investors through negotiation with them. The MIT then compares this information on future skill demand with the projection of the academics on the human resource development of the country. All of this becomes the basis for the identification of Singapore's skill needs and guidance for direction of change. The Economic Development Board (EDB hereafter), a government agency established in 1961 and playing a fundamental role in economic and human resource planning, then translates this information on future skill requirement into specific targets for the Council for Professional and Technical Education (CPTE hereafter). CPTE is the most crucial and direct link to translate the skill needs of the economy into specific targets for education

and training at all levels. Established in 1979, CPTE is a national body that sets targets for educational institutions at all levels and completes the linkage from economic needs of Singapore to education provision. Figure 5.13 visualizes this channel of communication[184].

In addition, the existence of CPTE provides a place of direct communication of all critical parties involved in matching skill demand and supply. This is demonstrated by the composition of CPTE, as shown in Figure 5.14. The CPTE is chaired by the Minister of MIT and composes of the chairman of EDB, Chairman of Public Service Commission, Representatives from the National Wages Council and NTUC[185], Minister of Education and other Ministers in charge of tertiary education. This shows how close the relationship is between industrial strategy and educational supply (Sung, 1998).

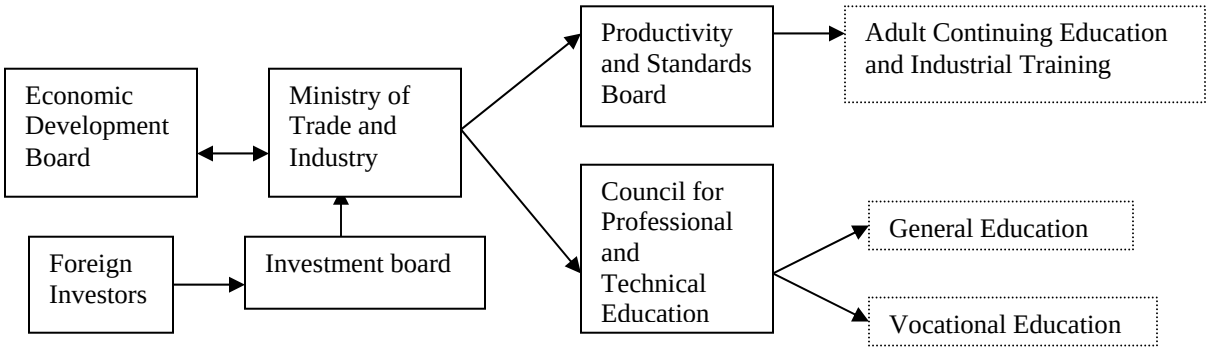
Secondly, even though the highly centralized and politically dominant PAP closely monitors policy making, the line ministries have increasingly been given the bureaucratic responsibility to design and implement new policies. Moreover, the dense cross-ministry linkages within the bureaucracy greatly facilitate policy coordination among different ministries. Ritchie has shown how policy initiatives and key personnel are often shared among ministries in Singapore, which significantly contributes to successful policy coordination and reform (Ritchie, 2005).

[184] PSB (Productivity and Standard Board) is another national body under MIT that is responsible for industrial training.
[185] The labor union is actively involved in industrial upgrading and training in Singapore.

Lastly but not least, even though the government plays a leading role in the development of education, the wide private sector participation in Singapore ensures a better match between education supply and economic demand. Not only are the employers, the unions and academia consulted, the government also encourages the participation of the private sector into the policy making process through various mechanisms (Ritchie, 2005; Tan, 1997). For example, the private sector has been incorporated into the leadership roles within the bureaucracy. The head of the NTUC directed the PSB and occupied critical leadership roles in the Ministry of Manpower. The government has also created institutions for the public and the private sector to work together. Examples include the country's research institutes and training facilities (Ritchie, 2005).[186]

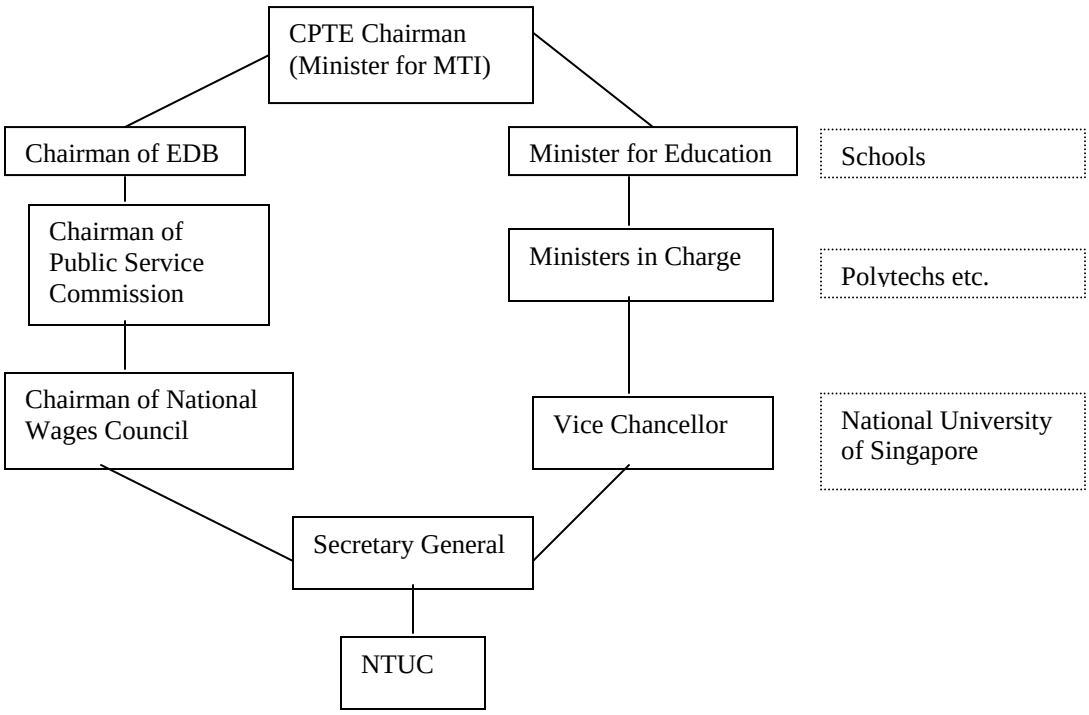
[186] Besides the state-led private sector participation in the policy making process, I don't have enough information whether the business sector played a more autonomous role such as lobbying for policy changes. Evidence shows their preference for skill demand is consistent with that of the government. However, given the limitations placed on interest groups in Singapore, I suspect the autonomous role of the private sector would be limited at best in affecting government education policies.

Figure 5.13 Singapore: The Linkages between Economy and Education



(Source: Sung, 1998)

Figure 5.14 Singapore: Composition of CPTE



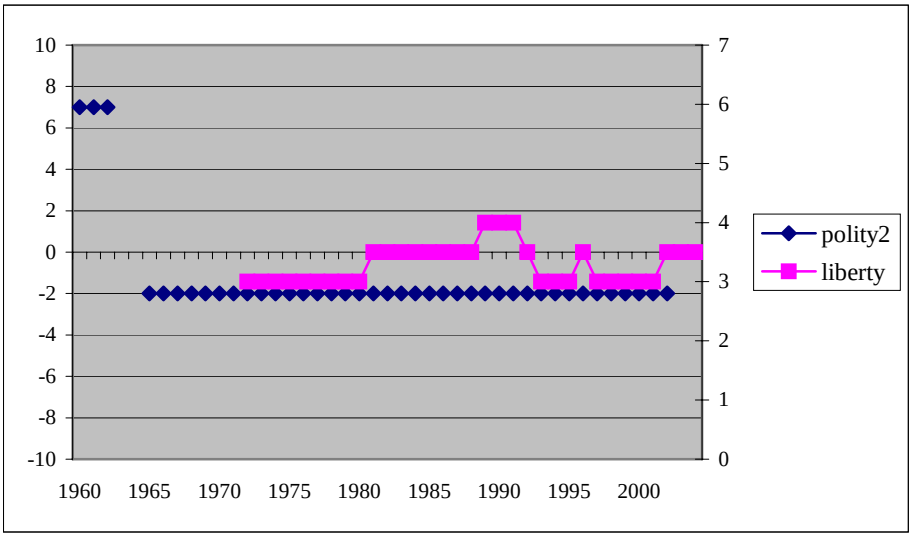
(Source: Sung, 1998)

5.2 The Authoritarian Regime and Government Education Provision in Singapore

5.2.1 The Authoritarian Regime in Singapore: An Overview

The political regime of Singapore after the PAP came to power can be separated into two periods. As can be seen from Figure 5.15 which shows the standard Polity score of Singapore, a short period between 1959 and 1965 has a score of 7 on a scale from –10 to 10 with -10 standing for most undemocratic regimes and 10 most democratic; the period after 1965 has a constant score of –2. The convention is to code countries scoring 6 or over democratic. The Freedom House liberty score shows a similar pattern. The average score of civil and political liberty in Singapore fluctuated around 3.5 after 1970s on a scale of 0 to 7 with 0 standing for the least liberty and 7 the most.

Figure 5.15 Political Regime in Singapore



Source: Polity IV and Freedom House.

After the short democratic period between 1959 and 1965, the withdrawal of the Barisan Socialis from the government in 1966 and the overwhelming victory of the PAP in the 1968 parliamentary election marked the beginning of an authoritarian regime ruled by the

PAP in Singapore until present. The PAP regime is characterized by regular election with very limited competition, successful one-party rule, control of dissidents and media, crash of trade unions, governing through grass-roots organizations and constant communication of public policy to the masses (Chee, 1991). It is also known for being corruption-free and highly efficient.

5.2.2 The Effects of the Authoritarian Regime on Government Education Provision

I argue that the authoritarian nature of the Singapore government has significant effects on its education provision: nation-building serves as a constant goal and the education system remains elite-oriented. In contrast to the Taiwan case where the political indoctrination and ideological function of the education system was gradually given away to cultivating democratic citizenship as democratization took place, a powerful authoritarian state with efficient bureaucracy ensures that nation-building and cultivating loyalty to the authoritarian state through civic and citizenship education is constantly renewed despite failures in Singapore. Also in contrast to the Taiwan case where there started a re-distribution of education resources from the elites to the masses, the education system in Singapore maintains elite-oriented throughout the authoritarian period. Lastly but not least, compared with the democratizing Taiwan case where recent education reform started from a civil education reform movement, education reforms were mainly initiated by the central government as interest groups are not mobilized in authoritarian Singapore. In contrast to the democratizing Taiwan case where electoral competition played a role in maintaining the momentum of the reform and protecting and equalizing education resources, and to its early democratic period where electoral

competition was associated with school expansion, limited electoral competition in the authoritarian period has no significant effects on government education provision. Below I will elaborate on these effects of authoritarian regime on government education provision in Singapore.

Continuing Nation-building under the Authoritarian regime

Besides serving the needs of the economy, another constant goal of the education system in Singapore is maintaining social cohesion and cultivating socially responsible citizens (Horsky and Chew, 2004; Kam and Gopinathan, 1999). This aspect of education not only provides the political order, stability and social cohesion critical for economic development, but also reinforces the legitimacy of the PAP rule. The nation-building function of the education system becomes increasingly important as Singapore transforms itself into an industrialized society in which social bonds are being eroded by all kinds of forces (Sharpe and Gopinathan, 2002) and social capital also becomes critical for success in this age of globalization (Brown and Lauder, 1996). However, nation-building through the education system proved to be never easy in Singapore.

The PAP faced a difficult task of nation-building from the beginning. The separation of Malaysia in 1965, the withdrawal of British forces, a population deeply divided by ethnicity, religion and language and the communist insurgency held little prospect for building a collective identity (Gopinathan and Sharpe, 2004). Building a “multicultural, multiracial and multilingual” society and cultivating citizens’ loyalty to Singapore as the

PAP desired thus was full of obstacles and the nationalistic education has met constant changes and failures.

After coming to power, the PAP adopted meritocracy, a common school curriculum and a bilingual policy for its education system as recommended by the 1956 *All Party Report on Chinese Education* (Gopinathan, 1991). Such policy was to ensure the equal treatment of all language groups and all pupils were given the same opportunities based on their talent. However, the implementation of this policy went together with arrests of Chinese dissidents who expressed grievances (Chee, 1991). A national school system starting in 1983 which only offers English as the first language has to coexist with the preservation of Special Assistance Chinese schools due to the pressure of the Chinese community, which of course drew criticism from other segments of the society (Gopinathan, 1998). The "Speak Mandarin Campaign" which was initiated in 1979 by Prime Minister Lee Kuan Yew as part of the efforts to promote cohesion among the Chinese community and preserve the Confusion tradition constantly caused complaints from the English-educated Chinese, different Chinese dialect groups as well as other ethnic groups who felt the government was giving favorable treatment to the Chinese.

The attempt to strengthen citizens' loyalty and identification with Singapore through civics and moral education was not smooth either. The practice of flag raising and pledge-taking was introduced in schools as early as 1966 (Gopinathan and Sharpe, 2004). However, early civic and moral classes such as *Ethics* in primary school (1959), *Civics* in secondary school (1962), *Education for Living* Program (1973) were regarded as weak by

the government (Chew, 1998). As the government began to upgrade the education system in 1979, moral education was also reviewed. The New Education System required the provision of moral education as a subject in both primary and secondary school (Kam and Gopinathan, 1999). Two sets of books titled *Good Citizen* and *Being and Becoming* were produced by the centralized Curriculum Development Institute of Singapore. Not long after, the government introduced *Religious Knowledge and Confusion Ethics* as compulsory and examinable subjects in upper secondary class in 1984 to complement existing moral programs (Chew, 1998). However, due to the objection that these classes might institutionalize existing ethic and group differences, contribute to religious revivalism and thus be harmful to the unity of Singapore, they were quickly abandoned in 1990 (Tan, 1997). By 1995, a new series of Civics and Moral Education was ready for full implementation in school (Chew, 1998).

These constant changes in the government's implementation of civics and moral education reflect the difficulty of citizen education in a multi-ethnic society like Singapore. The PAP leaders have became particularly concerned about citizen education since 1981, the first time when the PAP lost one seat in a parliamentary by-election (*The New York Times, May 20, 1982*). Prime Minister Lee Kwan Yew worried that Singapore was losing its Asian values due to speaking English and the influence of the west (*The New York Times, Nov. 15, 1988*). The *Speak Mandarin Campaign* I mentioned before was a response to these concerns (Gopinathan, 1998). But this program, like the *Religious Knowledge and Confucian Ethnics* Class, was not received well by all societal

groups. However, the importance of value education for nation-building dictated the PAP government to continue revamping it.

The civic and moral classes in the 1990s increasingly focuse on a nationalistic citizen education for Singapore. The curriculum content reinforces the official ideology and stresses the importance to have high economic growth, racial and religious harmony, right population growth and "strong and capable political leadership" and the social responsibility of a Singaporean to contribute to a good life with all these great qualities (Chew, 1998). This refocus on national education was even clearer when the Prime Minister Goh Chok Tong announced the need for "national education" at all levels of schooling in 1995, which was then launched by Deputy Prime Minister Lee Hsien Loong in 1997. National education was a new response by the PAP leaders to the failure of citizenship education in the past. Active citizens are lacking in today's Singapore that changes rapidly and becomes increasingly unable for a small group of social elites to govern (Gopinathan and Sharpe, 2004). The tenuous social bonds of the Singapore society are further weakened by increasing income inequality[187], increased mobility and access to information, a greater willingness to disagree and to question and most significantly, the importation of foreign talents (Sharpe and Gopinathan, 2002).

Unlike traditional civics and moral classes, the content of national education was infused into Civics and Moral classes, Social Classes, History and Geography and the general papers taken by Junior college students. The students are also required to observe Total

[187] The Gini index of Singapore increased from .43 in 1974 to .48 in 1999 (Mukhopadhaya, 2003), a level higher than other NICs.

Defense Day, International Friendship Day, Racial Harmony Day and National Day. They are also taken to museums to learn history more vividly. The objective of national education is to maintain social cohesion, the instinct of survival and the confidence in the future by making students aware of the selected history, achievements of Singapore and what happened globally (Gopinathan and Sharpe, 2004; Boon and Gopinathan, 2005). The desired outcomes of national education, should be a citizen that is responsible to himself, his family, his friends, his community and country (Ministry of Education, 2007)[188]. The effectiveness of this program is yet to be evaluated given past studies that moral and civic education classes are often slighted in an exam-centered system based on meritocracy (Chew, 1998). Moreover, the impacts of distant past of survival on a generation born in affluence are also questionable (Gopinathan and Sharpe, 2004). Studies also show that the experience of home and belonging amongst Singaporeans is largely framed in the material and social modernity of everyday life in Singapore instead of deeper emotional attachments (Velayuthan, 2004). The terrorist attack on the U.S. and the subsequent U.S.-led wars in Afghanistan and Iraq put new strains on social cohesion in a multi-ethnic society like Singapore. The MOE has identified the strengthening of interethnic relations in schools as a major priority for the next three years (Gopinathan, 2007).

An Elite-Oriented Education System

Another characteristic of the education system under the authoritarian regime in Singapore is its elite-orientation. This elite-orientation is not obvious as the system is

[188] This information is obtained from http://www.moe.gov.sg/corporate/desired_outcomes.htm, accessed April 22nd, 2007.

based on meritocracy. The government has been keeping public schools, and universities, affordable and open to all school-aged children and youths who qualify according to meritocratic selection regardless of race, gender and class background (Mukhopadhaya, 2003). However, given that brighter students tend to be those who have a better educational environment, frequently have parents who are better educated and thus are more likely to come from the rich and middle-class families, the system can be said elited-oriented. Mukhopadhaya (2003) has demonstrated that various merit scholarships and bursaries established by the government in early 1990s aiming at equalizing education opportunities for all, in several cases benefited kids from the rich and the middle-class families. Moreover, considering that the level of subsidies increases with the educational level, regardless of socio-economic group and there exists a correlation between parents' educational background and students' academic performance, the issue of equity in the distribution of educational resources is calling into question.

The recent educational reform to increase school autonomy by establishing independent and autonomous schools also seems to exacerbate the inequality of the education system. Independent and autonomous schools are usually converted from well-established and prestigious schools; they are academically selective and charge a much higher fee than other government schools.[189] There is already evidence that students from wealthier family backgrounds are over-represented in independent schools (Tan, 1998). Furthermore, the more competition among schools introduced by the MOE in 1992 seemed to create a hierarchy of schools with independent and autonomous schools at the

[189] For example, monthly independent school fees ranged between 50 and 100 Singapore dollars in 1990, way above the 10.5 Singapore dollar in non-independent secondary schools (Tan, 1998).

top as elite institutions for wealthier students. Since 1992, all secondary schools and junior colleges have been publicly ranked on an annual basis and the results have been published on local newspapers. However, since the ordinary schools are actually not competing on an equal footing with more autonomous and well-funded independent and autonomous schools, the increased competition created a vicious cycle for ordinary schools since they are not able to attract high academic achievers. Thus, independent and autonomous schools tend to develop as elite institutions for the brighter and the wealthier students (Tan, 1998; Gopinathan, 2007). Even though the government is well aware of the potential impacts of social stratification on social cohesion and its legitimacy, it claims that the education system is fair as it is based on merit and it is only right to nurture the more able students as the whole country will ultimately benefit (parliamentary Debates 59, January 16 1992: 365; quoted from Tan, 1998).

5.2.3 The Impacts of Electoral Competition and Interest Group Politics

Haggard and Kaufman have noted how the short democratic period between 1959-1965 in Singapore was associated with rapid education expansion (Haggard and Kaufman, forthcoming). This period was characterized by active competition between the PAP and the Communist Party (Barisn Socialis, BS hereafter), which separated from the PAP in 1961(Chee, 1991). The PAP government made promise of free, universal primary education in its 1959 campaign and embarked on massive school expansion program after it won the election. In the nine years from 1959 through 1967, nearly 72 million Singapore dollars were spent building 101 new government schools, and over three million dollars more were provided as grants to 30 government-aided schools for new

buildings. School enrollment continued to expand until universal primary schooling was reached in 1968. The teacher's education was expanded accordingly to accommodate the expansion in school enrollment (Thomas, Leong, Mosbergen, 1980).

Electoral competition has been very limited during the authoritarian period. It has been noted that even though the Singapore people generally want more opposition in the parliament, they recognize no viable alternative to the PAP rule, the opposition parties find it hard to get capable candidate to run and the more open and consultative style of the Goh Chok Tong government didn't gain the PAP more votes in the 1991 parliamentary election (Vasil, 2000). Does the limited electoral competition in the authoritarian period of Singapore still have any effect on government education provision? There is some evidence that elections are still important for the PAP leaders as they read election results as a popular endorsement of their legitimacy[190] and the PAP government started to link voters' support with public service provision in recent elections[191]. Thus electoral success can be argued to provide some kind of general incentive for the PAP government to provide quality public goods such as housing, education and healthcare. However, I cannot find direct linkages between electoral competition and government education provision. Education policy has not been a salient issue in elections. The PAP government cancelled the unpopular "graduate mother

[190] PM Lee Kuan Yew took a series of measures to strengthen the PAP rule including tighter control of the media after the PAP lost one parliamentary seat for the first time in 1981, to a Worker's Party candidate, J.B. Jeyaretnam, who ran on a platform of greater social welfare and sensitive government in a traditionally PAP dominated, working class constituency - Anson (*The Washington Post, Feb. 9, 1982*). He also looked upset and defeated when the PAP's popular vote decreased from 76% to 63% in the 1984 election. PM Chok Gok Tong said he didn't get the endorsement he wanted and would stop policy changes to a more open and consultative government after the 1991 election didn't give him as many votes as he would like.
[191] In both 1991 and 1997 elections, the PAP leaders threatened the voters they would withdraw public service programs in constituencies they didn't win.

scheme" only after the 1984 election[192]. It established communal self-help assistance programs – Council for the Education of Muslim Children (MENDAKI) in 1982, Singapore Indian Development Association (SINDA) and Chinese Development Assistance Council (CDAC) in 1992 to help the Malay, Indian and Chinese communities improve the performance of their poorly performed students in a meritocracy-based education system, which was attacked by the opposition parties as ignoring the poor and the academically weak students in the 1984 election (*The Guardian, May 3rd, 1985*). But I can find no evidence these groups are formed directly due to the electoral concerns of the PAP. The PAP leaders long expressed worries that the ethnic disparity in education performance might cause social instability (Vasil, 2000) and MENDAKI was formed well before the opposition attacked the New Education system. The government also only took measures to address public criticism to the elite-oriented independent schools after it lost the parliamentary majority in the 1991 general election.[193] There was also evidence that voting is a complicated issue and the voters do not simply reward generous social programs. The general public service package, including a $5 billion Edusave program proposed by the PAP government before the 1991 election didn't win the PAP more parliamentary seats and popular votes than the previous election because some voters suspected such big spending might hurt the Singapore economy (Vasil, 2000).

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[192] This scheme provided direct financial benefits and special school enrollment privileges for graduate mothers having more than two children. It also offered financial and other benefits for the voluntary sterilization of women with little education who had at least one child and whose total household income fell below a certain specified level (Mauzy & Milne, 2002: 60).

[193] First, the government limited the number of independent schools, thus reversing its earlier announcement that it wanted to see more schools turn independent; Second, the government appointed cost-review committee expressed concern over the high fees charged by the independent schools. Third, a new category of school-autonomous schools was established in 1994 which are offered the same flexibility as than the independent schools but charge lower fees (Tan, 1998). In 1993, a small family scheme was established to give financial incentives, in the form of social security fund and monthly children's education stipend, to poor two-children families with no mothers under 45 (Chua, 1994).

On the other hand, in contrast to the Taiwan case, interest groups are not mobilized in Singapore to publicly advance their education demands. Unlike Taiwan where recent education reform was pushed forward by a civil education reform movement, major reform measures in Singapore were all initiated by the central government. Back in the democratic period between 1959 and 1965, the PAP already started to establish party-controlled grass-roots organizations such as People's Association, Citizens' Consultative Committees to harness popular demands and interests (Bellows, 1970). During the authoritarian period, these party-controlled organizations continue to serve similar functions and western-style interest groups are not allowed except based on the principle of ethnic self-help (Mauzy and Milne, 2002). To be tolerated by the government, the ethnic self-help groups must shun overt politics and avoid all semblance of confrontation with the government (Barr, 2003). One case in point is the Association of Muslim Professionals (AMP hereafter), established in 1991, to promote the interests of the Malays as the organizers felt that the government organized Malay self-help groups didn't help promote Malay interests enough. It receives government support and operates out of premises rented from the government for a nominal fee. When the AMP put forward a plan for "Malay collective leader" in response to the feeling that Malay MPs had failed to articulate the views of the Malay community, especially regarding the compulsory education issue, its members were warned by the Prime Minister not to split the Malay Community and not to stray into the political arena.

5.3 Conclusion

In this chapter, I argued that similar to the Taiwan case, integration into the global market had a profound influence on government education provision in Singapore. The volatility and increasing competition in the global market was perceived by the Singapore government to exert particular pressure on its economy given its small size and limited natural resources. In response to these pressures from the global market, the Singapore government constantly updated its industrial structure and education system in order to stay competitive in the global market.

The PAP government quickly adopted an export-promotion policy based on labor-intensive industries, MNCs and state-owned enterprises after its separation from Malaysia. At this initial stage of industrialization during which Singapore faced little competition from the global market, the economy mainly required semi-skilled labor. The goal of the education system in this period thus focused on improving the basic numeracy and literacy of the population and cultivating basic technical skills. The economy exhibited remarkable growth during this period; primary education quickly reached universal enrollment and secondary enrollment also expanded. However, dropout rate of the education system was also quite high due to the bilingual requirement.

Increasing competition in the global market in the 1970s started industrial and education upgrading in Singapore. With rising wages and full employment reached in Singapore in early 1970s, the government felt the Singapore economy gradually lost it competitive advantage in labor-intensive industries as the second tier of newly-industrializing

countries with cheaper labor started to produce for the global market. The Singapore government initially adopted a strategy of forcing industrial upgrading through wage increase. This policy, which couldn't be fully implemented after the two oil crises and worldwide economic recession, proved quite unsuccessful in achieving its goal and was blamed for causing the economic recession of 1985. Other government measures to stimulate industrial upgrading to more technology-intensive industries included tax incentives for R&D, automization and computerization and establishing technical institutions with MNCs. By the end of 1980s, the economic structure and employment structure data shows the upgrading can be said somewhat effective. To ensure the changing manpower needs of the economy was in place, the government also adapted its education provision accordingly. This period witnessed the establishment of a supposedly more efficient New Education System characterized by streaming students into different tracks based on their academic capability. Curriculum writing was centralized and the emphasis continued to be on maths and technical subjects. Technical education was also upgraded to prepare for medium level technicians with the establishment of the first Technical Institute of Singapore. A vocational and industrial training board was set up in 1979. Tertiary education was expanded as well, though at a limited pace. These educational changes were accompanied by increases in education spending and enrollment at desired levels. However, the average years of education of the population remained relatively low given that some students were streamed for vocational training early.

The 1990s marked another stage of industrial and education restructuring in Singapore. After the economic downturn in 1985-86, the vision of the PAP leaders was that Singapore already exhausted the potential of manufacturing expansion and new engines of growth need to be sought in the world market with greater competition. The new economic strategy focused on technology and innovation, factors critical for success in a global knowledge economy. The government encouraged the growth of SMEs, regional and worldwide investment activities and high value-added services. These new economic strategies require people with entrepreneurship, creativity and ability to take risk and innovate. They also require the population to have a higher level of education in general. In response, the Singapore government made significant restructuring of its education system. Since 1991, all pupils have been guaranteed a minimum ten-year basic education and in 2003, primary education finally became compulsory. A vocational track was set up the secondary school level; the Vocational and Industrial Training board was renamed Institute of Technical Education in 1992 and only accepted student who completed secondary education. Tertiary education opportunity was greatly expanded. However, the more difficult reform task was how to make the once highly competitive system based on exam and meritocracy into one which could cultivate students to think critically and innovate, as required by the new economy. Initial measures included the establishment of independent and autonomous schools which were given more local autonomy. More measures were adopted after the “Thinking School, Learning Nation” speech by PM Goh Chok Tong. Many changes were introduced into school curriculum to cultivate the thinking and innovative abilities of the students; the teaching of English, ICT and life science were emphasized. Administrative reforms at various education levels were also

in place to make the system more flexible and attentive to local needs and autonomy. Education spending was expanded to keep up with the education expansion. A $5 billion Edusave plan was established to help students pay for their education. The enrollment and attainment data show the rapid educational developments achieved in this period, especially at the secondary and tertiary level. However, the reform to make the education system more flexible is much harder.

The Singapore state played a leading role in this close match between industrial and education upgrading in response to challenges from the global market. In practice, the match was made possible by various efficient policy linkages within the Singapore state. The subordination of the Ministry of Education to the Ministry of Trade and Industry ensures education plans could take into consideration the industrial requirement through dense communication channels. The Council for Professional and Technical Education under MTI directly brings together members responsible for economic policy making and education policy making for information-sharing and policy negotiation. In addition, relative bureaucratic autonomy at the line ministry level, dense cross-ministry linkages and the wide participation of the private sector in the policy making process all greatly facilitate the effective upgrading of the education system to serve economic needs. The success of the match has been proved by the constant popularity of Singapore as an investment site, despite increasing international competition. Sakellariou has also shown the return of education has not decreased in Singapore due to the reason that education expanded with industrial upgrading (Sakellariou, 2003).

The Singapore state has remained authoritarian since the PAP became dominated in parliament in 1968. Accompanying the economic logic of education supply in authoritarian Singapore is another logic of nation-building, which was critical for maintaining social cohesion and political order in a multi-ethnic state based on meritocracy and authoritarian leadership. This task was not an easy one from the beginning given the multi-culture, multi-ethnic and multi-language nature of the Singapore society. The tenuous social bonds were even more vulnerable as economic development also brought increasing income inequality, mobility, access to information and willingness to question and disagree. Even though the PAP long established the principle of "equal treatment of all languages", the implementation of any language policy was never smooth given its possible implication for ethnic parity. Various versions of civic and moral education to strengthen the loyalty of the Singaporeans have been tried and proved unsuccessful. Citizenship education was increasingly emphasized since the 1980s. The "national education" launched in 1995, a response of the PAP leaders to the lack of citizens committed to public service, marked a new stage of citizenship education in Singapore. Students are required to learn the history and achievements of Singapore through both formal curriculum and informal activities. The goal of national education is to cultivate citizens who love, know and be willing to serve Singapore. However, its effectiveness is yet to be evaluated.

Unlike the democratizing Taiwan case where a redistribution of education resources from the elites to the masses took place as democratization progressed, the education system in Singapore can be said remaining elite-oriented. Although the system is based on

meritocracy, brighter kids are more likely to come from wealthier families and with better-educated parents. Thus scholarships based on merit are likely to benefit kids from richer families. On the other hand, top schools with strict merit-selection criteria and higher fees end up becoming elite institutions. Such elite-orientation of the education system is consistent with the core values of the PAP regime (Chang, 2003; Barr, 2003; Horsky and Chew, 2004).

Although electoral competition in Singapore between 1959 and 1965 was associated with early school expansion, there is no evidence that the very limited electoral competition during the authoritarian period had any significant effects on government education expansion. On the other hand, western-style interest groups are not allowed in Singapore. Thus unlike Taiwan where recent education reform started from a civil education reform movement, reform measures in Singapore were mainly initiated by the central government.

The PAP government is as strong as before to control the Singapore society.[194] There is little doubt that the state would still remain central in education provision (Gopinathan, 2007). The challenge of globalization for the PAP government then is whether it could effectively reform its education system to produce the type of individuals with innovation and creativity required by the newest knowledge economy. Teachers, students and parents who got used to a system once heavily based on maths, science, technology, rote learning and exams may have a hard time adjusting to learning creativity and risk-taking,

[194] The popular votes of the PAP increased during the recent two elections comparing with the 1990s. The opposition parties won only two seats in both of them.

especially with the principle of meritocracy still central in Singapore society.[195] Another question, is what kind of creativity can be "taught" in a structured society like Singapore with limited local governance and political participation. It has been suggested creativity taught in Singapore can best be described as "rational problem solving" (Brown and Lauder, 1996). If, as Brown and Lauder argued, social capital such as trust and willingness to cooperate is as important as intellectual capital for success in the knowledge economy, the Singapore state has a even harder time meeting the demands of the new economy since maintaining social cohesion has proved to be a difficult task in the past (Brown and Lauder, 1996) and in a system which favors elites (Gopinathan, 2007).

Similar to the Taiwan case, findings on the effects of globalization in this chapter are different from the null-effect finding of the statistical studies. The trade indicators prove to be poor in capturing the aspects of globalization that affected government education provision. Profound changes in government spending and education structure took place when the trade indicators remained relatively constant. The trade intensity ratio fluctuated around 375% of GDP and the policy indicator remained constant after 1979, but all three specifications of spending increased until 1991, a period during which the Singapore government was active in updating its education system in response to increasing competition from the global market. [196] The capital account openness indicators were

[195] Five years after the "Thinking School, Learning Nation" Initiative, a girl in primary school still has less than 2 hours free per day (*The Guardian, Aug. 27, 2002*). Project work initiatives have been institutionalized and in schools well used but in many other schools it has been selectively routinised and absorbed into the teachers' repertoire (Gopinanthan, 2007).

[196] Between 1971 and 1980, the trade intensity ratio increased constantly from 240% of GDP to 439% and the policy indicator of current account openness also increased two times in 1974 and 1977 respectively,

also poor to capture the effects of globalization. Foreign direct investment and gross private capital flow in Singapore didn't increase significantly until 1991 even though education spending increased between 1979-1991 in response to the increasing competition from the second tier of industrializing countries. The policy indicator of capital account openness only changed twice in 1973 and 1978, with no significant changes in education spending yet except for the per capita specification.

On the other hand, another reason for the null-effect finding in the statistical study is that the spending indicators only partly captured the changes in government education provision affected by globalization: when foreign direct investment and private capital flows started to increase after 1991 and significant structural changes have been made to Singapore's education system, education spending only fluctuated around the high levels already reached.

Findings on the effects of authoritarian regime in this chapter are pretty consistent with the statistical study that democratization is associated with a shift of education resources from the tertiary level to the primary and the secondary level. An early democratic period in Singapore was associated with primary school expansion and there was no significant shift of resources from tertiary education to primary and secondary education under the authoritarian regime in the 1990s. In contrast, the education system continues to favor elites.

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but education spending didn't rise significantly as percent of total government spending and as percent of GDP.

Chapter 6 Globalization, Competitive Authoritarianism and Government Education Provision in Malaysia

In this chapter, I study how globalization and the competitive authoritarianism in Malaysia affect its government education provision. I start the study in 1957, when Malaysia gained its independence and cover materials until present.

I argue that similar to the Taiwan and the Singapore case, integration into the global market had significant impacts on government education provision in Malaysia. Later than Taiwan but around the same time as Singapore, Malaysia government started its period of industrialization based on export promotion in early 1970s. However, due to its richer natural resources, globalization affected government industrial strategy and education provision much later in Malaysia. Whereas Taiwan and Singapore governments already actively promoted upgrading of their labor-intensive industries and their education system in the late 1970s in response to competitive pressure from the world market, the Malaysian government adopted the same strategy almost a decade later after the prices of natural resources fell sharply in world market in middle 1980s, a time the government also realized that its labor-intensive exports would soon lose competitiveness as countries such as China and India entered the world market. Since then, industrial and education upgrading were perceived to be key strategies for the Malaysian government to survive in the increasingly competitive world market. Profound changes took place in government education provision. From early 1990s, human resource development through education and training became the top priority of government development plans in Malaysia whereas before the most important goal of

education provision was to cultivate national unity by addressing ethnic inequality. Fundamental reforms of the education system have been further carried out since middle 1990s to produce students with skills needed by the upgrading economy. Another purpose of the Malaysian government to implement these reforms is to make the education sector competitive in the global market as it is identified as a new engine of the country's economic growth, a trend also seen in Singapore.

The political regime of Malaysia has proved to be of authoritarian style after the 1968 racial riots. Similar to Taiwan before democratization and the authoritarian Singapore, the authoritarian government in Malaysia initiated all education reforms from top and cultivating national unity has been a constant theme of the education system. However, unlike authoritarian Singapore where I didn't find any significant impact of the competitive nature of the regime on government education provision, a more competitive parliamentary democracy in Malaysia has provided more space for interest groups to advance their educational demands. Electoral competition also played a role in materializing education reforms. However, a more authoritarian style of the Malaysian government in recent years is also associated with tighter control of its educational groups. These findings are consistent with the finding in Taiwan that a more democratized regime is associated with a more liberalized government education provision pushed by interest groups politics and electoral competition.

This chapter will be structured as follows. Section 6.1 will discuss how the changing nature of Malaysia's integration into the global market affects its education system.

Section 6.2 shows how the competitive nature of the Malaysia regime influences its education provision. Section 6.3 presents the conclusion.

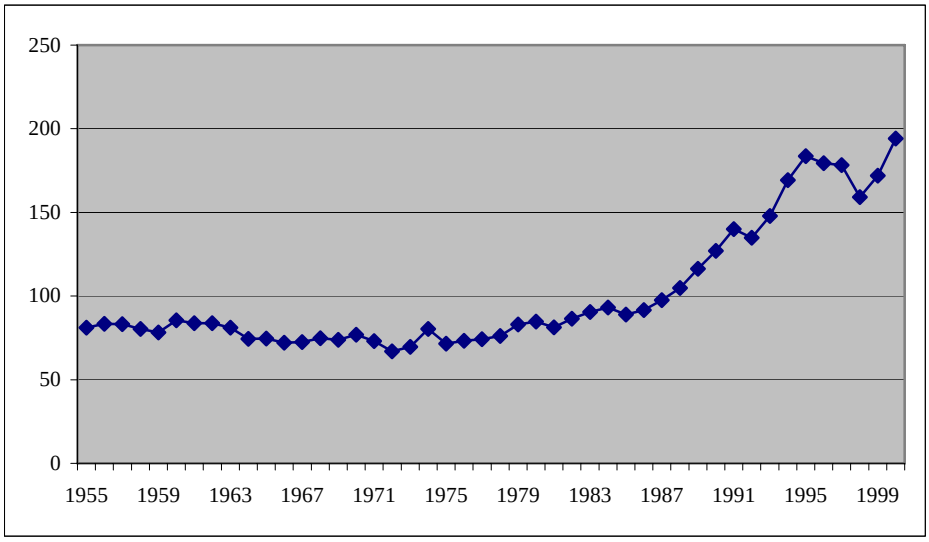
6.1. Globalization and Government Education Provision in Malaysia

6.1.1. Globalization in Malaysia: An Overview

Malaysia's economy was already highly dependent on trade at its independence. As can be seen from Figure 6.1, the trade intensity ratio of Malaysia already reached 83% in 1957, comparing with only 24% in Taiwan in the same year. However, unlike Taiwan whose trade intensity ratio started to increase in early 1960s and stabilized around 100% in 1970s, Malaysia's trade intensity ratio didn't start to rise significantly until middle 1980s, after which the ratio continued to rise to about 180% in the late 1990s. Foreign direct investment and gross capital flow also rose sharply in Malaysia in middle 1980s, as can be seen in Figure 6.2 and Figure 6.3. Foreign direct investment soared to 9% of GDP comparing with only 1% in 1987; gross private capital flow also reached a high of 25% of GDP in 1993 comparing with only 5% in 1987. Even though both measures dropped somewhat in early 1990s, they fluctuated at a level much higher than before the middle 1980s.[197] All these quantitative measures of openness show a continuing trend of the already open Malaysian economy to integrate further into the global market since middle 1980s.

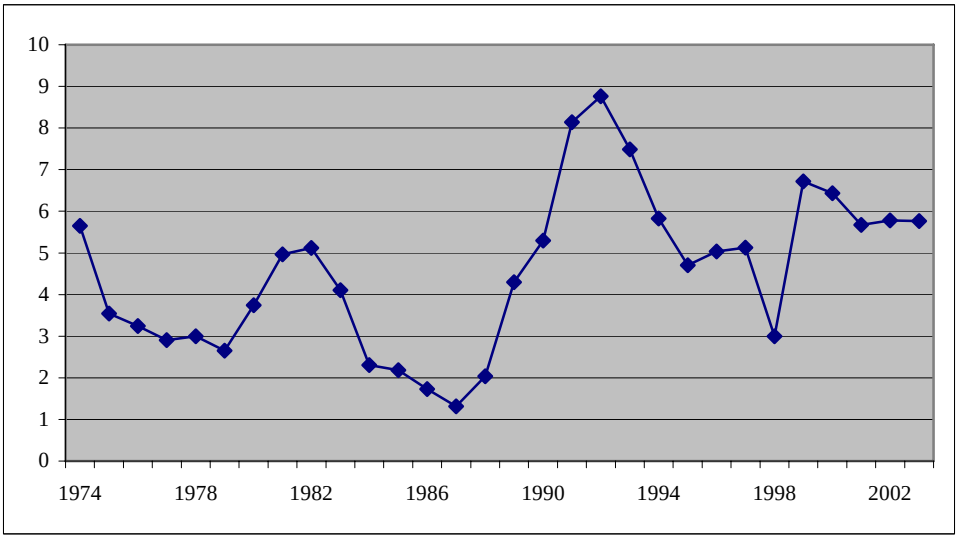
[197] Based on my coding of the IMF's *Annual Report on Exchange Restrictions*, Malaysia's current account openness increased from 5 to 6 in 1973 and from 6 to 6.5 in 1994 on a scale of 0-8 where 0 stands for least open and 8 the most; the score of its capital account openness increased from 2 to 3 in 1985 on a scale of 0-4 where 0 stands for least open and 4 the most.

Figure 6.1 Malaysia: Trade Intensity Ratio (1955-2000)



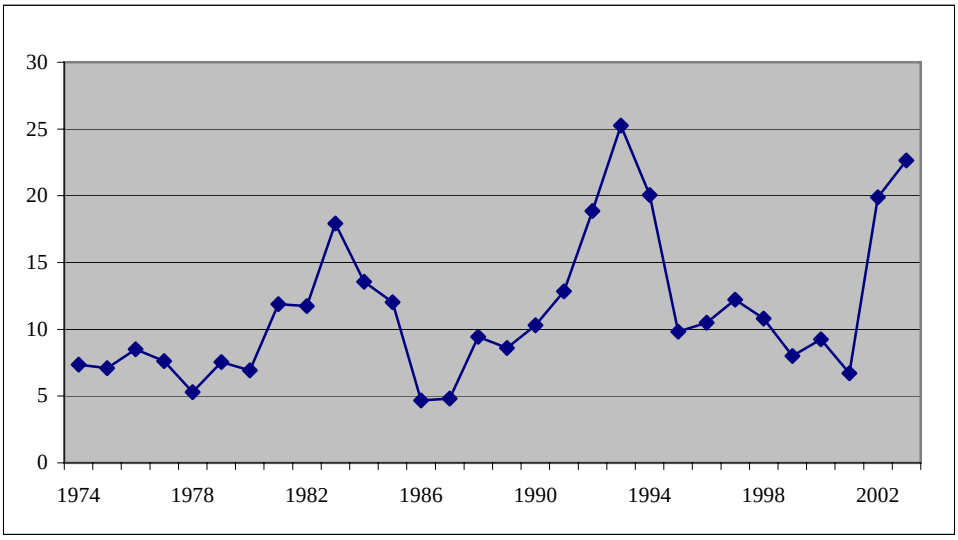
Source: Penn Table 6.2.

Figure 6.2 Malaysia: Foreign Direct Investment as % of GDP (1974-2003)



Source: World Development Indicators.

Figure 6.3 Malaysia: Gross Private Capital Flow as % of GDP (1974-2003)

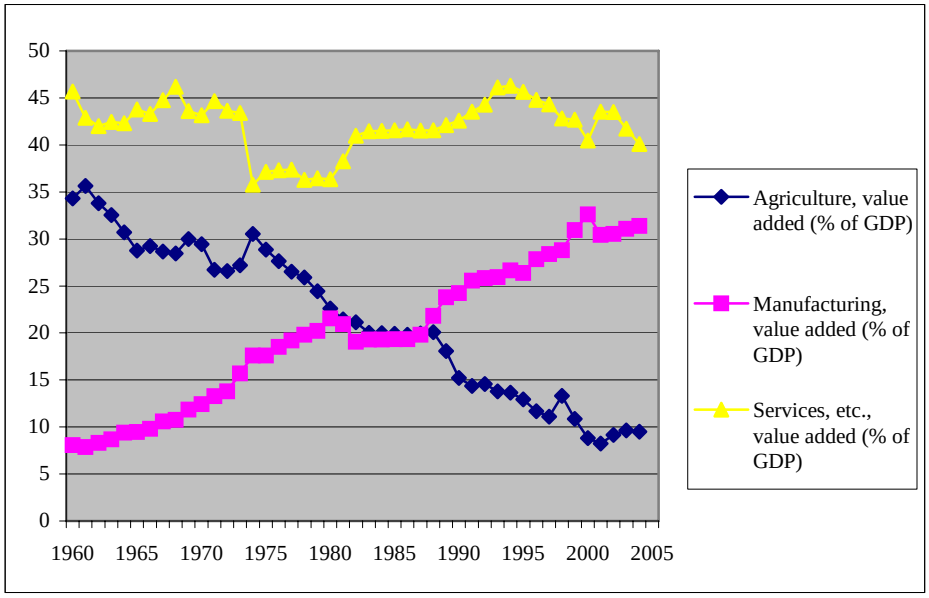


Source: World Development Indicators.

A look at some data on economic structure helps us understand better the nature of the increasingly open Malaysian economy. Figure 6.4 shows Malaysia had a larger agriculture sector at independence comparing with Taiwan during the same time period, not to mention the fully urbanized Singapore. Whereas the industry sector was already much greater than the agricultural sector in Taiwan in early 1970s, it was only until 1987 that the industry sector had a larger share over the agricultural sector for the first time in Malaysia. On the other hand, the share of Malaysia's service sector fluctuated around 40% during the study period comparing with a higher share of around 65% in Taiwan and Singapore at the end of 1990s. Changes in the composition of the manufacturing sector show resource-based activities such as wood and chemical products were dominant in Malaysia until the late 1980s after which non-resource based activities such as electrical machinery began to play a greater role, as can be seen in Table 6.1. All these data on economic structure suggest an upgrading of the Malaysian economy from resource-based, labor-intensive to more technology- and capital- intensive in the late 1980s. This critical

change of the Malaysian economy can also be seen in its employment structure, which has had a greater share of professional, technical, managerial and clerical employees since early 1990s, as shown in Table 6.2. The service sector also has an increasing share in fields such as communication and banking, as can be seen in Table 6.3.

Figure 6.4 Malaysia: Composition of GDP by Sector (1960-2005)



Source: World Development Indicators.

Table 6.1 Malaysia: Value-added by Malaysian Manufacturing Activities (% of Total)

	1963	1970	1981	1990	1996
Resource-based					
Processing of estate-type agricultural products in factories off estates	11.7	10.9	10.1	4.6	3.7
Food	15.4	16	8.8	6.1	4.1
Beverages	3.1	3.6	3.4	2.2	0.8
Tobacco products	6.7	7.2	3	1.4	1.1
Wood products	11.7	10	8.7	6.4	5.4
Furniture&fixtures	1.9	0.8	0.8	0.8	1.4
Printing, publishing&allied industries	7	6.2	4	2.9	2.6
Paper&paper products	0.7	0.8	1	1.7	1.7
Rubber Products	5.5	4.3	4.1	4.7	3.2
Chemicals& chemical products	10	9.3	5	10.8	7.8
Products of petroleum & coal	-	3.6	6.2	2.6	2.9
Non-metalic mineral products	6.5	6.9	5.1	4.9	4.1
Subtotal	80.2	80	60.3	49	38.7
Non-resource based					
Footwear(except rubber footwear), other clothing and made-up textile goods	1	1.1	2	3.1	1.6
Leather&leather products	0.2	0.2	0.1	0.1	0.1
Basic metal industries	0.9	2.8	3.4	3.9	3.5
Metal products	5.4	3.7	3.6	3.5	4.1
Machineary (except electronic machinery)	3.5	2.6	3.2	3.9	5.6
Electrical machinery	1.1	2.8	14	21.5	30.5
Transport Equipment	1.4	3.1	4.9	5.5	6.3
Miscellaneous	5.4	1.9	4.1	6.4	6.8
Subtotal	14.4	18.5	35.7	44.6	61.4

Source: Chye and Ariff, 2001, table 5.1

Table 6.2 Malaysia: Employment by Major Occupational Groups

Occupational Group	1970	1975	1980	1985	1990	1995	2000
Professional, Technical & Related	4.7	5.1	5.5	6.5	8.8	10.3	11
Administrative & Managerial	1.1	1.2	1.2	1.1	2.4	2.7	4.2
Clerical & Related	4.9	5.3	5.4	7.6	9.8	10.1	11.1
Sales	8.4	9	9.5	10.4	11.5	11.3	11
Service	7.4	8.2	8.8	9.6	11.6	12.4	11.8
Production&Related	25.2	27.8	30.8	29.8	27.6	32.2	32.8
Agricultural, Husbandry & Related	48.3	43.4	38.8	34.9	28.3	21	18.1

Source: Malaysia Plans, various years

Table 6.3 Malaysia: GDP by Sector, 1960-2005

	1960	1970	1980	1990	2000
Agriculture, forestry & Fishing	38	33.6	22.2	18.8	9.3
Mining & Quarrying	6	7.2	4.6	9.7	7.3
Manufacturing	9	12.8	20.5	27	30
Service					
Construction	3	3.8	4.5	3.5	3.7
Electricity, Water and Sanitary Services	1	2.6	2.4	1.9	3.4
Transport, Storage and Communication Services	4	3.8	6.5	6.9	8.2
Wholesale & Retail Trade	16	13.7	12.6	11	15.2
Banking, Insurance & Real Estate	1	2	8.2	9.7	12.4
Other Services*	22	25	23.2	11.5	16.1
Adjustments**	-	-	-	-	-5.1
Total	100	100	100	100	100

*Other than construction, electricity, transport, banking and including government services

**Less imputed bank service charges and plus import duties

Source: Athukorala, 2001, table 2.3

6.1.2 Globalization, Industrial Strategies and Government Education Provision

In the above section, I have identified two trends of the Malaysian economy in the middle and late 1980s: it was increasingly open and there was a structural upgrading to more technology- and capital- intensive industries. I argue that similar to the Taiwan and the Singapore cases but later than the two, structural upgrading was a conscious strategy of the Malaysian government to remain its economic competitiveness in the changing world market. This pressure to remain competitive by industrial upgrading has become more acute since late 1980s as the Malaysian economy integrated even more to the global market and countries such as China and India started to compete for business. These changes in global market and Malaysia's industrial strategy in turn have had profound influences on its education system. Fundamental reforms have been carried out so that the education system could produce enough manpower satisfying the needs of an updating economy. Another effect of the competitive pressure from the global market in Malaysia is that the education sector itself has been targeted by the government as a new engine of

growth. Laws and regulations have been modified in ways that could make the sector more efficient and attractive to foreign students. Below, I will show these changes of the education system in Malaysia as well as how these changes are linked to the government economic strategies and competitive pressure from the global market.

Agricultural Diversification, Import Substitution and Expanding Basic Education (1957-1970)

The economy of Malaysia was agriculture-based and highly dependent on exporting primary commodities such as rubber and tin at the time of independence. The new Malaysia government, led by the Alliance Party, focused on agricultural diversification and an industrial strategy of import substitution. Such industrialization strategy was feasible given that nearly half of Malaysia's goods and services were imported. Industries based on raw materials such as timber, rubber and tin were promoted since Malaysia lacked the technology and skills to produce efficiently intermediate and capital goods (Tan and Ariff, 2001). A few controls on foreign capital were imposed but the economy was basically free market (Munro-Kua, 1996). The effect of agricultural diversification was already significant by 1970 as timber and palm oil emerged as important export commodities and the production of crude petroleum started to gain importance (Malaysia: EPU, 2007). The overall economic growth in the 1960s was as high as over 5%. However, industrialization was progressing slowly and the share of manufacturing only increased by about 3% in this period.

With no particular pressure for structural upgrading from the world market, educational efforts of the government in this period focused on forming a single system of national

education[198] and expanding the provision of basic education. The Razak Report of 1956 and Education Ordinance of 1957 marked the government's efforts to achieve the first objective. The two documents recognized the objects of forming a single system of national education and making *Bahasa Malaysia* the main medium of instruction; they also symbolized the commencement of a Malaysia-oriented curriculum and conception of a single system of evaluation for all. On the other hand, the Rahman Talib Report in 1960 and Education Act in 1961 greatly expanded basic education opportunities. The two documents emphasized 3R basic education – reading, writing and arithmetic and a strong spiritual education (Malaysia: MOE, 2007). Primary school fees were abolished in 1961 and school-leaving age was raised to 14 (The First Malaysia Plan, 1966). In 1965, nine-year basic education was provided to all pupils and upper secondary school was divided into arts, science, technical and vocational streams to meet the basic needs of the economy (Aziz & Chew, 1980).

Nevertheless, the Malaysia government already realized the importance of developing manpower and started to incorporate education into its economic development plans. The First Malaysia Plan (1966-1970) clearly stated one of its main objectives was to "intensify and expand the development of human resources". Toward this end, "the traditional system of education is being re-oriented to achieve not only the objective of nation-building and universal literacy but also the economic goals of the country". The plan proposed to consolidate primary education, expand secondary education and focus

[198] There are three main ethnic groups in Malaysia: the Malays, the Chinese and the Indians. School system inherited from the British was a divisive force in the Malaysian society since Malays, Chinese and Indians went to their respective vernacular schools and the English schools were usually for the elites (Aziz & Chew, 1980).

tertiary education on teaching training. However, the economic goal of the education system was soon given away to the goal of social restructuring, as I will discuss below.

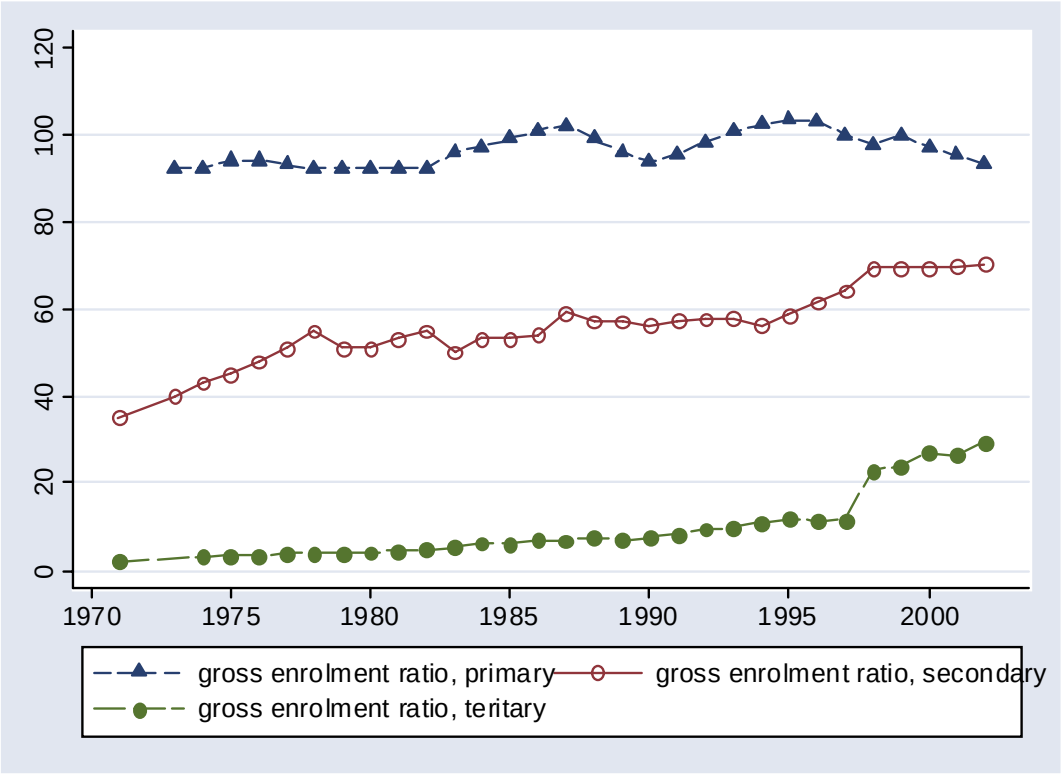
Educational spending and achievements in this period were quite impressive. The Malaysian government allocated 8.9% of its development budget to education in the First Malaysia Plan, next only to budget devoted to rural development, transport and utilities. Between 1960 and 1970, illiteracy rate decreased from 50% to 35%; average years of school during the same period also increased by about 1 year, to 3.9 years, as can be seen in Table 6.4. Figure 6.5 shows by 1970 primary gross school enrollment reached about 90%, secondary gross school enrollment reached 35% and tertiary enrollment reached 2%. The progress rate was comparable to Singapore but slower than Taiwan.

Table 6.4 Education Attainment in Malaysia (1960-2000)

Year	Population over age 15 (1000s)	Highest level attained							Average Years of School
		No Schooling	First level		Second Level		Post-Secondary		
			Total	Complete	Total	Complete	Total	Complete	
		(Percentage of the population aged 15 and over)							
1960	4455	49.7	38.6	13.6	10.1	3.2	1.5	1.1	2.88
1965	5116	41.4	44.2	15.8	12.9	3.4	1.5	1	3.39
1970	6012	35.3	46.7	17.4	16.6	4.6	1.5	1	3.9
1975	7099	31	46.6	19.2	20.7	6.2	1.7	1	4.43
1980	8351	26.8	46	23.8	25.1	7.9	2	1.1	5.09
1985	9614	23	45.6	20.1	28.7	10	2.6	1.4	5.48
1990	11070	19.4	45.4	23.2	31.9	11.9	3.3	1.9	6.03
1995	12497	17.6	44.3	27.2	33.8	12.6	4.4	2.5	6.49
2000	14429	16.2	42.4	26	36.2	13.5	5.2	2.9	6.8

Source: Barro and Lee, 2001

Figure 6.5 School Enrollments in Malaysia (1970-2003)



Source: UNESCO yearbook, various years.

New Economic Policy and an Education Policy Emphasizing Social Restructuring (1971-1982)

The racial riot in 1969 was a watershed in Malaysian history. For the first time, the Alliance Party lost two-thirds majority in the parliament and that ignited two-day communal riots.[199] The constitution and parliament was suspended between 1969 and 1971. When the parliament resumed in 1971, the Alliance Party, renamed the *Barisan Nastional* (the National Front), formulated the New Economic Policy, with its twin

[199] After the results were announced, the opposition parties held a series of victory rallies in Kuala Lumpur on 11 and 12 of May. On May 13th, in response to the opposition rallies, the Chief Minister of Selangor, Harun bin Haji Idris called for a pro-government demonstration and show of force. Malay politicians addressed the crowd which quickly assembled and claimed that Malay supremacy in government was being challenged by infidels and that they needed to teach the Chinese a lesson. This ignited two days of unprecedented communal riots. Official figures cited a death of 178 people and 6000 residents, 90% Chinese, were made homeless (Munro-Kua, 1996: 55).

objectives of eradicating poverty and restructuring society (Malaysia: EPU, 2007)[200]. To achieve the goal of eradicating poverty, the government focused on job creation and improving infrastructure and basic services for the rural area. Import substitution was accompanied by export promotion in this period to create more job opportunities. Export-oriented industries such as electronics and textiles were stimulated by fiscal and tax incentives. On the other hand, the government also promoted heavy industry through direct state involvement. To achieve the goal of restructuring society so the identification of race with economic function will finally be eliminated, the government created a strong affirmative action program that favored the *Bumiputera*s[201], the majority of which are the Malays, the politically dominant but economically poor ethnic group of the Malaysian society. The program provided privilege access for the *Bumipetras* to business opportunities, employment in the civil service and education and aimed to improve the capital share of the *Bumiputera* from a mere 2% to 30% (Munro-Kua, 1996; Tan and Ariff, 2001; Lee Hock Guan, 2005). Foreign direct investment was still generally welcomed but would be constrained by the capital share quota of 30%. Social restructuring was premised on an expanding economy. During this period, the real GDP growth rate was averaged over 7% and poverty incidence decreased from 49% to 18% (Mahadevan, 2006).

Under the New Economic Policy, promoting national integration and unity became the top priority of government education provision while meeting manpower needs of the

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[200] The information is from http://www.epu.jpm.my/New%20Folder/RecentEconomicHistory.htm, accessed April 23, 2007.

[201] *Bumiputera* literally means "son of the soil". It refers to the Malays and other indigenous tribes such as Kadanzandusuns, Muruts, Bajaus and other tribes in Sabah, Dayaks, Ibans, Penans and others in Sarawajk (Molly N..N. Lee, 1999).

economy served as a secondary goal. The national language, *Bahasa Malaysia*, was gradually implemented as the main medium of instruction in all schools despite warnings that the loss of English as Malaysia's *lingu franca* would be a necessary risk for the country (*The Globe and Mail*, Jan., 2nd, 1982). Major efforts were devoted to provide greater opportunities for the lower income and the Malay and other indigenous group (The Second Malaysia Plan, 1971). Ethnic quotas were imposed for the *Bumiputera* enrollment in tertiary education based on modified constitution[202]. The *Majlis Amanah Rakyat* (MARA), or Council of Trust for the Indigenous Peoples, established institutions such as Junior Science Colleges, Residential Secondary Schools to increase the enrollment of *Bumiputera* in science and science-related majors; it also initiated a two-year Matriculation program to expedite the intake of Malay students into local universities. Residential Secondary Schools and the Matriculation program were initially open to non-*Bumiputera* students but they essentially became the preserve of the *Bumiputera* students by early 1980s (Lee Hock Guan, 2005).

Government education provision in this period can certainly be said successful to achieve the goal of social restructuring. During this period, Malaysian government spent on average 5% of GDP on education, which was about 20% of government spending; per capita spending also increased rapidly, as can be seen in Figure 6.6, Figure 6.7 & Figure 6.8. Mainly as a result of improved *Bumiputera*s participation, gross secondary school enrollment increased from about 35% to around 52%; gender equity also dramatically

[202] Article 153 of the constitution was enlarged in 1970 to allow the king power to impose ethnic quotas for Bumiputeras participation in tertiary educational institutions.

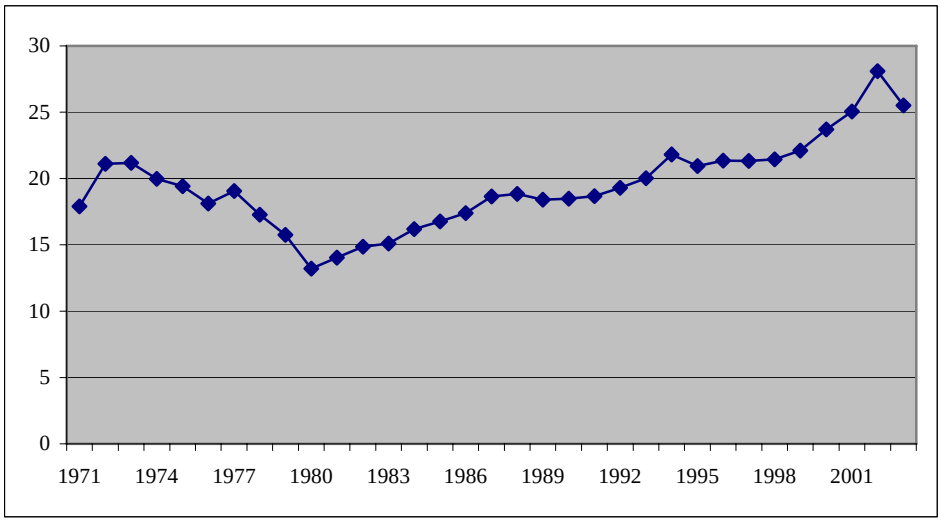
improved from a ratio of .8 to 1, as shown in Figure 6.9.[203] Average years of school of the population improved another year, catching up with that in Singapore.

On the other hand, the cost of this policy was limited opportunities for the non-*Bumiputera* groups. Only one type of college, the Tunku Abdul Rahman (TAR), established by the Malaysian Chinese Association, was for the *non-Bumiputera*s to pursue certificate and diploma education; funding for TAR was very limited comparing with resources devoted to the institutions for *Bumiputera*s. The ethnic quota policy at public universities also made it much more difficult for Chinese and Indian students to get a place in these institutions (Lee Hock Guan, 2005). Many of them ended up pursuing higher education overseas however not all the *non-Bumiputera*s students' families could afford that. Unfortunately, government scholarships were also mostly reserved for the *Bumiputera*s (Munro-Kua, 1996). Another consequence of the policy favoring *Bumiputera*s was that enrollment in science and technology fields lagged behind that of arts, as can be seen in Figure 6.5. One important reason was that *Bumiputera* students favored arts and a few science subjects that could be useful to get government jobs (Lucas and Verry, 1999). The Second and the Third Malaysian plans already noticed this lag and the heavy demand for higher and middle level manpower, especially in the public sectors such as education, health services and agricultural research and extension. The Fourth Malaysia Plan (1981-1985) started to emphasize improving the efficiency of the education system and the importance of skill upgrading. However, only when the government faced great pressure from the global market to upgrade its economy in late

[203] Pong argues this improvement in gender equity was partly a result of expanding opportunities under New Economic Policy and partly a result of Malay culture characterized by relative gender equity (Pong, 1999).

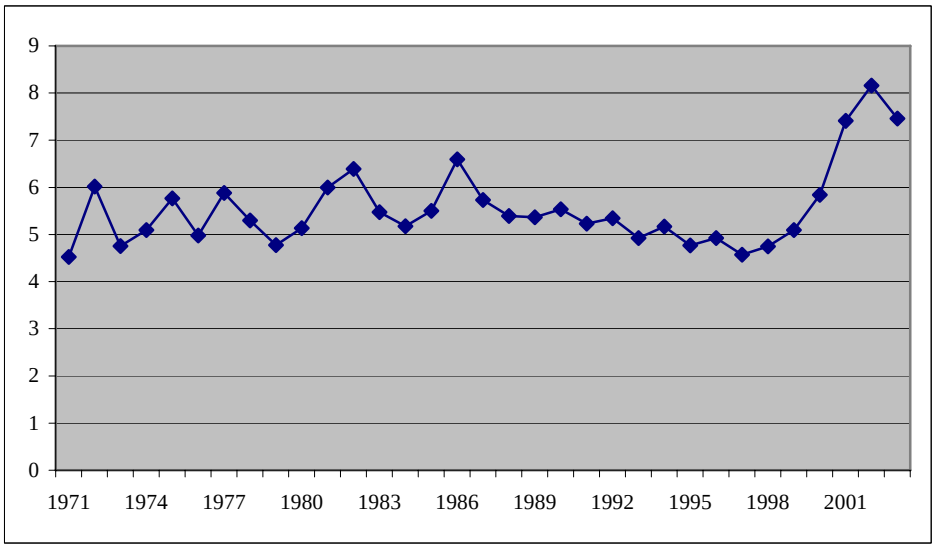
1980s and early 1990s did meeting the demands of the economy re-became the top priority of government education provision.

Figure 6.6 Malaysia: Education Spending as % of Total Government Spending



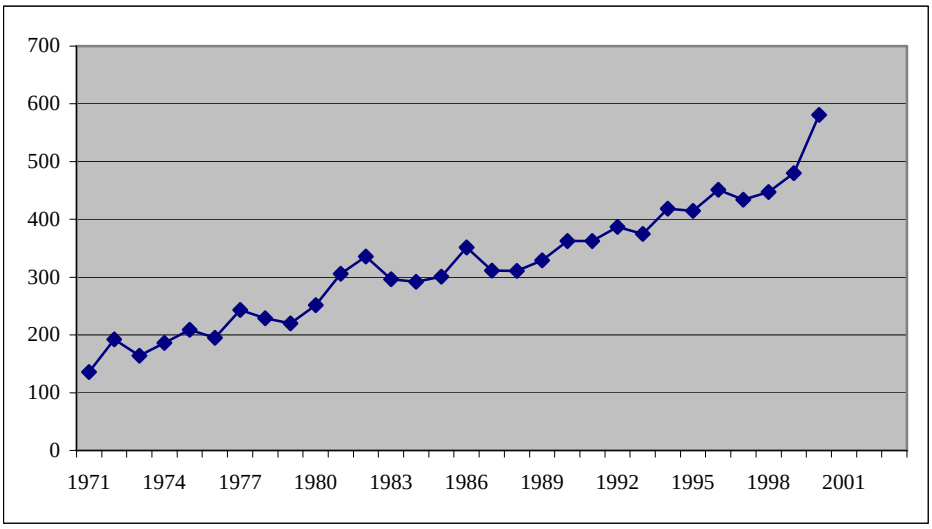
Source: Author's database.

Figure 6.7 Malaysia: Education Spending as % of GDP



Source: Author's database.

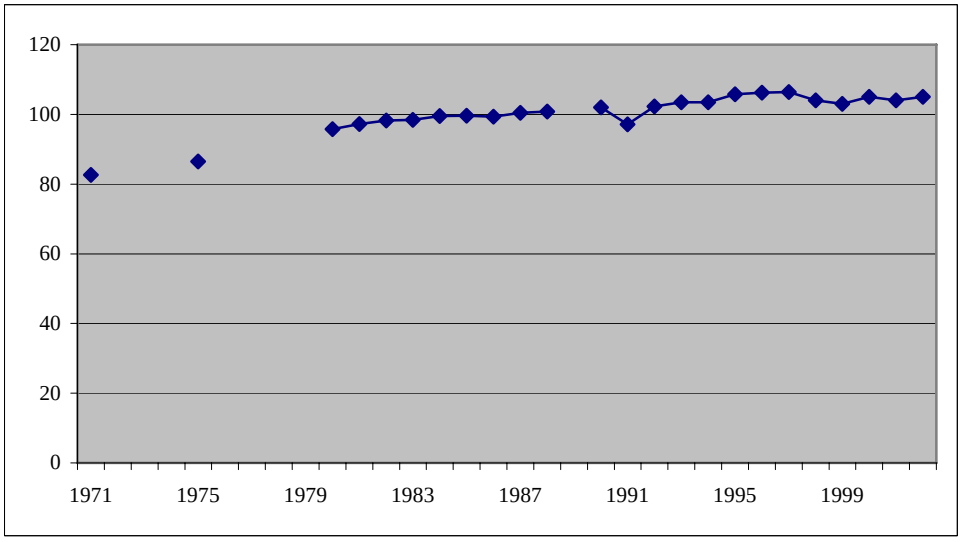
Figure 6.8 Malaysia: Education Spending per capita (PPP measures)



Source: Author's database.

Figure 6.9 Malaysia: Gender Equity in Education

(Ratio of Boys to Girls in Primary and Secondary School)



Source: Author's database.

Table 6.5 Malaysia: Arts and Science Components of Total Enrollment

	1970	1975	1980	1985	1991	1995	2000
Upper Secondary							
Arts	NA	NA	59.3	65.2	70.2	NA	NA
Science	NA	NA	33.4	28.7	20.5	32.2	45.6
Technical	NA	NA	2.2	2	1.5	NA	NA
Vocational	NA	NA	5.1	4.1	6.8	NA	NA
Post-Secondary							
Arts	NA	NA	56.1	63.3	72.6	NA	NA
Science	NA	NA	43.9	36.7	25.1	NA	NA
Tertiary Level							
Degree							
Arts	63.5	55.3	52.5	58.3	59	55	48
Science	31.4	33.9	38.3	30.2	27	28	29
Technical	5.1	10.8	9.7	11.5	14	17	23
Diploma							
Arts	41.2	45.8	41.2	51.2	53	50	43.2
Science	26.8	29.4	23.4	48.8	19	19	18.4
Technical	32	24.8	35.4	NA	28	31	38.4
Certificate							
Arts	NA	NA	NA	NA	17	20	22.5
Science	NA	NA	NA	NA	7	7	3.6
Technical	NA	NA	NA	NA	76	73	73.9

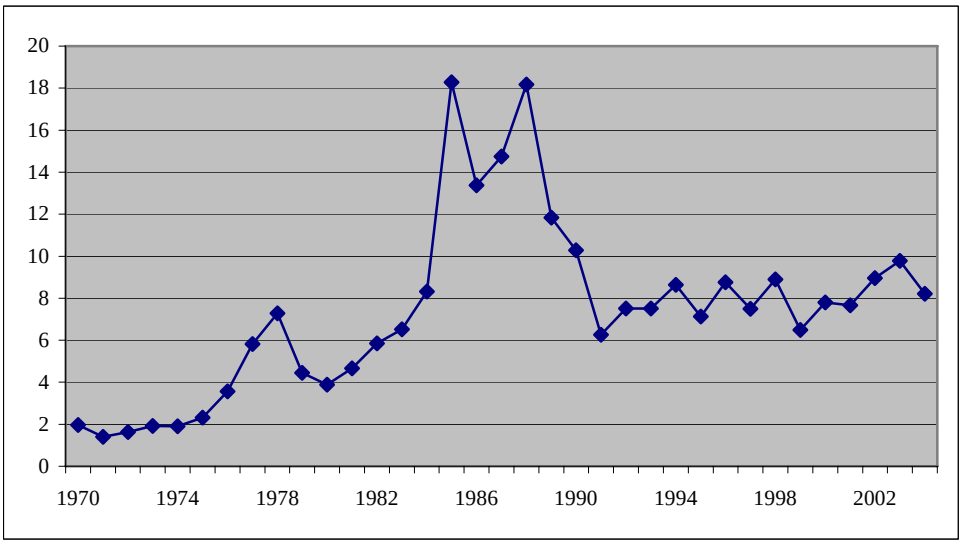
NA stands for data not available.

Source: Lucas & Verry, 1999, Table 4.16; Seventh Malaysia Plan: Table 10-3; Eighth Malaysia Plan, table 4-6; Fifth Malaysia Plan, table 19-2

Structural Adjustment and Educational Adjustment (1983-1990)

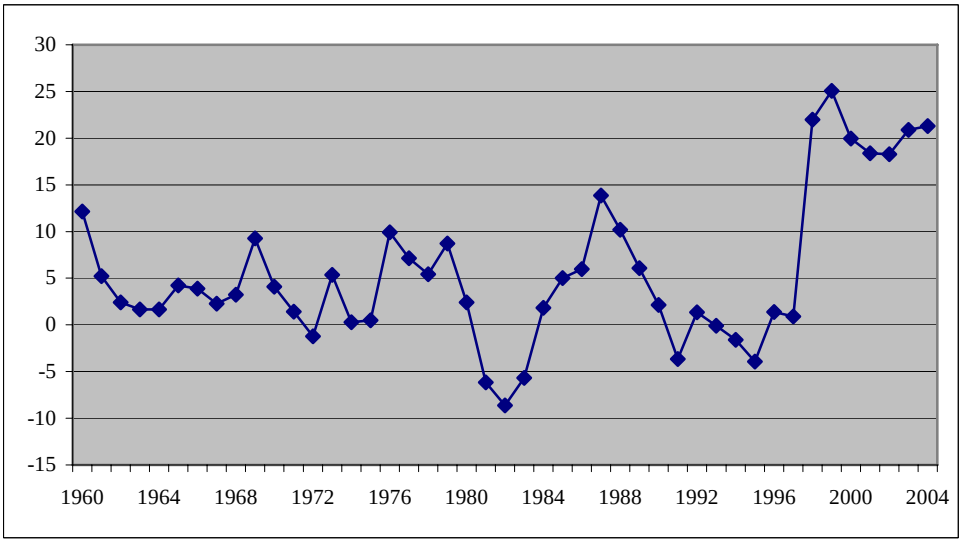
Malaysia's economy started to slow down in early 1980s due particularly to the prolonged recession in the global economy following the second oil shock in 1979. The collapse of primary commodity price was a devastating blow to the Malaysian economy dependent on exporting primary resources and resource-based products. The economy saw a twin deficit in budget and balance of payments (Malaysia: EPU, 2007). The government debt level rose quickly and reached a high of 18% by 1985, as shown in Figure 6.10. The trade deficit also reached a level of 8% in 1982, as can be seen in Figure 6.11.

Figure 6.10 Malaysia: Total Debt Service as % of GNI



Source: World Development Indicators.

Figure 6.11 Malaysia: Trade Deficit as % of GDP



Source: World Development Indicators.

In response to these changes in the global and the domestic economy, the government, led by the new Prime Minister Dr. Mahathir, began to institute major structural changes of the economy in 1983. Government expenditures were restrained to reduce budget deficits. Another important change was adopting an approach of private sector led growth

through privatization, de-regulation and liberalization.[204] The government also made great efforts in diversifying the manufacturing sector so that it would rely less on exporting primary commodities and importing capital and inter-mediate goods, a lesson learned in this economic recession. These measures proved effective in restoring growth. By the end of 1980s, Malaysia's economy grew at a rate of over 5% again; budget and trade deficit disappeared and the debt level deceased to about 10%. Trade openness and foreign direct investment soared, as shown in Figure 6.1 and Figure 6.2.

During this period of structural adjustment, the government continued to prioritize national integration and unity in its education provision despite the realization that skill formation would be increasingly important with the diversification of the country's manufacturing base. As stated in the Fifth Malaysia Plan (1986-90), "Skill formation at the intermediate and advanced levels will become increasingly important to cater for the skill requirements of high-technology and heavy industries". But fundamental changes of the education system only took place later when the Malaysian government faced increasing competition in the world market from the lower-cost countries in the early 1990s.

Expanding access to education for the low-income groups still remained top priority for the government in this period. The government devoted an increasing budget to education. Gross secondary school enrollment continued to improve while enrollment in

[204] In 1986, the government promulgated *Promotion of Investment Act* to encourage the participation of the private sector and foreign capital. Privatization of public sectors, agencies and enterprises were also introduced to increase their efficiency. The new role of the government was just to provide a supportive and conducive environment for the private sector to flourish (Malaysia: EPU, 2007).

tertiary educations started to climb (see Figure 6.5). Realizing the low enrollment in science subjects and vocational schools, the government carried out corresponding curriculum reform in this period. The new curriculum called KBSR and KBSM were introduced into primary and secondary schools in 1983 and 1988 respectively. Both curriculums emphasized student-centered learning and subjects exposing students to science, technology and entrepreneurship. Nevertheless, both curriculums had implementation troubles due to problems of teacher shortage and not enough classrooms (The Sixth Malaysia Plan, 1991). Changes were also made to the vocational school curriculum to attract more students. But contrary to the importance attached to vocational education in Taiwan or Singapore, academic subjects were given equal emphasis equivalent to that in the normal academic schools so students can get the basic qualifications for jobs in the public sector. This obviously didn't help much in creating more scientists, technicians and engineers important for the structural upgrading of the economy. At the degree level, over half of the students still enrolled in arts but 50% of art graduates studied applied art courses such as accounting, business and law. Another change, consistent with the government's economic strategy, was an increasing role of the private sector to provide education at secondary and tertiary levels (The Sixth Malaysia Plan, 1991).

Pressure from the Global Market, Vision 2020 and Educational Reforms (1991- Present)

New Development Policy and the Start of Education Reform (1991-2000)

Pressure from the global market stimulated industrial upgrading and fundamental education reforms in Malaysia. The 1990s in Malaysia began with the declaration of

Vision 2020, which envisaged Malaysia to become a developed nation in its own mould by 2020 (Malaysia: EPU, 2007). As the New Economic Policy (NEP hereafter) came to an end, the government announced the New Development Policy (1991-2000) (NDP hereafter), which aimed to achieve almost the same objective as that in the NEP: a balanced development with equitable growth. The NDP continued to favor the development of an active *Bumiputera* commercial and industrial class but unlike the NEP, no specific date was set for this goal. It again relied on the private sector to stimulate growth. Instead of eliminating relative poverty, the emphasis was put on eradicating hardcore poverty by creating employment.

Unlike the NEP, the NDP put a particular emphasis on structural upgrading and the importance of human resource development through education and training given the volatile and competitive global environment faced by Malaysia. As stated in the policy document:

> "…there are uncertainties in view of the volatile nature of interest rates and currency movements...in addition, there are also risks associated with the increasing competition in the export of agricultural and manufactured products which Malaysia will face especially from neighboring countries which have the advantage of low labor costs…in order to remain competitive in the export of manufactured goods and to sustain rapid economic growth, Malaysia must increase its productivity and further diversify into higher value-added production based on the downstream processing and manufacturing of its natural resources and primary products for exports."

Regarding the importance of education and training in this global competition, the document states:

> "During the decade of the nineties, human resource development will assume new importance. Competitiveness, productivity, innovativeness and capability in management of new technologies in Malaysia will be determined by the quality of its human resources. A productive and efficient labor force must be developed with strong ethnical and moral values and a commitment to excellence. With the increasingly globalization and internationalization of the world economy, the country will face more competition in trade and investment. In view of the challenges ahead, Malaysians should be well equipped with a strong base in education and training including the ability to communicate in a second language, for example English, which is an international language of commerce…Human resource development must contain policies and programs to continuously

> upgrade and improve the education and training programs and facilities to meet the changing skill requirements. The government will give a higher priority towards human resource development in the allocation of expenditures under the public sector program."

The policy also pointed out the directions for reform:

> "it is important to emphasize the development of mathematics, science, manipulative and communicative skills as well as proficiency in English and other foreign languages so that school leavers can be more readily acceptable for employment and further training by employers" (Malaysia: EPU, 2007)[205].

The government's concern that Malaysia's education system must be improved so that the country can remain competitive in the global market was also echoed in reports on the labor market. A report from the Malaysian Institute of Economic Research concluded that Malaysian campuses were swelled by students who pursed degrees that few private employers really wanted (*Financial Times*, Aug. 24th, 1990). In 1994, the *Financial Times* reported that "with severe labor shortages in many areas and wages rising, Malaysia is facing growing competition from lower cost producers such as Indonesia, Vietnam and China (*Financial Times*, Aug. 30th, 1994). A report by *New Strait Times* in 1995 said Malaysia needed about 56,500 engineers by the year 2000 but at the moment only had 26, 500 (*New Strait Times*, Nov. 24th, 1995). In 1998, the same newspaper reported a 20% shortage in all categories of scientists, engineers and technicians in all industrial sectors; and in electronic and electronical industry the shortage was even higher, about 34% (*New Strait Times*, May 21st, 1998). The tertiary school enrollment was especially low in Malaysia comparing with either Singapore or Taiwan. In 1990, gross tertiary school enrollment was only 7% in Malaysia versus 18% in Singapore and 30% in Taiwan.

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[205] The New Development Plan is available at http://www.epu.jpm.my/.

The Malaysian Ministry of Education implemented various changes in the education system in response to these manpower shortages which were hindering the upgrading and competitiveness of the Malaysian economy. As suggested by its then Education Minister, Datuk Seri Najib Tun Razak, Malaysia would like to create a new education system that is 1) student-focused instead of exam-oriented; 2) technology drive; 3) industry-relevant; 4) address key national concerns and needs (*New Strait Times*, May 16th, 1997). Similar to Singapore which extended its basic education to ten years in 1990, Malaysia extended its basic education to eleven years in early 1990s (Molly N.N. Lee, 1999). This change greatly expanded upper secondary education opportunities and increased demand for tertiary education.

The importance of science was also highlighted in the education system as the government worried Malaysia would lack engineers and scientists in the future. In the 1980s science became an optional subject in the revamped secondary school curriculum and the ratio of students who opted for science versus those who didn't in upper secondary school decrease to an all-time low of 22:78 in 1993 (Ministry of Education, 1994). In 1993, the Ministry of Education re-introduced science as a separate subject in the primary school curriculum whereas before science was part of an interdisciplinary subject called "man and his environment". It hoped that this policy change would get students interested in science from an early age (Molly N.N. Lee, 1999). Enrollment in the science stream and technical and vocational school were also greatly encouraged and the government would like to triple the number of students in scientific and technological fields by the turn of the century (*The Australian*, Nov. 7th, 1997)). Thirty-one more

vocational schools were built in this period (The Sixth Malaysia Plan, 1991). Efforts were also made to improve maths and science teaching at religious schools, where students usually performed worse in these subjects than ordinary national schools (*New Strait Times*, Jan. 21, 1995; April 3rd, 1996).

As in Taiwan and Singapore, the learning of English and Information and Communication Technology were assigned great importance in this round of educational reform as they were deemed critical for the success in the global competition. Education language was always a sensitive issue in Malaysia. After the 1969 racial riots, *Bahasa Malaysia* was announced as the medium of teaching in the national schools at all levels. However, the logic of survival in the global economy stimulated the Malaysian government to make policy changes. English was announced by the Ministry of Education as the medium of instruction of science and technical subjects in all institutions of higher learning in 1994. Prime Minister Dr. Mahathir backed up this policy change by saying that "English language could help Malaysia realize a developed country status by 2020" (*Business Times*, Feb. 26th, 1994). The 1996 Education Act also stipulated English to be the medium of instruction for private colleges even though three subjects need to be taught in *Bahasa Malaysia*: Malaysian Studies, Islamic Education for non-Muslims and Moral Values for Muslims (The *Australian*, Jan. 10th, 1996). Malaysia government also started its computer literacy program in this period. Pilot projects of computer-assisted teaching and learning were introduced at the primary and secondary level in 1994 (The Seventh Malaysia Plan, 1996). Schools were encouraged to set up computer labs as part of the co-curricular activities. Beginning in 1994, computer courses

were made compulsory in all teacher-training colleges. In 1996, Malaysia set up its first "smart lab" to provide students with access to multimedia, a local network and internet. This project aimed to provide urban and rural students equal access to computer resources and produce students with analytic and creative skills (*New Strait Times*, April 1st, 1997).

Similar to what happened in Taiwan, expansion of tertiary education through the private sector was another important trend of reform in Malaysia[206]. Two purposes were associated with this policy change: to produce more higher-skilled manpower with no extra burden on the state and to make higher education a competitive export sector in the global market. Given the restriction of the *University and University College Act* of 1971, private sector participation in the tertiary education was initially done through twinning programs with foreign institutions (the Seventh Malaysia Plan, 1996). With the implementation of *Private Higher Education Institutions Act* in 1996, foreign universities were allowed to set up campuses in Malaysia and local private universities were given more autonomy in their management (the Eighth Malaysia Plan, 2001). By the end of 2000, there were 22 public tertiary institutions versus 662 private institutions and the student ratio was 3:2, as can be seen in Table 6.6. The aspiration of Malaysia was to become a regional hub of education as it satisfied its own needs of tertiary education, a trend also seen in Singapore. Another trend associated with privatization was the corporatization of tertiary institutions, which started in 1996. The Malaysian government said this move would reduce government's financial burdens in maintaining these

[206] Another quick measure to produce more tertiary graduates to solve labor shortage was to cut the degree course by one year (*Financial Times*, Aug. 18th, 1995).

institutions and spur their growth (*Strait Times*, Jan. 26th, 1995). These measures also aimed to attract more foreign students to Malaysia as the education sector was identified as the new engine of growth by the government (*Strait Times*, July 24th, 1994).

Table 6.6 Malaysia: Tertiary Education Institutions and Enrollments, 2000

	Public	Private
Institutions		
university	11	5
university College	0	0
Polytechnic	11	3
Community College	0	632
Total	22	662
Enrollment		
Degree	201,271	32,480
Diploma	92,304	116,265
Certificate	28,154	60,840
Total	321,729	209,585

Source: The Ninth Malaysia Plan.

New Vision Policy and More Reforms (2001 – Present)

The task of education reform became more urgent as Malaysia entered the twenty first century and strived to build a knowledge economy. This urgency of reform was framed under the premises that growth based on productivity and knowledge was Malaysia's only option of survival in the increasingly fierce global competition of a more volatile international market as evidenced by the 1997 financial crisis[207]. The New Vision Policy, announced in 2001 to replace the New Development Policy, highlighted the necessity of building a knowledge-based society and generating endogenously-driven growth as Malaysia faced competition from both the developing and developed countries. Human capital built-up became the key of this strategy. Chapter 1 of this document expressed this thinking of the government quite well:

[207] Comparing with neighboring countries such as Thailand, Malaysia recovered quicker from the financial crisis due to the tight monetary policy adopted by the Malaysian government.

> "…Globally, the rules of competition have changed with the onset of the Information Age and a more integrated global economy as well as greater liberalization of the markets. A country's competitive advantage is no longer dependent on factors such as labor, land and natural resources, but on its potential to produce, acquire, utilize and disseminate knowledge. The availability of knowledge enhances the potential for lower-cost developing countries to move into high value-added products at a faster pace and enables new entrants to compete with established producers. With their huge domestic markets, these countries threaten to undermine the comparative advantage in some areas of manufacturing that Malaysia enjoyed for the last 30 years. On the other hand, the industrialized countries, which are focusing on knowledge as an important input in their production processes, have increased the share of high-technology industries in their total manufacturing value added and exports…consequently, Malaysia will have to intensify its efforts to stay ahead of the more dynamic developing countries and catch up with the developed countries…Malaysian industry and trade entities will, therefore, have to urgently build capability to contend with foreign competitors in the domestic market and enhance their export competitiveness…it is imperative that the country shifts from input-driven growth to productivity-driven growth so that the sources of economic growth are derived endogenously. Great emphasis will be placed on building Malaysia's human capital, productivity and capacity for knowledge absorption and utilization..."

In the New Vision Policy, social restructuring and helping the Bumipetras to achieve at least 30% participation in the economy is still an important goal but one that was less prioritized than building a competitive knowledge economy.

Against this backdrop, the pressure to reform the education system was even greater than the 1990s, as neighboring countries such as Taiwan and Singapore are also building up their knowledge economy but have a generally higher education level and an education system better structured meeting the needs of the labor market.[208] By 2003, the gross tertiary school enrollment was 72% in Taiwan, around 50% in Singapore but was only 29% in Malaysia. Enrollments in science and technology in Malaysia were still low comparing with Taiwan or Singapore despite progress made in the 1990s. Table 6.7 shows the lag of science and technology enrollment in Malaysia comparing with other East Asia countries. The quality of graduates was poor. Companies were complaining that it was hard to find good IT graduates in Malaysia (*Strait Times*, Nov. 30th, 2002). In

[208] As discussed in chapter 4 and 5, the education systems of Taiwan and Singapore from earlier on emphasized more on English education and the production of science and technology manpower, elements deemed critical for the knowledge economy.

2001, it was reported Malaysia's competitiveness ranking decreased comparing with Finland and Ireland and the suggestion was made that Malaysia should increase its internal competition (*New Strait Times*, Oct. 27th, 2001).

Table 6.7 Malaysia in Comparative Perspective: Tertiary Enrollment in Science and Technology

Country	Year	All Technical Subjects	Science +Math &Computer + engineering	
		% of Total Population	% of Total Population	% of Total Tertiary
South Korea	1993	1.66	1.34	31.20
Taiwan	1993	1.45	1.09	42.30
Singapore	1994	0.60	0.56	20.40
Hong Kong	1992	0.61	0.47	30.30
Thailand	1992	0.44	0.32	15.90
Malaysia	**1990**	**0.18**	**0.15**	**21.40**
Indonesia	1992	0.17	0.13	13.40
China	1993	0.16	0.12	31.70
India	1990	0.15	0.15	27.90
Pakistan	1991	0.07	0.07	34.00
Germany	1993	1.00	0.87	37.30
USA	1990	1.47	0.73	13.30
UK	1992	1.03	0.69	26.30
France	1991	1.08	0.68	21.20
Japan	1991	0.59	0.46	19.60
Netherlands	1992	0.91	0.17	NA

Source: Lall, 2000: Table 2.6.

Two important reforms were made in response to these challenges. In 2002, the quota system in public universities, which was established in 1971 and reserved 55% university places for the *Bumipuetra* students, was abandoned and a merit-based system was put into place. The quota policy was a very touchy issue in Malaysia after the 1969 racial riots and this important policy change was meant to improve the competitiveness of the education system. In response to opposition to the merit system, the Prime Minister Dr. Mahathir commented that the Malays must let go the crutches (the quota policy) so they wouldn't be just rely on their privileges and do not study or work hard (*Strait Times*, Aug. 1st, 2002). The government also resisted the pressure to put a 10% quota for

Bumipetras in private colleges (*New Strait Times*, Jun. 10th, 2002). On the other hand, the government announced a 10% reserve for Chinese and Indian students in junior colleges which used to be the prerogative for the *Bumipetra* students (*Strait Times*, Jun. 13th, 2002). All this symbolized a direction of change to a more competitive education system.

Another important policy change in Malaysia was a growing emphasis on English learning. As discussed above, maths and science already started to be taught in English in tertiary institutions since 1994. As the government worried about the large number of high school students who failed their English exams, a number of measures were adopted to remedy this situation. Local English teachers were sent abroad for training and new English courses were introduced in high schools (*The Weekend Australia*, Nov. 10th, 2001). From 2003, maths and science started to be taught in English in primary, secondary schools and matriculation colleges (the Ninth Malaysia Plan, 2006). In 2005, the Malaysian government allocated M$617 million in contract to boost English teaching (*South China Morning Post*, Feb. 26th, 2005).

All these changes in this period are remarkable given the sensitivity of race and language in the Malaysian context. The fact that the Malaysian government implemented these changes despite oppositions (which I will detail in section 6.2) reflected the profound influences of pressure from global competition. To survive in this competition, the Malaysian government also made great efforts to improve enrollment in the science

stream[209] and improve the quality of teaching at all levels. During the Eighth Malaysia plan (2001), the government started to re-orient societal and individual preferences towards skilled and other technical occupations recognizing the attitude change might be critical to improve the science and technological enrollment in Malaysia. However, reforms progressed slowly. Contrary to expectations, the *Bumiputera* enrollment increased in the public tertiary institutions after the canceling of the quota policy. It turned out there were two kinds of college entrance exams and the easier one was open only to the *Bumiputera*s (*The Strait Times*, May 25th, 2002). Malaysia's competitiveness ranked the 5th in Asia after Taiwan, Singapore, Japan and South Korea in a report by World Economic forum in 2005 due to "inadequately educated workforce and poor work ethnics in the national labor force" (*New Strait Times*, Sep. 29th, 2005).

Nevertheless, the Malaysian government seemed determined to continue improving its education system. As can be seen from Figure 6.6, Figure 6.7 & Figure 6.8, education spending increased rapidly after 1997. According to a recent report, it is pumping M$23 billion over the next four years to revamp the education system to produce students with higher skills and university graduates highly sought by the job market (*The Strait Times*, Jan. 18th, 2007).[210] Revamping the education system is also important as the government would like to attract more foreign students, which is good for Malaysia's economic

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[209] One effort was to improve the science teaching at Islamic religious schools, where students performed poorly in these subjects comparing with national schools. I detailed this politically sensitive measure later in section 6.2.2.

[210] The money will be used to expand school facilities at various levels and to provide students with education loans (Ritchie, 2005). Borrowing from reform measures of Singapore, the Malaysian government is going to start up 300 "cluster of schools" of excellence which has more autonomy of teacher and curriculum selection, 3 sports schools and 22 vocational schools. It is also going to increase the number of maths and science teachers, boosting basic necessities in rural schools and raising career prospects for teachers (*Strait Times*, Jan. 18th, 2007).

growth. The number of foreign students in Malaysia increased from around 31, 000 in 2003 to about 40,000 in 2005 (*New Strait Times*, Dec. 5th, 2004). Its goal is to attract 100,000 foreign students by 2010 (*Strait Times*, Oct. 10th, 2005).

6.1.3. Policy Linkages between Economic Planning and Education Planning

As traced in the above section, the Malaysian government gradually realized that the shortage of skilled manpower became a bottleneck of its economic growth as its economy opened more in late 1980s to the global market with increasingly fierce competition. The priority of government education provision was thus given away to meeting economic needs instead of social restructuring. Education reform became even more urgent in Malaysia as the 1997 financial crisis exposed the vulnerability of its economy and the government strived to build a knowledge economy with an inadequately educated labor force in a world market in which Malaysia faced double competition from both the developing and the developed countries.

Given the increasing importance of the economic goal of government education provision in Malaysia, an important question to ask is what policy linkages are in place to achieve the balance between the economic demand and the education supply? Despite that development planning has had a long history in Malaysia, the match between economic demands and education supply was certainly poorer comparing with either Taiwan or Singapore, as evidenced by the shortage of skills, especially that of science and technology in recent years. This could partly be explained by the priority attached to the social restructuring goal of education provision before 1990s. On the other hand, the

weak institutional linkages in Malaysia have also constrained successful education planning and reform.

Ritchie (2005) has suggested that the lack of bureaucratic coordination and limited private sector participation in the policy making process contributed to the limited education and training reform in Malaysia despite government rhetoric to revamp the system. Firstly, the four ministries responsible for education and training – the Ministry of Human Resource, the Ministry of Education, the Majlis Amanah Rakyat (MARA) and the Ministry of Youth and Sports all come under the umbrella of Economic Planning Unit in the prime minister's office and three of them full under the jurisdiction of National Vocational Training Council. However, there is little coordination between the National Vocational Training Council and the Economic Planning Unit and virtually no connections among the line ministries. Each ministry department controls its own infrastructure, develops its own curriculum and disburses a separate budget, as shown in Figure 6.12. The lack of coordination across line ministries results in lost economies of scale, considerable duplication and a fragmented strategic approach to education and training. One consequence of this institutional fragmentation, argues Ritchie, is the lack of demand-centered education and training despite enthusiasms over reform.

Secondly, there is a also growing centralization of bureaucratic control in the Prime Minister's office. This increasingly marginalizes the effectiveness of the line ministries without reducing the redundancy and waste. For example, in response to the 1997 financial crisis, the Prime Minister's office allocated large amount of budgets to the line

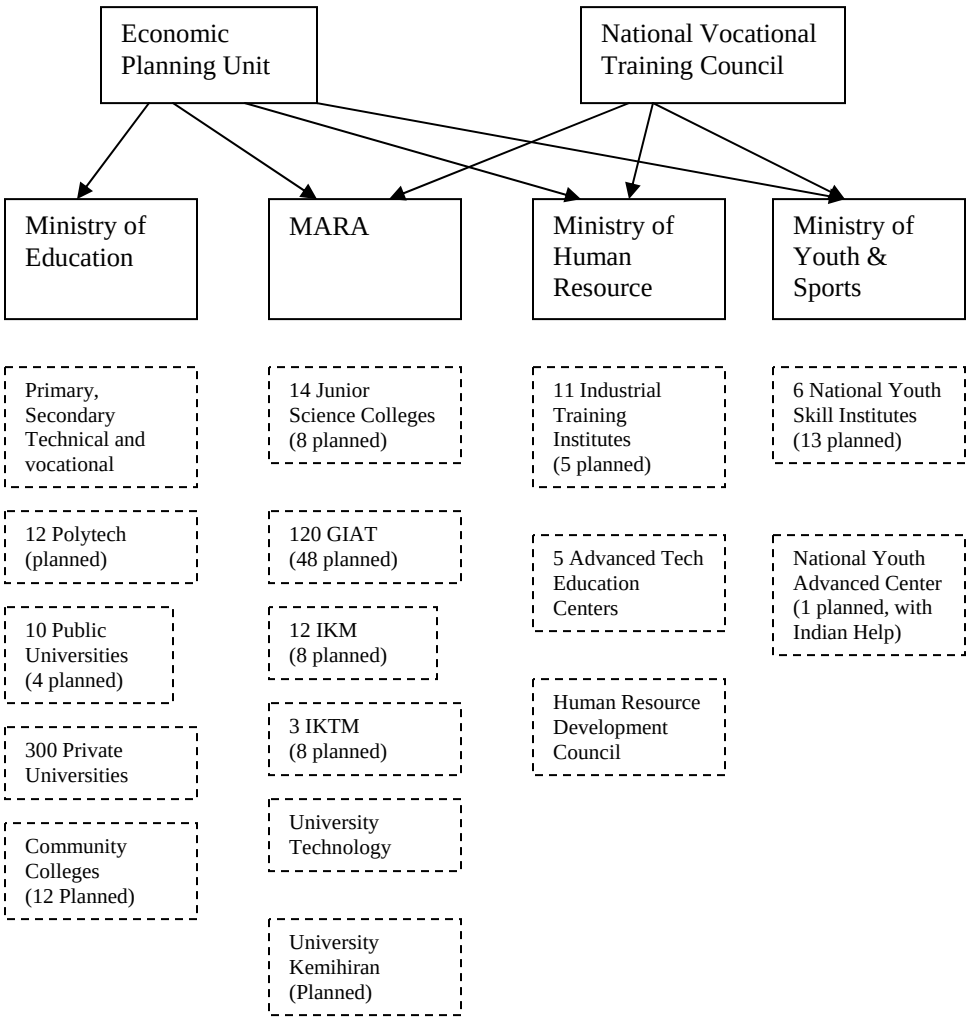
ministries but reduced their flexibility to spend it. Such centralization actually increased the lack of coordination by adding one more decision and funding point (Ritchie, 2005).

Thirdly, the participation of the private sector in the decision making process is very limited in Malaysia. The early National Economic Policy actually alienated local business leaders, the majority of whom are Chinese. Relations between the state, capital and labor have been shaped by communal tensions, which hamper coordination and cooperation. Although a number of agencies and forums exist for the government to consult the private sector, owners of small and medium-sized enterprises, academics and especially labor leaders are absent from these consultative bodies. Furthermore, the large firms that are consulted are not utilized to create or implement the actual policies (Ritchie, 2005).[211]

All of these institutional limitations mentioned above may continue to constrain the implementation of various education reform measures recently adopted by the Malaysian government. However, there needs time to evaluate the actual implementation of these still new measures.

[211] I do not have information besides the limited state-led participation of the private sector, whether the private sector played a more autonomous role through channels such as lobbying. My study shows the private sector has similar preferences as the government regarding education policies in recent periods. Given a more liberal attitude of the Malaysian government toward interest groups, the private sector might have played a more autonomous role but I do not have enough evidence to draw the conclusion.

Figure 6.12 Education Policy Making in Malaysia



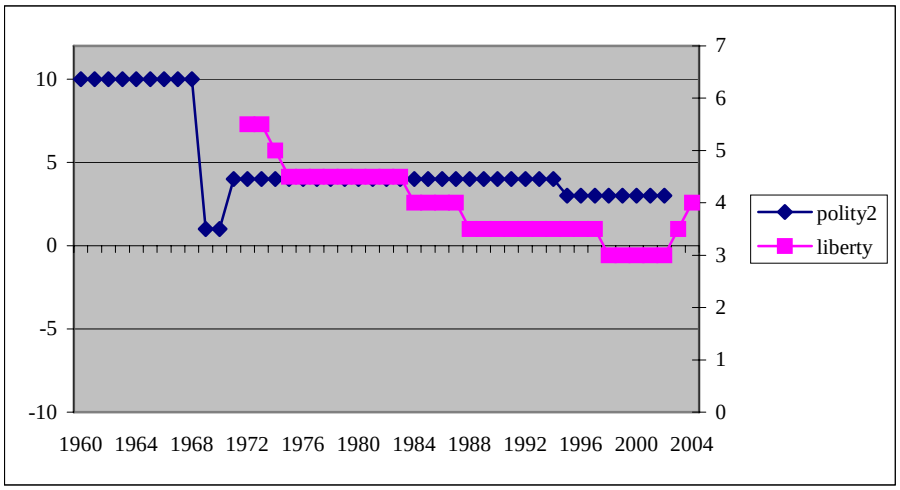
Source: Ritchie, 2005, Figure 2. Ministry of Education, Malaysia.

6.2 Competitive Authoritarianism and Government Education Provision in Malaysia

6.2.1 Competitive Authoritarianism and Ethnic Communalism in Malaysia: An Overview

The nature of the Malaysian regime took a sharp turn at the 1969 racial riot. As can be seen from Figure 6.13, the standard Polity score decreased dramatically in 1969 from 10 to 1 on a scale from 10 to –10 where 10 represents the most democratic regime and –10 the most undemocratic. Then the polity score increased to 4 in 1971; in 1993, the score decreased further to 3 in 1995 and kept at that level since then. The liberty score published by the freedom house, shows a decrease of civil and political liberties in Malaysia in early 1970s, 1980s and late 1990s but a small increase in recent years (Figure 6.13) [212]. As a comparison, the polity score for Singapore remained -2 since 1965; in contrast, Taiwan's polity score increased from –7 to 7 as democratization progressed in early 1990s.

Figure 6.13 Political Regime in Malaysia



Source: Polity IV and Freedom House.

[212] The liberty score shown in Figure 6.13, is an average of civil and political liberties on a scale of 0 to 7, where 0 stands for the most illiberal while 7 stands for most liberal. For a detailed explanation of constructing scores, see Appendix 1.8.

The roots of authoritarianism in Malaysia went back to the early independence period. Although parliamentary democracy was installed in 1957, political freedoms were already overridden in the Constitution by article 149 and article 150, giving the parliament and the executive special powers to deal with an emergency respectively. The *Emergency Law*, which was used by the British to suppress communist insurgencies and labor unrests by means such as detention and registration, ended in 1960 but was soon replaced by the *Internal Security Act* that allowed detention without trial. Only three years after independence and one year after the ratification of the constitution, 36 amendments of the constitution had been made.

After the 1969 racial riots, the Alliance Party announced a state of emergency and suspended the parliament and constitution for two years. Strong restrictions on media and public discussions of sensitive issues were imposed after the parliament resumed in 1971 and the Alliance Party renewed itself as *Barisan National* (National Front). The 1980s saw a further erosion of civil and political liberties and the strengthening of executive power under the rule of Dr. Mahathir. Ten laws were amended in this period to restrict liberties and increase the power of executive at the expense of the traditional Malay Ruler and the judiciary (Munro-Kua, 1996; Verma, 2002; Yap, 2005). Elections are held regularly but not fair. The *Internal Security Act* has been used widely to harm political oppositions; elections are usually called just one to two weeks before the election date and are filled with illegal practices such as vote-buying and phantom voting. The

detention and trial of deputy Prime Minister Anwar Ibrahim[213] in 1998 was just another case to show the authoritarian characteristic of the Mahathir regime.

Another feature of politics in Malaysia is communalism. The multi-ethnic nature and unequal race relations in Malaysia decided that political battles are frequently fought along ethnic lines. Figure 6.14 shows the ethnic composition in Malaysia. Malays received preferential treatment during the colonial period and have been the politically dominant ethnic group since independence. The special rights of Malays and the Malay rulers are guaranteed in the constitution (Lee Hock Guan, 2005). Islam was declared the official state religion and Malay the national language. The Chinese and Indians had to accept this arrangement in exchange for rights of citizenship (Munro-Kua, 1996). Even though the major minority parties, the MCA (Malaysia Chinese Association) and MIC (Malaysia Indian Congress) were co-opted into the Alliance coalition from early on, the UMNO (United Malays National Organization) was clearly always dominating the coalition (Munro-Kua, 1996). The core constituency of the major opposition parties, most of which claim to have universal ideology, are usually dominated by one ethnic group. For example, the Democratic Action Party (DAP), which pursues a democratic and socialist Malaysia, mainly attracts Chinese voters (Verma, 2002). Another major opposition party, the Islamic Party of Malaysia, with the goal of building a country based on Islamic legal theories, gains support largely from the Muslim and thus the Malay

[213] Anwar founded the Malaysian Muslim Youth Movement, a group highly critical of the government's secular-pragmatic approach toward the issue of Malay special rights and the problem of poverty. He was invited into the *Barisan National* by Dr. Mahathir in 1982 and rose quickly to the position of Deputy Prime Minister. He was also very popular with the West. It was popular conception that he was the successor of Dr. Mahathir. However, Anwar was arrested in 1998 for charges of corruption and homosexuality and was finally sentenced 6 years in prison. For a detailed account of the Anwar case, see Yap, 2005, page 57.

voters. The main constituency of the Sabah United Party (PBS), safeguarding the autonomy and prosperity of Sabah and promoting a democratic Malaysia, is Kadazan-Dusan, two indigenous ethnic groups in Sabah.

Figure 6.14 Ethnic Composition in Malaysia (% of Total Population)

Year	Bumiputera	Chinese	Indian	Other
1957	49	38	11	1
1870	53	36	10	1
1990	61	28	8	1
2000	65	26	8	1

source: Hirschman, 1980: Table 3.

Malaysia population census, http://www.statistics.gov.my/english/census/pressdemo.htm, accessed July 2, 2007.

6.2.2 Politics of Education Under the Competitive Authoritarian Regime

In this section, I argue that in contrast to democratizing Taiwan but similar to authoritarian Singapore, government education provision constantly served as a tool for nation building and maintaining the legitimacy of the ruling coalition in Malaysia. However, given its backgrounds of ethnic communalism and more competitive authoritarianism, education and language issues, which are important for maintaining group identity and upward social mobility, are more contested in Malaysia than in Singapore. With the Malays politically and culturally dominant, the minority ethnic groups are constantly claiming their rights of education and language while the Malay groups strive to maintain their dominance. Islamic education is another contested topic in Malaysia because the government has to achieve a balance between the demands of the Muslim and non-Muslim groups.

Comparing with authoritarian Singapore, the more competitive authoritarian regime in Malaysia allows more space for interest group activities and electoral politics. Education is always a hot topic in elections and the parties try to attract voters by supporting their educational demands. The ruling coalition, *Barisan National* is very careful when adopting education reform measures that would affect its core constituency – the Malays; it is also most likely to make compromises on educational demands of other groups during the time of a hotly contested election, especially when the groups making the demands are deemed as key voters. However, the authoritarian nature of the Malaysian government decides dissent opinions and activities on language and education, especially that from minority groups, are simply ignored or suppressed most of the time. An increasing authoritarian tendency of the Mahathir regime in the 1980s is also associated with more severe suppression of the dissent groups.

Below, I will first show how government education provision constantly served as a tool for nation-building and political indoctrination in Malaysia. Then I will demonstrate the contested politics of education in Malaysia focusing on three prominent issues - Chinese education, Islamic education, and the recent reforms on language of education and ethnic quotas.

Education as A Tool for Nation Building and Political Indoctrination in Malaysia

Government education provision has been an import tool for maintaining national unity and forging a Malaysian identity since the independence of Malaysia. Given the tense ethnic relation in Malaysia, nation building through the education system proved to be

rather unsuccessful. Nevertheless, as in Singapore, this aspect of education provision was constantly renewed given its importance.

Prior to the 1969 racial riots, nation building through government education provision largely meant promoting a unified national system of education using *Bahasa Malaysia* as the medium of instruction. This system was expected to constitute a common ground for a Malaysian identity and provide the social mobility necessary for the disadvantaged groups to improve their standing (Brown, 2007; Adnan and Smith, 2001). However, such a system was not put into place without protests from minority ethnic groups, which I will discuss in detail later in this section. The 1969 racial riots highlighted further for the political leaders the lack of national identity and unity in Malaysia; as a result, the content as much as the medium of instruction became more of a concern. After the riot, teaching of a "national ideology", *Rukunegara*, was made compulsory in primary and secondary education and a Civics course was introduced to instill its value. *Rukunegra* constitutes five elements: 1) faith in God; 2) loyalty to king and country; 3) respect for the rule of law; 4) upholding the constitution; 5) morals and good behavior. The Civics course specified five objectives: 1) to foster loyalty and love for the country; 2) to cultivate consideration for others of different racial origins and creeds; 3) to develop self-reliance; 4) to develop an innovative attitude, and 5) to develop correct social conduct, good behavior and morality. However, reviews of the Civics course indicated that the teaching was mostly futile since the curriculum focused on memorizing and neither the teachers nor the students showed much interest in the non-examinable course (Brown, 2007; Ahmad, 2004).

The *1983 National Curriculum* incorporated the teaching of Civics into history education which emphasized patriotism and loyalty to the country. But again, some study showed that it was not effective due to the vague definition of the teaching goals, the poor teaching quality of the teachers and its non-examinable status (Ahmad, 2004)[214]. Recently, the task of nation building is renewed through a broader course of moral education which promoted values of national unity, multiculturalism and patriotism (Brown, 2007). The effectiveness of this new course is yet to be evaluated given the past futility of similar courses, the actual segregation at national schools and the contested politics of education in Malaysia.

Besides nation-building, the education system was also used by the ruling coalition to cultivate values favorable to maintain its rule. Brown (2007) has demonstrated, by analyzing the school curriculum in details, how the current moral education courses instill values such as "respect and loyalty for the leaders, king and country", "the trustworthiness of incumbent government", gratitude for incumbent government and suspicion of democratic values[215]. He also showed that in the history textbooks, an almost linear regression was presented entwining independence, development and national unity; sensitive ethnic issues were brushed aside and loyalty and obedience to

[214] Ahmad showed in a survey study that even though 99% student participating in the survey thought developing citizenship was important, 95% of them didn't think history lessons taught in school helped in the learning of citizenship and 85% thought the teachers didn't emphasize citizenship values in their lessons (Ahmad, 2004).

[215] For example, in the secondary school textbook, the pupils are also encouraged to discuss the "bad effects" of political demonstrations when examining "freedom of speech", clearly aiming at the massive reformist demonstrations of 1998, which were universally criticized by the compliant and fettered newspaper industry (Brown, 2007).

the incumbent government was emphasized. However, these teachings are problematized by the contested politics of education in Malaysia, which I will discuss below.

Contested Politics of Education in Malaysia

Chinese Education

Despite the government's continuous efforts to cultivate a national education system with "Bahasa Malaya" as the medium of instruction, mother tongue education of the minority ethnic groups was constantly contested in Malaysia. The struggle of the Chinese for mother tongue education already started at the time of independence as school assistance was linked with the imposition of Malay or English as the sole medium of instruction. The Chinese-educated members swelled the Labor Party in order to register their protests. However, opposition to the Malay-based national education system was soon subjected to the extended power of the Alliance Party-led government as it amended the *Internal Security Act* in 1962. This amendment gave the government the power to order the immediate closure of any schools if found to be used for unlawful purposes (Munro-Kua, 1996). The Chinese community managed to reach a bargain with the government to keep their primary schools[216], but all secondary Chinese schools were required to covert into schools that use Malay as the main medium of instruction with the implementation of *National Language Act* in 1963 (Chan and Tan, 2006). The 1969 racial riots accelerated the conversion process; language and education became sensitive issues the public discussion of which was forbidden[217]. The government forced transition of the secondary

[216] The Indians were also able to keep their Tamil primary school.
[217] "There really wasn't much protest any more from our Chinese community", commented a journalist before the 1982 election, "We are not allowed to print anything that might inflare racial conflicts in the

Chinese schools to Malay-based instruction was completed in early 1980s (*Christian Science Monitor*, April 10th, 1980). But the transition didn't take place with further opposition from the Chinese community. The Chinese dissatisfaction of government education policy was also deepened as the New Economic Policy severely limited tertiary education opportunities for the Chinese[218].

The 1970s saw a resurgence of the Chinese education movement led by Dongjiaozhong[219], a national group advocating Chinese culture and education since the colonial period. Dongjiaozhong launched an alternative education system with its own books, curriculum and examinations and enrollments in the Chinese schools increased with these efforts. The efforts of the movement culminated in 1983 when an application to establish a Chinese university was filed. The government refused to give permit, a decision backed up by the Supreme Court. As key leaders of Dongjiaozhong joined the Barisan-component party before the 1982 election, the movement fell into disarray (Wah, 2002).

Nevertheless, another Chinese movement emerged in 1986 before the parliamentary election. Twenty-seven Chinese clans, educational and community groups formed a Civil Rights Committee to press the government for change. They distributed booklets to

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country and of course anything you do with this issue (Chinese education) will do that", *The Globe and Mail*, Jan. 11th, 1983.

[218] State institutions were allocated quotas for the intake of *Bumiputera*; government funding for places at universities, both in Malaysia and abroad was almost entirely restricted to *Bumiputera*; between 1980 and 1984, over 95 percent of the successful applicants to overseas study grants were *Bumiputera* (Brown, 2007).

[219] Dongjiaozong is a common contraction that refers to two large Chinese organizations that often work in tandem, the United Chinese School Teachers Association and the United Chinese School Committees Association (Brown, 2007).

various parts of Malaysia to spell out Chinese demands on political representation, economics, social issues, culture, language and education (*Christian Science Monitor*, July 3rd, 1986). Street protests and boycott of classes took place after the election as the government sent teachers who didn't speak Mandarin to senior posts in government-aided Chinese primary schools (*The Washington Post*, Oct. 29th, 1987). The cycle of protest was intensified by a series of counter-protest organized by various groups within UMNO and ethnic tensions reached critical levels before 1987[220] (Brown, 2007). Comparing with the Dongjiaozhong-led movement in the 1970s, the increasingly authoritarian government led by Dr. Mahathir, which just survived a UMNO internal crisis[221], acted much tougher on the Chinese protestors this time. It arrested seventy opposition leaders and academics in "Operation Lalang" and closed three newspapers which were critical of the government.

Despite the government's suppression of the Chinese education movement, the competitive nature of the Malaysian regime ensured that the government has to walk a fine line between suppressing and meeting the educational needs of the Chinese as the opposition party often highlights this issue to attract Chinese voters who are critical for the ruling coalition to maintain its two-thirds majority in the parliament. The government was particularly eager to make compromises when the election was hotly contested. The mainly Chinese dominated opposition party, Democratic Action Party (DAP), made the

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[220] For a detailed account of this cycle of events, see Brown, 2007.

[221] Dr. Mahathir's presidency was challenged by an alliance of two prominent members of UMNO (Razaleigh and Musa) in the 1987 party election. In a bid to outdo his opponents, Mahathir ordered the high court to deregister UMNO. Rzaleigh-Musa also filed a case to court accusing some articles of UMNO's party guidelines are unconstitutional. The Supreme Court in the end ordered UMNO as illegal. Dr. Mahathir in turn had to organize a new UMNO to contest in the 1990 election. Prominent members of the judiciary were later suspended (Verma, 2002).

government's favoritism toward the *Bumiputeras* in tertiary education a leading issue in the election campaign of 1978 (*The Globe and Mail*, July 15th, 1978). It re-emphasized the Chinese education issue in the 1983 campaign[222] (*The Globe and Mail*, Jan. 11th, 1983). In turn, the UMNO-led alliance government had to reassure the Chinese voters during the campaign that Chinese primary schools would not be closed (*The Globe and Mail*, Jan. 11th, 1983). During the 1986 election, the alliance government made several pledges relating to the upgrading of Chinese education and more financial allocations for new Chinese villages but it was accused of not fulfilling these promises later by its fraction party, Malaysia Chinese Association (MCA), which tried to maintain Chinese votes that were increasingly attracted by DAP.

The tension between the Alliance government and the Chinese community became less intense in the 1990s as the government took measures to liberalize its education system, largely as a result of pressure from the global market, as I detailed in section 6.1. The liberalization measures were welcomed by Chinese parties and voters as they provided more opportunity for Chinese students and Chinese-medium schools; Dr. Mahathir was able to attract more Chinese voters in the 1995 election due to these measures (*The Guardian*, April. 27th, 1995). A great breakthrough for the Chinese educational groups took place during the hotly contested 1999 election when Dr. Mahathir promised to consider long-standing demands made by Chinese education activists to increase the number of Chinese schools (*Christian Science Monitor*, Nov. 26th, 1999) and in 2001, the

[222] "The Chinese schools", said Lim Kit Siang, leader of the Chinese dominated Democratic Action Party, "face a real threat of extinction." He charged that only Malay schools are being built while the Chinese schools are bursting at the seams but so far the protests have fallen on deaf ears (*The Globe and Mail*, Jan. 11th, 1983).

MCA received green lights from the government to open a Chinese university (*Strait Times*, July 16th, 2001).

Islamic Education

Islamic education is another point of contestation in multi-ethnic and multi-religion Malaysia given the special status of Islam as the state religion. Islamic education has gained increasing importance due to pressures from the Muslim groups. In 1960, religious study was made compulsory for all Muslim students in government schools. With the resurgence of Islam in Malaysia in the 1970s, the government implemented a series of education reforms in response to criticism from the Pan Malayan Islamic Party (PAS) and other Islamic groups and organizations. In 1977, the government established secondary religious schools which offered Arabic language and higher Islamic education to all students from the first year of secondary school. In 1979, the *Report of the Cabinet Committee on the Review of the Implementation of Education Policies* recommended all Muslim students sit for Islamic religious knowledge at national examinations. Based on the same report, the periods devoted to Islamic study were increased and moral education was introduced for non-Muslim students in the New Primary School Curriculum (KBSR) promulgated in 1983 and also in the New Secondary School Curriculum (KBSM) adopted in 1988 (Rosnani, 1996). To attract votes away from the Islamic opposition party – PAS, the Prime Minister Dr. Mahathir also allowed the establishment of the first Islamic University where English and Arabic would be used before the 1982 election[223] (*The New York Times*, April 25th, 1982).

[223] The Prime Minister also made a pilgrim to Mecca before the 1982 election.

Despite these efforts, the government's Islamic education policies were attacked by both Muslim and non-Muslim groups. On one hand, the Muslims, most of which are Malays, complain that the national schools are ineffective in teaching religious education, reflected in the fact that a sizeable students are not able to read the Quran in Arabic and do not know how to perform the obligatory prayers; also, Islam is taught as a private matter of the individual with no relation to other subjects, a notion foreign to Muslims. The Muslim Youth Movement of Malaysia (ABIM), whose members are mainly intellectuals, have criticized the government's education policy as being overconcerned with physical and material development and manpower training and failed to establish the moral character of the students (Rosnani, 1996). These dissatisfactions were reflected in an increasing number of enrollments in private religious schools. In 2002, there were 70,235 pupils enrolled in private religious schools whereas the number of enrollment in national religious schools were only 40, 008, a significant decrease from an enrollment of 63, 000 in 1999 (*New Strait Times*, Dec. 1st, 2002). On the other hand, non-Muslim groups criticized the national schools as being over-Islamized as only 2% of Chinese and 4% of Indian students go to national primary schools (*South China Morning Post*, March 14th, 2003). The Chinese and Indian community strongly opposed the government's move to make Islamic Civilization a compulsory subject for university students and as a result, the teaching of other civilizations was also included in the course (*Chronicle of Higher Education*, Oct. 17th, 1997).

But the Muslims were not happy with private religious schools either. These schools were usually poorly funded, the curriculum was very limited and outdated and the methodology employed in these schools didn't encourage scientific inquiry and critical thinking. Graduates from these institutions are usually steadfast in their belief but lack higher education opportunities due to their narrow and specialized curriculum (Rosnani, 1996). In 1996, the Education Ministry identified more than 300, 000 pupils of religious schools who have little or no understanding of basic reading, writing and counting skills and only 25% of students were enrolled in science class (*New Strait Times*, Jan. 19th, 1996). Recent data shows that only 2.2% students in these schools got As in science exams comparing with a 15.4% A rate in national schools; the A rate for English exam was only 3% for religious schools comparing with an A rate of 18.7% for national schools (*New Strait Times*, Jan. 4th, 2003).

Due to the poor performance of the religious schools, the government started to revamp the religious education system since the middle 1990s. Earlier efforts were focused on introducing more science and technical subjects into religious schools (*New Strait Times*, Jan. 21st, 1995; April 3rd, 1996; July 4th, 1996). In 1996, the parliament passed *Control of Religious School Enactment* (*New Strait Times*, April 19th, 2002). With increasing Islamic militancy and opposition movement to the government in the late 1990s as shown in a series of university protests, the government tightened control on religious schools. The terrorist attack on the United States intensified Malaysian's government's efforts in this direction. In 2001, Prime Minister Dr. Mahathir announced the government would cut funding for 650 private religious schools, which were largely run by Muslim

fundamentalists supporting the Islamic Opposition Party, PAS (*Strait Times*, September 3rd, 2001). These schools teach students the politics of hatred, charged Dr. Mahathir (*Strait Times*, Feb. 14th, 2003). Students in these schools were invited to transfer to national schools. The government's decision to stop funds for religious schools was heavily criticized by the opposition. PAS declared that this was a deliberate move to destroy Islam since the religious schools are the last bastion of the Ummah to protect and preserve the faith (*New Strait Times*, Dec. 1st, 2002). It launched a nation-wide campaign to save the schools, even seeking the intervention of traditional Sultans (*Strait Times*, Feb. 14th, 2003) but the Sultans backed the government's decision (*Strait Times*, March 15th, 2003). The compromise was reached that schools that complied with the government's syllabus would regain their funding (*New Strait Times*, Nov. 15th, 2002).

Nevertheless, moderate Islamic education continued to be important in Malaysia as Muslims are the majority of the voters. In 2004, the government led by the new Prime Minister Abdullah Ahmad Badawi launched a new development framework, *Islam Hadhari*, which aims to bring the people back to the basics and fundamentals of Islam (The Ninth Malaysia Plan, 2006-2010).

Recent Reforms on Language of Education and Ethnic Quota in Tertiary Institutions

I have mentioned that in order to make the education system more efficient and more in tune with producing manpower suitable for the knowledge economy and the global market, the Malaysian government made two significant reforms in recent years: firstly, maths and science would be taught in English rather than Malay in primary and

secondary schools; secondly, ethnic quota for Malays in tertiary institutions was cancelled. Since these two reforms touched the most sensitive issues in the Malaysian society – language of education and the privilege of the Malays, they met with fierce opposition from related groups. In the end, the powerful authoritarian government under Prime Minister Dr. Mahathir was able to implement these policy changes despite oppositions. However, given the competitive nature of the regime, the government had to walk a fine line not traveling too far to offend the opposition groups and turning away its core voters.

Malay groups are the main opposition to English teaching. As the government increased the importance of English since middle 1990s, various Malay groups such as Malaysia Intellectual Congress (MIC) expressed worries that the learning and use of *Bahasa Malay* might be gradually ignored by the government in the education system. When the government planned to privatize the education system in 1995, the MIC handed a petition demanding that Malay be the language of instruction in private institutions of higher learning (*New Strait Times*, Dec. 20th, 1995). To appease these groups, the Malaysian government constantly made announcements that the national language status of Malay will be ensured and its usage would be encouraged in the private sector. When universities were corporatized in 1995, the government didn't forget to reassure the Malay groups that *Bahasa Malaysia* would continue to be the medium of instruction (*New Strait Times*, June 16th, 1995). A panel on *Bahasa Malaysia* was also set up in 1996 to make sure the efforts to enhance *Bahasa Malaysia* would be fully implemented (*New Strait Times*, April 12th, 1996). In the same year, the Prime Minister encouraged the

private sector to use *Bahasa Malaysia* (*New Strait Times*, August 18th, 1996). In 1997, the Education Minister Datak Seri Najib Tun Razak commented that "the government will ensure that *Bahasa Malaysia* will be the main language used in the implementation of the Multimedia Super Corridor", a project to attract foreign high-tech companies (*New Strait Times*, May 20th, 1997). In 2003 when the medium of instruction for science and maths was changed to English for primary and secondary schools, the government promised the Malay groups again that it would never side-line *Bahasa Malaysia* in its bid to boost the usage of English in the education system (*New Strait Times*, September 3rd, 2003).

Some Chinese educational groups such as Dong Jiaozhong also expressed some objections to the introduction of English teaching (*Strait Times*, August 11th, 2002). Their protests result in a rare fracture in the BN public façade, with the MCA and other Chinese-based parties openly expressing their opposition to the policy. An ethnicized-debate was provoked between newspapers controlled by respective parties. The Chinese party was accused of "arrogance" and of suffering from a "superiority complex". The government raised the specter of the *Operation Lalang* arrests as the accusations and counter-accusations increased in the debate, threatening to use the ISA against "educational extremists" (Brown, 2007).

The reform of canceling ethnic quota was also very political. Besides improving the competitiveness of the education system, the Mahathir government also worried about the growing polarization and Islamic opposition to the government in Malaysia's tertiary

institutions (*Strait Times*, July 6th, 2001). This policy change affecting the privileged rights of the Malays met serious opposition from UMNO youth wing and other Malay groups (*Strait Times*, June 13th, 2002). Even though canceling of quota actually increased the Malay enrollment in tertiary institutions in the following year due to the fact the easier exam to tertiary institutions was only open to the Malays (*Strait Times*, May 25th, 2002), various Malay groups still would like the government to re-instate the quota system (*The Australian*, June, 15th, 2006). As commented by Johor UMNO chief Datuk Abdul Ghani Othman, the constitution already defined the racial positions in Malaysia and the quota system shouldn't be cancelled. But the government seemed to be firm on this policy. During the debate, there was some voice arguing there should be quota for the poor non-Muslim Bumiputra of Sabah and Sarawak and the Indian community since it is they who are under-represented in the current education system (*Business Times*, August 6th, 2001; *South China Morning Post*, July 13th, 2003). But these voices are weak given the weak political position of these groups. On the other hand, schools of the increasingly critical voter – the Chinese, received extra funding from the government to compensate for their decreased enrollment in tertiary institutions after canceling of the quota system due to an unfair exam system[224].

6.3. Conclusion

In this chapter, I argue that consistent with the findings in Taiwan and Singapore, globalization has had a profound influence on government education provision in

[224] More than 800 government-aided Chinese primary schools will receive up to RM50 million in grants under the 9th Malaysia Plan – almost twice as much as before to ease their unhappiness over the current exam system to tertiary institutions (*Strait Times*, April 5th, 2006).

Malaysia. The forces of globalization operated at both the state and the system level in the Malaysian case: on one hand, the Malaysian economy integrated deeper into the global market through diversified manufacturing in the late 1980s; on the other hand, the global market became more competitive at around the same time as more newly-industrialized, low-cost developing countries started to produce for the global market. These two forces of globalization increased the vulnerability of the Malaysian economy and exerted enormous pressure on the Malaysian government to restructure its education system to keep up with the needs of its economy, for which structural upgrading and human resource development are now the keys to survival and sustainable growth.

As I have detailed, government education provision didn't rank high on the development agenda of the Malaysian government until pressured by the globalization forces in the late 1980s. The Malaysian economy was already relatively open at the time of independence as it depended heavily on resource-based exports such as tin and rubber. The Malaysian government first adopted economic strategies of agricultural diversification and import substitution after independence. In this early period of economic development, government education provision focused on expanding basic education and building a national system of education. Developing adequate human resources through education and training also started to be emphasized in government development plans. However, the priority of government education provision was soon given to that of social restructuring after the 1969 racial riots. Promoting national unity and integration became the top priority of the public education system between 1971 and 1982. *Bahasa Malaysia* replaced English and other vernacular languages as the medium

of instruction in all national schools and favorable treatments in education opportunities and scholarships were given to the *Bumipetras*, the politically dominant but economically and educationally weak ethnic group in Malaysia. Such education policy was an integrated part of the New Economic Policy in this period, which aimed to achieve the twin goals of eradicating poverty and social restructuring. The implementation of New Economic Policy was premised on an expanding Malaysian economy, which exhibited remarkable growth rate in this period with its flourishing resource-based and labor-intensive exports.

However, changing conditions of the world market soon exposed the vulnerability of the Malaysian economy, which slowed down in early 1980s due to the two oil crises. In 1985, the Malaysian economy went into a deep recession after a sharp drop of primary commodity prices in the world market. Against this backdrop, the Malaysian government started to restructure the economy by encouraging private-sector growth, foreign direct investment and manufacturing diversification. These measures brought Malaysia out of recession at the end of 1980s, by which foreign direct investment soared in Malaysia and its trade dependence also increased significantly but through a more diversified manufacturing base. Nevertheless, fundamental changes of the education system came later. Government education provision in the restructuring period still prioritized promoting national unity and integration. Major efforts were spent on improving the participation of low-income groups. Some curriculum changes were made to make science and maths more attractive to students but these changes had implementation

problems. Vocational education was made more academic to suit the tastes of the *Bumiputera* students who usually would like to seek public sector employment.

Fundamental structuring of the education system in Malaysia only started in the early 1990s as the government realized the growing vulnerability of its economy in an increasingly competitive global market. With Malaysia striving to become a developed country in 2020, structural upgrading and human resource development became important components of the New Development Policy, which replaced the New Economic Policy in 1991. Educational reforms were implemented to produce medium and high skilled manpower essential for the upgrading of the economy. Basic education was extended to 11 years to prepare more graduates with tertiary education. Teaching in science, maths and English was emphasized and improved, so was that of the computer skills and communication technologies. To increase the supply of tertiary education without adding to the financial burden of the government, privatization and corporatization of the tertiary sector was also implemented in the middle 1990s.

The economic function of government education provision became more critical as Malaysia entered the twenty-first century and the government aimed to build a competitive knowledge economy. Two reforms that touched the most sensitive issues of the Malaysian society – the privilege of the Malays and the Malay language - were implemented by the government despite strong oppositions: the ethnic quota enjoyed by the Bumiputeras at tertiary institutions was cancelled in 2001; English replaced the national language, *Bahasa Malaysia* as the medium of instruction in maths and science at

the primary and secondary schools in 2003. For the government, both measures were expected to improve the competitiveness of the Malaysian education system, which then could produce graduates capable to compete in the global market. Another reason for reform is to attract more foreign students since the education sector has now been identified by the government as a new engine of growth.

Despite the enthusiasm over reform in Malaysia, comparing with Taiwan and Singapore, the match between education supply and economic demand is much poorer. This is partly due to the earlier priority attached to social restructuring instead of serving economic needs. On the other hand, the policy linkages are weaker in Malaysia to produce effective policy changes. There lacked coordination among various education ministries. The power has also been increasingly centralized in the Prime Minister's office which left less autonomy for the line ministries. Moreover, there is also limited consultation with the private sector. For the large firms that are actually consulted by the government, they are given rare opportunities for participation in policy making and implementation. These institutional features might continue to hinder fundamental education reforms in Malaysia.

As in Singapore, the above mentioned education upgrading were implemented by an authoritarian government in Malaysia, which has been in power since independence. Elections are held regularly but the authoritarian regime has severely limited civil and political freedoms and increased the power of the executive through a series of constitutional amendments. Similar to Singapore, nation-building and cultivating values

favorable to maintaining the legitimacy of current regime has been a constant goal of the education system in Malaysia. But this task proved to be more difficult than in Singapore given both pedagogical difficulties and its more contested politics of education. The competitive nature of the regime and its more liberal attitude toward interest groups comparing with Singapore provides more space for opposition activities and electoral politics. Given the political and cultural dominance of the Malays, most of these politics of education are played along ethnic lines in Malaysia. On one hand, the minority groups such as the Chinese are constantly reclaiming their rights to mother tongue education and more equal distribution of educational resources; on the other hand, the Malay groups also strive to maintain their dominance and privilege in the education system, as represented by demands such as maintaining ethnic quotas, ensuring Malay as the main medium of instruction and improving Islamic education. Education and language are always hot topics at election times as parties try to attract voters by supporting their educational demands. The ruling coalition is very careful in implementing any education reforms that might affect the interests of its core supporters; it is most likely to make comprises on the demands of the politically critical voters before a hotly contested election. But at other times, dissent opinions and demands are mostly ignored by the authoritarian government. A more authoritarian style of the Mahathir government in the 1980s was also associated with tighter control on the dissent groups.

It remains to be seen whether the recent reform measures in Malaysia to improve its competitiveness would be successful. It takes time to changes the preferences of the majority Malays who usually favor arts instead of science and engineering, especially

given that they are still treated favorably at jobs such as civil service. Enough qualified English teachers are yet to be trained. The quota system is not fully removed since the *Bumiputera* students can take easier entrance exams to the tertiary institutions. The competitive authoritarian regime in Malaysia has been strong initiating these reforms but it is unclear how far it is willing to travel without risking its two-thirds majority votes in the parliament. It also remains to be seen how much reform is actually carried out given the weak policy linkages that hinder education reform in Malaysia. Another challenge for the government is how to build national unity in a now ethnically polarized education system. This is important if the government wants to mobilize the students to study for national development; social capital is also more important in the increasingly complex knowledge economy. The results of recent government efforts to strengthen national unity by measures such as vision school, military training and Anak Malaysia (student clubs) where students of different ethnic groups are put together for study, training and extra-curricular activities are not very desirable yet[225] (*Times Higher Education Supplement*, March 9th, 2001; *South China Morning Post*, Jan. 6th, 2004; *New Strait Times*, Feb. 29th, 2004).

The findings on the effects of globalization in this chapter are against the null-effect finding in the statistical studies. A rough look at the bivariate relations between the globalization variables and education spending in the Malaysia case indicates that similar

[225] In 1997, the government proposed the construction of "vision schools", in which a Malay-language primary schools would share a compound and some facilities with Chinese and Tamil schools. Tuition would remain separate but pupils would share a dinning hall and playing field. This proposal to help promote ethnic interaction and integration was met with outraged protests by the Chinese educationalist movement, which discerned a "hidden agenda…to have a single medium of instruction in all schools" (Brown, 2007).

to the Taiwan and the Singapore cases, the influences of the global market are not well captured by the globalization variables. Even though trade intensity ratio already started to increase in the 1970s, education spending as percent of government spending didn't increase significantly until 1980s and education spending as percent of GDP didn't increase significantly until late 1990s; only per capita education spending has the same constant increasing trend as the trade intensity variable since the 1970s. The policy indicator of trade openness only changed once in 1994. What happened is in the Malaysian case, globalization had significant effects on government education provision only when competition in the global market became intense for Malaysia but the trade indicators are not good representations of this competition.

The capital account openness indicators seem to be better capturing the increasing competition of the global market in the Malaysian case as the Malaysian government only liberalized its capital markets when competition in the global market started to become intense. Foreign direct investment and private capital flow increased dramatically between late 1980s and 1993, a period when education spending as percent of government spending and education spending as percent of GDP also increased.

The Malaysian case is relatively unique in that the authoritarian government implemented an education policy that prioritized social redistribution favoring the Malay masses until changes are pressured by the globalization forces and the activism of Islamic extremism in universities. This seems to be in contradiction with the finding in democratizing Taiwan that democratization was associated with a redistribution of education resources

favoring the masses and in Singapore where authoritarianism was associated with an elite-oriented education system. However, given the motivation for such education policy in Malaysia was the leaders' concern for social peace after the 1969 racial riots and the authoritarian regime in Malaysia is more competitive than that of Singapore, the findings can be said mostly consistent.

Chapter 7 Globalization, Democratization and Government Education Provision in Thailand

This chapter studies how globalization and democratization affect government education provision in Thailand. I start my study in 1958, which marked the beginning of the modern economic development of Thailand[226] (Dixon, 1999), and cover material available until present.

I argue that similar to what happened in Taiwan, Singapore and Malaysia, increasing integration into the global economy also significantly impacted government education provision in Thailand. However, this impact was felt the latest in Thailand, as export promotion only became the dominant economic strategy in the middle 1980s, more than two decades later than Taiwan and more than one decade later than Singapore and Malaysia. The Thai government started to reform an education system which used to focus primarily on expanding primary education in the early 1990s as Thailand began to face an acute shortage of skilled manpower and an increasing competition from lower cost countries such as Vietnam, China and India. Nevertheless, fundamental education reforms started to be carried out only after the 1997 Asian financial crisis, during which Thailand experienced vividly the vulnerability of its open economy in the increasingly volatile global market and realized the importance of upgrading its human resource. Besides the "later comer in the global economy" factor, education reform in Thailand was

[226] Dixon argue that most studies of Thailand's development consider the coup d'etat of October 1958 and the establishment of the regime of Marshal Sarit Thanart as marking the beginning of the modern economic growth in Thailand. The Sarit government repudiated the Thai ethnocentric state *dirigisme* – economic intervention and the creation of state commercial and industrial enterprises to preempt economic development from non-Thai control – that had marked socioeconomic policy since the coup that ended the absolute monarchy in 1932; it also allowed the private business sector (largely Chinese or Sino-Thai at the time) to come forth as the engine of growth of Thai development (Dixon, 1999: 77-78).

also delayed due to an unstable political system which saw frequent regime changes and weak policy linkages matching economic demand and education supply.

Regarding the effects of democratization, evidence suggests democratic openings in Thailand was associated with pro-poor education expansion and fundamental education reforms: the short democratic government between 1973-76 saw the initiation of an education reform as part of the movement toward more democratization of the country; democratization in the 1990s was also associated with the expansion of basic education from primary to lower secondary level and fundamental reforms of the education system. These are consistent with the effects of democratization on government education provision in Taiwan. In contrast to Taiwan where civil society played a great role in pushing changes in government education provision, educational and bureaucratic elites played the major role in initiating the reforms in the short democratic period of 1970s. However, it is not completely clear what democratic processes produced the changes in the 1990s due to the limitations of my research. It seems to me that electoral competition at best played a limited role in expanding education access and had no clear effects on structural reforms. There is some evidence that the role of democratic elites was salient in initiating education reforms; moreover, interest groups, NGOs and others in the civil society may also have played a role pushing for education reforms given their vast number and wide interests in Thailand but I was not able to find solid evidence of this sort.

This chapter will proceed as follows. Section 7.1 discusses the impacts of globalization on government education provision in Thailand. The effects of democratization are explored in section 7.2. Section 7.3 concludes the chapter.

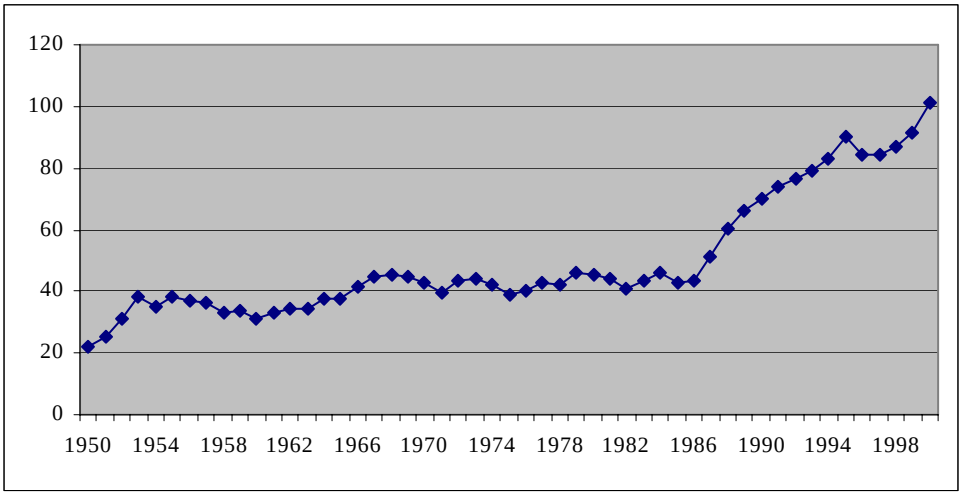
7.1 Globalization and Government Education Provision in Thailand

7.1.1 Globalization in Thailand: An Overview

When Thailand started its modern economic development in the late 1950s, its economy was a little bit more open than Taiwan, but much less open than Malaysia. The trade intensity ratio (the sum of import and export as a percentage of GDP) in this period, was 33% for Thailand, 24% for Taiwan but 83% for Malaysia. However, Thailand further opened to the global market almost more than two decades later than Taiwan and one decade later than Malaysia. As can be seen from Figure 7.1, the trade intensity ratio of the Thai economy only started to rise significantly after the middle 1980s and gradually climbed to a high of 100% in 2000, a level already reached by Taiwan in the 1970s.[227]

[227] The economies of Malaysia and Singapore depend more on the global market comparing with Thailand and Taiwan, with a trade intensity ratio of 180% and 350% in 2000 respectively. Consistently, the trade policy indicator also showed an increase of trade openness score from 3 to 3.5 on a scale of 0 to 8 in 1990.

Figure 7.1 Thailand: Trade Intensity Ratio (1950-2000)

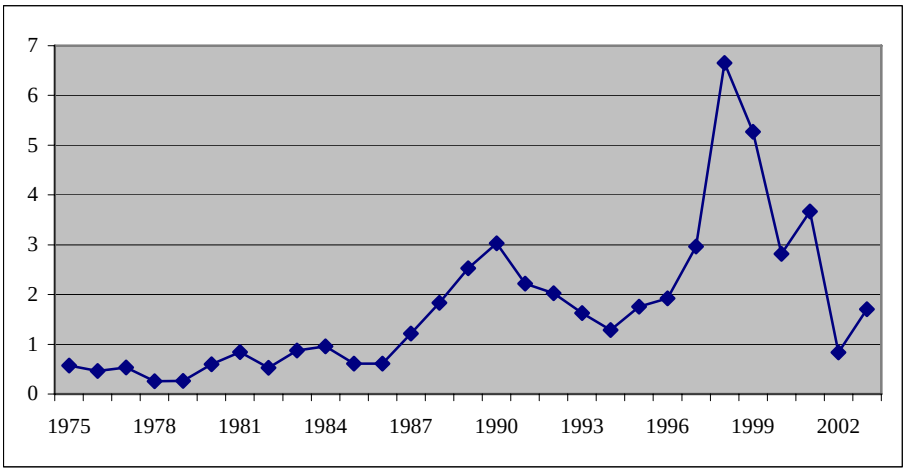


Source: Penn Table 6.2

Integration into the global capital market did not deepen in Thailand until the late 1980s. As shown in Figure 7.2 and Figure 7.3, both foreign direct investment and private capital flow as percent of GDP has increased dramatically since about 1987. Foreign direct investment improved from less than 1% of GDP before 1987 to a high about 6% in 1998. During the same period, gross capital flow increased from about 5% of GDP to about 18%. However, the 1997 financial crisis had a disastrous effect on foreign direct investment in Thailand, which dropped to a low of 1% in 2002. In comparison, foreign direct investment composed around already 6% of GDP in Taiwan and Malaysia since middle and late 1980s respectively.[228] Singapore relied more heavily on foreign direct investment, which contributed about 20% of its GDP since early 1980s.[229]

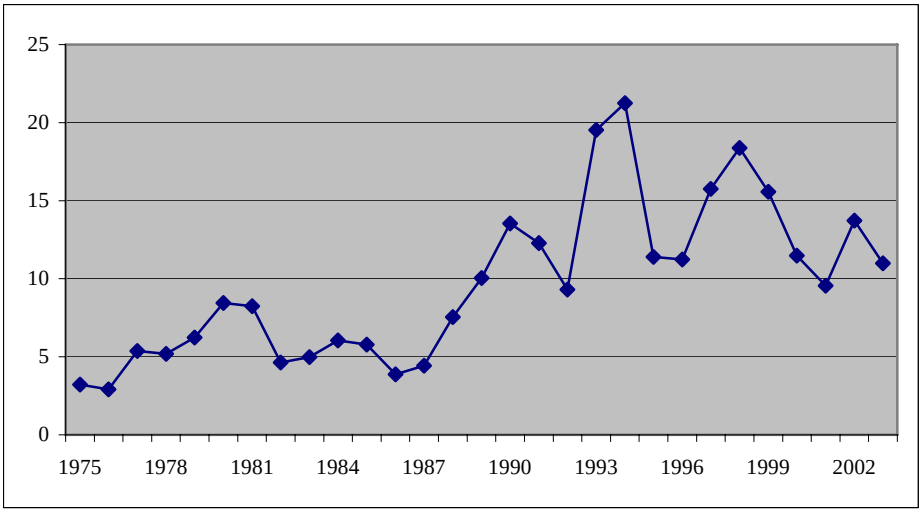
[228] Foreign direct investment data for Taiwan is from http://www.unctad.org/sections/dite_dir/docs/wir06_fs_tw_en.pdf, accessed April 12, 2007.
[229] However, my own coding of capital account openness didn't show any change between1971 and 2002: the capital account openness score in Thailand has remained 1.5 on a scale from 0 to 4.

Figure 7.2 Thailand: Foreign Direct Investment as % of GDP (1975-2003)



Source: World Development Indicators.

Figure 7.3 Thailand: Gross Private Capital Flow (1975-2003)



Source: World Development Indicators.

Data on economic structure reveals the changing nature of the increasingly open economy in Thailand. Table 7.1 shows the successful industrializing process in Thailand. The share of manufacturing overtook that of agriculture in the late 1980s. Manufacturing has also played an increasingly important role in export earnings since the late 1980s, as

can be seen in Table 7.2. Whereas in the 1970s, agriculture and related products composed of 77% of the export earnings and manufacturing only 15%, the share of agricultural products decreased to only 24% of export earnings while that of manufacturing increased to a high of 67% in 1990. Meanwhile, the service industry increased its share only slightly since 1960, by about 7% from 47% to 54% in 1998.

Table 7.1 Thailand: GDP by Sector (1960-1998)

	1960	1970	1980	1990	1994	1998
Agriculture	39.7	30	23.2	14.4	11.4	11.8
Mining & Quarrying	1.1	1.5	3.4	2.7	1.6	2
Manufacturing	12.6	17.1	21.3	24.7	31.3	31.9
Services	46.6	50.9	52.4	57.9	55.7	54.2
Construction	4.6	5.8	5.3	5.2	6.1	3.2
Electricity & Water Supply	0.4	1.5	1	3	2.6	3.1
Transportation & Communication	7.5	6.8	5.8	7.1	7.7	9.2
Wholesale & Retail trade	15.2	17.4	16.7	17.6	16.2	14.9
Banking, Insurance & Real Estate	1.9	3.9	3.1	5.3	7.6	5.7
Ownership of Dwelling	2.8	1.9	3.5	3.6	2.6	3.4
Public Administration and Defense	4.6	4.3	4.7	3.8	2.6	3.2
Other Services	9.6	9.3	12.3	12.3	10.3	11.5
Total	100	100	100	100	100	100

Source: Dixon, 1999, table 1.8; National Statistics of Thailand

Table 7.2 Thailand: Export Earnings, Percentage Composition

	1970	1980	1990	1994
Agriculture, Fishing and Forestry	77.1	68.3	23.5	17.4
Mining	0.1	2.1	1.6	0.6
Manufacturing	15.4	26.8	68.6	81.1
Others	3.2	1.5	1	0.7
Re-exports	3.6	1.3	0.2	0.2
Total	100	100	100	100

Source: Dixon, 1999, table 1.3.

But different from the industrializing experience in either Taiwan or Malaysia, the agricultural sector still employed half of the labor force in Thailand despite that its value composed a mere 10% of GDP in 2000; on the other hand, the industry sector only employed 15% of the labor force despite composing more than 30% of the GDP, as shown in Table 7.3. This shows the highly unequal nature of the Thai economy, which

concentrated the fruits of economic growth to only a relatively small share of the population. In 1996, the income of people in the top 20% makes up of 54% of GDP while those at the bottom 20% only composes of 4%. This economic inequality is also regional: Per capita income in Bangkok is 12 times higher than those outside (Thailand: The Eighth National Economic and Social Development Plan, 1997-2001).

Table 7.3 Thailand: Employment Structure (1960-2000)

	1960	1970	1980	1990	1994	2000
Agriculture	82.3	79.3	71.9	63.5	60.8	48.8
Industry	4.2	5.8	7.9	14.2	15.8	14.5
Service	13.5	14.9	20.2	22.3	23.4	36.7

Source: Dixon, 1999, table 1.9; National Statistics of Thailand

The composition of the manufacturing sector shows a clear pattern of industrial upgrading that gradually took place in Thailand. As can be seen from Table 7.4, in 1970, the largest shares of manufacturing went to primary products such as food and beverage. However, by the end of 1970s, labor-intensive industries such as textiles started to gain more importance. In the 1980s, garments and textiles contributed the largest shares of the manufacturing sector. The shares of technology-intensive industries such as electronics and transport equipments started to grow in the late 1980s and by the early 1990s, they replaced textile and garments as the most important manufacturing sectors. But the composition of the import structure of Thailand shows that its technology-intensive industries still rely highly on importing capital goods. As can be seen from Table 7.5, the share of capital goods imports also doubled between 1980 and 1994, from 24% of total imports to 44%. Imports of capital goods and intermediate goods composed of a high of 67% of total imports in 1994. This in turn implies the local technology content is still relatively low.

Table 7.4 Thailand: Composition of Manufacturing GDP

	1970	1980	1990	1994
Food	16.5	14.1	5.9	5.2
Beverages	11.7	9.8	6	5.6
Tobacco	8.5	6.6	2.7	1.3
Garments	9.1	9.1	10.8	8.7
Textiles	9	14.5	10.9	8.5
Leather, leather products and footwear	2.5	1.8	3.6	3.2
Wood and wood products	4.1	2.1	1	0.5
Furniture and fixtures	1.9	1.3	2.9	3.2
Paper and paper products	1.4	1.8	1.3	0.9
Printing	1.4	1.6	1	0.6
Chemicals and chemical products	3.6	4.2	2.6	1.8
Petroleum Products	5.7	5.2	5.6	6
Rubber and rubber products	2.6	2.7	2.3	2.1
Non-metallic mineral products	4	3.6	5.8	7.5
Basic Metals	2.7	1.8	1.5	1.9
Fabricated Products	3.1	1.9	2.8	3.6
Machinery	3.1	3.4	5.5	6.5
Electrical machinery	1.9	2.9	9.8	12.2
Transport equipment	5.5	7.8	8.8	10.8
Others	4.8	3.8	9.2	9.9
Total	100	100	100	100

Source: Dixon, 1999, table 4.9.

Table 7.5 Thailand: Import Composition (1960-1994)

	1960	1970	1980	1990	1994
Consumer Goods	35	19.4	10.2	8.5	10.6
Intermediate Products*	18.1	24.9	24	33.8	23.8
Fuels and Lubricants	10.6	8.6	31.1	9.2	7.6
Capital Goods	24.6	34.7	24.4	38.8	44.3
Other	11.7	12.4	10.3	9.7	13.7
Total	100	100	100	100	100

*includes components and raw materials, but excludes fuels and lubricants

Source: Dixon, 1999, table 1.4;

7.1.2 Globalization, Industrialization Strategies and Government Education Provision in Thailand

In section 7.1.1, I have shown three characteristics of the Thai economy as it integrates into the global market: 1) the integration started in middle 1980s and continued today; 2) the open economy in Thailand exhibited a high level of sectoral and regional inequality

as the fruits of industrialization concentrates in the manufacturing sector and in the Bangkok area; 3) even though the Thai economy shows an industrial upgrading from labor-intensive to technology-intensive industries in early 1990s, the local technology level is still low given that these industries rely heavily on importing capital and intermediate goods.

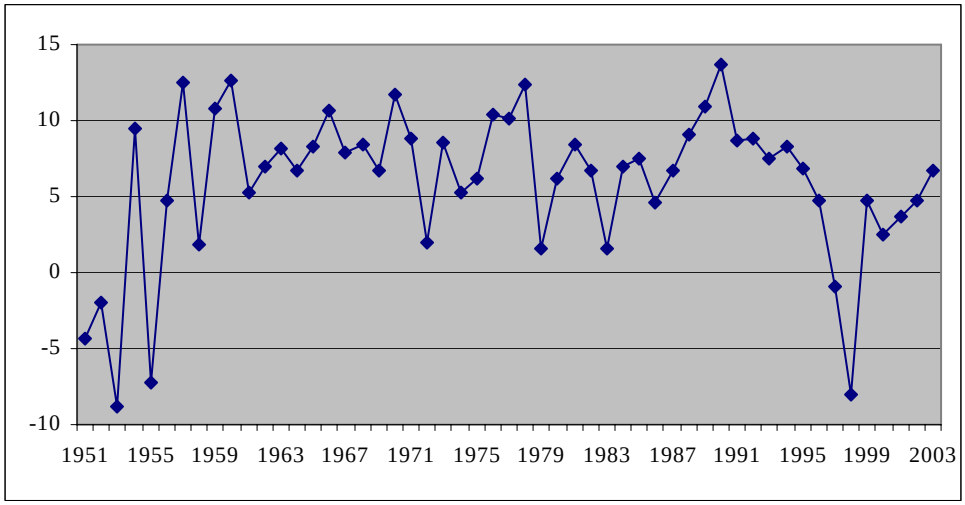
In this section, I argue that in accordance with these characteristics of the Thai economy, the Thai government was pressured to reform its education system from the early 1990s, since Thailand, with severe shortage of skilled manpower, began to face increasing competition in the global market not only from lower-cost countries such as Vietnam, China and India, but also from developing countries with higher level of human capital such as Taiwan, Singapore and Malaysia. Nevertheless, fundamental reforms of the development model and the education system only began to be carried out after the 1997 Asian financial crisis, which has had a disastrous effect on the Thai economy and signaled the urgency of reform. Below I will detail this process of changes in government education policies associated with changes in economic strategies and competition from the global market.

Economic Strategy and Government Education Provision before Integration into the Global Market (1958 - 81)

Agricultural Diversification, Import Substitution and Education System as a Tool for Nation-building (1958 -1971)

Between 1958 and 1971, the Thai economy was mainly inward-oriented. The Sarit Thanant government, which came to power through military coup in 1958, began the modern economic development phase in Thailand with the establishment of development agencies such as National Economic Development Board, Board of Investment, Budget Bureau and the Office of Fiscal Policy (Dixon, 1999). Similar to the economic strategy adopted in resource-rich Malaysia during this period, the first (1961-66) and second (1967-71) economic development plans of Thailand focused on the diversification of the agriculture sector, relying at that time primarily on rice, and the expansion of manufacturing sector through heavy investment in infrastructure. An industrialization strategy of import substitution was adopted with tariffs protecting domestic industries (Dixon, 1999). Such an industrialization strategy served well the interests of a ruling alliance of the military, the bureaucrats and the business. During this period, the Thai economy exhibited an average growth rate of 8% (shown in Figure 7.4), quite remarkable in a comparative context. The share of manufacturing increased from 13% to 17% of GDP.

Figure 7.4 Thailand: Real GDP Growth Rate (1951-2003)



Source: Penn Table 6.2.

With no demanding pressure from either the economy or the global market on the skill requirement of the labor force, government education provision in this period focused on the political function of the education system. The Thai government quickly imposed a uniform education system in Thai national language[230] which could help building the loyalty to the central government and suppressing communism in the outer regions (Dixon, 1999). In the second development plan period (1967-71), compulsory education was extended from 4 to 7 years. Although developing human resource to match the manpower requirements of the economy was claimed to be one of the most important policy objects in this plan, the priority was given to developing the private sector, national infrastructure and the rural area. However, some reforms were adopted to make the school curriculum less academic and more attuned to the needs of the community and the economy. For example, comprehensive secondary schools began to be established in 1966 with the help of World Bank (Haddad, 1994), which provided alternatives to the purely academic stream. Efforts were also made to improve the vocational schools (Thailand: the Second Economic and Social Development Plan, 1967). Despite these efforts, limited emphasis was placed on science, technology or vocational skills and the matching with labor market was quite poor (Dixon, 1999).

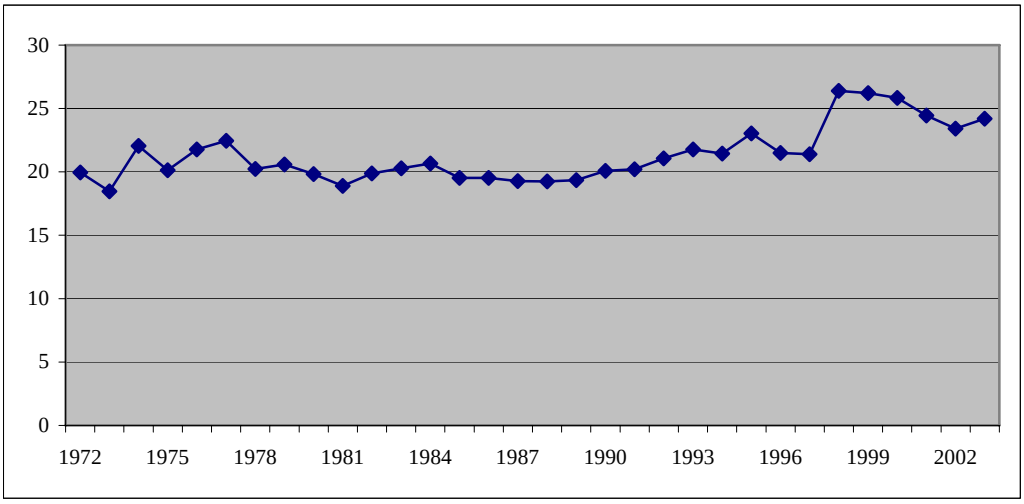
By the end of 1960s, Education spending composed 20% of government spending, after development and defense (Figure 7.5). Between 1967 and 1972, education spending composed 3% of GDP, roughly 16% to 18% of the total government budget. In consistent

[230] In 1966, the dominant ethnic group in Thailand, the Thai, formed about 83% of the population (Haddad, 1994). The rest of the population included minority groups such as the Chinese, the Hill Tribes in the North, Malays in the South and others.

with the education priorities in this period, over 50% of the budget was devoted to primary education, 16% to university and technical education and only 10% to secondary education (Nakornthap, 1987). Gross primary school enrollment reached 80% (Figure 7.6), some progress for Thailand even though Taiwan and Singapore in this period already reached universal primary education. Illiteracy rate for the population aged 15 and over decreased from 46% to 32%, as can be seen in Table 7.6. However, average years of school staggered at around 3.5 years, reflecting a high dropout rate after just the 4th grade. Comparing with an average years of school of 5.3 years in Taiwan, 5 years in Singapore and 3.9 years in Malaysia during the same period, the education level of Thailand lagged far behind Taiwan and Singapore and somewhat beyond Malaysia, probably reflecting a lower GDP per capita, larger rural population, the concentration of education resources in Bangkok (Kuhonta, 2003) and in university education (Nakornthap, 1986)[231].

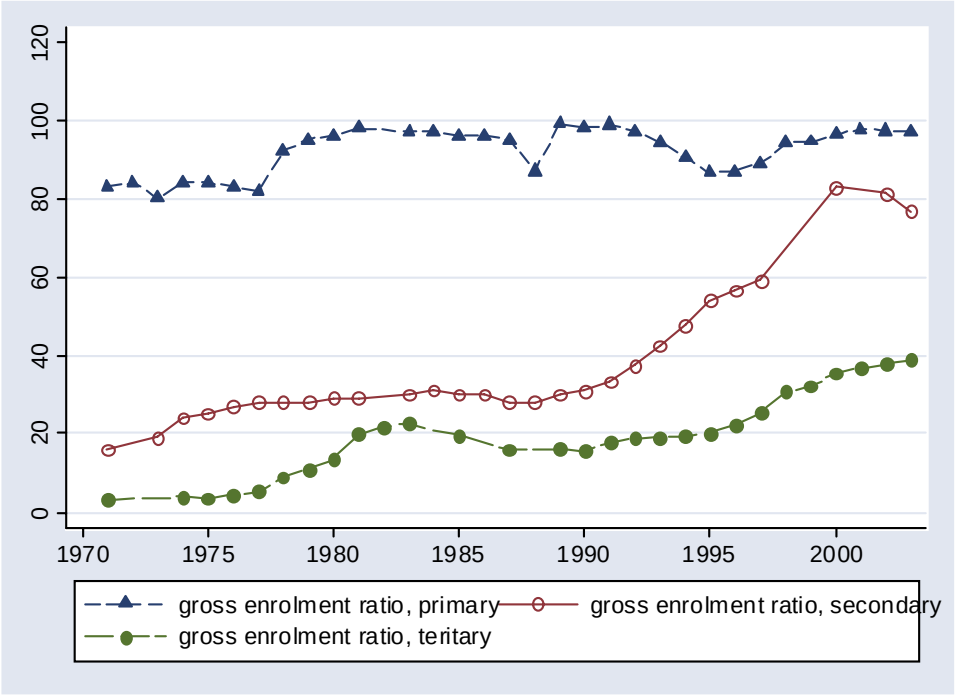
[231] By 1971, GDP per capita was $3111 for Taiwan, $5870 for Singapore, $3006 for Malaysia and only $1863 for Thailand. Thailand also has a higher rural population. In 1971, the proportion of urban population was 62% in Taiwan, 100% in Singapore, 34% in Malaysia but only 21% in Thailand. Kuhonta gives two reasons for the particularly low secondary school enrolment in Thailand: 1) without subsidized education, poorer households do not see the benefits of sending their children to secondary schooling; 2) the proportion of secondary schools is extremely low in the rural areas compared with urban areas, as well as in the North and Northeast compared to the Central Plains (Kuhonta, 2003). In 1972, the cost per student at the elementary level was only 499 baht while at the university level, it soared to 13,244 baht per student (Nakornthap, 1986).

Figure 7.5 Education Spending as % of Government Spending



Source: Author's database.

Figure 7.6 Thailand: Gross School Enrollments (1970-2003)



Source: UNESCO Yearbooks, various years.

Table 7.6 Thailand: Education Attainment

Year	Population over age 15 (1000s)	No Schooling	Highest level attained: First level Total	First level Complete	Second Level Total	Second Level Complete	Post-Secondary Total	Post-Secondary Complete	Average Years of School
			(Percentage of the population aged 15 and over)						
1950	5743	66.1	32.3	11.1	1.5	0.2	0.1	0.1	1.69
1960	7315	45.8	49.8	38.6	4.0	1.0	0.4	0.2	3.59
1965	8309	39.9	55.0	18.5	4.5	1.0	0.5	0.4	3.14
1970	9792	31.9	62.5	19.0	4.8	0.8	0.8	0.4	3.49
1975	11577	31.4	60.5	14.6	7.1	1.2	1.0	0.6	3.54
1980	14132	18.5	69.2	3.3	9.5	3.8	2.8	1.2	4.04
1985	16607	17.8	68.0	22.1	9.6	2.5	4.6	2.3	4.93
1990	19065	19.6	64.3	28.6	10.2	3.1	5.9	3.8	5.32
1995	21223	17.6	63.7	28.3	10.9	3.3	7.9	5.1	5.68
2000	22941	16.4	62.8	27.9	11.0	3.3	9.9	6.5	5.98

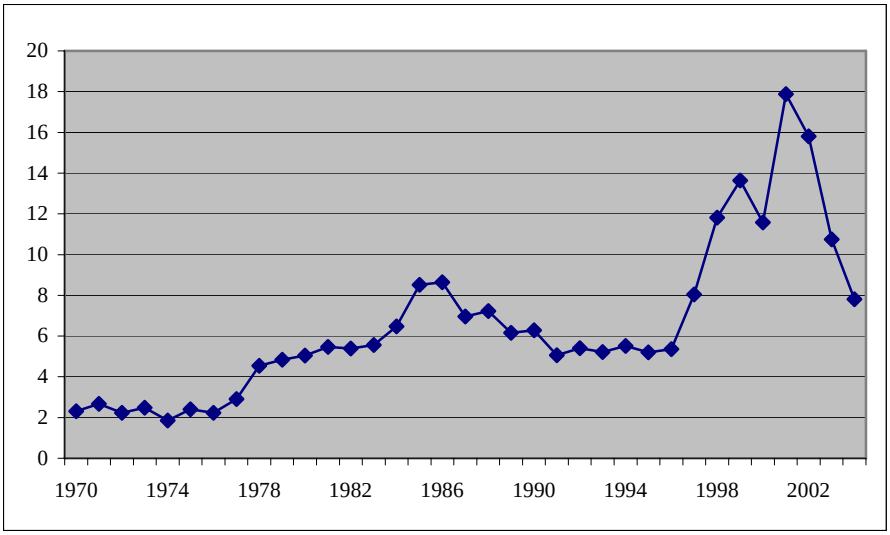
Source: Barro and Lee, 2001

Economic Uncertainty, Political Instability and Education Expansion at All Levels for Social Betterment (1972 - 81)

The 1970s in Thailand was characterized by both economic uncertainty and political instability (Dixon, 1999). The rise of oil prices and the fall of commodity prices in the world market severely worsened the trade balance of Thailand; moreover, the withdrawal of American forces in 1976 resulted in the loss of an important source of foreign exchange and aid (Hussey, 1993; Dixon, 1999; Phongpaichit and Baker, 2002). On the political front, this decade saw frequent regime changes: student democratic movement overthrew the military rule of Thanom Kittikachorn in 1973; but the civilian regime was quickly toppled by the military again in 1976; between 1976 and 1980, three military leaders, one after another, served as the Prime Minister (Neher, 2001). All these factors contributed to the relative slow growth of the Thai economy in this period. Foreign direct investment largely bypassed Thailand due to both economic and political uncertainties, cumbersome certification process and less English proficiency in Thailand comparing

with neighboring countries such as Malaysia and Philippines (Dixon, 1999; Rasiah, 2003). Economic growth fluctuated widely, reaching a low of 2% in 1972 and 1979 (see Figure 7.4). Government debt climbed from 2% of GNI to 5%, as can be seen in Figure 7.7.

Figure 7.7 Thailand: Total Debt Service as % of GNI



Source: World Development Indicators.

Government education policy in this turbulent period largely reflected the preferences of the democratic government in 1973, whose development priorities were economic growth, social equality and rural development. The Third Economic and Social Development Plan (1972-76) stressed human resource development and promoting equality in education; improving and expanding access became the top objective of government education policy:

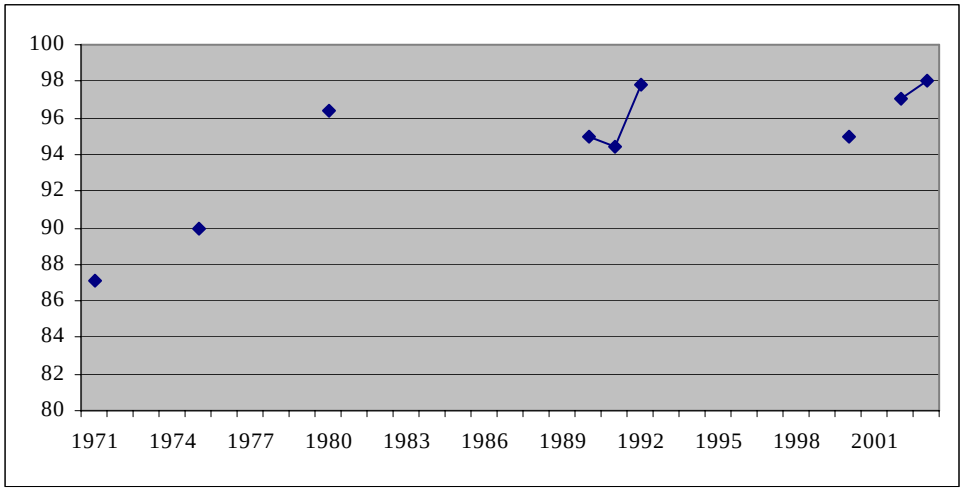
> "The government finds it necessary to improve education at all levels, not only in quality, but also in quantity, in order to provide an increasing number of school children to meet the government's commitment to make education more widely accessible" (Thailand: The Third Economic and Social Development Plan, 1972).

In 1974, a special committee was formed to make plans for fundamental education reform which was published in 1975: 1) there should be more equitable allocation of education resources; 2) change the grade structure from 7-3-2 to 6-3-3; 3) make the curriculum more practical and relevant to the real life needs of the learners; 4) unify and decentralize the administrative structure (Haddad, 1994). These policy recommendations were reflected in the Fourth National Economic and Social Development Plan (1977-81) under the military government, which stressed heavily the importance of "promoting social justice by reducing socio-economic disparities and improving mass welfare". This plan aimed to transfer the grade structure as recommended by the special committee and expand enrollment at all levels and teacher training. On the other hand, the plan also realized the education system was not in tune with social and economic realities and would like to encourage students to take part in community development (Thailand, the Fourth National Economic and Social Development Plan, 1977).

However, given the economic and political turmoil in this period, these policies didn't implement quite well in practice and produced limited success (Dixon, 1999). Access was expanded: gross primary school enrollment started to rise in 1977 from 82% to 98% in 1981; gross secondary school enrollment improved from 16% in 1971 to 29% in 1981; tertiary school enrollment increased dramatically from only 3% in 1971 to 20% in 1981, due mainly to the establishment of two open universities in 1971 and 1978 respectively. Average years of school improved by half a year. Gender equity in education also improved tremendously to almost parity in the early 1980s (Figure 7.8). The government devoted a little bit more of its budget to education and more specifically to secondary

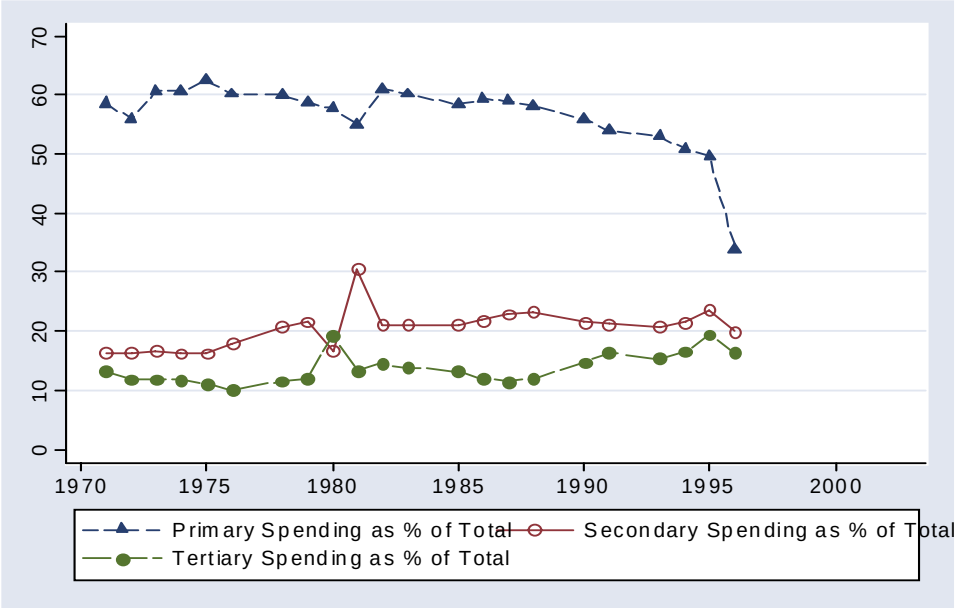
education (Figure 7.5 & Figure 7.9). Despite these progresses in access, attainment and gender equity, secondary and tertiary enrollment still concentrated in the Bangkok area; also, parents and students still favored civil service jobs and social science subjects (Haddad, 1994) despite the Fourth plan encouraged developing science and technology.

Figure 7.8 Thailand: Gender Equity in Education (Ratio of Boys to Girls in Primary and Secondary School)



Source: Author's Database.

Figure 7.9 Thailand: Education Spending at All Levels (as % of Total Education Spending)



Source: Author's Database.

Structural Adjustment and the Stagnation of Government Education Provision (1982 – 1991)

1982-1991 was the period during which the Thai government began to integrate its economy into the global market. Given the slowed growth in the 1970s, the Thai government faced pressure to make structural adjustment of the economy, especially from the urban business group. Technocrats on the planning board already started to promote export in the 1970s, as can be seen in the Third Social and Economic Development Plan, but little was implemented in practice (Phongpaichit and Baker, 2002). In 1980, the Thai government accepted a five-year structural adjustment program from the World Bank, committed to economic stabilization, export promotion, privatization and opening the Thai economy more to the global market. This structural adjustment program met with fierce opposition from related interests such as public sector employees, the Finance Ministry and groups benefiting from import substitution and was implemented only partially (Dixon, 1999; Phongpaichit and Baker, 2002).

However, when the Thai economy was worsened again in the middle 1980s as the world market price for Thai products such as rice, coconut oil, tapioca, tin, and sugar collapsed (Hussey, 1993) and the economic growth rate went down to a mere 2-5%, the anti-reform forces were swept away (Phongpaichit and Baker, 2002). The slowdown of agricultural sector also contributed to the urgency of adjustment. By 1985, fiscal, monetary and trade reforms were under way and tariff and tax structures were re-oriented toward export promotion (Hussey, 1993). Thailand soon became a favorite site for foreign investment by the end of 1980s due to its competitive labor cost, relative political stability and racial

harmony and minimal labor organizations. The currency appreciation in Japan, South Korea and Taiwan and the removal of these countries from the list of favored countries under the General System of Preferences by the U.S. in 1989 also added to the attractiveness of Thailand as an investment site (Hussey, 1993). The Thai economy continued to grow after 1985; by 1990, the economic growth rate of Thailand reached 14%, the highest in Asia at this time. As already described in section 7.1.1, during this period, the Thai economy also quickly transformed from labor-intensive to more technology-intensive even though the technology-intensive sectors relied heavily on importing capital goods.

As the Thai government prioritized structural adjustment and faced no severe skill shortage in its labor-intensive industries which required only basic skills and were still competitive in the global market, it made no particular efforts to update the education system, as can be seen from the priorities of the development plans. Human resource development was dropped as an objective from the Fifth National Economic and Social Development Plan (1982-96), which focused on restoration of the country's economic and financial position and structural adjustment of the economy. Even though the plan recognized problems in the education system such as education quality, unequal opportunities between the urban and the rural area and the lack of a unified administrative system of education, no specific measures were taken to address these problems. Targets were only set up to continue reducing illiteracy rates and providing textbooks for all students in depressed rural areas in two years. The plan also mentioned to maintain the supply of graduates in engineering, architecture, transportation, economics, arithmetic,

and computer science while slowing down those in law, education, anthropology, social science and business, but no corresponding manpower planning was carried out. The Sixth Plan (1987-91) continued to prioritize structural adjustment and economic growth. The role of education and training was mentioned at more of an individual level:

> "The government needs to provide formal and non-formal education and training to students and the general public to inculcate a sense of righteousness, responsibility, discipline, honesty, diligence and self-sufficiency besides a knowledge of a vocation and the determination for self-development to enable the people to lead a decent life, carry out their work and contributes to society" (Thailand, the Sixth National Economic and Social Development Plan, 1987-1991).

It was mentioned briefly that vocational education needed to be directed toward market requirements and the education system should develop middle-level and high-level manpower in such fields as electricity, electronics, metallurgy and modern business services which were undersupplied despite high market demand. Nevertheless, no specific measures were proposed to meet these goals.

The stagnation of government education provision in this period can be seen in the almost unchanged gross enrollment rates at all levels at the end of 1980s comparing with 1981. Average years of school of the population did increase from 4 to 5.3 years as the policy of extending compulsory education from 4 to 6 years in the 1970s began to bear fruit. However, secondary school enrollment was very low in Thailand comparing with its East Asian counterparts. In 1990, gross secondary school enrollment was 31% in Thailand, 56% in Malaysia, 68% in Singapore and 85% in Taiwan. Technical enrollments at the tertiary institutions were also much lower comparing with Taiwan or Singapore. For example, technical enrollments at the tertiary level in Thailand were only one third of

Taiwan and almost one half of Singapore (Lall, 2001)[232]. Such inadequate education system soon became the bottleneck for the growth of the open economy in Thailand and competitive pressures from the global market quickly forced the Thai government to respond and address the inadequacy of its education system.

Global Pressure, Skill Shortage and Reforming the Education System (1992 – present)

Global Pressure, Skill Shortage and Expanding Secondary Education (1992-1996)

Competition in the global market started to exert pressure on the Thai economy and education system since the early 1990s. Inadequate infrastructure and education system, rising labor costs and increasing competition from low-cost countries such as Indonesia, India, China and Vietnam slowed the growth of the Thai economy as the export boom faltered (Dixon, 1999; Phongpaichit and Baker, 2002), as can be seen in Figure 7.4. Comparing with countries such as Taiwan and Singapore and to some degree Malaysia where governments adopted all kinds of policy measures to upgrade the technology level of local industry at similar phase of economic development, the Thai government seemed to lack an effective strategy for boosting R&D and industrial upgrading (Lall, 2001). Instead, the Thai government in the early 1990s made efforts in expanding heavy industry serving domestic markets such as steel, cement and petrochemicals and investing in infrastructure, highway, power generation and telecommunications, probably due to pressures from domestic business interests. Meanwhile, the financial sector was further liberalized to the international capital market.

[232] Malaysia has an even lower technical enrollment ratio comparing with Thailand at the tertiary level (Lall, 2001), for reasons I have discussed in chapter 6. For a comparison of technical enrollments in the tertiary sector, see Table 6.7 in Chapter 6.

The lack of human resources was perceived to endanger the competitiveness of Thailand. Skill shortage and the inadequacy of the education system were widely reported in the media[233]. The Thai Development Institute calculated in 1991 that even if all Thai children stayed at school after primary school, only a quarter of Thai workers would have any kind of secondary education by 2000 (*Financial Times, Dec. 14th, 1995*). It was reported in 1993 that Thailand produced some 3, 500 engineering graduates a year, only about half as many as the private industry needs (*The Globe and Mail, May 18th, 1993*). There also existed doubts whether the frequently changed Thai government, which was usually interested in short-term projects, had the political will to reform the education system (*Business Times, August 12th, 1994*).

Despite having a less effective strategy of industrial and education upgrading comparing with Taiwan, Singapore and to some extent Malaysia, evidence shows that in this period the Thai government started to address the inadequacy of the education system in response to competitive pressures from the global market. The pressure of reform was reinforced by the democratization forces, a point I will discuss later in section 2 of this chapter. The Seventh National Economic and Social Development plan (1992-1996), under the newly elected Chuan Leekpai government, re-prioritize human resource development aside from the goals of economic growth and income redistribution. Human resource was identified as one of the constraints for future economic development in this plan:

> "A key issue facing the country at this time is that human resource development thus far has not been able to support the process of national development in an efficient manner…Thailand's

[233] *Journal of Commerce, June. 9th, 1992; Financial Times, September 11th, 1992; Business Times, April 29th, 1993.*

> traditional comparative advantage in human resources has gradually been eroded as wage rates rise steadily and as Thailand faces labor shortage in quantity and quality terms, particularly at the basic, medium and high skill levels in science and technology-related fields."

The plan decided to increase the role of government in human resource development, for example, by assisting the underprivileged to realize their potential and to help raise their capacity in various ways. Compulsory education was extended from 6 to 9 years given the particularly low secondary school enrollment. Subsidies would be offered to the underprivileged group to encourage them to go to school. An admission ratio of science to social science was set at 30:70 for university students. Methods and principals of teaching science, maths and linguistics were to be developed. Efforts were also made to improve life-long learning and vocational education with the help of UNESCO (UNESCO, 1995).

These policies seemed to be quite effective in expanding education access in this period. Secondary school enrollment quickly increased from 31% in 1991 to 60% in 1996; tertiary enrollment also rose dramatically from 16% in 1991 to 22% in 1996. Central government education spending increased by about 1% of the total budget. However, the expansion was shortly disturbed by the Asian Financial Crisis in 1997.

Asian Financial Crisis, People-centered Development and Fundamental Education Reform (1997-Present)

The 1997 Asian financial crisis exposed the vulnerability of the open Thai economy and signaled the urgency of both economic and education reform. A high current account deficit, open capital account, a fixed exchange rate regime and economic bubbles in the

financial and property sector in middle 1996 made Thailand the perfect target for speculators. Thailand's economy was devastated during the 1997 Asian financial crisis. The economic growth rate dropped to negative in 1997 and to a low of negative 8% in 1998. The IMF package which suggested raising taxs, cutting government spending, tightening monetary policies and increasing interest rates didn't work well in recovering the Thai economy. By 1998, the Thai government broke away from the IMF's advice, brought down the interest rates and re-invested in public works by funds mainly from Japan. The economy began to recover in 1999. The main engine of growth was technology-intensive export which still relied heavily on foreign imports and had little linkage with the rest of the economy (Phongpaichit and Baker, 2002).

The 1997 financial crisis, together with the "People's Constitution" passed in the same year, had a profound influence on the development model and government education provision in Thailand. The Eighth National Economic and Social Development Plan (1997-2001) changed the development model from one focusing on economic growth based on natural resources and low labor cost to people-centered development. Fully developing human potential became the top priority of the plan. The 1999 Education Act, which implemented the spirit of the 1997 constitution and the new development model, marked the initiation of a fundamental education reform in Thailand history[234]. The major reform tasks based on the Act included: 1) provide 12 years of free basic education to all Thai citizens; 2) learning reform: change the traditional rote-learning model into learner-centered teaching-learning process, allowing learners to develop at their own pace

[234] The interview on "Education Reform", Speaker: Dr. Vichai Tunsiri, An Extraordinary Committee of the Senates, "Newsline" program TVT. 11, June 28, 1999 at 22:00 – 22:30 pm, Thailand.

and in accord with their potential; 3) reform of the educational administrative structure: the central educational administration will be made more efficient by combining the once fragmented departments while centralized control of education will be move to the local (Thailand: Office of the National Education Commission)[235]. The Ninth Economic and Social Development Plan (2002-06) re-emphasized the importance of people-centered development and education reform:

> "In order for Thailand to maintain its international competitive position, there is an urgent need to undertake necessary structural reforms and develop human resources to facilitate timely adjustment to rapidly changing conditions…education reform should be undertaken, with an emphasis producing technically qualified teachers of high moral standing. Curriculum and learning processes should be adjusted to enable life-long learning and creativity. These should be geared towards skill upgrading and job employment generation."

These reform measures have started to be implemented. Education spending has on average increased by about 4% of government budget after 1997. Education access has been expanded: both secondary and tertiary gross school enrollment continued to increase. I cannot obtain complete gross secondary school enrollment data in this period, but limited data shows secondary school enrollment increased dramatically, from about 56% in 1996 to about 77% in 2003 (Figure 7.6). Gross tertiary enrollment also increased from about 22% to 40% during the same period. The Ministry of education was required to cut its administrative staff by 25% by 2001, establish a more competitive wage system for its staff and enable local governments to offer teachers more attractive wages (*Far East Economic Review*, October 8, 1998)[236]. In 2003, the three ministries and agency responsible for education, namely, Ministry of Education, Ministry of University Affairs, and Office of the National Education Commission was merged into a single Ministry of

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[235] Thailand: ONEC, "Thailand's Education Reform: The National Education Act 1999, Hope for a Better Thailand", http://www.onec.go.th/move/news/nov_28a.htm, accessed April 12, 2007

[236] This reform was one condition for the Thai government to obtain a $500 million loan from the Asian Development Bank (*Far East Economic Review*, October 8, 1998).

Education, Culture and Religion with a new administrative structure (Thailand: Ministry of Education). The devolution of centralized power to local learning areas and school-based parent-teaching associations began its experimentation phase (Hallinger and Kantamara, 2001). The public tertiary institutions were given financial autonomy for the first time in 1998 (*Far East Economic Review*, October 8, 1998). The MOE also began to reform the science and technology education[237].

The Thai government was pretty ambitious in this round of education reform, which reflected the influences of both globalization and democratization forces. It would like to compete with Singapore and Malaysia to be a regional leader in education provision (*Strait Times*, Jan. 24th, 2003). Despite all the recent achievements, education reform proved to be a difficult task in Thailand. There is doubt how much political will exists in Thailand to reform the education system. In 2001, the Minister of Education quitted his post just after a few months on the job due to power struggle at the center (*Education Week*, September 26, 2001). Entrenched interests benefiting from the old system (e.g. stakeholders in the Ministry of Education) may well resist the reform (Fry, 2002). Even though education spending now ranks the highest on the government agenda, 80% of the expenditure goes to teachers and staff whose lobby opposed reform measures such as providing twelve years free education and emphasis of higher qualification for teachers, which might negatively affected its salaries and perks (Kuhonta, 2003). The Thaksin government, which came to power in 2001, prioritized economic stabilization and

[237] Thailand: ONEC, "Policy Research for Science Education Reform in Thailand", http://www.onec.go.th/english_ver/chin_po/index_chpo.htm, accessed April 12, 2007. This research document recognized the very low competitiveness of Thailand in science and technology on a world scale.

populist policies such as cheap health care and micro-credit for the villages and didn't do much about the education reform (*Economist*, Feb. 12th, 2005). Ritchie suggested in general, education reforms have been haphazard, incomplete and sluggish. For example, even though the 1999 Education Reform Act mandates reform objectives and time frames, it does not adequately address the process by which the reform will be carried out. As a result, negotiations over the actual implementation of the bill have been extensive and conflictual, with no indication of whether agreement can or will be reached (Ritchie, 2005). The match between education supply and industry needs is still quite poor. To illustrate, although the Thai Ministry of Labor and Social Welfare spent U.S. $153 million to improve its technical education training courses, none of the employees of the largest technology company in the country were graduates (Ritchie, 2005). The recent military coup that toppled the Thaksin government made the future of education reform unclear.

Secondly, the reform regarding student-centered learning required a change of mind which is not an easy task. "Thai history and the nature of our culture means teachers believe that learning is by repetition and not by investigation", said Mr. San Woarainthara, director of the Ministry of Education's Teacher Training Education Bureau (*Strait Times*, June 6th, 2001).

Thirdly, providing 12 year free basic education means the state will assume the financing of places that currently are financed almost entirely by the private sector, e.g. in private general and vocational secondary schools (World Bank, 2001). This requires greater

financial commitment of the state. Moreover, ensuring the quality of the new schools and supplying adequate teaching staff, especially in the vast rural area, is more difficult than expanding the school in number (Thongthew, 1999). The Thai government also needs to address the long-standing problem of regional inequality that concentrates most of the education resources in Bangkok (Kuhonta, 2003).

Thailand was also lagged behind its neighbors in internet usage and IT education: by 2007, only 13% of the population use internet compared with 63% in Taiwan, 67% in Singapore, and 48 percent in Malaysia[238]. The Thai government was slow in acknowledging the importance of internet and only reserved its use for academic institutions and government agencies[239] (Prammanee, 2003).

7.1.3 Globalization and Government Education Provision: The Policy Linkages

I have shown in the above section that similar to Taiwan, Singapore and Malaysia, competition in the global market pressured the Thai government to prioritize and reform its education system. However, comparing with Taiwan and Singapore, and to some degree Malaysia, the shortage of skills was more severe in the labor market and education reform was more of a responsive nature in Thailand. The education reform also looks harder to be implemented. As a result, Thailand lags far behind Taiwan and Singapore, and to a small extent Malaysia, in the educational level of the population, the availability of technical manpower, the training in international language and international

[238] Data source: http://www.internetworldstats.com/stats3.htm, accessed May 4, 2007.
[239] Prammanee also mentioned a number of other reasons for the slow growth of IT industry in Thailand: political uncertainty, changes in the government, budget revisions, corruption and the low efficiency of English (Prammanee, 2003).

communication technology. By 2000, the average years of school of population aged 15 are 8.8 years in Taiwan, 7 years in Singapore, 6.8 years in Malaysia, and 6 years in Thailand. The proportion of population aged 15 and above that attained secondary school education is 46% in Taiwan, 35% in Singapore, 36% in Malaysia but only 11% in Thailand. University technical enrollments as percent of total population are 1.1% in Taiwan, .6% in Singapore but only .3% in Thailand, followed by .1% in Malaysia (Lall, 2001). According to the most recent data, research and development workers per 1000 people is 5.7 in Taiwan, 4.7 in Singapore, while only .29 in Malaysia and .28 in Thailand[240]. I argue that this could be partly explained by the weaker policy linkages matching the demands of the economy and education supply in Thailand. Here I suggest several factors that contribute to the weak policy linkages.

First of all, at the national level, the government organizational structure in Thailand couldn't well coordinate economic and education planning. The economic planning body, National Economic and Social Development Board (NESDB hereafter), is weaker comparing with the economic planning body such as Council for Economic Planning and Development in Taiwan or Economic Development Board in Singapore. Indeed, unlike development plans in Taiwan and Malaysia, the development plans in Thailand can be said rather brief and usually include no specific sector plans and measures to implement them. On the other hand, unlike Economic Planning Unit in Malaysia which could allocate budget along with policy planning, the Thai NESDB has no real power in practice to ensure that its ideals are implemented: the budget bureau has the final say in

[240] Data for Taiwan is for the year 2004, obtained Taiwan Bureau of National Statistics, http://eng.stat.gov.tw/lp.asp?ctNode=2265&CtUnit=1072&BaseDSD=36. Data for Singapore, Malaysia, and Thailand is from UNDP human development indicators, 2006.

allocating the budget (Kuhonta, 2003). There is also no institution such as Council for Professional and Technical Education or Productivity and Standards Board as in Singapore to directly coordinate market demand and education and training supply.

Secondly, at the sectoral level, there lacked coordination among various agencies responsible for education in Thailand until the recent reform in 2003. Such administrative structure makes any reform slow and difficult. Before the reform in 2003, four ministries at the central government shared the responsibility of education administration: 1) The Office of the Prime Ministers was responsible for the overall financing and staffing of the education system. Several departments in this office were involved to accomplish this task: National Economic and Social Development Board (responsible for overall national planning), Budget Bureau (responsible for the allocation of budget), Civil Service Commission (responsible for teacher staffing) and National Education Commission (responsible for policy making and education planning at all levels). 2) Ministry of Education took charge of secondary education and the pedagogical aspects of education. 3) Ministry of Interior was responsible for primary education. 4) Office of State University was in charge of tertiary education (Buripakdi and Mahakhan, 1980). In total, there are at least 14 separate bodies for the central administration of education and training under these four main units, with a small number of agencies for special purposes (World Bank, 2001), as shown in Figure 7.10. Such fragmented central administrative structure requires great coordination and cooperation on any reform measures. Ritchie argues the best example to illustrate this is Thailand's efforts to create a skills development fund. The initial effort started in 1994 and the 1997 crisis opened the

opportunity to alter the fund more along the lines of Singapore and Malaysia, which proved to be more successful. But genuine disagreements within the fragmented bureaucracy opened the door for vested interests to reassert their influences. In its final form, the fund looks nothing more like that of Malaysia and Singapore but a bureaucratic haven for inefficiency and rent seeking (Ritchie, 2005).

On the other hand, the administration is centralized in Bangkok, leaving much room for corruption and little autonomy for local administrative authorities, schools, teachers and parents. In 1996, the decision-making procedures of the Budget Bureau resulted in only half of the higher-education budget's being spent. The balance is tied up in bureaucratic limbo (*The Chronicle of Higher Education*, November 14, 1997). The Ministry of Education also has a history of misappropriations and graft (*Far Eastern Economic Review*, October 8, 1998). "The ministry's inflexibility has kept the national curriculum consistently six or seven years behind the economy's needs", commented by a Western consultant in Bangkok (*Far Eastern Economic Review*, October 8, 1998). Wanchai Srichana, who headed the first autonomous public university in Thailand, referred to the centralized bureaucratic control of the education system as the greatest obstacle to improve the education system in Thailand. "There are an impregnable number of bureaucracies, which seem to spend most of their time preventing new projects from being born", he commented (*The Chronicle of Higher Education*, November 14, 1997).

Thirdly, although various committees and council exist in Thailand to extract private sector input, little room for genuine participation is provided. The early technical

education had few linkages with private sector and the academia (Ritchie, 2005). The situation doesn't seem to be changed much in recent years. Ritchie gave a nice example how the offer of the CEO of a high-tech supplier to the hard disk drive industry to involve in the training of skilled craftsman in precision engineering was rebuffed as unneeded by the government (Ritchie, 2005).[241]

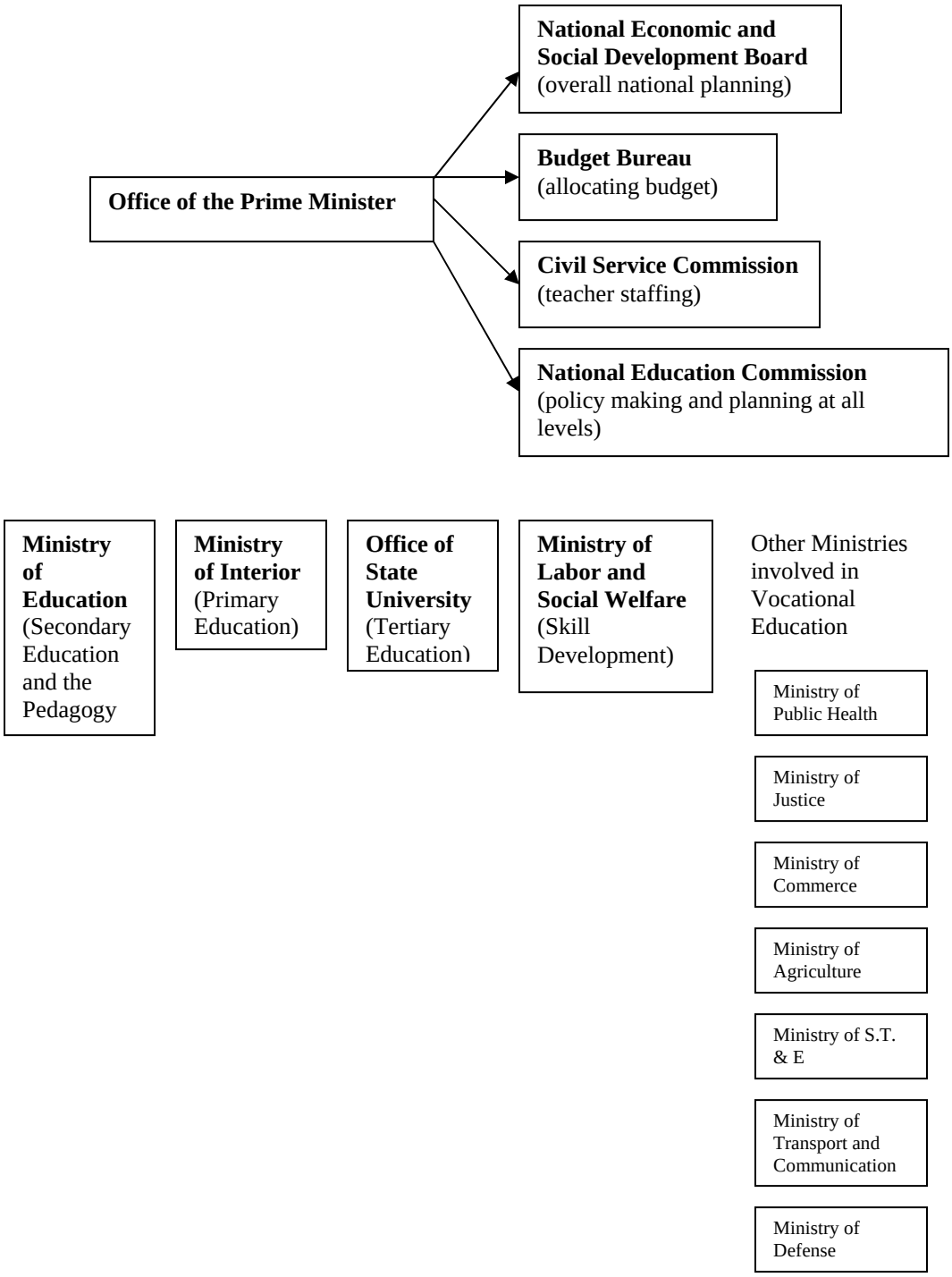
Lastly but not least, the frequent regime changes in Thailand also contribute to the lack of political will to establish strong policy linkages matching economic demand and education supply which requires a lot of time and efforts. As will be discussed below, most politicians in Thailand regard politics as just another kind of business to make money. Measures that can increase their popularity in a short term such as building a school are usually preferred than structural education reforms whose benefits usually take much longer time to materialize.

The Thai government has started to adopt a more holistic approach to education and economic planning which tried to integrate the participation of all stake-holders and improve the efficiency of public government agencies at the central level (Eighth National Economic and Social Development Plan 1997-2000). The centralized control of education is also being transferred to the local. Yet, the effects of these administrative reforms are to be seen. Possible obstacles of the reform include the difficulties in

[241] I do not have information on the autonomous role the private sector played in initiating policy changes in the Thai case. Given the history of collaboration between the business and political elites in Thailand, the private sector might have played a role in affecting government education policies. However, the preferences of the private sector might differ depending on the nature of their business. For example, the big domestic business in the import-substitution sector may be less interested in education upgrading than the export-oriented sector which needs to face global competition.

changing the attitudes of the general public and the government and the re-financing and staff re-deployment of the public administration system (Teokul, 1999).

Figure 7.10 Education Policy Making Institutions in Thailand, Before 1997



Source: World Bank (2001) & Ritchie, 2005

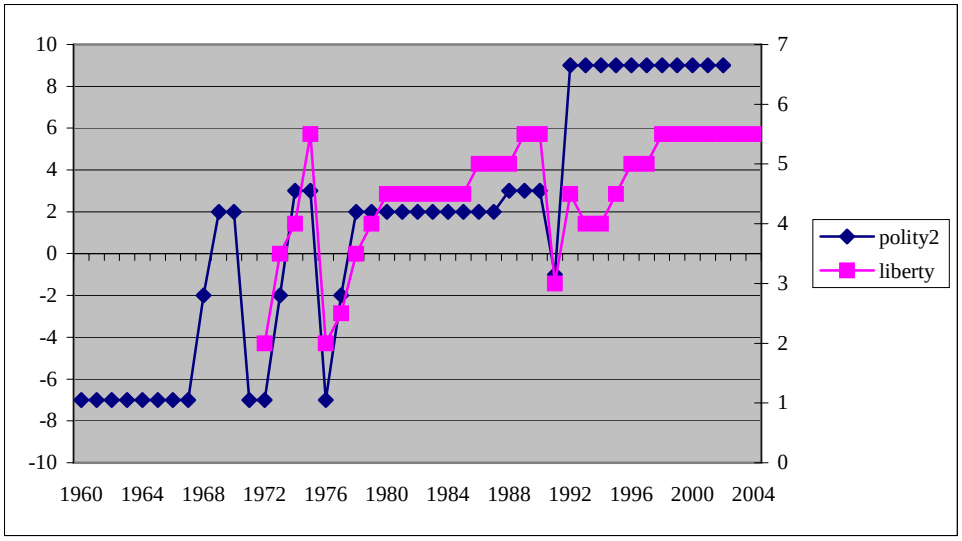
7.2 Democratization and Government Education Provision in Thailand

7.2.1 Democratization in Thailand: An Overview

Figure 7.11 shows the standard Polity and Freedom House Liberty Scores for Thailand. Both exhibit similar progression from authoritarian toward democratic regime. The period before 1968 was characterized by strict military rule which allowed no political parties. 1968-71 was a short political opening during which election of the lower house was allowed for the first time but the military junta quickly returned in 1971. The 1973 student uprising against the military government, backed up by an alliance of the king, farmers, labors and the Bangkok middle class, opened then the most democratic period in Thailand history but the fruits of the student rebellion was quickly hijacked by a center-right regime which was taken over by the military again in 1976 (Pasuk and Baker, 2002). However, the returned military regime couldn't oppress as before after this democratic opening and ruled with a more moderate hand that tried to co-opt, manipulate and even meet the needs of the citizens which were ignored before the 1973 rebellion. In 1988, Chatichai Choonhavan became the first Member of Parliament to be elected as Prime Minister in Thailand history and the military power was subordinated under his rule. When his government was overthrown by the military generals in 1991 who later formed a coalition government composed mainly of military leaders in 1992, mass demonstration against the military leaders erupted in Bangkok. By the end of 1992, Thailand had its elected civilian government and has met the criteria for democracy in citizen participation, electoral competition and civil liberties (Neher, 1992& 2001) until the military initiated another coup and toppled the Thaksin government in 2006.

For my purpose, this political history of Thailand can be grouped into four periods: strict military rule before 1973, democratic interregnum between 1973-1976, moderate military rule between 1977-1988, and democratic government after 1992.

Figure 7.11 Democratization in Thailand



Source: Polity IV and Freedom House.

7.2.2 Democratization and Government Education Provision in Thailand

In this section, I argue that democratic periods in Thailand seem to be associated with more equal distribution of education resources, education expansion at the primary and the secondary level and fundamental education reforms. Secondary materials suggest that education and political elites played the major role in changing the education system in the short democratic period of 1970s while public participation was limited. However, due to the limitation of my research, it is not very clear what mechanisms under the Thai democracy in the 1990s have produced these educational changes. Limited evidence suggests that education is not a prominent issue in the Thai elections which are rampant

with vote-buying and distributing localized goods. Some evidence shows democratic elites have played a significant role in pushing education reforms. Given the thriving civil society in Thailand, NGOs may also have played a great role in pushing for education re-distribution and expansion but more research needs to be done before drawing any conclusion. On the other hand, there is little change in the social and political function of the Thai education system associated with democratization which continues to focus on the teaching of Buddhist virtues.

Democratization and Education Expansion and Reform

Evidence suggests that both democratic periods in Thailand history are associated with pro-poor education expansion and resource distribution. I have mentioned in section 7.1.1 that the short democratic government between 1973 and 1976 prioritized social redistribution, and government education policy until 1981 reflected this priority of the democratic government. Education policy, and social policy in general, was incorporated into the national development plan for the first time under the democratic government (Teokul, 1999). The democratic government initiated the first major education reform since 1960 (Nakornthap, 1986). Emphasis was placed on more equitable allocation of education resources, better implementation of the 6-year compulsory education especially in the rural area, making the curriculum more practical and relevant to community life and decentralizing the administrative structure. These policies were articulated in the third and fourth economic development plans (Haddad, 1994) and were partially implemented (Nakornthap, 1986). Free basic education was also promised by the Kukrit's government for "anyone whose income fell below 1000 baht per month"

(Nakornthap, 1986)[242]. Despite poor implementation given the short time length of the democratic government, primary school enrollment increased to almost universal enrollment and secondary school enrollment also increased significantly but was concentrated in Bangkok. In contrast, tertiary school, which served the rich more than the poor[243], expanded significantly due to the establishment of two open universities in 1971 and 1978, the pre-democratic and post-democratic period ruled by the military.

The democratic government of Chuan Leekpai, which was elected to power as candidate of the Democratic Party in 1992, was also associated with pro-poor education policies. Among them, his government extended compulsory education from 6 to 9 years; specific measures such as Student Loan Scheme and Tuition Waiver Program were set up to help the poor students and reduce disparities in education (Murray, 1996; World Bank, 2001). Total education spending increased by about 2% of total government budget under his government; spending on secondary school increased by about 2% of total education spending; gross secondary enrollment also increased dramatically from 37% to 54%. Comparing with the stagnation of government education provision in the 1980s under the moderate military regime, this achievement of the democratic government was remarkable. The promulgation of the most democratic constitution in Thailand history in 1997 is also associated with pro-poor education expansion and more remarkably, a fundamental reform of education system in Thailand. The constitution stipulates that 12

[242] The Kurkit's government also promised free bus transportation and medical services for the poor (Nakornthap, 1986).
[243] In the mid-1980s, of the students who passed the university entrance exams, 46 percent were Bangkok residents and 74 percent were children of proprietors or government officials. Furthermore, the subsidies provided by the government for the tertiary level far outweigh those provided for the primary and secondary levels (Kuhonta, 2003).

year free basic education will be provided to all citizens. The 1999 new Education Act, based on the spirit of the constitution, started a fundamental reform of the Thai education system in areas such as access, learning mode, administrative structure and quality control. The government also implemented several strategies to ensure students would not be deprived of education opportunities after the 1997 financial crisis. For example, the government protected education expenditure by re-allocating capital expenditure to basic education services; it introduced scholarship program by using Asian Development Bank's Social Sector Program Loan; education loan programs were also expanded to cover wider targeted students; parents were allowed to pay tuition fees in installments and public schools were permitted to waive tuition fees on a case-by-case basis (Murray, 1996; World Bank, 2001).

Democratization and Government Education Provision: The Mechanisms

Given the above mentioned association between democratic periods and education policy changes such as pro-poor education expansion and fundamental education reforms in Thailand, the mechanisms linking democratic regime to these changes need to be explored. My exploration here is quite tentative given the limited evidence I could gather.

Electoral competition in Thailand, seems to have played a very minor role, if any, in expanding education access and redistributing education resources to the poor. It seems to have played no role in structural education reforms. I don't have much information on elections in the short democratic period. But given the frequency of elections, the newly formation of the political parties and the main conflict between democratic and anti-

democratic forces during that period, it is hard to imagine education figured prominently in the elections. On the other hand, the recent Thai elections are famous for being rampant with vote-buying and distributing localized patronage. Policy issues such as education policy rarely figure in the elections. In the 1992 election, successful candidates each spent about US$1 million on elections and generally sought public support by promising to bring development to their provinces (King, 1992). In the 1995 election, PollWach, the national organization to monitor the fairness of elections, reported 2,268 election related complaints (Murray, 1996). The 1996 election was called by the commentators "the dirtiest in Thailand history" (*New York Times*, Nov. 19th , 1996). The main distinction among the candidates in the 1992 election was supporting the military or the democrats (King, 1992). In the 1995 election, the democrats for the first time in Thai history released a 32-page booklet outlining its policies which included "human resource development in the field of education and training" but other parties followed suit except on the issue of constitutional reform and the policy differences among the parties were much less important than allegations and counter-allegations of corruption (Murray, 1996). Also few Thais expected the Chavalit Yongchaiyudh government which was elected to power through patronage to address serious issues such as corruption or a decline in competitiveness (*Business Week*, Dec. 2nd, 1996). Education restructuring was also not a prominent issue for the Thaksin government, which won the election through populist policies such as aiding small entrepreneurs, cheap health care, debt moratorium for the farmers and village fund (*Economist*, Feb. 12th, 2005). If electoral competition has any effect on government education provision in Thailand, it might be through building

more schools as a form of patronage but the effect on total education spending or structure reform is minor.

Although it is the protest of private school teachers that pushed for discussion on education reform in the Ministry of Education and scholars in the education circle also participated widely in the 1970s reform, public participation was generally missing and education reform was mainly from top-down (Nakornthap, 1986). However, I am not sure what role the public played in the 1990s reform due to the limitation of my research. Given the thriving of civil society in Thailand, it is possible that civil society actors such as the NGOs have played a role in lobbying the government for education expansion and reform. There are about 15, 000 NGOs in Thailand (*New Strait Times*, June 14th, 1996) and many of them are active in keeping children in schools (e.g. The Bangkok Foundation for Women, *New Strait Times*, June 4th, 1998), providing education to sex workers (e.g. Empower, The Strait Times, July 30th, 2005) and urban poors (e.g. Human Development Center, *The Toronto Sun*, March 28th, 1999) and working in the area of education reform (e.g. Thai Education Foundation). However, I can draw no conclusion here since I was not able to gather more information on educational groups in Thailand.

The educational and bureaucratic elites played the major role in initiating education reform in the 1970s. Discussion on fundamental education reform was already started by the education elites before the 1973 student uprising. After the formation of the democratic government, a special committee consisting of prominent and highly respected Thai intellectuals and bureaucrats was established by the Ministry of Education

to spearhead the 1974 education reform and linkages between the educational and bureaucratic elites are critical in the realization of the reform (Nakornthap, 1986). It seems to me for the 1990s reform, political and educational elites such as Chuan Leekpai in 1992 and Prawase Wasi, who was critical in drafting and pushing through the 1997 constitution (Wasi, 2002) may also have played very important roles in pro-poor education expansion and education reform. Kuhonta argued that the education reforms in mid-1990s were initiated not by the government but by a group of civic-minded intellectuals concerned that Thailand's lack of advanced skills in the global economy would hold back its economic potential (Kuhonta, 2003). But again, the limitation of my research prevented me to draw any definite conclusion.

Democratization and Civic Education in Thailand

Unlike my findings in the Taiwan case where democratization was also associated with a change in the political function of the education system from political indoctrination and ideological control to cultivating democratic citizenship, there seems to be little change in the political and social function of education Thailand in the democratic period. Given the special status of Buddhism in Thailand[244], civic education in Thailand focused on cultivating desirable human characteristics of the students, such as honesty, responsibility, kindness, critical thinking, diligence and fairness, virtues in Buddhism (Pitiyanuwat and Sujiva, 1999; Baker, 1999). In the recent round of education reform, the teaching of four "noble truths"[245] in Buddhism is strongly recommended for moral and

[244] The majority of Thais are Buddhist and they are extremely comfortable with their religion (Baker, 1999).
[245] For a detailed discussion of the four noble truths, see Pitiyanuwat and Sujiva, 1999. The four "noble truths" imply four divine abidings: 1) loving kindness toward all beings; 2) compassion toward those in

civics teaching (Pitiyanuwat and Sujiva, 1999). Buasuwan suggests the Thai secondary education system still insists on creating loyalty and obedient citizens in the recent round of education reform (Buasuwan, 2003).

7.3 Conclusion

In this chapter, I argue that integration into the global market which becomes increasingly competitive has had a significant impact on government education provision in Thailand. Human resource development through the education system was not prioritized by the Thai government before the global market exerted pressure for reform. Between 1958 and 1970, with no particular pressure for skilled human resource from an economy based solely on agricultural diversification and import substitution, the Thai government focused on unifying the education system and expanding primary education to build the loyalty of citizens. The education policy of the 1970s, which was characterized by economic uncertainty and political instability, reflected to a large extent the preferences of the short democratic government between 1973 and 1976. Its priority was given to further expanding primary education from 4 to 6 years and allocating the educational resources more equally. With the collapse of prices for Thai products in the world market and a worsening trade balances, the Thai government finally structured its economy in the middle 1980s. Fiscal, monetary and trade reforms were adopted to promote export and open Thailand more to the world economy. At this phase of structural adjustment which relied mainly on labor-intensive export industries as the growth engine, the Thai government made no particular efforts to update either its industry or education system as

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distress who need our help; 3) ability to rejoice with those who are appropriately and 4) impartiality towards all beings.

its economy was still competitive in the world market. During this period, the secondary gross enrollment of Thailand was the lowest in East Asia. Technical enrollments of university students were also much lower than countries such as Singapore or Taiwan.

With rising labor costs and increasing competition from lower-cost countries such as Indonesia, Vietnam, India and China in the early 1990s, the Thai industries soon felt the pressure of upgrading and the inadequacy of the Thai education system to supply skilled labors in various fields. Such competitive pressure from the global market forced the Thai government to prioritize human resource development in its development goals despite lacking a clear strategy for industrial upgrading. Compulsory education was extended from 6 to 9 years and reforms have been suggested to improve vocational education as well as the teaching of maths and technology in schools. More government spending was devoted to education, especially at the secondary level. These measures quickly improved the secondary school enrollment.

The 1997 Asian Financial Crisis interrupted the Thai government's efforts to upgrade its education provision briefly but fundamental education reforms were initiated after the crisis as the Thai government realized the vulnerability of its open economy and shifted the development model from economic growth based on resource and labor-intensive industries to people-centered development. The new Education Act promulgated in 1999 stipulated that 9 year compulsory education and 12 year free basic education should be provided to all Thai citizens; moreover, reforms would be carried out to change the traditional learning mode to student-centered learning; education administrative structure

should be consolidated and centralized power be devolved to the local level. Some of these reform measures have started to be implemented but their results are yet to be evaluated.

The finding in the Thai case that integration into an increasingly competitive global market forces the Thai government to expand its education access, make the education system more efficient and cultivate its students the skills required by the global knowledge economy is consistent with my findings in Taiwan, Singapore and Malaysia. However, unlike Taiwan and Singapore, and to some extent Malaysia, the skill shortage is more severe in Thailand and education reforms are more of a responsive nature. The Thailand government seemed to lack a clear strategy of industrial and education upgrading, as found in the Taiwan and the Singapore case, and to some degree, the Malaysia case. This may partly be explained by the weak policy linkages in Thailand matching economic demand and education supply. At the national level, the economic planning agency was relatively weak and there were no institutions to coordinate economic demand and education supply. At the sectoral level, there lacked coordination among various ministries responsible for education and the Education Ministry, centralized in Bangkok, left too much room for corruption and too little for local autonomy. The opportunities for the private sector to participate in the policy making process were very limited. Political instability and the weak position of the Ministry of Education in relation to other departments also weakened the effectiveness of government education provision in matching the needs of the economy.

Regarding the effects of democratization, I found in the Thailand case that the two democratic periods (1973-76, 1992-2006) were associated with pro-poor education expansion, redistribution of education resources and fundamental reforms of the education system. The 1973 democratic government focused on more equitable allocation of the education resources, better implementation of the 6-year compulsory education especially in the rural areas, and making the school curriculum more relevant to community life. The 1992 democratic government extended the compulsory education from 6 to 9 years, promised 12 year free basic education for all Thai citizens and initiated a fundamental education reform. Government education spending increased in these two periods and education access was greatly expanded at the secondary level. In contrast, the military rule in the 1970s was associated with expansion in tertiary education and the military period in the 1980s was associated with stagnation of government education provision. Such finding is consistent with my finding on the effects of democracy in the Taiwan case.

However, unlike the Taiwan case where I found a significant role of the civil society and a limited role of electoral competition in pushing education expansion and the liberalization of the education system, education and political elites played the major role in changing the education system in the short democratic period of 1970s in Thailand with little public participation. It is not very clear what are the main forces of education change in the 1990s due to the limitation of my research. Limited evidence suggests that electoral competition at most has a minor role in expanding education access; on the other hand, democratic elites and the civil society may have played a critical role but

more research needs to be done to draw the conclusion. Unlike the Taiwan case where I find significant changes of the political function of the education system associated with democratization, civic education in Thailand has continued to focus on teaching Buddhist virtues in the democratic period.

Consistent with other three case studies, the finding on the effects of globalization in this chapter is against the null-effect finding on globalization in the statistical study. Despite the inconsistency, the globalization variables used in the statistical study seems to capture the influences of globalization well in the Thai case. The trade intensity ratio started to increase significantly since late 1980s in Thailand and the policy indicator of trade openness increased in 1990, both coincided with the period that the global market started to exert pressure on the economy and the education system in Thailand. The same pattern existed for the indicators of capital account openness. Consistently, education spending as percent of government spending and as percent of GDP started to increase slightly since late 1980s and increased more dramatically after 1997 as the capital account openness indicators improved.

On the other hand, the finding on the positive role of democracy in expanding secondary education is consistent with the statistical finding that democracy increases secondary spending and secondary enrollment.

Chapter 8 Conclusion

This chapter concludes the dissertation. Section 8.1 summarizes the main findings. Contributions and limitations of the dissertation are discussed in section 8.2. Section 8.3 considers the implications of my research and points the directions for future research.

8.1 Main Findings

8.1.1 Findings from the Statistical Study

The statistical part of the dissertation (chapter 2&3), investigates the average effects of globalization and democratization on government education provision in East Asia. Globalization is operationalized as trade and capital market openness; standard Polity scores measure the degree of democracy; and four dimensions of government education provision are examined: education spending, access, attainment of the population and gender equity in education. Eight countries/political entities compose the study sample: Hong Kong (before 1997), Taiwan, South Korea, Singapore, Malaysia, Thailand, Philippines and Indonesia, and the data period covers from 1971 to 2003.

<u>Findings on Globalization</u>

The statistical study has not found a robust relationship[246] between the globalization variables and the education variables after controlling for factors such as GDP per capita, government revenue, electoral and business cycle and capital intensity of the economy. Neither trade openness nor capital market openness has a consistently significant effect

[246] As already discussed in section 1.4.1 of chapter 1, a robust finding in my study refers to one whose result is consistent despite a number of changes in model specifications such as using alternative indicators of globalization and democratization, putting different controls in the model, varying sample and estimation method.

on total education spending, spending at different levels of education and various education outcome indicators (gross school enrollment and attainment at all levels, and gender equity in education).

Findings on Democratization

On the other hand, democracy has been found to have significant effects on a number of education indicators after controlling for effects such as wealth, government revenue, electoral and business cycle, and capital intensity of the economy. The robust findings are: 1) democracies have a higher per capita education spending than non-democracies; 2) democracies have a higher per student spending as percent of GDP per capita at the primary and the secondary levels than non-democracies; 3) democracies devote a smaller proportion of their education budget to the tertiary level; 4) democracies have a higher gross secondary school enrollment rate and a higher average years of school for the male. The magnitudes of these effects are pretty significant, as can be seen from Table 8.1.

Table 8.1 Effects of Democracy in East Asia

	Regional average*	Democracy**
Total Education Spending (per capita)	$243***	+ $91***
Primary Spending (per student as % of GDP per capita)	11%	+ 3%
Secondary Spending (per student as % of GDP per capita)	14%	+ 5%
Tertiary Spending (as % of total education spending)	18%	- 13%
Gross School Enrollment (Secondary Level)	63%	+ 14%
Average Years of School (male)	7.1	+ 1

* Data refers to the average of all countries in the sample between 1971-2003.
** Depending on the adjustment rate of model, these effects of democracy are realized in approximately 8 to 16 years.
*** Data is based on Penn table 6.1, constant international dollar, 1996 as the baseline.

8.1.2 Findings from the Case Studies

The effects of globalization and democratization on government education provision are then investigated in four case studies in the dissertation: Taiwan, Singapore, Malaysia and Thailand (Chapter 4 through 7). This selection of cases is ideal for structured case comparison since the cases can be compared in a number of ways to identify the effects of globalization and democratization given their nice variations on both the independent and dependent variables.

Findings on Globalization

Globalization has been found to have significant effects on government education provision in all four cases. In the early industrialization period of import substitution, the education systems of all four countries focused on expanding basic education and the task of nation-building. As these countries adopted an outward-oriented economic strategy, increasing competition from the global market eventually exerted pressure on the governments to update their industries and adapt their education system to the needs of the economy and the global market. Table 8.2 details the effects of globalization on government education provision in the four cases.

Table 8.2 The Effects of Globalization on Government Education Provision

	Taiwan	Singapore	Malaysia	Thailand
1950s	*Import substitution* * relied on the primary school system left by the Japanese * focused on nation-building		*Import substitution* * expanded basic education * formed a single system of national education	*Import substitution* *expanded basic education *formed a single system of national education
1960s	*Labor-intensive export* * education planning prioritized on national development plans * expanded compulsory education from 6 to 9 years	*Import substitution* * centralized the communal education system * emphasized maths, science &technical subjects		
1970s	* emphasized vocational & science education * enrollment control of academic and tertiary education	*Labor-intensive export* * cultivated basic numeracy, literacy & technical capacity of the population	*Labor-intensive export & import substitution* * corrected ethnic inequality by favoring the *Bumipetras*	*Economic uncertainty* * addressed inequality in education * expanded access, especially to rural areas
1980s	*Global competition* *initial stage of high-tech export* *further internationalization* * better implementation of the 9-year compulsory education * updated the quality of vocational education * expanded the supply of science & technological power	*Global competition* *second industrial revolution* * streaming to improve the efficiency of the education system * English offered as the first language in all primary schools * updated vocational education * emphasis on technical and science education	*Global market shock* *structural adjustment* *further internationalization* *manufacturing diversification* * education provision still focused on national unity and correcting ethnic inequality	*Global market shock* *structural adjustment* *labor-intensive export* * education provision stagnation (national plans focused on structural adjustment)
1990s	*More global competition* *build knowledge economy* *high-tech export expansion* * expanded senior high and tertiary enrollment * a shift from rote-learning to student-centered system * emphasis on English & ICT * de-centralization: more school autonomy, particularly at the tertiary level; greater role for private schools; university research more pro-market	*Economic crisis* *more global competition* *build knowledge economy* *high-tech export expansion* *encouraged entrepreneurship* * minimum 10-year education opportunities; compulsory primary education * expanded tertiary education * updated vocational and technical education * a shift from rote-learning to cultivating critical thinking * emphasis on English & ICT, life sciences * de-centralization: more autonomy for schools and more competition	*Competition from the China, India and Vietnam* *industrial upgrading* *prioritized human resource development* * expanded compulsory education from 6 to 11 years * expanded tertiary education through the private sector * started to emphasize vocational schools * emphasis on science & technology * emphasis on English & ICT * decentralization: more autonomy for schools; corporatization of universities	*Competition from the China, India and Vietnam* *further internationalization* *expanded heavy industry* * expanded compulsory education from 6 to 9 years * improved life-long learning * improved vocational education * emphasized science subjects * correcting inequality: subsidies for underprivileged groups
After 1997			*Economic crisis & more global competition* *build knowledge economy* *endogenously-driven growth* * cancelled ethnic quota * more emphasis on English teaching * re-oriented social attitudes to science & technology	*Economic crisis & more global competition* *people-centered development* * 12 year free basic education * a shift from rote-learning to student-centered system * administrative reform: consolidation at central level and decentralization

As can be seen in Table 8.2, Taiwan and Singapore already started education upgrading in the early 1980s as their governments quickly felt international competition after a period of labor-intensive export promotion due to their limited natural resources. Education upgrading measures in this early period included expanding compulsory education from the primary to the lower secondary level, updating vocational education and emphasizing the teaching of science and technical subjects, all aimed at cultivating medium-level manpower that could satisfy the needs of the economy at the initial stage of high-tech expansion.

The 1990s saw a second round of education reform in these two countries as they strived to stay ahead in the global market but faced double competition from more low-cost developing countries as well as the high-tech developed countries. In this second round of education reform, efforts were concentrated on cultivating higher-level manpower competitive in the global knowledge economy. This time, education opportunities were expanded at the upper secondary and tertiary level; vocational schools and technical education were upgrade; the study of English and ICT, the language and skill critical for the knowledge economy, were emphasized; administrative reforms such as de-centralization were carried out to make the education system more flexible and efficient; another important change was a shift away from a rote-learning system to a student-centered system capable of producing students with abilities essential to survive in the knowledge economy such as interpersonal communication, innovation and critical-thinking. In both periods of education reform, expanding education access was usually associated with increasing education expenditure, enrollment at the targeted levels and

improved education attainment of the total population. To avoid extra financial burden on the government, the private sector has been allowed to play a larger role in the recent expansion of tertiary education, particularly in Taiwan and to a less degree in Singapore.

Global competition forced education reforms in Malaysia and Thailand later. Although opening to the global market at around the same time as Singapore, Malaysia was more resource-rich and thus felt the global pressure to update its industry later. Thailand was also more resource-rich, poorer and adopted an outward economy strategy only in the middle 1980s. But global competition from the newly developing countries such as China, India and Vietnam in the early 1990s eventually exerted pressure on these countries to update their industry and education system. The 1997 financial crisis further exposed the vulnerability of their open economy and signaled the urgency of reform.

Probably due to “learning effects”, the 1990s education reform in Malaysia and Thailand exhibited characteristics that can be found in both the first and second round of reforms in Taiwan and Singapore. On one hand, their education systems needed to be updated to produce medium level engineers and technicians to meet the demands of upgrading the economy from labor-intensive to technology-intensive industries, a task accomplished in Taiwan and Singapore in the 1980s reform. On the other hand, both countries also wanted to cultivate manpower competitive in the new global knowledge economy. Thus we can see from table 8.2 that the 1990s education reform in these two countries involved measures to achieve both goals. Compulsory education was expanded quickly to the upper secondary level; vocational education and the teaching of science and technology

started to be emphasized. Also adopted were measures similar to those in recent education reforms in Taiwan and Singapore which included expanding tertiary education, improving the teaching of English and ICT, de-centralization and a shift away from the rote-learning system to a student-centered one. Similar to what happened in Taiwan and Singapore, expanding education access was associated with increasing government education expenditure and improved enrollments and attainments of the population at the targeted levels. The private sector has also been given a greater role in expanding tertiary education, particularly at the tertiary level.

However, these changes of the education system are not an automatic function of the pressure from the global market. The primary education expansion at the import-substitution stage laid a good foundation for later expansion and reform. More importantly, the role of the state is critical in initiating and implementing the changes.

The Taiwanese and the Singapore governments have played a very active role in adapting their education system to the needs of their open economy. Industrial and education upgrading are conscious strategies for the governments to survive in the competitive global market. In addition, as summarized in Table 8.3, strong policy linkages exist in these two cases to ensure the policy changes are implemented well in practice. Education planning in both cases is subordinated to a very powerful economic planning agency which makes sure economic needs are taken into consideration when making education policies. In Singapore, various communication channels exist across different department ministries to facilitate policy coordination; and agencies such as Council for Professional

and Technical Education and Productivity and Standards Board directly coordinates education supply and economic demand. Even though the centralized and politically dominant PAP closely monitored policy making, the line ministries have been given increasingly given autonomy in designing and implementing new policies. There is also wide private sector participation in the process. Not only are employers, unions and academics are consulted during the policy making process, but the private sector is also incorporated into the leadership role of the bureaucracy.

In Taiwan, key ministries such as Budget, Finance, Demography, Education and Labor directly participate in manpower planning which is strictly implemented in practice. However, in contrast to Singapore, the private sector in Taiwan was excluded from the policy making process during the authoritarian period. The democratic period is associated with a more diversified policy making process which started to incorporate actors such as local governments, schools and local representatives. The implication of this policy making process is yet to be evaluated.

The linkages between education supply and economic demand are weaker in Malaysia as evidenced by the particular shortage of science and engineering power. This is partly explained by the fact that the Malaysian state has only started to adjust its education system to the needs of its economy in the 1990s, more than a decade later than Taiwan and Singapore. On the other hand, the Malaysian state exhibits institutional features that hinder effective policy coordination and reform. There lacks coordination among various ministries responsible for education and training. The growing centralization of power in

the Prime Minister's office also limits autonomy for the line ministries. In contrast to Singapore, there is little private sector participation in the policy making process. Owners of small and medium-sized enterprises, academics and labor leaders are absent from the consultative bodies. For big enterprise which do participate in the consultative bodies, there lacked genuine participation opportunities.

The linkage between education supply and economic demand was the weakest in Thailand, as proved by its particular shortage of skilled manpower and a decreasing ranking of international competitiveness. Besides a late start in adapting its education system to the needs of the economy and a weak political will to reform the system due to frequent government changes, several institutional factors have hindered an effective match between economic demand and education supply in Thailand. The central planning agency was weak comparing with those in the other three cases, with no real power to implement its policies. There also lacked coordination among a number of institutions responsible for education. The Education Ministry, centralized in Bangkok, left too much room for corruption and too little for local participation. In addition, although various committees and councils exist to extract private sector input, little room for genuine participation was provided. This partly explains why Thailand lagged behind Taiwan, Singapore and Malaysia, especially in secondary enrollment and the supply of science and technology manpower. The effects of recent administrative reforms in Thailand to make the education system more efficient are to be evaluated.

Table 8.3 Policy Linkages between Economic Demand and Education Supply

Taiwan	Singapore	Malaysia	Thailand
Strong. Education Planning is subjected to economic planning. MDPs are strictly implemented. Centralized under the authoritarian period. Exclusion of private sector participation. Democratization is associated with a more diversified education policy making process whose implications are yet to be evaluated.	Strong. Education Planning ias subordinated to economic planning. Strong channels of communication among different ministries. Agencies to directly coordinate education supply and economic demand. Line ministries are given increasing autonomy for policy design and implementation. Wide private sector (employers, unions, academics) participation (consultation and leadership role).	Weak. Lacks coordination among education bureaucracies. Policy making is centralized in the Prime Minister's Office which reduced the flexibility of line ministries. Limited private sector participation. Owners of SMEs, academics, labor leaders are absent from the consultative bodies. No genuine participation opportunity for the big business.	Weak. Weak central planning agency. Lacked coordination among various ministries responsible for education. Education ministries centralized in Bangkok left too much room for corruption and too little for local participation. Lacked genuine opportunities for private sector participation despite the existence of several consultative bodies. Effects of recent administrative reforms to be evaluated.

Findings on Democratization

Effects of Democratization

Democratization has been found to have significant impacts on government education provision in both Taiwan and Thailand, the two cases that experienced democratic transition in the sample. In both countries, democratization is associated with expanding education access, a more equal distribution of education resources and fundamental reforms of the education system. In Taiwan, democratization is associated with expanding education access at the upper secondary and tertiary level, greater education spending, legislation to protect education spending and redistributing the education resources from the elites to the masses. Moreover, fundamental reforms have been carried out to free the education system from the ideological, political and administrative control of the state. In Thailand, both democratic periods are associated with expansion of basic

education, more equal distribution of education resources and fundamental reforms such as learning reforms and decentralization.

These findings on the effects of democratization are re-confirmed by the findings from the two authoritarian cases. Consistent with the finding that democracies redistribute education resources from the elites to the poor, in Singapore the education system based on meritocracy remains elite-oriented during the authoritarian period whereas the early democratic period was associated with primary school expansion. The Malaysian case is relatively unique since education policies under the authoritarian regime have favored the economically weak Malay masses until changes are pressured by the globalization forces and the activism of Islamic extremism in universities. However, given that the motivation for such policy is maintaining social peace and the authoritarian leaders in Malaysia are more constrained by a more competitive regime than their counterparts in Singapore, the finding can be said consistent.

Also consistent with the finding that democratization is associated with freeing the education system from the tight ideological and political control of the state in the Taiwan case, education systems constantly serve as tools of nation-building and political indoctrination in authoritarian Singapore and Malaysia. However, in the Thailand case, the education system continues to emphasize the teaching of Buddhist virtues in the democratic periods. This inconsistency could be well understood by the special importance of Buddhist religion in Thailand.

Mechanisms

I find that civil society has played a major role in changing government education policies in Taiwan. The education reform organizations successfully mobilized all strata of Taiwanese society to support education reform and protect education spending through initiating society-wide discussion, holding protests and pushing for legislations. Meanwhile, electoral competition also played a role in maintaining the momentum of the reform, protecting education spending and equalizing education resources. Since education has become a relatively salient issue at national elections, the candidates generally support reform demands put forward by the education groups; to attract their votes, the candidates also refrain from unpopular education measures such as spending cut. Meanwhile, local representatives and legislators would fight for education resources for their respective constituencies.

Unlike the forces of change in Taiwan, public participation was very limited and electoral competition seems to have played no role in the education reform under the 1970s short democratic government in Thailand. The main architects of reform were educational and bureaucratic elites. Due to the limitation of my research, I do not have enough information on the main actors that pushed for changes in recent democratic periods in Thailand. Civil society and democratic elites may be important forces of change. Election competition, at best, played a limited role in encouraging school construction. Since the Thai election is rampant with corruption, vote-buying and localized issues, I suspect that it have played a salient role in initiating fundamental education reforms.

Similar to Taiwan, electoral competition was associated with school expansion in the early democratic period of Singapore. In contrast to Taiwan and its early democratic period, interest groups and electoral competition played no role in affecting education policy changes in the authoritarian period of Singapore where western-style interest groups are not allowed and there is limited space for meaningful electoral competition. In Malaysia where the authoritarian regime allows for more competition and civil and political liberty, the politics of education is more contested even though interest group demands are ignored most of the time. Electoral competition also plays a greater role in affecting education policy changes in Malaysia comparing with Singapore: the ruling coalition is cautious in adopting any reform measures that might offend its core voters and it is most likely to make comprises to interest groups before a hotly contested election. However, a more authoritarian style of the Malaysian government in recent years is associated with more severe suppression of the education groups.

Table 8.4 summarizes the effects of polity on government education provision and the forces of change in all four cases.

Table 8.4 Effects of Polity on Government Education Provision

	Taiwan	Singapore	Malaysia	Thailand
Polity	Democratization	Authoritarianism	Competitive authoritarianism	Democratization
Effects of polity	Democratization is associated with education liberalization * Free the system from the political and ideological control of the state * Less state control of the textbook market * Decentralization: more autonomy for schools, teachers, and parents	The authoritarian regime constantly renewed the education system for the purpose of nation-building despite failures.	The education system constantly served as a tool for nation-building and political indoctrination under the competitive authoritarian regime.	The teaching of Buddhist virtues continues to be emphasized in the democratic periods.
	Democratization is associated with: * Expanding education access * Greater education spending; Legislation to protect education spending * Redistributing education resources from the elites to the masses	Early democratic period is associated with primary school expansion. The education system based on meritocracy remains elite-oriented under the authoritarian regime.	Education policies used to favor the economically weak *Bumipetra* masses.	Both democratic periods are associated with * Expansion of basic education * More equal redistribution of education resources * Fundamental education reforms
Forces of change	Education reform movement played a major role in: 1) forcing the government to reform by mobilizing all strata of society 2) protecting education spending through protests and pushing for legislation.	Western style interest groups are not allowed. Only ethnic self-help groups can be established.	Interest group demands ignored most of the time; but some room for contested politics of education. The more authoritarian style of the regime is associated with more severe suppression of the interest groups.	Public participation was limited in the 1970s reform. Educational and Bureaucratic elites played the major role. Interest groups and democratic elites might have played a role in the 1990s but I do not have enough information to draw the conclusion.
	Electoral competition maintained the momentum of the reform, protected education spending and equalizing education resources. * Candidates usually support the demands of the education groups at national elections to attract votes. * Candidates refrain from unpopular education policies such as spending cuts. * Representatives and legislators fight for education resources for their constituencies.	Electoral competition was associated with early school expansion during the early democratic period. Electoral competition played no role in pushing for education policy changes during the authoritarian period.	Electoral competition played a limited role in education policy changes. * The ruling coalition is cautious in adopting any reform measures that might offend its core voters. * It is most likely to make comprises before a hotly contested election.	Electoral competition seems to have played no role in the 1970s given the main conflict was between democratic and anti-democratic forces. Electoral competition at best played a role in encouraging school construction in the 1990s. It seems to have played no role in initiating fundamental reforms since the Thai election is rampant with corruption, vote-buying and localized issues.

Findings on the Interaction of Globalization and Democratization

In the two democratization cases - Taiwan and Thailand, recent education reforms are affected by the forces of globalization as well as democratization. On some occasions, these two forces reinforced each other in demanding changes of the education system. For instance, in Taiwan as well as Thailand, administrative reforms such as decentralization required by the global economy to make the education system more efficient are reinforced by the democratic demands for more school and individual autonomy. Another example is expanding education access (at the junior high level in Thailand and the senior high and tertiary level in Taiwan), which is demanded by the competitive global economy as well as the democratic forces (reform groups in Taiwan and the democratic government in Thailand). Moreover, both the global and the democratic forces required a move-away from an exam-centered system to a student-centered system in Taiwan.

However, there also existed tensions between the demands by the global economy and the changes associated with democratization. One case in point is the study of English and the study of the local language in Taiwan. The former is required by the global economy while the latter is demanded by many education reform groups. Even though the Taiwanese government made official policies for both to be studied in school, the English-in-Education policy was more systematically and thoroughly planned by the central government, and subsequently more vigorously implemented by all parties concerned (central and local governments, schools, teachers and textbook publishers). Another tension is illustrated by the popular resistance to the neo-liberal measures of

education management in Taiwan. Students, professors and parents protested neo-liberal measures such as charging higher tuition or cutting education spending under the name of improving efficiency.

Findings on the Obstacles of Recent Education Reforms

Common to all four cases, several kinds of education reforms are the most difficult in the recent round of education restructuring: institutional reform, reforms to redistribute resources, learning reform and reforms to maintain social cohesion.

Both institutional reform and reforms that redistribute education resources touch the interests of the stakeholders in the old system and are likely to be met with fierce opposition. The increased opening of participation channels and electoral competition under democracy does not weaken, and may often strengthen the relative influence of vested interests opposed to changes. In Taiwan, school teachers resisted the increasing job burden caused by the new integrated curriculum which aims to cultivate the creativity and innovative ability of the students; normal college professors sought to restore the unified entrance exam replaced by a plural admission system that weakened their monopoly power over teacher training. In both cases, the government had to take a defensive position due to these oppositions and moved slower with the reforms even though it promised supporters further reform. In Thailand, the stakeholders in the Ministry of Education resisted administrative reforms that would reduce their power; teachers unions opposed reform measures such as providing 12-year free basic education and emphasis of higher qualification for teachers, which might negatively affect its

salaries and peaks. Given the already slow reform process hindered by weak institutions in Thailand, the future of these reforms are uncertain. In Malaysia, the authoritarian government cancelled the ethnic quota policy which gave preferential treatment to mainly the Malay groups despite strong opposition. However, the Malay enrollment in the tertiary institutions actually increased after the cancellation due to an unfair exam system still favoring the Malays. It is unclear how far the government is willing to travel to implement the merit system which might cost it Malay voters. Despite some efforts to redistribute the education resources from the elites to the masses in Taiwan such as increasing funding for compulsory and private education and reducing spending for the universities, vocational education whose students are mainly from the less well-to-do family are still under-funded comparing with academic education. In Thailand, the government still needs to address the long-standing problem of inequality which concentrates most of the education resources in the Bangkok area. These political obstacles to reforms are consistent with those identified in studies of Latin America (Nelson, 2006; Kaufman and Nelson, 2004).

For all four East Asian countries/political entities, the transformation of an exam-based system based on rote learning to a student-centered one which cultivates the students abilities to think and to create might take a long time to be realized since such learning reform requires changes at the social value level as well as possible changes of the fundamental principles of the old education system. For example, the students in Taiwan are not happier with the introduction of the learning reform since the pressure for academic advancement is still heavy in the Taiwanese society. In Singapore, with the

principal of meritocracy still central in society and limited opportunities for political and local participation, it may take a long time for teachers, students and parents to adjust to the new system that promotes the cultivation of creativity and critical thinking. In Thailand, learning reform involves a change at the cultural value level in that the Thai teachers believe learning is by repetition and not by investigation. It will also take a long time to change the preferences of the Malays who favor arts instead of science and engineering in Malaysia.

Maintaining social cohesion through the education system has been found to be difficult in Singapore and Malaysia, the two authoritarian cases. In Singapore, cultivating the citizens' loyalty is not an easy task in a system that favors the elites and that has increasing social inequality, mobility and access to information and importation of foreign talents. To build national unity in a now ethnically polarized education system proves challenging for the Malaysian government.

Table 8.5 summarizes these obstacles to reforms in the four cases.

Table 8.5 Obstacles to Education Reforms

	Taiwan	Singapore	Malaysia	Thailand
Institutional Reform	Stakeholders of the old system resisted change, e.g. school teachers resisted the increasing job burden caused by the new integrated curriculum; normal college professors sought to restore the unified entrance exam replaced by a plural admission system that weakened their monopoly power over teacher training		Unclear how far the government is willing to travel to cancel the ethnic quota system which might cost it Malay voters. Stakeholders such as bureaucrats in the old system may hinder administrative reforms needed.	There is doubt how much political will exists to reform the system given that politicians prefer measures that give them immediate popularity. Entrenched interests resisted changes. E.g. stakeholders in the MOE resisted administrative reforms that reduce their power; teachers unions opposed reform measures such as providing 12-year free basic education and emphasis of higher qualification for teachers.
Social Redistribution	Different access to learning global skills; underinvestment in private schools and vocational schools			The government needs to address the long-standing problem of regional inequality that concentrates most of the education resources in Bangkok.
Learning Reform	Students are not happier after the reform since the pressure for academic advancement is still heavy. Creativity and ability to innovate may take a long time to cultivate	It may take a long time for teachers, students and parents to adjust from an exam-based system to one that cultivates creativity and critical thinking with the principal of meritocracy still central in Singapore society. What kind of creativity can be taught in Singapore with limited local governance and political participation?	It takes time to change the preferences of the majority Malays who prefer arts instead of science and engineering.	Student-centered learning is not an easy task in the Thai culture in which the teachers believe learning is by repetition and not by investigation.
Reforms to maintain Social Cohesion		Social cohesion is hard to maintain in an education system which favors elites.	How to build national unity in a now ethnically polarized education system.	

8.1.3 Triangulating the Statistical Study with the Case Studies

Findings on Democratization

The findings on democratization from the case studies are generally consistent with the statistical findings. The findings in the Taiwan case that democratization is associated with higher education spending and spending favoring basic education are consistent with the statistical findings that democracies have a higher per capita spending in general and that democracies have a higher per student spending at the primary and the secondary level respectively. Moreover, democratization is associated with expanding education access to the secondary level in the Thai case, a finding consistent with the statistical finding that democracies have a higher secondary enrollment rate. In contrast and also consistent with the statistical findings, the education system remains elite-oriented in authoritarian Singapore.

The case studies reveal other effects of democratization on government education provision which are not captured by the dependent variables (spending, enrollment, attainment and gender equity) in the statistical study. In both Taiwan and Thailand, democratization is found to be associated with the initiation of fundamental education reforms such as administrative and learning reform. In Taiwan, democratization is also associated with freeing the education system from the ideological and political control of the state and legislations to protect education spending.

Moreover, the politics behind the simple association between democratization and changes in government education provision is interrogated in the case studies, as summarized in section 8.1.2.

Findings on Globalization

The findings on the significant effects of globalization on government education provision (including spending, outcomes and structural reforms) in all four cases are against the null-effect finding on globalization in the statistical study. However, the case studies shed some light on why the statistical study would produce a null-effect finding.

In all four case studies, I find that it is not the immediate adoption of an outward-oriented strategy, but the increasing competition in the global market for the country involved that exerted great pressure to update its economy and education system. That is why in three out of four cases, Taiwan, Singapore and Malaysia, the trade indicators used in the statistical study are not good measures for this aspect of globalization. Because the trade indicators started to rise immediately as the countries adopted an outward strategy but faced no competition from the global market and thus had no significant changes in its education provision. However when global competition for these countries began to increase and the governments made corresponding changes in their education system, the trade indicators remained constant in Taiwan and Singapore, only continued to increase in Malaysia. The trade indicators only captured well the influence of globalization in the Thai case, where their trends matched well with the increasing global competition for Thailand.

On the other hand, the capital account openness indicators seem to be better measurements for increasing competition in the global market, especially for the developing countries that entered the global market in the 1980s. In all four cases, increasing foreign direct investment, private capital flows and liberalizations in government capital accounts coincided better with increasing competition in the global market than the trade indicators. However, for the early openers such as Taiwan, increasing global competition preceded significant openings of their capital markets.

Another reason why the statistical study produces a non-significant finding is that changes in government education provision are only partially captured by the spending and outcome variables used. For example, in the Singapore case when foreign direct investment and gross private capital flows increased significantly in the 1990s, government education spending didn't change significantly but profound structural changes took place in its education system such as de-centralization, emphasis on critical thinking and life-learning.

Besides revealing the limits of the statistical studies, the case studies also show the process how global competition is translated into changes in government education policies by changing the preferences of the government and the private sector, and how these preference changes are translated into changes in government education provision through various policy linkages, which I have already summarized in section 8.1.2.

Table 8.6 compares the findings from the statistical study and the case studies.

Table 8.6 Triangulating the Statistical Study with the Case Studies

Findings	Statistical Study	Case Studies
Democratization	Democracies have: * A higher education spending per capita. * A higher per student spending as percent of GDP per capita at the primary and secondary level. * A higher secondary gross school enrollment level. *Democracies devote a lower proportion of education spending to the tertiary level. *Democracies have a higher average years of school for the male.	Democratization is associated with: * Greater education spending (Taiwan). * Pro-basic education spending (Taiwan and Singapore). * Expansion of basic education to the secondary level (Thailand). * The initiation of fundamental education reforms: learning reform, decentralization etc. (Taiwan and Thailand). * Education liberalization (Taiwan). *Forces of Change*: Taiwan: Civil society played a major role; electoral competition a limited role. Thailand: Civil society and democratic elites may have played a great role; electoral competition played no role. Singapore: Electoral competition is associated with school expansion in the early democratic period. No role of interest groups or electoral competition in the authoritarian period. Malaysia: More contested politics of education. A limited role of electoral competition.
Globalization	Neither trade openness nor capital account openness has significant impacts on government education provision, evaluated from spending, access, attainment and gender equity.	Globalization has significant effects on government education provision, evaluated from spending, access, attainment, gender equity and structural changes in the education system. *Why the statistical study produced a null-effect finding:* * Neither trade nor capital account openness are good measures for global competition. * Structural changes such as shift in subject emphasis and decentralization cannot be captured by the dependent variables in the statistical studies. *Policy linkages translating globalization into changes in education supply:* Taiwan: Strong. Singapore: Strong. Malaysia: Weaker. Thailand: The weakest.
Globalization & Democratization		*Reforms required by both forces*: administrative reform such as decentralization (Taiwan and Thailand); expanding education access (Taiwan and Thailand); a move-away from the exam-centered system to a student-centered one (Taiwan). *Tensions between the requirement of the global and the local*: the study of global and local language (Taiwan); neo-liberal style of school management such as charging higher school fees met with fierce opposition from students, parents and teachers (Taiwan). *Reform hurdles*: Institutional reforms and reforms redistributing resources are the most difficult (Taiwan, Malaysia, Thailand); also difficult are learning reforms (Taiwan, Singapore, Malaysia, Thailand) and reforms that maintain social cohesion (Singapore, Malaysia).

8.2 Contributions and Limitations of My Study

8.2.1 Contributions

My study contributes to the literature in three significant ways: 1) it fills an important regional gap in the literature; 2) the substantive findings help us better understand the effects of globalization and democratization on government education provision and how those effects are produced; 3) the research design that triangulates the carefully executed statistical study with comparative case studies ensures the robustness of the findings.

Filling an Important Regional Gap

To my knowledge, my study has produced the first piece of systematic statistical and comparative evidence on how globalization and democratization affects government education provision in East Asia. Even though how globalization affects government education spending and outcomes have been investigated by a number of scholars in Latin America and in global samples such as middle-income countries and developing countries,[247] no study has been carried out using other regional samples. Similarly, although plenty of statistical studies have been done to explore the effects of democratization on government education spending and outcomes in global samples and Latin America[248], few studies have been done in other developing regions such as Africa

[247] Literature on Latin America includes: Kaufman and Segura, 2001; Brown, 2004; Huber, Mustillo and Stephens, 2004; Avelino, Brown and Hunter, 2005; Hecock, 2006. Literature on global samples includes: Dion, 2005; Rudra and Haggard, 2005. For details on these literatures, please refer to section 1.1.2. in chapter 1.

[248] Global literature includes: Sloan and Tedin, 1987; Brown, 1999 & 2004; Lake and Baum, 2001; Baum and Lake, 2003; Lindert, 2003; Siegle, 2004; Rudra and Haggard, 2005; Dion, 2005; Stroup, 2006. Latin America literature includes: Ames, 1987; Kaufman and Segura, 2001; Brown, 2004; Huber, Mustillo and Stephens, 2004; Avelino, Brown and Hunter, 2005; Brown and Hunter, 2004a; Hecock, 2006. For details on these literatures, please refer to section 1.2.2. in chapter 1.

and Asia[249]. On the other hand, the case study literature on the effects of globalization is scattered while that of democratization are still in its early stage in developing regions such as East Asia[250]. My study fills these important gaps in the literature by producing both statistical and comparative case studies evidence in East Asia, a region where education is perceived as being highly valued by the governments and where are also deeply affected by the trends of globalization and democratization. Table 8.7, Table 8.8, and Table 8.9 locate my study in the literature.

My study also contributes to the literature of East Asian welfare studies. Existing studies have devoted their attention primarily on the effects of democratization on health care and social protection (Kwon, 2005; Wong, 2004; Aspatler, 2002). My study is the first regional investigation in the realm of education by employing both statistical and comparative case study methods[251]

[249] To my knowledge, one statistical study has been done in Africa (Stasavage, 2005) and in three countries of East Asia (Chan, 1997).

[250] There are a number of case studies carried out on how globalization affects government education provision in East Asia (Mok, 2000, 2001, 2002, 2003; Law, 2004) and South Africa (Akoojee and McGrath, 2004). Qualitative studies on the effects of democratization are richer in the developed countries (Engerman, Mariscal and Sokoloff, 1998; Lindert, 2004); a few are in developing countries: Brown on Brazil (2002), Corrales on Agentina (2004), Stasavage on Uganda (2005b), Crouch (2005) and Engelbrecht (2006) on South Africa, and Perry on Eastern Europe (2005). For details of these literatures, see section 1.1.2 and 1.2.2 of chapter 1.

[251] Chan's study is the only one I know that uses the statistical method to explore the effects of democratization on education spending in three countries (South Korea, Hong Kong and Taiwan) (Chan, 1998).

Table 8.7 Statistical Literature on the Effects of Globalization and My Study

	Global Sample	Latin America	East Asia
Trade integration	*Positive effect* - Trade on education spending as % of GDP in middle developing countries (Dion, 2005) *Negative effect* - Trade on education spending as % of GDP in developing countries (Rudra & Haggard, 2005) *No effect* - Trade on gross school enrollment at all levels in developing countries (Rudra & Haggard, 2005)	*Positive effect* - Trade on education and health spending as % of GDP (Huber, Mustillo & Stephens, 2004) - PPP measure of trade on education spending as % of GDP (Avelino, Brown & Hunter, 2005) - Maquila export activity on primary spending per student (Hecock, 2006) *No effect* - Trade on education and health spending (Kaufman & Segura-Ubiergo, 2001) - Trade on education spending per capita (Brown, 2004)	*No effect* - **Two indicators of trade on education spending (as % of total government spending, as % of GDP and per capita spending)** - **Two indicators of trade on spending at primary, secondary and tertiary levels** - **Two indicators of trade on gross school enrollment at all levels, education attainment and gender equity in school (My Study)**
Capital account openness	*Mixed effect* - Capital flows on education spending as % of GDP in middle developing countries (Dion, 2005) *No effect* - Capital flows on education spending as % of GDP in developing countries (Rudra & Haggard, 2005) *No effect* - Capital flows on gross school enrollment at all levels in developing countries (Rudra & Haggard, 2005)	*Positive effect* - Policy indicator on education and health spending (as % of government spending and as % of GDP) (Kaufman & Segura-Ubiergo, 2001) *Negative effect:* - FDI per capita on primary education spending per student (Hecock, 2006) *No effect* - Capital flows on education spending as % of GDP (Avelino, Brown & Hunter, 2005) - FDI on education and health spending as % of GDP (Huber, Mustillo & Stephens, 2004)	*No effect* - **Three indicators of capital account openness on education spending (as % of total government spending, as % of GDP and per capita spending)** - **Three indicators of capital account openness on spending at primary, secondary and tertiary levels** - **Three indicators of capital account openness on gross school enrollment at all levels, education attainment and gender equity in school (My Study)**

Table 8.8 Statistical Literature on the Effects of Democratization and My Study

Global Sample	Latin America	Africa	East Asia
Positive effect - Democracy on education spending as % of GDP in the long run in middle income countries (Dion, 2005) - Democracy on gross primary school enrollment but the effect diminishes with increasing wealth (Brown, 1999) - Democracy on secondary gross school enrollment (Lake & Baum, 2001) - Democracy on female's secondary school enrollment (Baum & Lake, 2003) - Democracy on gross school enrollment at all levels in developing countries (Rudra & Haggard, 2005) - Competitive executive recruitment on gender equity (Brown, 2004) - Democracy on literacy rate (Siegle, 2004) - Political freedom on grade 5 completion rate but effects diminish with degree of economic freedom (Stroup, 2007) ***Negative effect*** - Democracy on education spending as % of GDP in the short run (Dion, 2005) - Democracy on per capita and per student education expenditure (Lott, 1999) ***No effect*** - Democracy on enrollments at all levels and literacy rates (Sloan & Tedin, 1987) - Democracy on primary spending per student as % of GDP per capita (Lindert, 2003) - Democracy on education spending in developing countries (Rudra & Haggard, 2005)	***Positive effect*** - Heightened electoral competition on education spending (Ames, 1987) - Democracy on education and health spending (per capita, as % of public spending, as % of GDP) (Kaufman & Segura-Ubiergo, 2001) - Democracy on education spending per capita (Brown and Hunter, 2004) - Democracy on education spending as % of GDP (Avelino, Brown & Hunter, 2005) - Democracy on primary spending as % of total education spending (Brown, 2004) - Democracy on primary spending (Brown & Hunter, 2004) - Electoral competition on primary education spending per student (Hecock, 2006) ***No effect*** - Democracy on health and education spending as % of GDP (Huber, Mustillo & Stephens, 2004)	***Positive effect*** - Democracy on education spending as % of GDP and as % of total government spending (Stasavage, 2005)- Democracy on primary spending as % of GDP and as % of total government spending (Stasavage, 2005) ***No effect*** - Democracy on university spending as % of GDP and as % of total government spending (Stasavage, 2005)	***Positive effect*** - Democracy on per capita education spending (Chan, 1997) - **Democracy on education spending per capita** - **Democracy on primary and secondary spending per student as % of GDP per capita** - **Democracy on gross secondary school enrollment and male's average years of school** ***Negative Effect*** - **Democracy on tertiary spending as % of government spending (My Study)**

Table 8.9 Case Study Literature on the Effects of Globalization and Democratization and My Study

	Developed Countries	Latin America	Africa	East Asia	Eastern Europe
Globalization			- The fiscal constraint policy adopted by the government in response to globalization had a disastrous effect on both school quantity and quality in South Africa (Akoojee & McGrath, 2004).	- Globalization changed the role of states in higher education provision, financing and regulation in South Korea and Taiwan (Mok, 2000, 2001, 2002 &2003) - Globalization is associated with hanges of emphasis in school curriculum in Taiwan and HK (Law, 2004) - **Globalization had significant effects on expanding education access, improving school enrollments and attainments and structural reforms in Taiwan, Singapore, Malaysia and Thailand (My study)**	
Democratization	- The expansion of suffrage has a positive correlation with primary school enrollment and increase in literary in America and Canada (Engerman, Mariscal and Sokoloff, 1998) - Expansion of suffrage correlated with the expansion of early mass education in France, England, Germany and Britain before 1914 (Lindert, 2004)	- Democracy has a positive effect on financing basic education in Brazil (Brown, 2002) - Democracy is associated with laws removing school and university fees, stipulating 10 years of compulsory education and requiring federal spending to double in 5 years in Argentina (Corrales, 2004)	- Democracy has a positive effect on financing basic education in Uganda (Stasavage, 2005b) - Democratization is associated with administrative reforms and redistributing resources from the rich to the poor in South Africa (Crouch, 2005) - Democratization is associated with inclusive education in South Africa but implementation is till problematic after 10 years of democratization (Engelbrecht, 2006)	- **Democracies have a positive effect on financing basic education, expanding basic education access in Taiwan and Thailand.** - **Democratization is associated with fundamental education reforms such as resource redistribution, administrative and learning reforms in Taiwan and Thailand (My Study).**	- Democratization is associated with removing the state monopoly on the education system (Perry, 2005)

Improving the Understanding How Globalization and Democratization Affect Government Education Provision

My substantive finding on the effects of globalization on government education provision in East Asia adds evidence to the "human capital investment" theory that in response to the competition and economic insecurity in the global market, both the governments and individuals would have incentives to improve the skill level and the productivity of the labor, a measure also welcomed by the private sector.

My finding further contributes to the theory by providing an understanding of the possible changes of the education system associated with globalization and when and how those changes would take place. As I have summarized, in East Asia, changes in government education provision start to take place usually when countries begin to face increasing competition in the global market and lose comparative advantage in their labor-intensive industries. This global competition exerts pressure on them to upgrade their industry and the skill level of their labor force. Education system is thus reformed in a way to suit the needs of the economy. Given the basic education level of the population, the first reform measures usually include expanding basic education access from the primary to the lower secondary level, emphasizing vocational education and the study of science and technology. Other reform measures, based on the nature of the global economy that the countries compete in, may involve further expanding basic education access to the upper secondary level, expanding tertiary enrollment, further updating vocational and technical education, emphasizing the study of skills essential to survive in the global economy such as English, ICT, life science, innovative and critical thinking abilities, administrative reforms to make the education system more efficient,

and allowing the private sector to play a greater role in financing education. Efforts to expand primary education during the import-substitution period lay the foundation for later upgrading. More importantly, an active state that prioritizes national economic development and a policy making process that well matches education planning to economic planning and ensures the implementation of the reform measures is critical to translate the global pressure into the needed changes in the education system.

Regarding the effects of democratization, my findings add strength to the theory that democracy provides better education services. The East Asian case provides a hard test for the effects of democracy since authoritarian regimes in this region have proven to be successful in both economic development and improving the education level of their citizens. Thus the finding that democratization is associated with basic education expansion, a shift of education resources from the elites to the poor and fundamental reforms of the education system adds strong evidence to the positive role of democracy.

My findings also suggest that among the several mechanisms that link democracy to better education provision as stated in the introduction, the role of civil society is perhaps the most important whereas electoral competition has played only a limited role. The civil society was the major force of change in initiating education reform, protecting education spending and equalizing education resources in Taiwan. It probably has also played a critical role in recent education expansion, redistribution and reform in Thailand but I can draw no definite conclusion due to the limitation of my research. In contrast, electoral competition only played a limited role in protecting education spending, equalizing education resources and maintaining the momentum of reform in Taiwan. In Thailand,

electoral competition at best played a very limited role in encouraging school construction. Another important agent of change in Thailand is the educational and bureaucratic elites, who pushed for education reforms during the short democratic period of 1970s and perhaps have also played a critical role in recent education expansion and fundamental reform. My finding further suggests that comparing with measures such as increasing education spending and expanding access, structural education reforms, especially those reallocate resources and power, are not easier, if not more difficult, under democracy, since these will meet with resistance from vested interests, for whom democratization does not weaken, and sometime strengthen their power. These reforms are easier to occur when the civil society is better organized, as in the Taiwan case, and/or when the political leaders saw the reform as a crucial means to national economic development, as in both Thailand and Taiwan. These conclusions are consistent with that of Nelson (2006) and Corrales (1998).

Triangulating the Statistical Study with Comparative Case Studies Ensures the Robustness of the Findings

Lastly, my dissertation contributes to the literature by a careful research design that triangulates the statistical study with comparative case studies. The statistical part of the dissertation explores the average effects of globalization and democratization on government education provision in eight East Asian countries. Multiple indicators of the dependent variable are used, the model is specified carefully, and various robustness checks are employed. Such design directly addresses the limitations of the current literature and thus ensures the findings are not sensitive to possible changes in variable

operationalization, model specification, countries in the sample, and estimation method chosen.

The comparative case study part investigates in depth the effects of globalization and democratization in four countries/political entities. The structured case comparison technique ensures the common effects of globalization and democratization are identified properly. The case studies not only find effects that are not captured by the statistical study, but also help to reveal the mechanisms that link globalization and democratization to their effects and the politics under the simple statistical associations.

Finally, as I have detailed in section 8.1.3, the triangulation of the statistical study with the case studies ensures the robustness and validity of the findings. The triangulation also sheds lights on why globalization produces a null-effect in the statistical study and helps improve similar statistical studies in the future.

8.2.2 Limitations

There are two main limitations of my study. Firstly, results from the statistical study could be improved with better data and modeling strategy. Secondly, there is still much to be desired in the case studies in which more political stories could be told with research strategies such as doing fieldwork.

Limitations of My Statistical Study

Even though my statistical study is carefully designed and I have been conservative in only presenting the robust findings, data limitation leaves much room for its improvement. Even though Taiwan and Hong Kong are included in the dataset, they are basically excluded from the estimation of the basic models due to missing data on several key independent variables. There is no current and capital account openness policy indicator available for Taiwan; neither can I find comparable data of foreign direct investment and gross capital flows for it. Hong Kong lacks data on capital stock and the standard Polity score. Although I was able to include both countries in the estimation sample by slightly changing model specifications later when I checked the robustness of the findings, obtaining better data for these two countries would probably further improve the findings.[252]

On the other hand, the dependent variables are also second best. The total education spending data only includes that of central government. For most countries in my sample, this is not a big problem since central government spending composes the majority of the spending. Nevertheless, in a case like Taiwan where central government spending only accounts for about one third of total education spending, the data is a very rough approximation even though the trends of central government spending and general government spending are similar. The disaggregate spending data at different levels of education only contains current expenditure; it is also only available for years before

[252] Upon completion of the dissertation, I came to know there is an update on the Penn table (from 6.1 to 6.2) from where I obtained my real GDP per capita data. Using data from the Penn table 6.2 means I could have several more cases for estimation for the total education spending models and some of the spending outcome models. I re-estimated these models using real GDP per capita data from Penn 6.2. The robust findings do not change.

1996 and thus seriously limits the number of cases for estimation. Education participation would be better measured by net school enrollment rather than gross school enrollment. Unfortunately, there are too many missing values for the former to be of statistical use. On the other hand, education attainment data is only available every five years and the very limited number of cases greatly constrains the number of controls that can be put into the model and the accuracy of the estimation.

The results of the spending and spending outcome models could be improved if I can properly control for variables such as youth population, spending constraints and population available to be educated from the previous level. However, I was not able to do so due to problems of endogeneity and the lack of good instruments.

Limitations of My Case Studies

I relied mainly on secondary literature, government documents and newspaper reports to do the case studies. Thus my study is strong in identifying the changes of government preferences associated with globalization and democratization and corresponding changes in its education provision as presented by these documents. However, my study is relatively weak in tracing the political process that produces these changes.

On the effects of globalization, even though I have made an effort to identify changes in government preferences, the preferences of the private sector, and the policy linkages matching the economic demand and the education supply, I was not able to uncover in more detail the politics that translate global pressure into changes in education policy

such as government deliberation, bureaucratic politics and interest group politics during the policy making process. This meant that I was not able to test for alternative theories since there is no information on how alternative education policies might be discussed. In the Malaysian case, the political stories are partly captured but they are largely missing in Taiwan, Singapore and Thailand because of less data availability.

Due to similar data limitation, the mechanisms linking democratization to its effects on government education provision are better captured in Taiwan than in Thailand. I was able to access more materials on interest group politics and electoral competition in Taiwan given my language expertise. But I have no such advantage for Thailand; and unlike Malaysia or Singapore, there is also less English material available for Thailand. Even though I suspect civil society and democratic elites played a large role in recent Thai education reform, the information I collect is not enough for me to draw a definite conclusion.

Lastly, I identified changes in government education provision mainly by those specified in government documents, newspaper reports and secondary materials. However, the actual implementation of these policies might be different depending on a lot of factors such as bureaucratic politics, coalition politics and social value changes. Even though I was able to partly evaluate the implementation of the policy changes by data on spending, enrollment, attainment and gender equity, my study is relatively weak in evaluating the

actual implementation of structural changes such as administrative and learning reform, particularly in recent periods[253].

8.3 Implications of My Study and Directions for Future Research

8.3.1 Implications

My study has important implications given the important role of education in individual welfare, economic development and poverty alleviation. Globalization would not necessarily lead to a "race to the bottom" in the realm of education since competition from the global market would eventually force the governments to improve the education level of their population by measures such as expanding education access and investing in science and technology. Investments in education would in turn have positive consequences for the welfare of population in developing countries whereas the low wages in the labor-intensive period are "temporary ill" that will be eventually overcome (Manning, 1998). Globalization would also imply a convergence of the national education systems which will be geared towards the requirements of the global economy. However, the role of the states is critical in this race of "education upgrading". The states that prioritize the importance of human capital in their development model early and have efficient policy linkages matching economic demand and education supply will stay ahead.

On the other hand, countries that experience democratization would probably have better education services for the poor. Increasing education spending, expanding education

[253] On the other hand, it might still be too early to evaluate the most recent reform measures which will take a long time to be implemented.

access, and structural reforms of the education system will be demanded by groups in the civil society. The sympathy of democratic elites and electoral competition are other two possible channels of change. However, reforms that redistribute power and resources, such as institutional reform and resource redistribution, will not be easier in democracies since they affect vested interests whose power democracy might not weaken, but often strengthen, as shown in my Taiwan and Thailand case and studies in other regions (Geddes, 1994; Corrales, 1998; Kaufman and Nelson, 2004; Nelson, 2006).

For countries that experience both globalization and democratization, the demands on the education system by the two forces may reinforce or may conflict each other. Examples of the former include expanding education access, administrative reforms such as decentralization to make the education system more efficient and learning reform. Cases of the latter are the study of English and the local language and applying market principle to education provision which might be resisted by the local people. The final outcomes of these reforms will depend on a lot of factors such as coalition-building, the relative power of the stakeholders and the reform forces, the institutional context of bargaining between national and local politicians, the timing of the reform, the political will of the leaders, and whether the reform is linked to goals higher than the education sector itself (Kaufman and Nelson, 2004; Nelson, 2006).

8.3.2 Directions for Future Research

However, more research needs to be done before the above claims can be made with more confidence. I would suggest the below directions for future research.

Firstly, given that both my statistical study and case studies are limited for reasons mentioned in section 8.2.2, I would invite future researchers working on similar topics to overcome those limitations. In particular, for the statistical study, careful thought needs to be given on how to capture the aspect of globalization that matters. My study suggests increasing competition in the global market for the country involved is critical and an indicator that could measure this competition probably could produce better results[254]. For case studies, fieldwork and language expertise would definitely be helpful to collect more materials for the political process that links globalization and democratization to their effects.

Secondly, since my study only covers eight East Asian countries, one wonders whether these findings are unique to them, especially given that education is long perceived to be particularly valued in these countries. It would be interesting to see whether the same results would apply to other Asian countries such as those in South Asia or former communist countries. As countries such as China, India and Vietnam gradually integrate into the global market in recent years, would we see similar education upgrading take place when they start to face competition from even lower cost countries? Similar extensions of the study could be done in Eastern Europe or Africa. For example, in contrast to my finding in East Asia, the recent transition of South African economy from racially-exclusive, inward-looking to more outward-looking has been associated with

[254] A possible indicator of this sort might be the percent of high-tech exports in a country. However, data on this variable from World Development Indicators is only available from the late 1980s which constrains studies on a longer time period. One may also construct a qualitative indicator of the competition a country faces by coding its economic history.

public expenditure cut that led to poorer provision in terms of both quality and quantity of school (Akoojee and McGrath, 2004). I also see a need for comparative case studies in Latin America where plenty of statistical studies have been done but the mechanisms that produce these statistical results are not very clear.

Thirdly, another logical extension of the study is to see what effects globalization and democratization have on health care and social security in East Asia – the other two important categories of social welfare in the western literature. Scholars on East Asia have started this effort (Kwon, 2005; Wong, 2004; Aspalter 2002) but no statistical study has been done yet and comparative case studies are in their early stage.

Last but not least, the links between education, individual welfare, and national economic and political development could be investigated further in East Asia. Does education upgrading lead to an improvement of individual welfare at the micro level? What are its implications for social inequality? With an education system geared towards global economy, will East Asian countries do better in the global economic race? What are the implications of such an economically driven education system for the political development in this region? Will democracies and non-democracies behave differently regarding these questions?

Appendices

Appendix 1.1 Comparative Perspective: Social Spending as % of Government Spending (1972-2000)

Scale	OECD		Eastern Europe& Central Asia		Latin America & Caribbean		Middle East & North Africa		Sub-Saharan Africa & South Asia		East Asia	
	Germany	67.6	Slovenia	68.7								
	France	67.3										
	Austria	67.0										
	Switzerland	65.7	Poland	65.3	Uruguay	65.5						
	Netherlands	61.3										
60	Luxembourg	60.6										
			Czech Rep.	59.5	Costa Rica	59.5						
			Latvia	59.2								
	Belgium	57.8										
	Sweden	57.7										
	Spain	56.9	Estonia	56.6								
	Finland	55.8	Slovak Rep.	55.7	Chile	55.0						
	Ireland	53.5	Croatia	53.8								
	Denmark	53.4										
	Iceland	52.2										
50	Italy	50.9										
					Argentina	48.9						
					Panama	48.1						
	Australia	47.6			Barbados	47.2						
	UK	47.3										
	Norway	47.0										
	Canada	47.0										
	USA	46.2	Belarus	45.6								
					Bolivia	43.0						
40	Portugal	41.2			Colombia	42.9			Mauritius	41.2		
					Brazil	39.4						
			Hungary	37.4	Paraguay	37.7	Tunisia	37.0				
			Cyprus	36.7								
					Venezuela	35.6						
					Mexico	35.1						
	Greece	34.2										
			Bulgaria	33.7								
			Romania	33.5			Israel	33.1				
30									Zimbabwe	31.1		
							Iran	29.7	Sri Lanka	29.5	Malaysia	29.5
									Burkina Faso	28.3	Thailand	29.3
					Dominican Rep.	27.8			Lesotho	27.9	Singapore	27.1
					Belize	27.8						
					Nicaragua	26.9	Kuwait	26.8			Korea	26.6
							Morocco	25.7	Burundi	26.0		
							Egypt	23.9	Myanmar	23.9		
							Bahrain	22.4	Cameroon	23.1		
									Zambia	22.2		
									Madagascar	22.1		
			Turkey	21.5								
									Mali	20.9		
20									Ethiopia	20.3		
									Bhutan	18.7		
									Nepal	17.2		
											Indonesia	16.4
10							Syria	14.1				
5									Pakistan	5.1		

* The entries represent the average from 1972-2000.

Sources: Government Finance Statistics CD-ROM 2000 data, kindly provided by Barak Hoffman.

Appendix 1.2 Comparative Perspective: Social Security Spending as % of Government Spending (1972-2000)

Scale	OECD		Eastern Europe& Central Asia		Latin America & Caribbean		Middle East & North Africa		Sub-Saharan Africa & South Asia		East Asia	
50					Uruguay	52.8						
	Luxembourg	49.4										
	Germany	48.3	Poland	48.5								
	Switzerland	47.6										
	Sweden	47.1										
	Spain	45.5										
	Austria	45.1										
			Slovenia	44.0								
	France	43.2										
	Belgium	41.7	Latvia	41.5								
40	Denmark	40.8			Argentina	40.5						
	Canada	38.2										
	Netherlands	37.2										
	Norway	34.8										
	Finland	34.4	Belarus	34.1								
			Croatia	32.2	Chile	32.3						
			Estonia	32.0								
	Italy	31.3	Czech Rep.	31.2								
	UK	31.0										
30	USA	30.8										
	Australia	28.8	Hungary	29.0	Brazil	28.8						
	Ireland	26.9	Bulgaria	26.9								
			Slovak Rep.	26.1								
	Portugal	23.5	Romania	23.1								
20					Paraguay	20.1						
	Greece	19.3	Cyprus	19.5								
	Iceland	18.3			Bolivia	18.8	Israel	18.2				
									Mauritius	17.9		
					Costa Rica	16.5						
					Mexico	16.1						
					Barbados	15.7			Sri Lanka	15.1		
					Panama	14.9						
					Colombia	13.4	Tunisia	12.5				
							Kuwait	10.9				
10							Egypt	10.1				
							Iran	9.1				
					Nicaragua	9.0						
					Venezuela	7.2					Korea	7.2
					Dominican Rep.	5.5	Morocco	5.9	Zimbabwe	5.7		
									Burundi	5.3		
5									Myanmar	5.3	Indonesia	5.1
									Ethiopia	4.9		
									Burkina Faso	4.8		
									Cameroon	4.6		
			Turkey	4.2	Belize	4.2	Syria	4.0	Mali	4.5	Malaysia	4.0
									Madagascar	3.4	Thailand	3.4
							Bahrain	2.9				
									Pakistan	2.0	Singapore	2.1
									Zambia	1.8		
									Bhutan	1.6		
1									Lesotho	1.6		
									Nepal	0.9		

* The entries represent the average from 1972-2000.

Sources: Government Finance Statistics CD-ROM 2000 data, kindly provided by Barak Hoffman

Appendix 1.3 Comparative Perspective: Health Spending as % of Government Spending (1972-2000)

Scale	OECD		Eastern Europe& Central Asia		Latin America & Caribbean		Middle East & North Africa		Sub-Saharan Africa & South Asia		East Asia	
20	Iceland	21.5			Costa Rica	21.0						
	Germany	18.6	Slovak Rep.	18.9								
			Czech Rep.	17.5								
	France	16.2			Panama	16.5						
			Estonia	15.4								
15			Croatia	15.3								
	Switzerland	14.8										
	Ireland	14.1	Slovenia	14.2								
	UK	13.4										
	USA	13.1										
	Austria	12.3										
	Netherlands	12.3										
	Australia	11.1			Barbados	11.7						
10	Italy	10.8			Dominican Rep.	10.1						
			Poland	9.9	Venezuela	9.6						
	Portugal	8.1	Latvia	8.8	Chile	8.5						
					Belize	8.3			Mauritius	8.2		
	Finland	7.9			Nicaragua	7.9	Bahrain	7.9	Lesotho	8.0		
	Greece	7.0			Colombia	7.3						
					Brazil	6.7	Tunisia	6.6	Zimbabwe	6.7		
									Zambia	6.4	Singapore	6.4
									Bhutan	*6.4*		
			Cyprus	6.1					Burkina Faso	6.2		
									Myanmar	*6.0*	Thailand	5.8
	Norway	5.7			Peru	5.7			Madagascar	5.7	Malaysia	5.6
	Spain	5.5					Iran	5.5				
	Canada	5.5					Kuwait	5.4				
5					Bolivia	5.2	Israel	5.4	Sri Lanka	*5.2*		
			Romania	4.7	Uruguay	4.7			Nepal	*4.6*		
			Hungary	4.0	Paraguay	4.2			Burundi	4.3		
									Cameroon	4.2		
			Belarus	3.9					Ethiopia	3.9		
			Bulgaria	3.1			Morocco	3.2	Mali	3.3		
			Turkey	3.1								
					Mexico	2.6	Egypt	2.7				
2	Luxembourg	2.3			Argentina	2.0					Indonesia	2.3
	Denmark	1.9										
	Belgium	1.8							India	*1.8*		
	Sweden	1.6					Syria	1.5				
1									Pakistan	*1.2*	Korea	1.3

* The entries represent the average from 1972-2000.

Sources: Government Finance Statistics CD-ROM 2000 data, kindly provided by Barak Hoffman

Appendix 1.4 Comparative Perspective: Education Spending as % of Government Spending (1972-2000)

Scale	OECD		Eastern Europe& Central Asia		Latin America & Caribbean		Middle East & North Africa		Sub-Saharan Africa & South Asia		East Asia	
					Colombia	22.2						
20					Costa Rica	22.0					Thailand	21.3
					Barbados	19.7					Malaysia	19.4
					Bolivia	19.1						
					Venezuela	18.8			Zimbabwe	18.7		
					Peru	18.6			Lesotho	18.4		
							Tunisia	17.9	Burkina Faso	17.3	Hong Kong	17.9
											Korea	17.9
					Panama	16.7	Morocco	16.7	Burundi	16.3		
					Mexico	16.5	Iran	15.0	Mauritius	15.1		
15					Belize	15.2					Singapore	14.8
	Belgium	14.3	Turkey	14.2	Chile	14.2			Cameroon	14.3	Philippines	14.6
									Zambia	14.1		
	Finland	13.4			Paraguay	13.5			Mali	13.1		
									Madagascar	13.0		
	Ireland	12.5			Dominican Rep.	12.2			Myanmar	12.7		
	Iceland	12.4										
	Netherlands	11.8					Bahrain	11.6	Nepal	11.7		
			Cyprus	11.1			Egypt	11.1	Ethiopia	11.5		
	Denmark	10.7	Czech Rep.	10.8								
			Slovak Rep.	10.7					Bhutan	10.8		
10			Slovenia	10.5	Nicaragua	10.0	Kuwait	10.5				
	Portugal	9.6					Israel	9.5	Sri Lanka	9.3		
	Austria	9.6										
			Estonia	9.2								
	Sweden	9.1										
	Luxembourg	9.0	Latvia	8.9			Syria	8.6				
	Italy	8.8										
					Uruguay	8.0						
	France	8.0										
	Greece	7.9										
	Australia	7.7	Belarus	7.6							Indonesia	7.7
											Taiwan	7.2
			Poland	6.9								
	Norway	6.5	Croatia	6.3	Argentina	6.5						
5	Spain	5.9	Romania	5.7								
			Hungary	4.5								
			Bulgaria	3.7	Brazil	3.9						
	Canada	3.3										
	Switzerland	3.3										
	UK	2.8										
	USA	2.2							India	2.2		
1									Pakistan	1.9		
	Germany	0.8										

* The entries represent the average from 1972-2000.

Sources: Government Finance Statistics CD-ROM 2000 data, kindly provided by Barak Hoffman
Asian Development Bank Key Indicators, Various Years

Appendix 1.5 Central Government Education Spending as % of GDP (1972-2000)

Scale	OECD		Eastern Europe& Central Asia		Latin America & Caribbean		Middle East & North Africa		Sub-Saharan Africa&South Asia		East Asia	
8									Lesotho	8.21		
	Belgium	6.93										
6	Netherlands	6.17			Barbados	6.12			Zimbabwe	6.22		
							Tunisia	5.86				
							Morocco	5.30			Malaysia	5.55
							Kuwait	5.29				
5	Ireland	5.27					Israel	5.26				
					Costa Rica	4.88						
					Panama	4.78			Zambia	4.78		
			Slovak Rep.	4.54			Egypt	4.47				
	Finland	4.26	Slovenia	4.20			Iran	4.29				
					Venezuela	4.07						
4					Belize	4.04			Burundi	4.03		
	Denmark	3.99	Czech Rep.	3.94	Chile	3.89			Mauritius	3.95		
	Italy	3.82							Bhutan	3.93		
	Portugal	3.81										
	Sweden	3.79										
	Luxembourg	3.77									Thailand	3.70
	Iceland	3.68										
	Austria	3.61			Bolivia	3.63	Bahrain	3.58			Singapore	3.63
	France	3.31	Cyprus	3.38	Nicaragua	3.33						
					Peru	3.32						
			Turkey	3.18					Mali	3.12		
3	Greece	3.01			Colombia	3.05						
			Latvia	2.89	Mexico	2.99					Korea	2.92
			Estonia	2.83							Hong Kong	2.89
			Poland	2.80			Syria	2.74	Sri Lanka	2.73		
			Belarus	2.67					Cameroon	2.65		
									Ethiopia	2.54	Philippines	2.58
	Norway	2.41							Burkina Faso	2.49		
			Hungary	2.35					Madagascar	2.31		
			Romania	2.02	Uruguay	2.07						
2												
	Australia	1.95			Dominican Rep.	1.87			Nepal	1.80		
	Spain	1.75							Myanmar	1.73		
			Bulgaria	1.59							Indonesia	1.61
					Paraguay	1.44						
1	UK	1.08			Brazil	1.05					Taiwan	1.07
					Argentina	0.95						
	Canada	0.76										
	Switzerland	0.70										
	USA	0.49							Pakistan	0.39		
									India	0.32		
	Germany	0.25										
0			Croatia	0.00								

* The entries represent the average from 1972-2000.

Sources: Government Finance Statistics CD-ROM 2000 data, kindly provided by Barak Hoffman
Asian Development Bank Key Indicators, Various Years

Appendix 1.6 Comparative Perspective: Education Spending per capita by PPP measure (1972-2000)

Scale	OECD		Eastern Europe& Central Asia		Latin America & Caribbean		Middle East & North Africa		Sub-Saharan Africa & South Asia		East Asia	
	Belgium	1091.8										
1000	Netherlands	1076.7										
	Luxembourg	822.2										
	Denmark	814.6										
	Finland	719.0										
	Ireland	706.7										
	Sweden	696.5					Israel	691.7				
	Iceland	685.0							Seychelles	650.3		
	Italy	574.8			Barbados	595.9						
500	France	568.0	Czech Rep.	511.3							Singapore	514.1
	Norway	451.7	Slovak Rep.	477.3							Hong Kong	492.4
	Greece	352.1										
	Portugal	348.4							Mauritius	344.5		
300					Venezuela	319.8					Malaysia	319.2
					Panama	246.7	Tunisia	276.9				
					Costa Rica	245.7					Korea	245.9
					Jamaica	239.2						
			Estonia	233.2	Chile	232.9						
			Poland	212.7	Mexico	217.0						
200			Hungary	208.6			Iran	201.4				
			Turkey	192.1	Belize	195.2						
	UK	184.1	Belarus	182.8								
			Latvia	181.8								
					Guyana	167.6			Zimbabwe	167.4		
					Peru	163.4	Morocco	163.8				
	Canada	153.6			Uruguay	156.3					Thailand	154.1
					Colombia	152.1			South Africa	145.7		
100	USA	113.2	Bulgaria	100.7			Egypt	127.2	Lesotho	108.9		
			Romania	95.7	Nicaragua	99.8					Taiwan	95.3
					Bolivia	92.5						
					Argentina	88.6	Syria	82.1				
									Congo, Rep.	75.6	Philippines	76.6
									Senegal	74.5		
					Honduras	68.7						
					Brazil	66.8						
									Togo	61.9		
					Paraguay	61.1			Cameroon	61.1		
50					Dominican Rep.	60.1	Yemen	51.5	Zambia	60.2		
	Japan	46.8										
	Germany	40.0									Indonesia	40.4
30	Austria	37.7							Burundi	30.4		
	Australia	25.5							Mali	27.9		
									Rwanda	21.9		
									Madagascar	21.7		
20									Burkina Faso	20.5		
									Nepal	19.9		
5					Haiti	12.9			Ethiopia	15.4		
									India	5.0		
									Pakistan	4.3		

* The entries represent the average from 1972-2000.

Sources: Government Finance Statistics CD-ROM 2000 data, kindly provided by Barak Hoffman
Asian Development Bank Key Indicators, Various Years

Appendix 1.7 Comparative Perspective: Government Spending as % of GDP (1972-2000)

Scale	OECD		Eastern Europe& Central Asia		Latin America & Caribbean		Middle East & North Africa		Sub-Saharan Africa & South Asia		East Asia	
							Israel	55.3				
50	Netherlands	52.1	Hungary	52.6			Kuwait	50.4				
	Belgium	48.5										
									Lesotho	44.6		
	Italy	43.4	Bulgaria	43.5					Maldives	44.0		
	Ireland	42.1	Slovak Rep.	42.4								
	Luxembourg	42.0										
	Sweden	41.9										
	France	41.5										
			Poland	40.7			Egypt	40.4				
40			Slovenia	40.0								
	Portugal	39.6										
	UK	38.3										
	Greece	38.1										
	Austria	37.7										
	Denmark	37.5										
	Norway	37.2	Czech Rep.	36.4					Bhutan	36.4		
			Romania	35.7								
			Belarus	35.1								
									Zambia	34.0		
					Nicaragua	33.2			Zimbabwe	33.3		
			Latvia	32.4			Tunisia	32.7				
							Syrian	32.0				
	Finland	31.8			Barbados	31.1	Morocco	31.8				
	Germany	30.1	Estonia	30.7								
30			Cyprus	30.5								
	Spain	29.9							Sri Lanka	29.4		
	Iceland	29.6										
					Panama	28.6	Iran	28.6			Malaysia	28.1
					Chile	27.3						
					Brazil	27.1						
					Belize	26.6			Mauritius	26.1		
	Australia	25.5			Uruguay	25.9						
									Burundi	24.7		
									Mali	23.9		
	Canada	23.0	Turkey	22.4	Costa Rica	22.2			Ethiopia	22.1		
	United States	21.8			Venezuela	21.7						
20	Switzerland	21.3							Pakistan	20.6	Singapore	20.3
					Bolivia	19.1						
					Mexico	18.2			Cameroon	18.6	Indonesia	18.2
					Peru	17.9			Madagascar	17.8	Thailand	17.8
											Philippines	17.9
											Korea, Rep.	16.4
											Hong Kong	16.2
					Dominican Rep.	15.3			Nepal	15.4		
					Argentina	14.7			India	14.9	Taiwan	14.6
									Burkina Faso	14.4		
					Colombia	13.7			Myanmar	13.6		
10					Paraguay	10.7						
0			Croatia	0.0								

* The entries represent the average from 1972-2000.

Sources: Government Finance Statistics CD-ROM 2000 data, kindly provided by Barak Hoffman; data on Hong Kong, Phillipines is collected from Asian Development Bank Key Indicator Series, various years; data on Taiwan is from Taiwan National Bureau of Statistics.

Appendix 1.8 List of Variables

Name	**Label**	**Source**
e_gov	education spending as % of total government spending	Spending data only include that of central government. Data for Hong Kong, Malaysia, Philippines, Singapore and Taiwan are from Asian Development Bank (ADB) *Key Indicator Series*. Korea and Indonesian data are from IMF *Government Finance Statistics* (GFS) 2004 CD-ROM. Thailand data 1971-94 are from ADB, 1995-03 are from GFS. The consistency of different data sources are checked and validated.
e_gdp	education spending as % of GDP	GDP data is from World Bank: *World Development Indicators* (WDI), 2005, online
e_pc	education spending per capita (PPP measure)	Constructed based on PPP measure from Penn table 6.1. Population data are from WDI. Formula: e_pc(ppp measure)=(education spending per capita in local price)*real gdp per capita (constant price: Laspeyres)/gdp per capita (local price)
trade	trade intensity	trade=(import+export)/GDP*100. Data is from WDI 2005 online. Taiwan data is from Penn table 6.1.
tradres	trade excluding the effect of country size	Trade residual from regressing lntrade on lngdp. (Plumper 2001)
fdi	gross foreign direct investment as % of GDP	WDI 2005 online.
pkf	gross private capital flow as % of GDP	WDI 2005 online.
opencur	current account openness coded as 0-8 (0=not free, 8=free)	Annual data. Author's coding based on Quinn's Coding Rules (1997). Source: IMF: *Annual Report on Exchange Restrictions* (1972-2003)
opencap	capital account openness coded as 0-4 (0=not free, 4=free)	same as above.
polity2	degree of openness of political institutions, Scale: -10-10 (-10=high autocracy, 10=high democracy)	Polity IV.
regime	regime type (Polity), coded as 0, 1 (0=autocracy, 1=democracy)	Author's coding based on polity2 from Polity IV. Countries scoring 6 or more points are coded as democracy.
ACLP2	regime type (ACLP), coded as 0, 1 (0=autocracy, 1=democracy)	Alvarez, Cheibub, Limongi and Przeworski's coding of regime type(1996) combined with regime type (Polity) for years after 1990.
polyarchy	polyarchy, 0-100	Vanhanen (2003).
liberty	liberty score, 1-7 (1=not free, 7=most free)	Freedom House (2005 online); Scores of HK are provided to the author by the publisher. The liberty score is an average between political rights and civil liberty scores.
select	legislative selection, coded as 0-2 (0=no legislature exists, 1=legislature not elective, 2=legislature elective).	Arthur S. Bank: Time Series Cross Sectional dataset.
election	election year, coded as 0, 1 (0=election year, 1=non-election year)	Author's coding. For Taiwan, Indonesia, Korea, Singapore, Philippines, presidential elections are coded; for Malaysia and Thailand, parliamentary elections are coded. The variable is coded 1 in the calender year if the election is held in July through December and is 1 in the year preceding the election year if the election is held in January through June.(Kraemer, 1997a) Source: Arthur S. Banks: *Political Handbook of the World*, various editions.

Name	Label	Source
rev_gdp	revenue as % of GDP	Source for revenue data is the same as that of spending data.
lngdp_pc	ln real gdp per capita (constant price, Laspeyres)	Penn table 6.1.
outputga2	Real gdp per capita (constant price, Laspeyres) output gap	outputgap = (Real GDP per capita-Hondrick Prescott Filtered Real GDP per capita)/Hondrick Prescott Filtered Real GDP per capita*100. HP filtered real gdp per capita is caculated using excel added in by Kurt Annen (downloadable at www.web-reg.de).
urban	urban population as % of total population	Penn table 6.1.
pop014	Age 0-14 as % of total population	WDI 2005 online; Taiwan data is from Taiwan National Bureau of Statisitics (TNS).
pop65	Age 65 and above as % of total population	WDI 2005 online; Taiwan data is from Taiwan National Bureau of Statisitics (TNS).
ks_gdp	capital stock as% of GDP	Brookings Institute, Barry Bosworth and Susan Collins(2003)
fkf_gdp	gross fixed capital formation as % of GDP	WDI 2005 online; Indonesia data from Brookings Institute, Barry Bosworth and Susan Collins(2003); Taiwan data is from Asian Development Bank Key Indicators, various years.
kf_gdp	gross capital formation as % of GDP	WDI 2005 online;
crisis 97	1997 Asian Financial Crisis, coded as 0, 1 (1=1997, 0=other years)	Author's coding.
after97	1997 Asian Financial Crisis, coded as 0, 1 (1=1997 and after, 0=before 1997)	Author's coding.
gini	Gini Index	Deininger and Squire, 1996.
prim_edu	primary school spending as % of total education spending	UNESCO yearbook, various years. Statistical Yearbook of the Republic of China, various years.
sec_edu	secondary school spending as % of total education spending	ibid.
ter_edu	tertiary school spending as % of total education spending	ibid.
prim_gdp	primary school spending as % of GDP	UNESCO yearbook, various years; WDI 2005 online; Statistical Yearbook of the Republic of China, various years.
sec_gdp	secondary school spending as % of GDP	ibid.
ter_gdp	tertiary school spending as % of GDP	ibid.
primps	primary school spending per student as % of GDP per capita	ibid.
secps	secondary school spending per student as % of GDP per capita	ibid.
terps	tertiary school spending per student as % of GDP per capita	ibid.
gelprim	gross primary school enrolment	UNESCO yearbook, various years; Statistical Yearbook of the Republic of China, various years.

Name	Label	Source
gelsec	gross secondary school enrolment	ibid.
gelter	gross tertiary school enrolment	ibid.
nelprim	net primary school enrolment	ibid.
nelsec	net secondary school enrolment	ibid.
nelter	net tertiary school enrolment	ibid.
school	average years of school, total	Barro and Lee, 2001
schoolm	average years of school, male	ibid.
schoolf	average years of school, female	ibid.
lp	% of population with primary education attained	ibid.
ls	% of population with secondary education attained	ibid.
lh	% of population with post-secondary education attained	ibid.
GPI	Ratio of girls to boys in primary and secondary education	WDI 2005 online
schratio	Ratio of girls' average years of school to that of boys	constructed from Barro and Lee, 2001. Schratio=schoolf/schoolm
litadult	Adult (24 and above) literacy rate	WDI 2005 online
lityouth	Youth (15-24) literacy rate	ibid.
decade	A decade dummy of 1990s. decade=1 if year>=1990	Author's Coding
d70	A decade dummy of 1970s. d70=1 if year<=1979	Author's Coding
hk	A country dummy of Hong Kong. hk=1 if country=Hong Kong	Author's Coding
ind	A country dummy of Indonesia. ind=1 if country=Indonesia	Author's Coding
mal	A country dummy of Malaysia. mal=1 if country=Malaysia	Author's Coding
kor	A country dummy of South Korea. kor=1 if country=South Korea	Author's Coding
sin	A country dummy of Singapore. sin=1 if country=Singapore	Author's Coding
phl	A country dummy of Philippines. phl=1 if country=Philippines.	Author's Coding
tha	A country dummy of Thailand. tha=1 if country=Thailand.	Author's Coding
taw	A country dummy of Taiwan. taw=1 if country=Taiwan.	Author's Coding

Appendix 2.1 Summary of Descriptive Statistics

Education Spending as % of Total Government Spending — E_GOV

country	N	Mean	Std. Deviation	Minimum	Maximum
Thailand	32	21.34	2.16	18.46	26.39
Malaysia	33	19.43	3.31	13.22	28.10
Hong Kong	33	17.92	1.87	14.17	21.29
Korea	31	17.86	1.92	13.99	21.44
Singapore	31	14.78	5.45	7.44	24.75
Philippines	32	14.56	3.42	10.99	21.80
Indonesia	28	7.67	1.75	3.74	9.97
Taiwan	31	7.20	2.40	2.85	11.50
Total	251	15.26	5.68	2.85	28.10

Education Spending as % of GDP — E_GDP

country	N	Mean	Std. Deviation	Minimum	Maximum
Malaysia	33	5.55	0.85	4.52	8.16
Thailand	32	3.70	0.53	2.88	4.81
Singapore	31	3.63	0.86	2.35	5.31
Korea	31	2.92	0.40	2.05	3.63
Hong Kong	33	2.89	0.68	2.19	4.68
Philippines	32	2.58	0.70	1.55	4.01
Indonesia	28	1.61	0.30	0.93	2.13
Taiwan	31	1.07	0.49	0.41	2.43
Total	251	3.03	1.44	0.41	8.16

Per Capita Education Spending (PPP) — E_PC

country	N	Mean	Std. Deviation	Minimum	Maximum
Singapore	26	514.07	255.80	164.00	895.41
Hong Kong	30	492.44	270.62	154.77	1065.53
Malaysia	30	319.16	105.39	135.95	580.69
Korea	30	245.88	142.99	72.88	501.58
Thailand	29	154.11	80.35	58.19	306.99
Taiwan	27	95.34	78.37	22.83	234.83
Philippines	29	76.56	25.22	46.31	131.38
Indonesia	27	40.40	11.84	13.79	57.45
Total	228	243.18	227.20	13.79	1065.53

Primary Spending as % of Total Education Spending — PRIM_EDU

country	N	Mean	Std. Deviation	Minimum	Maximum
Philippines	9	61.72	2.67	57.60	65.70
Thailand	22	56.55	6.07	33.93	62.50
Korea	20	50.95	8.91	40.90	68.30
Hong Kong	16	39.54	12.91	21.40	66.80
Malaysia	22	37.38	3.96	31.18	48.90
Singapore	22	33.24	5.48	23.38	43.00
Taiwan	33	26.82	3.99	21.98	35.10
Indonesia	0				
Total	144	41.18	13.65	21.40	68.30

Appendix 2.1 (Continued)

Secondary Spending as % of Total Education Spending SEC_EDU

country	N	Mean	Std. Deviation	Minimum	Maximum
Singapore	22	36.35	2.55	29.07	41.10
Malaysia	22	34.85	4.05	26.90	43.26
Taiwan	33	33.67	3.36	30.15	41.43
Korea	20	32.17	6.78	17.30	41.40
Hong Kong	16	31.88	6.37	21.30	40.70
Thailand	22	20.42	3.37	16.20	30.60
Philippines	9	10.76	2.91	6.70	15.70
Indonesia	0				
Total	144	30.40	8.35	6.70	43.26

Tertiary Spending as % of Total Education Spending TER_EDU

country	N	Mean	Std. Deviation	Minimum	Maximum
Singapore	22	23.97	8.60	14.70	44.08
Hong Kong	16	23.44	7.63	1.50	37.10
Taiwan	33	22.62	4.51	14.12	34.97
Philippines	12	19.65	3.91	10.84	22.70
Malaysia	23	15.58	3.57	9.40	25.24
Thailand	22	13.69	2.60	10.10	19.44
Indonesia	5	11.06	4.19	5.97	17.65
Korea	20	8.84	1.73	6.91	12.30
Total	153	18.15	7.37	1.50	44.08

Primary Spending as % of GDP PRIM_GDP

country	N	Mean	Std. Deviation	Minimum	Maximum
Malaysia	22	1.98	0.27	1.43	2.52
Thailand	21	1.98	0.30	1.30	2.51
Korea	20	1.48	0.23	1.08	1.87
Philippines	9	1.17	0.14	0.98	1.43
Singapore	22	1.13	0.21	0.78	1.60
Hong Kong	16	0.97	0.25	0.66	1.49
Taiwan	31	0.29	0.16	0.12	0.80
Indonesia	0				
Total	141	1.24	0.66	0.12	2.52

Secondary Spending as % of GDP SEC_GDP

country	N	Mean	Std. Deviation	Minimum	Maximum
Malaysia	22	1.85	0.31	1.22	2.48
Singapore	22	1.27	0.32	0.92	1.96
Korea	20	0.91	0.24	0.53	1.31
Hong Kong	16	0.81	0.23	0.47	1.13
Thailand	21	0.73	0.16	0.47	1.14
Taiwan	31	0.36	0.17	0.15	0.96
Philippines	9	0.20	0.06	0.13	0.29
Indonesia	0				
Total	141	0.91	0.56	0.13	2.48

Appendix 2.1 (Continued)

Tertiary Spending as % of GDP — TER_GDP

country	N	Mean	Std. Deviation	Minimum	Maximum
Singapore	22	0.90	0.51	0.39	2.16
Malaysia	23	0.82	0.18	0.43	1.15
Hong Kong	16	0.60	0.24	0.03	1.14
Thailand	21	0.48	0.12	0.33	0.75
Philippines	12	0.39	0.06	0.27	0.47
Korea	20	0.25	0.06	0.17	0.38
Taiwan	31	0.25	0.15	0.08	0.66
Indonesia	5	0.17	0.09	0.10	0.32
Total	150	0.51	0.35	0.03	2.16

Primary Spending per student as % of GDP per capita — PRIMPS

country	N	Mean	Std. Deviation	Minimum	Maximum
Korea	26	12.51	3.09	6.09	18.38
Malaysia	24	12.22	2.73	9.03	20.16
Taiwan	33	12.04	5.21	4.76	21.82
Thailand	25	11.88	3.02	7.14	18.30
Hong Kong	19	8.21	2.54	5.70	14.78
Philippines	15	7.91	2.70	4.58	12.51
Singapore	22	7.90	1.46	5.72	10.69
Indonesia	5	4.08	1.10	3.20	5.93
Total	169	10.54	3.95	3.20	21.82

Secondary Spending per student as % of GDP per capita — SECPS

country	N	Mean	Std. Deviation	Minimum	Maximum
Malaysia	22	20.95	3.64	13.98	28.33
Taiwan	33	18.76	4.51	9.07	26.30
Thailand	22	14.12	2.91	9.73	20.99
Singapore	19	12.95	1.67	10.20	17.02
Korea	24	11.11	4.62	3.95	23.74
Hong Kong	16	10.16	4.97	5.83	20.53
Indonesia	6	7.00	1.32	5.59	8.70
Philippines	15	4.98	3.28	1.91	10.69
Total	157	13.90	6.18	1.91	28.33

Tertiary Spending per student as % of GDP per capita — TERPS

country	N	Mean	Std. Deviation	Minimum	Maximum
Malaysia	19	124.59	48.47	58.29	246.12
Thailand	20	56.73	52.16	16.25	185.45
Hong Kong	15	49.21	15.29	3.46	69.37
Singapore	22	48.11	12.54	32.41	72.50
Taiwan	33	40.84	9.70	16.75	59.49
Indonesia	9	20.73	15.64	9.37	60.38
Philippines	14	14.33	3.31	9.24	21.15
Korea	26	12.20	8.24	4.74	33.96
Total	158	46.52	42.05	3.46	246.12

Appendix 2.1 (Continued)

Trade Intensity — TRADE

country	N	Mean	Std. Deviation	Minimum	Maximum
Singapore	30	344.10	51.11	223.69	439.03
Hong Kong	33	226.30	50.30	161.15	330.60
Malaysia	33	137.06	49.82	69.26	229.28
Taiwan	28	92.66	8.01	68.55	106.24
Thailand	33	69.59	28.35	34.81	125.40
Philippines	33	65.12	23.41	39.15	110.94
Korea	33	63.01	8.86	39.38	79.46
Indonesia	33	51.96	12.61	31.10	96.19
Total	256	129.48	101.34	31.10	439.03

Current Account Openness — OPENCUR

country	N	Mean	Std. Deviation	Minimum	Maximum
Hong Kong	32	7.95	0.27	6.50	8.00
Singapore	32	7.91	0.30	7.00	8.00
Malaysia	32	6.08	0.36	5.00	6.50
Indonesia	32	6.08	0.46	5.50	6.50
Philippines	32	3.86	1.91	2.50	6.50
Thailand	32	3.20	0.25	3.00	3.50
Korea	32	2.88	1.45	2.00	5.50
Total	224	5.42	2.19	2.00	8.00

Capital Account Openness — OPENCAP

country	N	Mean	Std. Deviation	Minimum	Maximum
Hong Kong	32	3.97	0.18	3.00	4.00
Singapore	32	3.84	0.32	3.00	4.00
Malaysia	32	2.59	0.50	2.00	3.00
Indonesia	32	2.34	0.48	2.00	3.00
Korea	32	2.25	0.44	2.00	3.00
Philippines	32	1.69	0.97	1.00	3.00
Thailand	32	1.50	0.00	1.50	1.50
Total	224	2.60	1.03	1.00	4.00

Polity Regime — REGIME

country	N	Mean	Std. Deviation	Minimum	Maximum
Philippines	32	0.50	0.51	0.00	1.00
Korea	32	0.47	0.51	0.00	1.00
Taiwan	32	0.34	0.48	0.00	1.00
Thailand	32	0.34	0.48	0.00	1.00
Indonesia	32	0.13	0.34	0.00	1.00
Malaysia	32	0.00	0.00	0.00	0.00
Singapore	32	0.00	0.00	0.00	0.00
Total	224	0.25	0.44	0.00	1.00

Appendix 2.1 (Continued)

Freedom House Liberty Score — LIBERTY

country	N	Mean	Std. Deviation	Minimum	Maximum
Hong Kong	32	4.77	0.57	3.50	5.50
Thailand	32	4.47	1.02	2.00	5.50
Korea	32	4.41	1.51	2.50	6.00
Philippines	32	4.36	1.14	3.00	6.00
Taiwan	32	4.11	1.41	2.50	6.50
Malaysia	32	3.94	0.70	3.00	5.50
Singapore	32	3.28	0.33	3.00	4.00
Indonesia	32	2.91	0.81	1.50	4.50
Total	256	4.03	1.16	1.50	6.50

Polity Democracy Index — POLITY2

country	N	Mean	Std. Deviation	Minimum	Maximum
Malaysia	32	3.75	0.44	3.00	4.00
Thailand	32	3.38	4.98	-7.00	9.00
Philippines	32	0.53	7.97	-9.00	8.00
Korea	32	0.03	6.80	-9.00	8.00
Taiwan	32	-0.97	7.11	-8.00	9.00
Singapore	32	-2.00	0.00	-2.00	-2.00
Indonesia	32	-5.19	4.69	-7.00	7.00
Total	224	-0.07	6.09	-9.00	9.00

GDP per capita (PPP) — GDP_PC

country	N	Mean	Std. Deviation	Minimum	Maximum
Hong Kong	30	17014	6739	6995	26703
Singapore	26	13659	5333	5870	24939
Taiwan	28	8640	4348	3112	17056
Korea	30	8172	4177	2957	15881
Malaysia	30	6032	2111	3007	9937
Thailand	30	4052	1812	1863	7094
Philippines	30	2999	246	2467	3424
Indonesia	30	2454	892	1143	3990
Total	234	7772	6153	1143	26703

Revenue as % of GDP — REV_GDP

country	N	Mean	Std. Deviation	Minimum	Maximum
Singapore	31	31.31	4.45	23.76	39.00
Malaysia	33	23.05	2.79	17.07	26.94
Indonesia	29	22.00	3.21	15.44	30.48
Korea	31	17.26	2.32	12.54	23.27
Thailand	31	15.97	2.09	12.57	19.79
Hong Kong	33	15.95	2.23	11.94	21.30
Philippines	32	15.10	2.35	10.84	19.81
Taiwan	32	14.29	2.96	11.32	20.04
Total	252	19.31	6.11	10.84	39.00

Appendix 2.1 (Continued)

Capital Stock as % of GDP — KS_GDP

country	N	Mean	Std. Deviation	Minimum	Maximum
Singapore	30	258.95	49.97	146.19	332.72
Thailand	30	244.95	44.34	181.10	359.29
Philippines	30	226.67	46.10	158.22	280.45
Malaysia	30	224.36	57.90	142.61	342.66
Korea	30	182.38	61.02	89.53	300.57
Indonesia	30	162.88	52.70	93.32	274.91
Taiwan	30	148.87	29.43	90.55	202.09
Total	210	207.01	62.82	89.53	359.29

Output Gap — OUPUTGA

country	N	Mean	Std. Deviation	Minimum	Maximum
Philippines	30	0.08	3.80	-7.46	8.11
Thailand	30	0.04	4.66	-9.96	8.36
Malaysia	30	0.03	3.48	-5.45	7.55
Indonesia	30	0.02	3.67	-9.19	6.41
Hong Kong	30	-0.01	3.84	-6.43	9.20
Singapore	26	-0.04	3.02	-5.15	5.99
Korea	30	-0.06	3.82	-6.62	8.39
Taiwan	28	-0.12	2.83	-6.78	5.17
Total	234	-0.01	3.64	-9.96	9.20

Urbanization — URBAN

country	N	Mean	Std. Deviation	Minimum	Maximum
Singapore	33	100.00	0.00	100.00	100.00
Hong Kong	33	95.26	4.55	88.12	100.00
Taiwan	27	67.95	3.70	62.48	77.00
Korea	33	65.75	12.85	42.17	80.31
Malaysia	33	48.39	9.02	34.29	63.76
Philippines	33	45.95	9.06	33.50	60.97
Indonesia	33	29.13	8.63	17.52	45.53
Thailand	33	27.94	2.99	21.46	31.95
Total	258	59.86	26.99	17.52	100.00

Age 0-14 as % of total population — POP014

country	N	Mean	Std. Deviation	Minimum	Maximum
Philippines	33	40.51	2.55	36.00	45.08
Malaysia	33	38.00	3.11	33.02	44.10
Indonesia	33	36.97	4.32	29.73	42.22
Thailand	33	34.49	7.53	22.86	45.95
Korea	33	29.27	6.53	20.71	41.21
Taiwan	33	28.54	5.58	19.83	38.71
Singapore	33	25.69	4.96	20.72	37.56
Hong Kong	33	23.56	5.36	15.78	35.68
Total	264	32.13	7.77	15.78	45.95

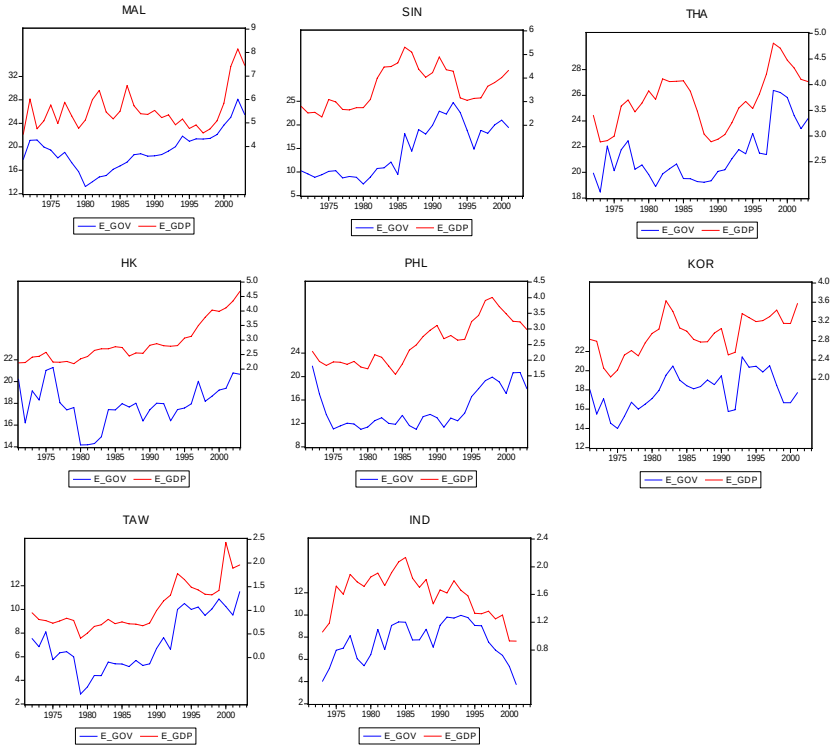
Appendix 2.1 (Continued)

Government Spending as % of GDP GOV_GDP

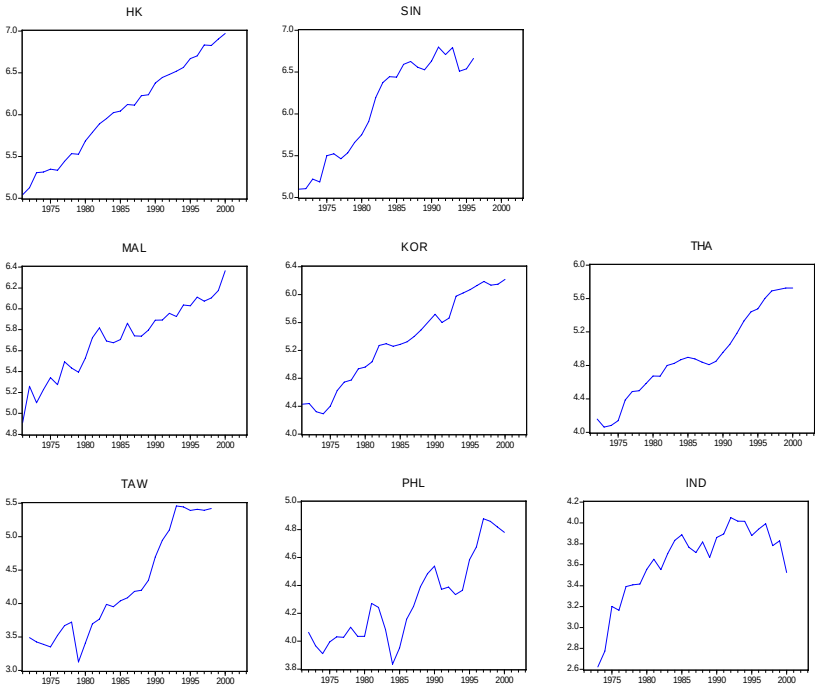
country	N	Mean	Std. Deviation	Minimum	Maximum
Malaysia	33	0.29	0.06	0.21	0.43
Singapore	31	0.27	0.08	0.14	0.49
Indonesia	29	0.22	0.04	0.15	0.32
Philippines	32	0.18	0.03	0.10	0.24
Thailand	32	0.17	0.02	0.13	0.21
Korea	31	0.16	0.01	0.13	0.20
Hong Kong	33	0.16	0.03	0.11	0.23
Taiwan	31	0.15	0.03	0.10	0.24
Total	252	0.20	0.07	0.10	0.49

Appendix 2.2 Time Trends of the Variables

Education Spending as % of Government Spending and Education Spending as % of GDP

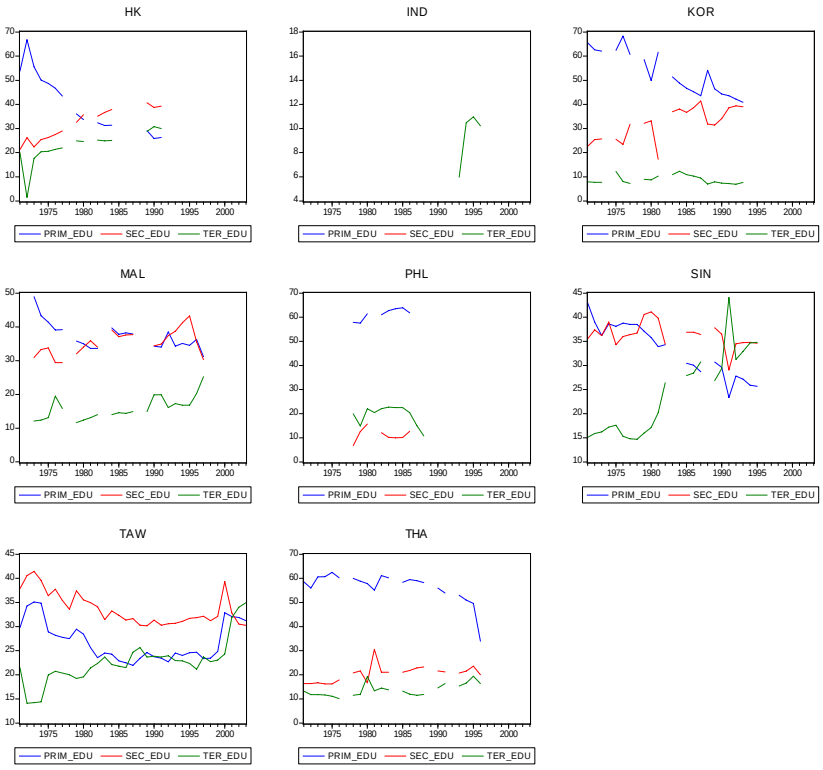


Education Spending per capita (log)

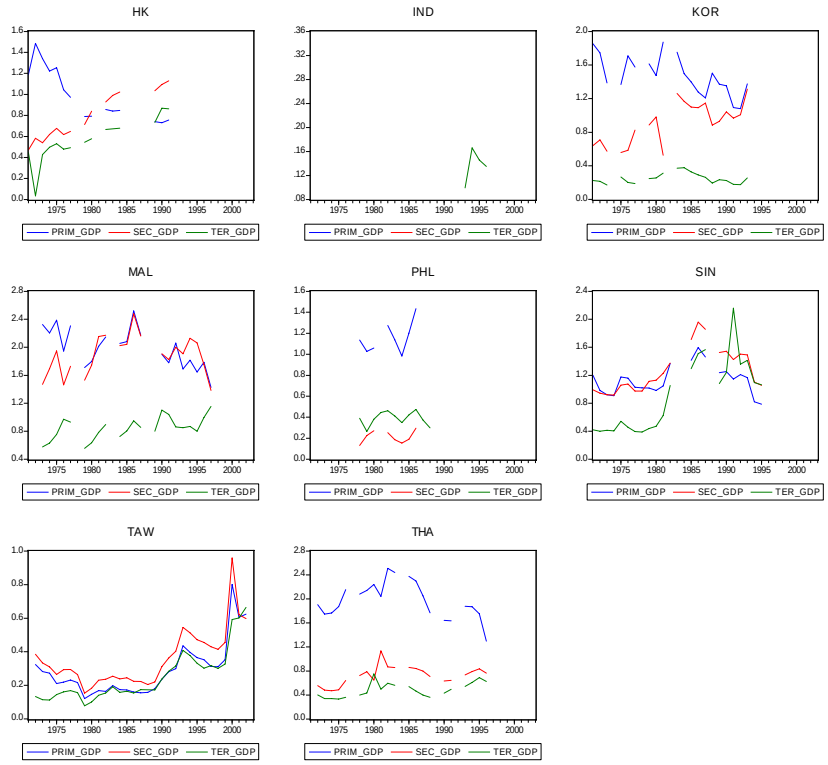


Appendix 2.2 (Continued)

Primary, Secondary and Tertiary Spending as % of Total Education Spending

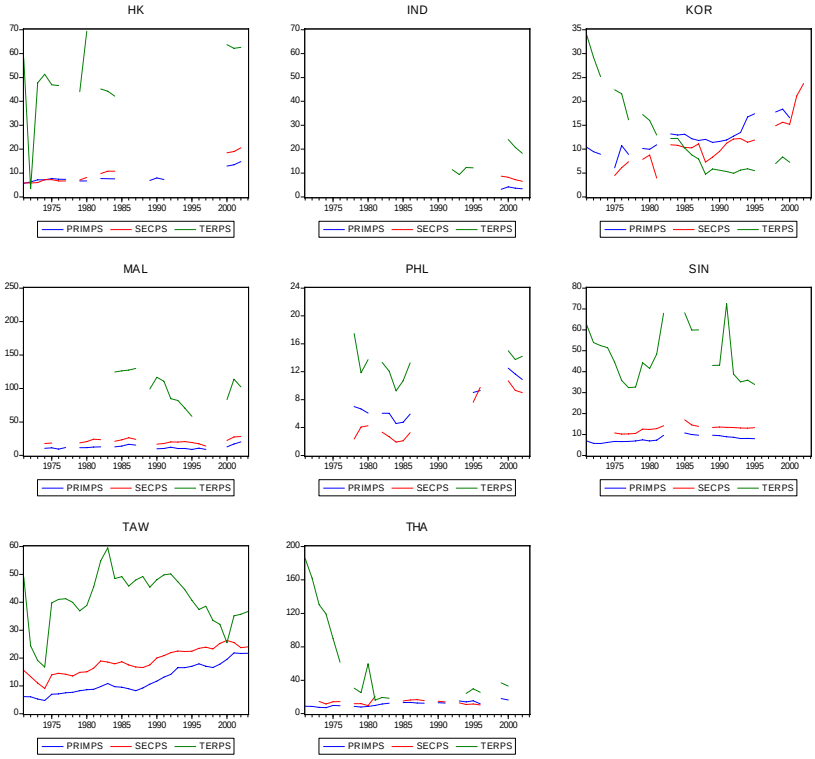


Primary, Secondary and Tertiary Spending as % of GDP



Appendix 2.2 (Continued)

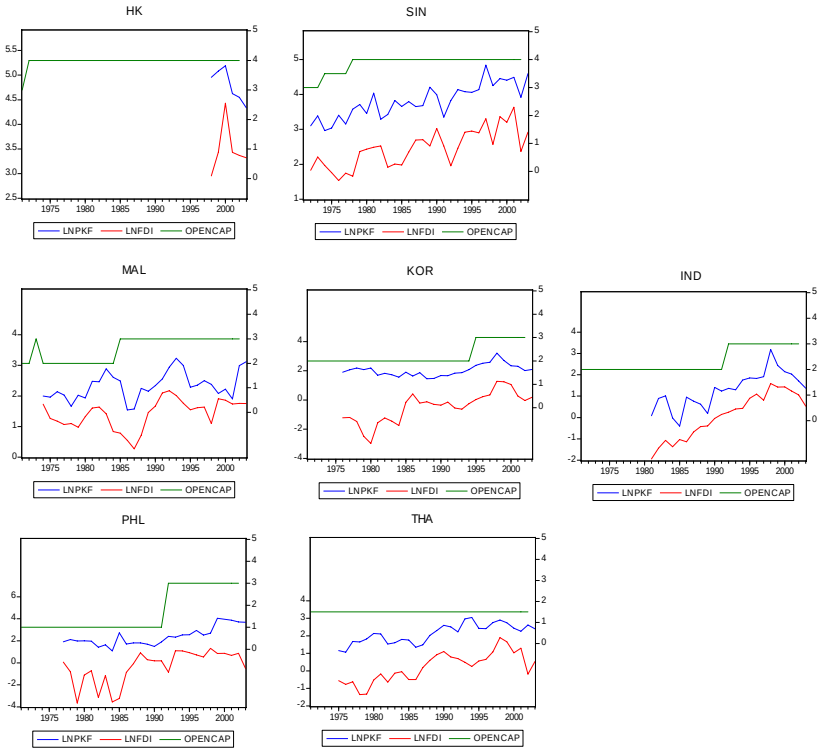
Primary, Secondary, Tertiary per student spending as % of GDP per capita



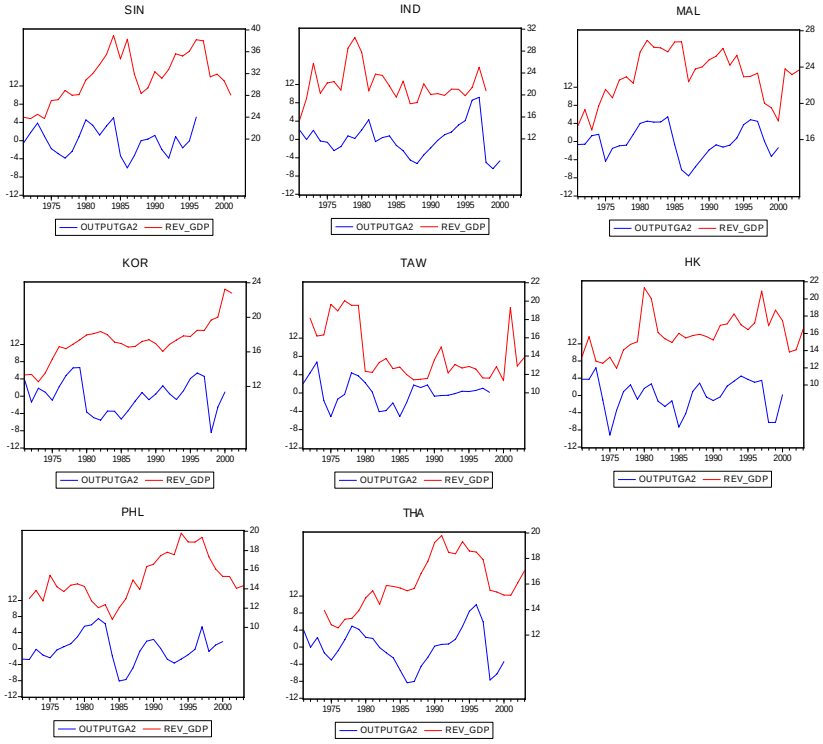
Trade (log) and Current Account Openness

Appendix 2.2 (Continued)

Foreign Direct Investment (as % of GDP), Gross Private Capital Flow (as % of GDP) and Capital Account Openness

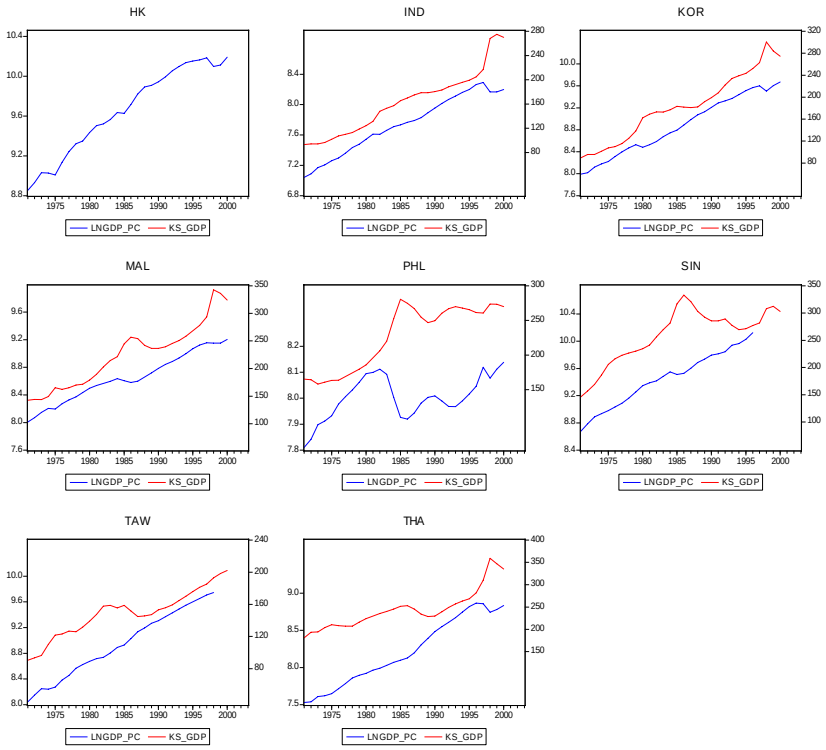


Output Gap and Government Revenue as % of GDP

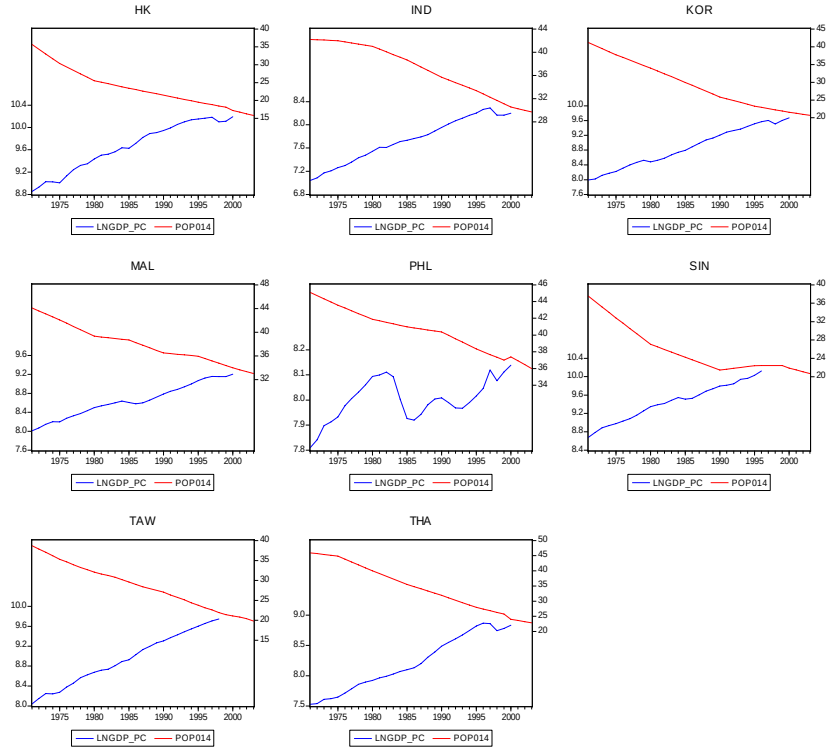


Appendix 2.2 (Continued)

GDP per capita (log) and Capital Stock as % of GDP



GDP per capita (log) and Youth Population (0-14) as % of Total Population



Appendix 2.3 The Author's Coding of Current and Capital Account Openness

Country	Year	Current Account Openness	Capital Account Openness	Country	Year	Current Account Openness	Capital Account Openness
Hong Kong	1971	6.5	3	Philippines	1971	2.5	1
Hong Kong	1972	8	4	Philippines	1972	2.5	1
Hong Kong	1973	8	4	Philippines	1973	2.5	1
Hong Kong	1974	8	4	Philippines	1974	2.5	1
Hong Kong	1975	8	4	Philippines	1975	2.5	1
Hong Kong	1976	8	4	Philippines	1976	2.5	1
Hong Kong	1977	8	4	Philippines	1977	2.5	1
Hong Kong	1978	8	4	Philippines	1978	2.5	1
Hong Kong	1979	8	4	Philippines	1979	2.5	1
Hong Kong	1980	8	4	Philippines	1980	2.5	1
Hong Kong	1981	8	4	Philippines	1981	2.5	1
Hong Kong	1982	8	4	Philippines	1982	2.5	1
Hong Kong	1983	8	4	Philippines	1983	2.5	1
Hong Kong	1984	8	4	Philippines	1984	2.5	1
Hong Kong	1985	8	4	Philippines	1985	2.5	1
Hong Kong	1986	8	4	Philippines	1986	2.5	1
Hong Kong	1987	8	4	Philippines	1987	2.5	1
Hong Kong	1988	8	4	Philippines	1988	2.5	1
Hong Kong	1989	8	4	Philippines	1989	2.5	1
Hong Kong	1990	8	4	Philippines	1990	2.5	1
Hong Kong	1991	8	4	Philippines	1991	2.5	1
Hong Kong	1992	8	4	Philippines	1992	6	3
Hong Kong	1993	8	4	Philippines	1993	6.5	3
Hong Kong	1994	8	4	Philippines	1994	6.5	3
Hong Kong	1995	8	4	Philippines	1995	6.5	3
Hong Kong	1996	8	4	Philippines	1996	6.5	3
Hong Kong	1997	8	4	Philippines	1997	6.5	3
Hong Kong	1998	8	4	Philippines	1998	6.5	3
Hong Kong	1999	8	4	Philippines	1999	6.5	3
Hong Kong	2000	8	4	Philippines	2000	6.5	3
Hong Kong	2001	8	4	Philippines	2001	6.5	3
Hong Kong	2002	8	4	Philippines	2002	6.5	3
Hong Kong	2003	NA	NA	Philippines	2003	NA	NA
Indonesia	1971	5.5	2	Singapore	1971	7	3
Indonesia	1972	5.5	2	Singapore	1972	7	3
Indonesia	1973	5.5	2	Singapore	1973	7	3
Indonesia	1974	5.5	2	Singapore	1974	8	3.5
Indonesia	1975	5.5	2	Singapore	1975	8	3.5
Indonesia	1976	5.5	2	Singapore	1976	8	3.5
Indonesia	1977	5.5	2	Singapore	1977	8	3.5
Indonesia	1978	5.5	2	Singapore	1978	8	4
Indonesia	1979	5.5	2	Singapore	1979	8	4
Indonesia	1980	5.5	2	Singapore	1980	8	4
Indonesia	1981	5.5	2	Singapore	1981	8	4
Indonesia	1982	6	2	Singapore	1982	8	4
Indonesia	1983	6	2	Singapore	1983	8	4
Indonesia	1984	6	2	Singapore	1984	8	4
Indonesia	1985	6	2	Singapore	1985	8	4
Indonesia	1986	6	2	Singapore	1986	8	4
Indonesia	1987	6.5	2	Singapore	1987	8	4
Indonesia	1988	6.5	2	Singapore	1988	8	4

Appendix 2.3 (continued)

Country	Year	Current Account Openness	Capital Account Openness	Country	Year	Current Account Openness	Capital Account Openness
Indonesia	1989	6.5	2	Singapore	1989	8	4
Indonesia	1990	6.5	2	Singapore	1990	8	4
Indonesia	1991	6.5	2	Singapore	1991	8	4
Indonesia	1992	6.5	3	Singapore	1992	8	4
Indonesia	1993	6.5	3	Singapore	1993	8	4
Indonesia	1994	6.5	3	Singapore	1994	8	4
Indonesia	1995	6.5	3	Singapore	1995	8	4
Indonesia	1996	6.5	3	Singapore	1996	8	4
Indonesia	1997	6.5	3	Singapore	1997	8	4
Indonesia	1998	6.5	3	Singapore	1998	8	4
Indonesia	1999	6.5	3	Singapore	1999	8	4
Indonesia	2000	6.5	3	Singapore	2000	8	4
Indonesia	2001	6.5	3	Singapore	2001	8	4
Indonesia	2002	6.5	3	Singapore	2002	8	4
Indonesia	2003	NA	NA	Singapore	2003	NA	NA
Korea	1971	2	2	Thailand	1971	3	1.5
Korea	1972	2	2	Thailand	1972	3	1.5
Korea	1973	2.5	2	Thailand	1973	3	1.5
Korea	1974	2	2	Thailand	1974	3	1.5
Korea	1975	2	2	Thailand	1975	3	1.5
Korea	1976	2	2	Thailand	1976	3	1.5
Korea	1977	2	2	Thailand	1977	3	1.5
Korea	1978	2	2	Thailand	1978	3	1.5
Korea	1979	2	2	Thailand	1979	3	1.5
Korea	1980	2	2	Thailand	1980	3	1.5
Korea	1981	2	2	Thailand	1981	3	1.5
Korea	1982	2	2	Thailand	1982	3	1.5
Korea	1983	2	2	Thailand	1983	3	1.5
Korea	1984	2	2	Thailand	1984	3	1.5
Korea	1985	2	2	Thailand	1985	3	1.5
Korea	1986	2	2	Thailand	1986	3	1.5
Korea	1987	2	2	Thailand	1987	3	1.5
Korea	1988	2	2	Thailand	1988	3	1.5
Korea	1989	2	2	Thailand	1989	3	1.5
Korea	1990	2	2	Thailand	1990	3.5	1.5
Korea	1991	2	2	Thailand	1991	3.5	1.5
Korea	1992	2	2	Thailand	1992	3.5	1.5
Korea	1993	2	2	Thailand	1993	3.5	1.5
Korea	1994	3	2	Thailand	1994	3.5	1.5
Korea	1995	5.5	3	Thailand	1995	3.5	1.5
Korea	1996	5.5	3	Thailand	1996	3.5	1.5
Korea	1997	5.5	3	Thailand	1997	3.5	1.5
Korea	1998	5	3	Thailand	1998	3.5	1.5
Korea	1999	5	3	Thailand	1999	3.5	1.5
Korea	2000	5	3	Thailand	2000	3.5	1.5
Korea	2001	5.5	3	Thailand	2001	3.5	1.5
Korea	2002	5.5	3	Thailand	2002	3.5	1.5
Korea	2003	NA	NA	Thailand	2003	NA	NA

Appendix 2.3 (continued)

Country	Year	Current Account Openness	Capital Account Openness
Malaysia	1971	5	2
Malaysia	1972	5	2
Malaysia	1973	6	3
Malaysia	1974	6	2
Malaysia	1975	6	2
Malaysia	1976	6	2
Malaysia	1977	6	2
Malaysia	1978	6	2
Malaysia	1979	6	2
Malaysia	1980	6	2
Malaysia	1981	6	2
Malaysia	1982	6	2
Malaysia	1983	6	2
Malaysia	1984	6	2
Malaysia	1985	6	3
Malaysia	1986	6	3
Malaysia	1987	6	3
Malaysia	1988	6	3
Malaysia	1989	6	3
Malaysia	1990	6	3
Malaysia	1991	6	3
Malaysia	1992	6	3
Malaysia	1993	6	3
Malaysia	1994	6.5	3
Malaysia	1995	6.5	3
Malaysia	1996	6.5	3
Malaysia	1997	6.5	3
Malaysia	1998	6.5	3
Malaysia	1999	6.5	3
Malaysia	2000	6.5	3
Malaysia	2001	6.5	3
Malaysia	2002	6.5	3
Malaysia	2003	NA	NA

Appendix 2.4 Comparison of Quinn's Coding of Capital Account Openness and the Author's

Country	**Year**	Current Account Openness		Capital Account Openness	
		Quinn[1]	*Jing Chen*[2]	Quinn	*Jing Chen*
Hong Kong	1959	5		3	
Hong Kong	1973	8	*8*	4	*4*
Hong Kong	1982	8	*8*	4	*4*
Hong Kong	1988	8	*8*	4	*4*
Hong Kong	1997	8	*8*	4	*4*
Indonesia	1959	1		1.5	
Indonesia	1973	6	*5.5*	2.5	*2*
Indonesia	1982	6	*6*	2.5	*2*
Indonesia	1988	6	*6.5*	2.5	*2*
Indonesia	1997	6	*6.5*	3	*3*
Korea	1959	2		1	
Korea	1973	3.5	*2.5*	1	*2*
Korea	1982	5	*2*	2	*2*
Korea	1988	5	*2*	2	*2*
Korea	1997	5	*5.5*	2.5	*3*
Malaysia	1959	6.5		3	
Malaysia	1973	6.5	*6*	3	*3*
Malaysia	1982	7	*6*	2	*2*
Malaysia	1988	7	*6*	2.5	*3*
Malaysia	1997	6.5	*6.5*	2.5	*3*
Philippines	1959	1		0	
Philippines	1973	2.5	*2.5*	1	*1*
Philippines	1982	2.5	*2.5*	1	*1*
Philippines	1988	3	*2.5*	1	*1*
Philippines	1997	7	*6.5*	3	*3*
Singapore	1959	6.5		3	
Singapore	1973	7	*7*	3	*3*
Singapore	1982	8	*8*	4	*4*
Singapore	1988	8	*8*	4	*4*
Singapore	1997	8	*8*	4	*4*
Thailand	1959	4		2	
Thailand	1973	3.5	*3*	1.5	*1.5*
Thailand	1982	3.5	*3*	1.5	*1.5*
Thailand	1988	3.5	*3*	1.5	*1.5*
Thailand	1997	4	*3.5*	1.5	*1.5*

[1.] Sources: Quinn, Dennis, "The Correlates of Change in International Financial Regulation", *American Political Science Review*, Vol. 91, Issue 3, p. 531, September 1997

[2.] My codings are based on IMF's *Annual Report on Exchange Restrictions*. The coding rule is from Quinn.

Appendix 2.5 Democratization in East Asia

Country	Year of Democratization*
South Korea	1987
Philippines	1986
Thailand	1991
Taiwan	1991
Indonesia	1998

* The coding is based on Polity IV data.

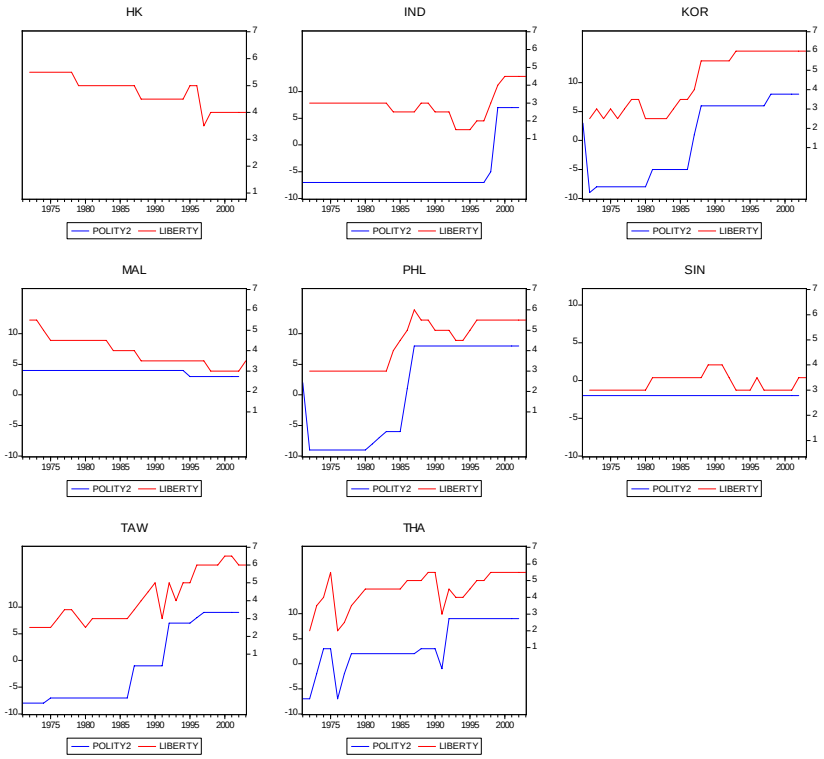
Appendix 2.6 Pearson Correlations Among Alternative Measures of Democracy

	Polity Score	Polyarchy Score	Liberty Score	Democracy Residual	Size of Winset	Regime	ACLP Regime
Polity Score	1						
Polyarchy Score	.72**	1					
Liberty Score	.84**	.7**	1				
Democracy Residual	.64**	.46**	.53**	1			
Size of Winset	.77**	.53**	.66**	0	1		
Regime	.76**	.69**	.75**	.60**	.49**	1	
ACLP Regime	.76**	.61**	.81**	.59**	.50**	.89**	1

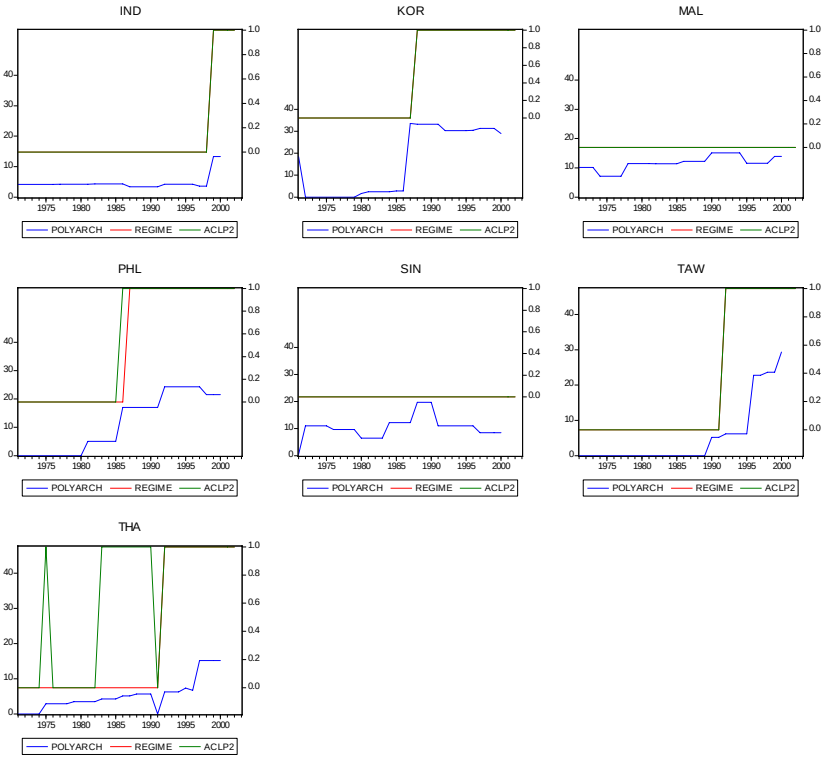
**Significant at .01 level.

Appendix 2.7 Time Trends of Democracy Indicators

Polity II and Freedom House Liberty Scores



Polyarchy Scores and Two Dichotomous Measures of Democracy (Regime and ACLP2)



Appendix 2.8 Data on Ethnic Fraction in East Asia

Country	YEAR	Ethnic Fraction Index*
Phillipines	1948	84
Phillipines	1958	84
Phillipines	1968	84
Phillipines	1978	84
Indonesia	1958	75
Indonesia	1968	75
Indonesia	1978	75
Malaya+/Malaysia	1968	65
Malaya+/Malaysia	1978	65
Thailand	1948	57
Thailand	1958	57
Thailand	1968	57
Thailand	1978	57
Singapore	1968	41
Singapore	1978	41
Taiwan	1958	4
Taiwan	1968	4
Taiwan	1978	2
South Korea (ROK)	1958	1
South Korea (ROK)	1968	1
South Korea (ROK)	1978	1

* A higher number indicates a deeper ethnic fraction in the country.

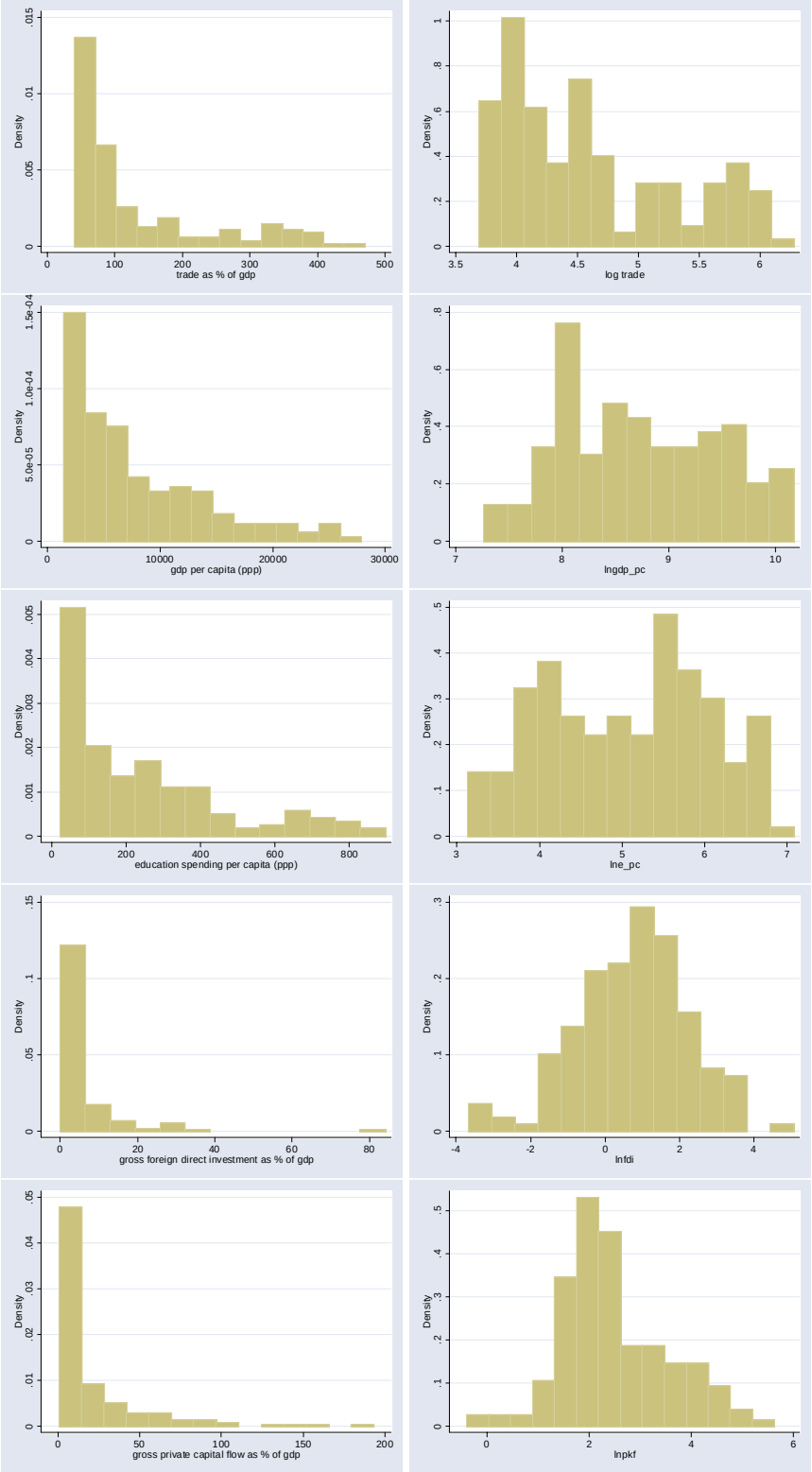
Source: World Bank, kindly provided by Barak Hoffman.

Appendix 2.9 East Asia in Comparative Perspective: Foreign Aid, External Debt, and Inflation (1971-2003)

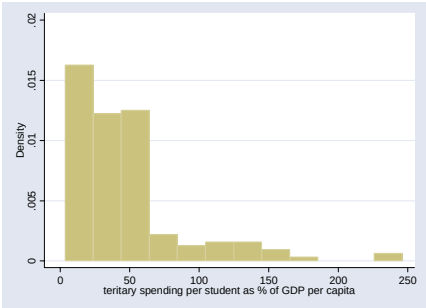
	1970s	1980s	1990s	2000-04
Aid (% of GNI)				
Middle East & North Africa	NA	NA	1.53	1.27
Europe & Central Asia	NA	NA	0.88	0.92
East Asia & Pacific	**1.00**	**0.98**	**0.84**	**0.37**
Latin America & Caribbean	0.37	0.45	0.39	0.32
Aid per capita (current US$)				
Middle East & North Africa	24.19	26.74	27.51	23.14
Latin America & Caribbean	3.94	8.34	12.29	11.00
East Asia & Pacific	**1.74**	**3.14**	**5.11**	**4.07**
Europe & Central Asia	0.51	1.02	18.70	23.02
External debt, total (DOD, current US$)				
Latin America & Caribbean	9.7E+10	3.7E+11	5.9E+11	7.7E+11
Europe & Central Asia	2.0E+10	1.3E+11	3.4E+11	6.1E+11
East Asia & Pacific	**2.4E+10**	**1.2E+11**	**4.1E+11**	**5.3E+11**
Middle East & North Africa	2.1E+10	1.0E+11	1.5E+11	1.5E+11
Inflation, GDP deflator (annual %)				
Europe & Central Asia	NA	3.06	195.03	6.13
Middle East & North Africa	10.75	9.27	7.58	5.79
Latin America & Caribbean	13.12	11.10	10.78	5.72
East Asia & Pacific	**NA**	**6.16**	**6.24**	**3.90**

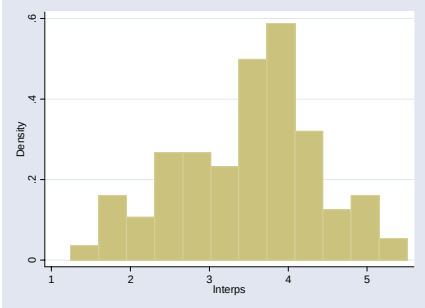
Sources: World Development Indicators (2005 online). *NA indicates the data is not available.

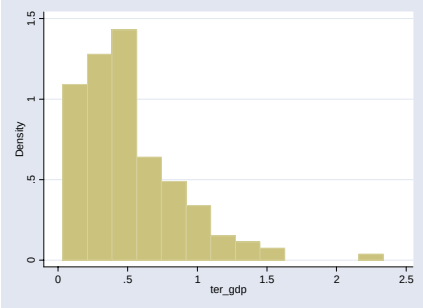
Appendix 2.10 Effects of Log Transformation

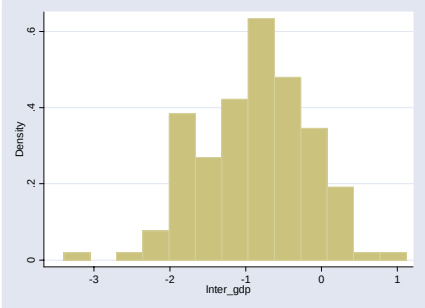


Appendix 2.10 (Continued)









Appendix 2.11 Total Government Education Spending Models - Residual Analysis

Model (1): Education Spending as % of Government Spending

Summary of Residuals

	Mean	Std. Dev.	Freq
Indonesia	0	0.99	25
South Korea	0	1.51	28
Malaysia	0	0.91	28
Philippines	0	1.23	28
Singapore	0	2.55	24
Thailand	0	1.14	26
Total	0	1.44	159

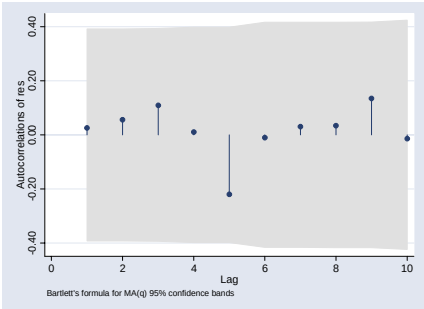
Analysis of Variance

Source	SS	df	MS	F	Prob>F
Between Groups	0	5	0	0	1
Within Groups	329.88	153	2.16		

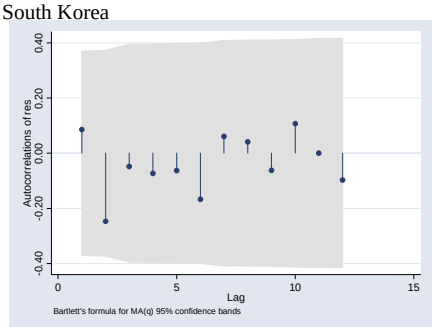
Bartlett's Test for Equal Variances: chi2(5)=39.64 Prob>chi2=0

Autocorrelation of Residuals:

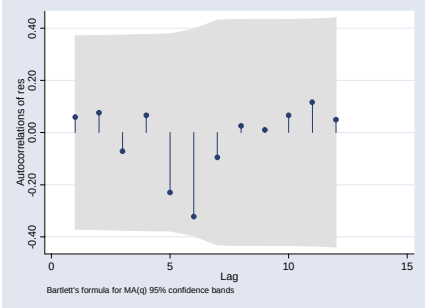
Indonesia



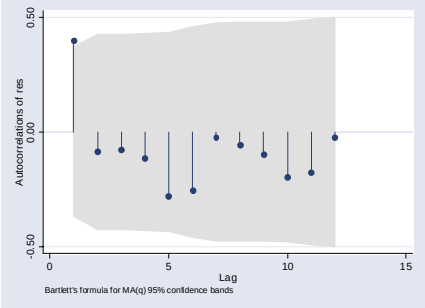
South Korea



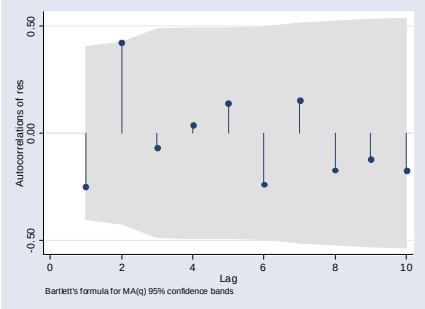
Malaysia



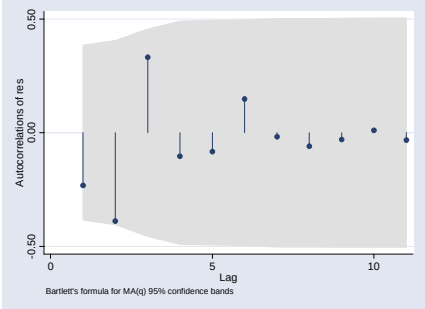
Philippines



Singapore



Thailand



Appendix 2.11 (Continued)

Model (2): Education Spending as % of GDP

Summary of Residuals

	Mean	Std. Dev.	Freq
Indonesia	0	0.24	25
South Korea	0	0.24	28
Malaysia	0	0.44	28
Philippines	0	0.25	28
Singapore	0	0.36	24
Thailand	0	0.21	26
Total	0	0.3	159

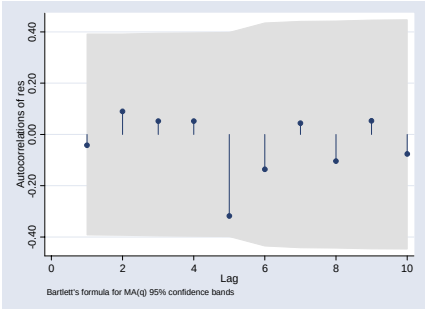
Analysis of Variance

Source	SS	df	MS	F	Prob>F
Between Groups	0	5	0	0	1
Within Groups	13.92	153	0.09		

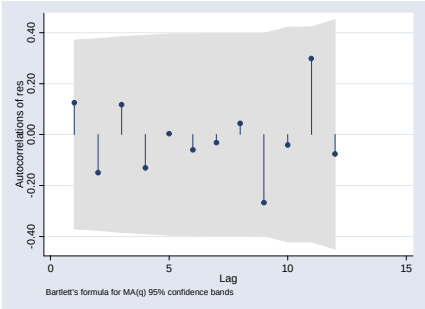
Bartlett's Test for Equal Variances: chi2(5)=24 Prob>chi2=0

Autocorrelation of Residuals:

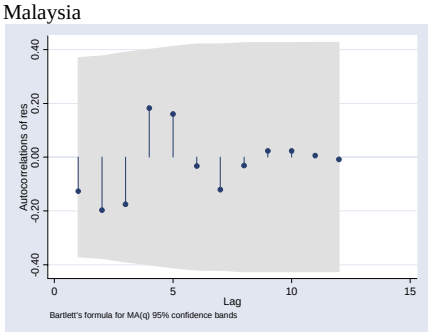
Indonesia



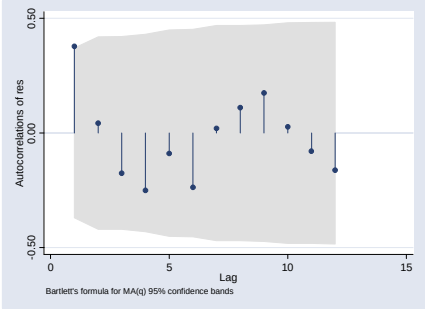
South Korea



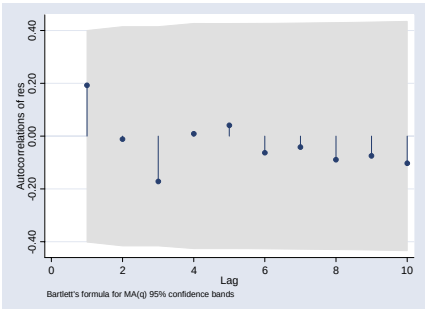
Malaysia



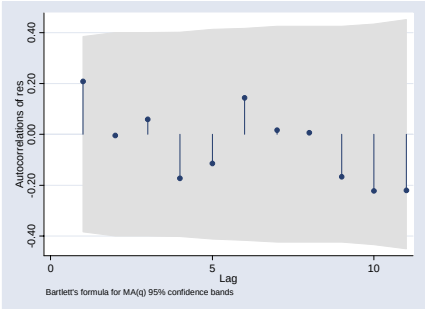
Philippines



Singapore



Thailand



Appendix 2.11 (Continued)

Model (3): Education Spending per capita (Log)

Summary of Residuals

	Mean	Std. Dev.	Freq	
Indonesia	0	0.11	25	
South Korea	0	0.09	28	
Malaysia	0	0.08	28	
Philippines	0	0.09	28	
Singapore	0	0.1	24	
Thailand	0	0.06		26
Total	0	0.09	159	

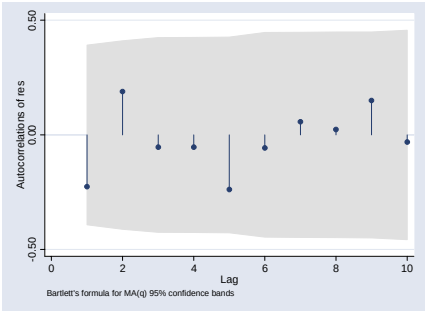
Analysis of Variance

Source	SS	df	MS	F	Prob>F
Between Groups	0	5	0	0	1
Within Groups	1.21	153	0.01		

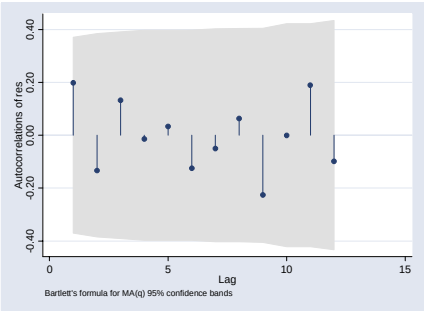
Bartlett's Test for Equal Variances: chi2(5)=7.9 Prob>chi2=.16

Autocorrelation of Residuals:

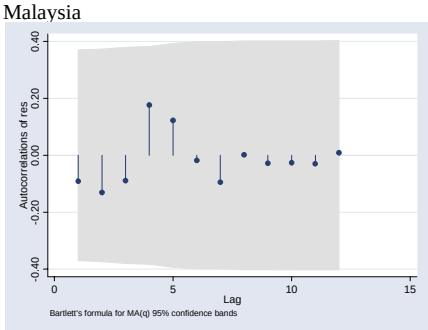
Indonesia



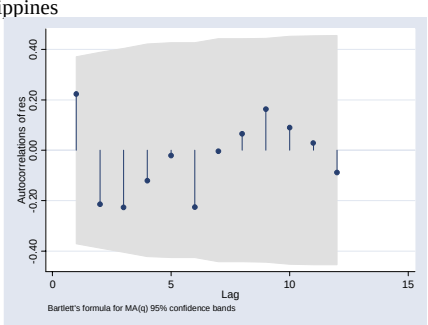
South Korea



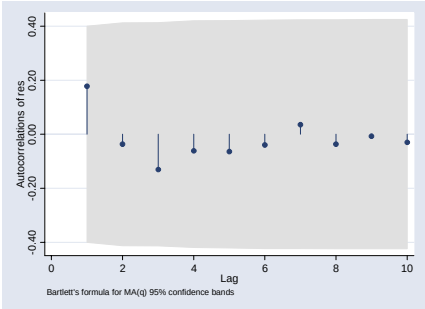
Malaysia



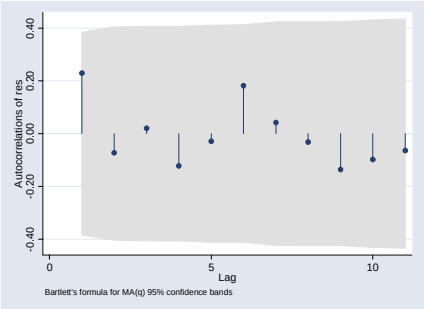
Philippines



Singapore



Thailand



Appendix 2.12 Total Government Education Spending: Two Specifications of Business Cycle

		Education Spending as % of Government Spending		Education Spending as % of GDP		Education Spending per capita (log)	
Model		(1)	(2)	(3)	(4)	(5)	(6)
Trade (log) $_{t-1}$	D.	-.4	.12	.37	.54*	.14	.17*
		(1.4)	(1.4)	(.29)	(.3)	(.09)	(.1)
	L.	1.4*	1.5**	.27*	.33**	.11***	.12***
		(.74)	(.74)	(.15)	(.16)	(.04)	(.04)
Capital Account Openness $_{t-1}$	D.	-.4	-.39	-.03	-.01	-.02	-.02
		(.42)	(.41)	(.11)	(.11)	(.03)	(.03)
	L.	-.04	-.08	-.03	-.02	-.01	-.02
		(.29)	(.29)	(.06)	(.06)	(.02)	(.02)
Regime $_{t-1}$	D.	.54	.52	.27*	.27*	.1**	.1**
		(.74)	(.74)	(.15)	(.14)	(.05)	(.05)
	L.	-.25	-.25	.21**	.23**	.08**	.09***
		(.47)	(.45)	(.11)	(.1)	(.03)	(.03)
Election$_t$	D.	-.14	-.14	.04	.04	.01	.01
		(.18)	(.18)	(.04)	(.04)	(.01)	(.01)
GDP per capita (log) $_{t-1}$	D.	-11	125	-2.3	51**	-.08	16**
		(7.2)	(112)	(1.5)	(21)	(.39)	(6.1)
	L.	-1.1*	-1.1*	-.47***	-.39**	.19***	.22***
		(.67)	(.68)	(.17)	(.16)	(.07)	(.07)
Revenue as % of GDP $_t$	D.	-.09	-.09	.05***	.05***	.01**	.01**
		(.07)	(.07)	(.01)	(.01)	(.004)	(.004)
	L.	-.001	-.003	.04***	.04***	.01***	.01***
		(.06)	(.06)	(.01)	(.01)	(.003)	(.003)
Output Gap $_t$	D.	-.02		-.02**		.01**	
		(.04)		(.01)		(.003)	
	L.	.01		.02*		.001	
		(.04)		(.01)		(.003)	
Growth$_t$	D.		-.01		-.02***		.01***
			(.04)		(.01)		(.002)
	L.		-1.3		-.52***		-.05**
			(1.1)		(.02)		(.06)
Capital Stock as % of GDP $_{t-1}$	D.	-.02	-.01	.0002	.004	.0003	.001
		(.03)	(.03)	(.005)	(.006)	(.001)	(.001)
	L.	.01	.01	.004***	.003**	.001**	.001**
		(.01)	(.01)	(.001)	(.001)	(.0005)	(.0004)
Lagged Dependent Variable		-.3***	-.3***	-.4***	-.4***	-.36***	-.39***
		(.06)	(.06)	(.07)	(.07)	(.06)	(.06)
Decade		.92**	.88**	-.14	-.14	-.03	-.03
		(.45)	(.45)	(.1)	(.1)	(.03)	(.03)
Constant		8.1	7.7	2*	1.3	-.89**	-1.1***
		(5.3)	(5.3)	(1.2)	(1.1)	(.42)	(.41)
R^2		.27	.28	.36	.38	.36	.38
N		159	159	159	159	159	159

Note: All Models are estimated through OLS with panel corrected standard errors. D. refers to a differenced term of the explanatory variable and L. refers to a lagged term. In brackets are panel corrected standard errors. Country Dummies are not shown for clarity of presentation.

*significant at .1 level; ** significant at .05 level; ***significant at .01 level.

Appendix 2.13 The Effect of Inequality on Education Spending

	Education Spending as % of Government Spending	Education Spending as % of GDP	Education Spending per capita (log)
Model	(1)	(2)	(3)
Gini Index$_{t-1}$	.15	-.02	-.004
	(.21)	(.04)	(.01)
Trade (log) $_{t-1}$	-7.5*	.05	.11
	(4)	(.69)	(.21)
Capital Account Openness $_{t-1}$	1.2	.13	.08
	(1.8)	(.32)	(.1)
Regime $_{t-1}$	-1.4	.22	.08
	(1.9)	(.34)	(.1)
GDP per capita (log) $_{t-1}$	5.5*	.25	1
	(2.8)	(.49)	(.15)
Decade	1.2	-.16	-.08
	(1.6)	(.27)	(.08)
Constant	-6.6	1.4	-4.3***
	(19)	(3.2)	(.96)
R^2	.24	.07	.88
N	37	37	37

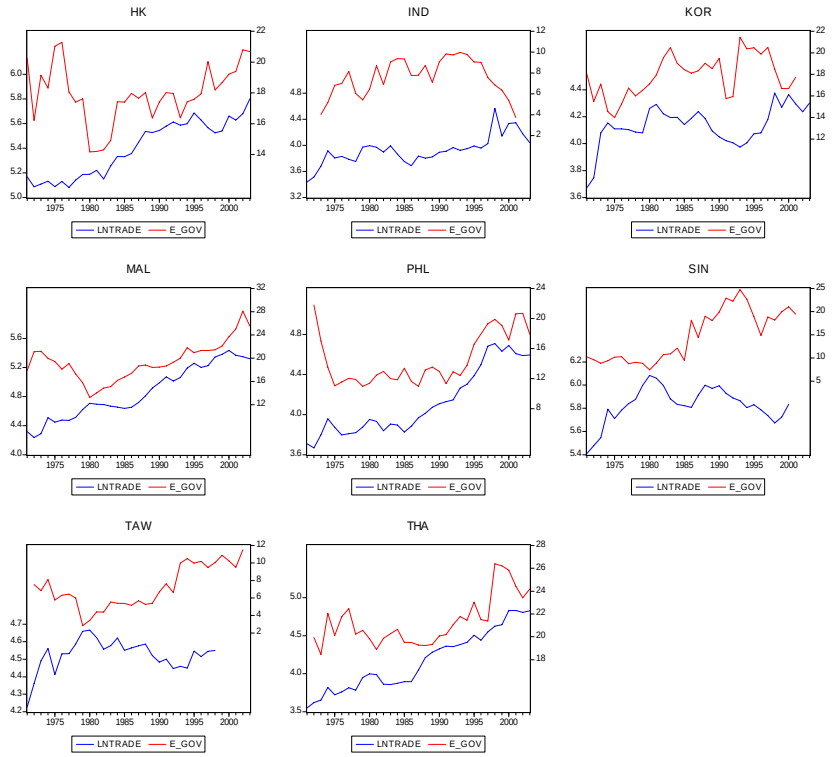
Note: All models are estimated through OLS with fixed effects.

All models have 6 to 8 observations from each panel, except Philippines which has only 3-4 observations.

*significant at .1 level; ** significant at .05 level; ***significant at .01 level.

Appendix 2.14 Bilateral Relationship Between Trade Integration and Total Government Education Spending

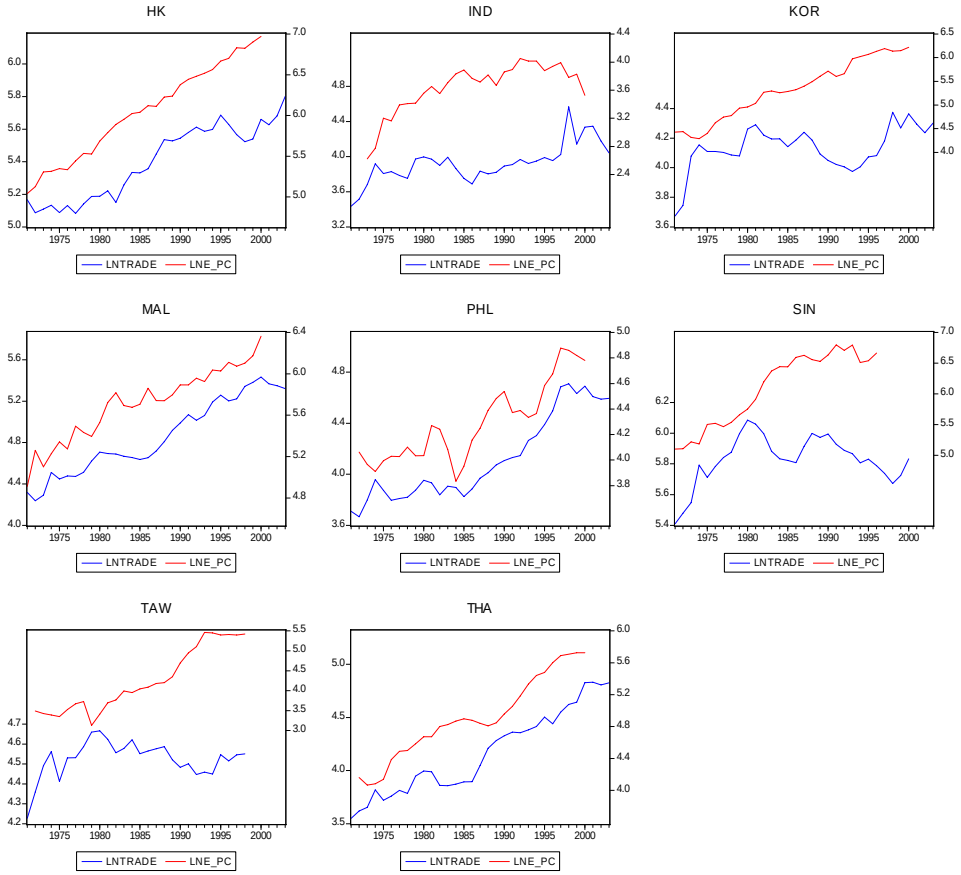
Trade (log) and Education Spending as % of Total Government Spending



Trade (log) and Education Spending as % of GDP

Appendix 2.14 (Continued)

Trade (log) and Education Spending per capita (PPP measure)



Appendix 2.15 Total Government Education Spending Models - 1970s Dummy

		Education Spending as % of Government Spending		Education Spending as % of GDP		Education Spending per capita(log)	
Model		(1)	(2)	(3)	(4)	(5)	(6)
Trade (log) $_{t-1}$	D.	-.4	.21	.37	.41	.14	.14
		(1.4)	(1.4)	(.29)	(.29)	(.09)	(.09)
	L.	1.4*	1.5**	.27*	.29*	.11***	.12***
		(.74)	(.73)	(.15)	(.15)	(.04)	(.04)
Capital Account Openness $_{t-1}$	D.	-.4	-.28	-.03	-.01	-.02	-.01
		(.42)	(.42)	(.11)	(.11)	(.03)	(.03)
	L.	-.04	.04	-.03	-.02	-.01	-.01
		(.29)	(.29)	(.06)	(.07)	(.02)	(.02)
Regime $_{t-1}$	D.	.54	.78	.27*	.32**	.1**	.12**
		(.74)	(.75)	(.15)	(.15)	(.05)	(.05)
	L.	-.25	.32	.21**	.33***	.08**	.12***
		(.47)	(.52)	(.11)	(.11)	(.03)	(.04)
Election$_t$	D.	-.14	-.14	.04	.04	.01	.01
		(.18)	(.17)	(.04)	(.04)	(.01)	(.01)
GDP per capita (log) $_{t-1}$	D.	-11	-8	-2.3	-1.9	-.08	.1
		(7.2)	(7.2)	(1.5)	(1.5)	(.39)	(.39)
	L.	-1.1*	-1.1*	-.47***	-.51***	.19***	.21***
		(.67)	(.65)	(.17)	(.17)	(.07)	(.07)
Revenue as % of GDP $_t$	D.	-.09	-.13*	.05***	.04***	.01**	.01**
		(.07)	(.07)	(.01)	(.01)	(.004)	(.004)
	L.	-.001	-.09	.04***	.03**	.01***	.01***
		(.06)	(.07)	(.01)	(.01)	(.003)	(.004)
Output Gap $_t$	D.	-.02	-.03	-.02**	-.02**	.01**	.01**
		(.04)	(.04)	(.01)	(.01)	(.003)	(.003)
	L.	.01	-.03	.02*	.01	.001	-.0002
		(.04)	(.04)	(.01)	(.01)	(.003)	(.003)
Capital Stock as % of GDP $_{t-1}$	D.	-.02	-.01	.0002	.002	.0003	.001
		(.03)	(.02)	(.005)	(.005)	(.001)	(.001)
	L.	.01	.001	.004***	.003*	.001**	.001
		(.01)	(.01)	(.001)	(.002)	(.0005)	(.0005)
Lagged Dependent Variable		-.3***	-.34***	-.4***	-.44***	-.36***	-.4***
		(.06)	(.07)	(.07)	(.07)	(.06)	(.06)
Decade'90s		.92**	.99**	-.14	-.15	-.03	-.03
		(.45)	(.41)	(.1)	(.09)	(.03)	(.03)
Decade'70s			4.7		.72		.18
			(3.1)		(.43)		(.12)
1970s*trade$_{t-1}$	D.		-1		-.17		-.05
			(.77)		(.11)		(.03)
	L.		-1.3*		-.2*		-.06*
			(.76)		(.11)		(.03)
Constant		8.1	11**	2*	2.6**	-.89**	-.81**
		(5.3)	(5.4)	(1.2)	(1.2)	(.42)	(.43)
R^2		.27	.32	.36	.38	.36	.38
N		159	159	159	159	159	159

Note: Panel corrected standard errors are used with OLS estimation for all models.

* significant at .1 level **significant at .05 level ***significant at .01 level.

Appendix 2.16 Current Education Expenditure at Different Levels - Residual analysis

Model (1): Primary Spending as % of Total Government Education Spending

Summary of Residuals

	Mean	Std. Dev.	Freq
South Korea	0	4.31	15
Malaysia	0	1.73	17
Philippines	0	2.14	6
Singapore	0	1.78	18
Thailand	0	3.75	16
Total	0	2.89	72

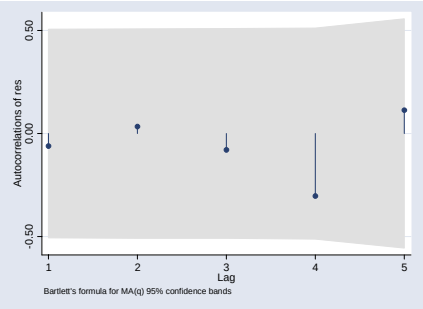
Analysis of Variance

Source	SS	df	MS	F	Prob>F
Between Groups	0	4	0	0	1
Within Groups	595	67	8.88		
Total	595	71	8.38		

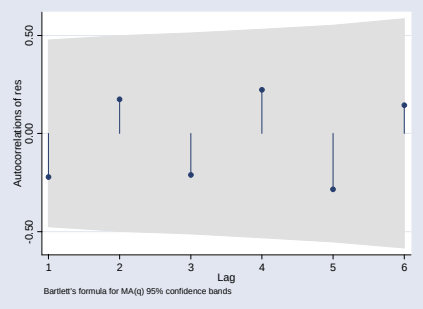
Bartlett's Test for Equal Variances: chi2(5)=20 Prob>chi2=0

Autocorrelation of Residuals:

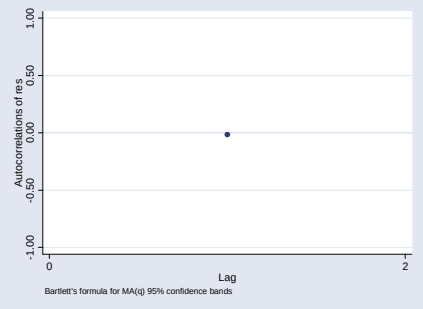
South Korea



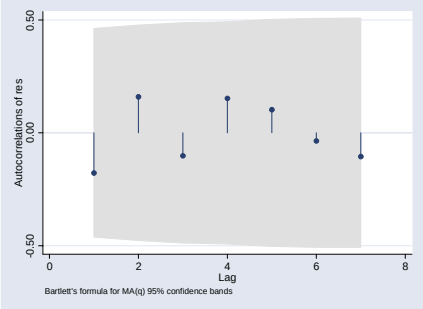
Malaysia



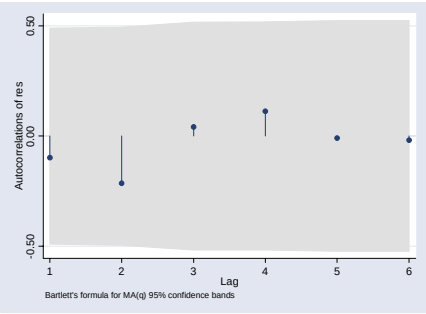
Philippines



Singapore



Thailand



Appendix 2.16 (Continued)

Model (2): Primary Spending as % of GDP

Summary of Residuals

	Mean	Std. Dev.	Freq
South Korea	0	0.15	15
Malaysia	0	0.18	17
Philippines	0	0.06	6
Singapore	0	0.12	18
Thailand	0	0.2	14
Total	0	0.15	70

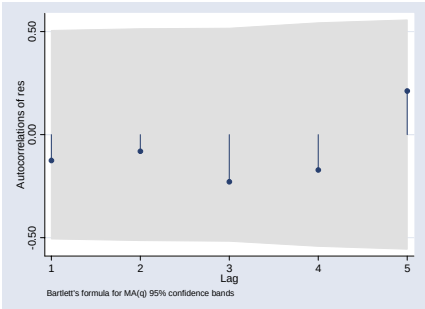
Analysis of Variance

Source	SS	df	MS	F	Prob>F
Between Groups	0	4	0	0	1
Within Groups	1.63	65	0.03		
Total	1.63	69	0.02		

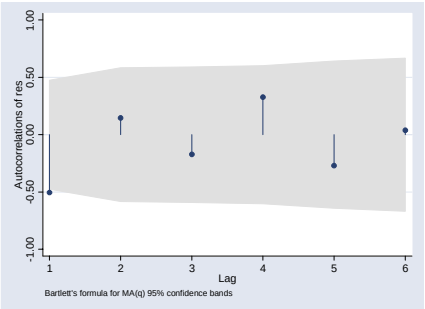
Bartlett's Test for Equal Variances: chi2(5)=9.6 Prob>chi2=.05

Autocorrelation of Residuals:

South Korea

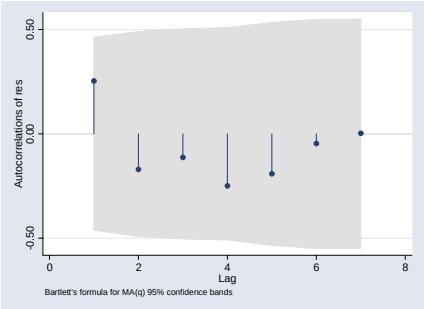


Malaysia

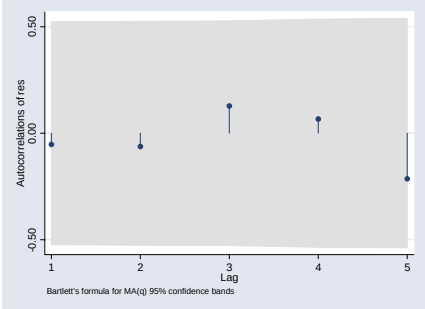


Philippines

Singapore



Thailand



Appendix 2.16 (Continued)

Model (3): Primary Spending per student as % of GDP per capita

Summary of Residuals

	Mean	Std. Dev.	Freq
South Korea	0	1.15	19
Malaysia	0	1.27	17
Philippines	0	0.76	8
Singapore	0	0.75	18
Thailand	0	1.24	15
Total	0	1.05	77

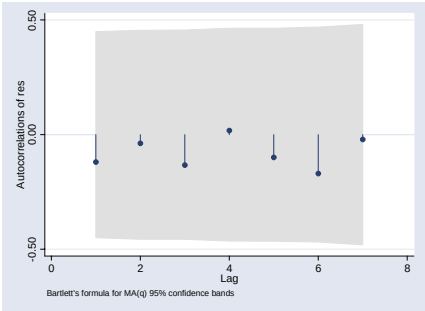
Analysis of Variance

Source	SS	df	MS	F	Prob>F
Between Groups	0	4	0	0	1
Within Groups	84.58	72	1.17		
Total	84.58	76	1.11		

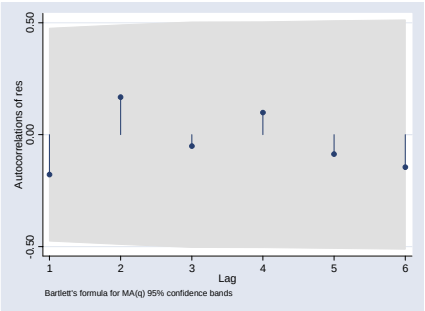
Bartlett's Test for Equal Variances: chi2(5)=6.4 Prob>chi2=.17

Autocorrelation of Residuals:

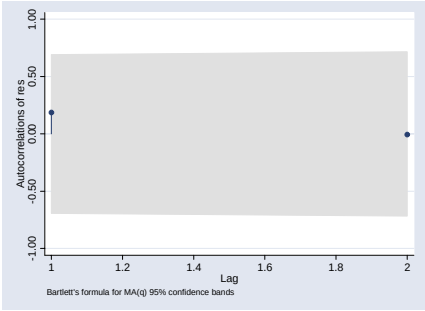
South Korea



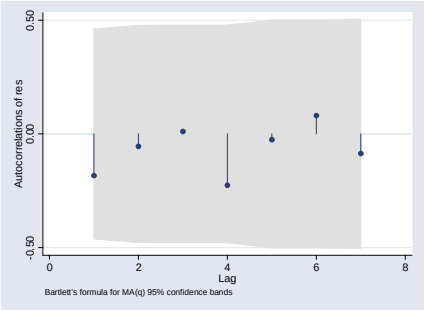
Malaysia



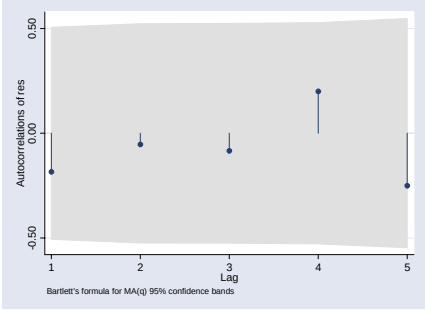
Philippines



Singapore



Thailand



Appendix 2.16 (Continued)

Model (4): Secondary Spending as % of Total Education Spending

Summary of Residuals

	Mean	Std. Dev.	Freq
South Korea	0	3.31	15
Malaysia	0	3.20	17
Philippines	0	1.56	6
Singapore	0	2.34	18
Thailand	0	3.75	16
Total	0	2.99	72

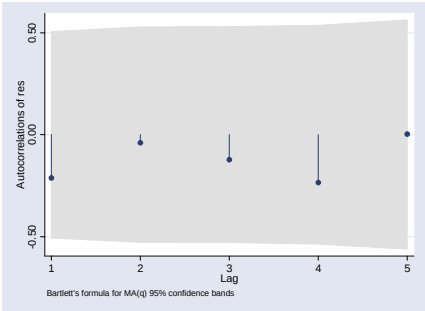
Analysis of Variance

Source	SS	df	MS	F	Prob>F
Between Groups	0	4	0	0	1
Within Groups	633.22	67	9.45		
Total	633.22	71	8.92		

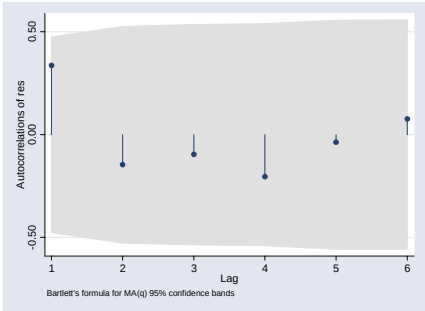
Bartlett's Test for Equal Variances: chi2(5)=6.5 Prob>chi2=.17

Autocorrelation of Residuals:

South Korea

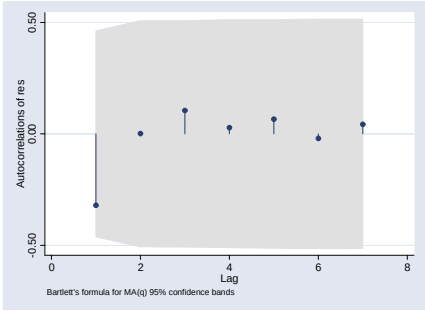


Malaysia

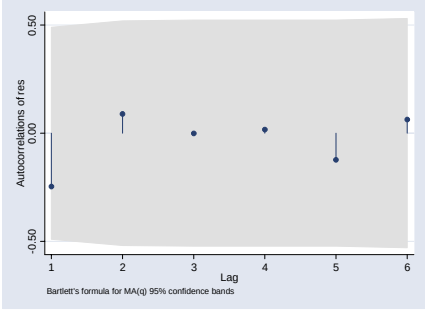


Phillippines

Singapore



Thailand



Appendix 2.16 (Continued)

Model (5): Secondary Spending as % of GDP

Summary of Residuals

	Mean	Std. Dev.	Freq
South Korea	0	0.13	15
Malaysia	0	0.17	17
Philippines	0	0.06	6
Singapore	0	0.14	18
Thailand	0	0.14	14
Total	0	0.14	70

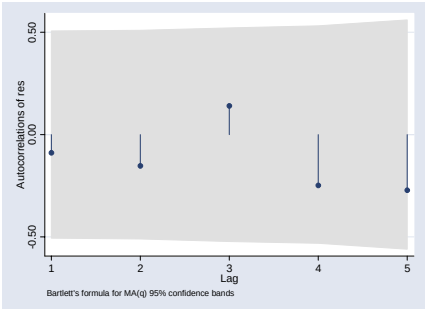
Analysis of Variance

Source	SS	df	MS	F	Prob>F
Between Groups	0	4	0	0	1
Within Groups	1.34	65	0.02		
Total	1.34	69	0.02		

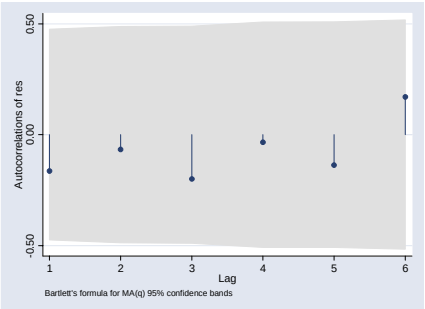
Bartlett's Test for Equal Variances: chi2(5)=5.23 Prob>chi2=.26

Autocorrelation of Residuals:

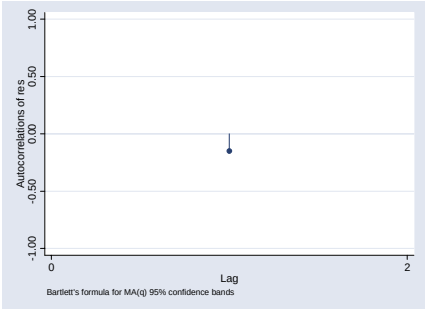
South Korea



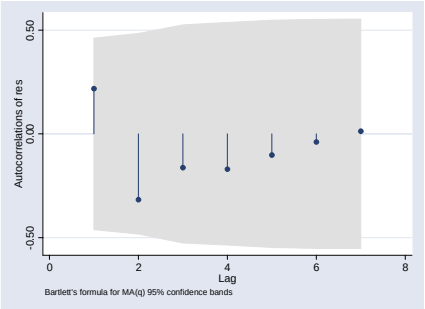
Malaysia



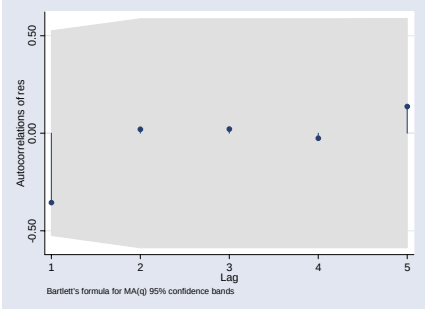
Philippines



Singapore



Thailand



Appendix 2.16 (Continued)

Model (6): Secondary Spending per student as % of GDP per capita

Summary of Residuals

	Mean	Std. Dev.	Freq
South Korea	0	2.01	19
Malaysia	0	1.57	15
Philippines	0	0.65	8
Singapore	0	0.92	15
Thailand	0	3.10	12
Total	0	1.83	69

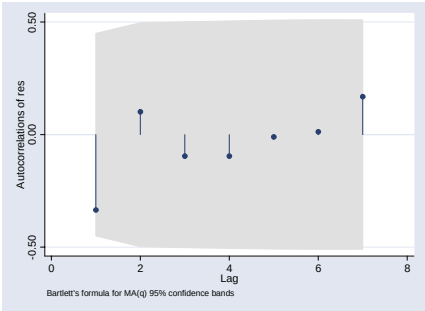
Analysis of Variance

Source	SS	df	MS	F	Prob>F
Between Groups	0	4	0	0	1
Within Groups	228.24	64	3.57		
Total	228.24	68	3.56		

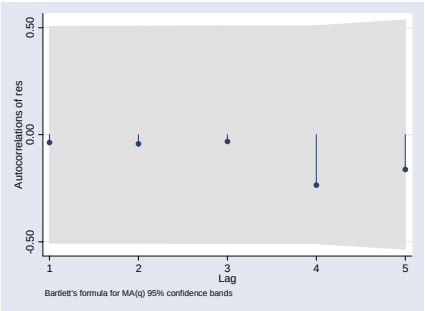
Bartlett's Test for Equal Variances: chi2(5)=25.92 Prob>chi2=0

Autocorrelation of Residuals:

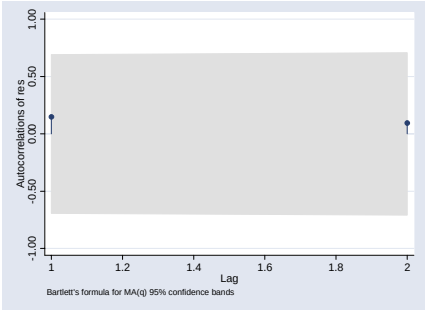
South Korea



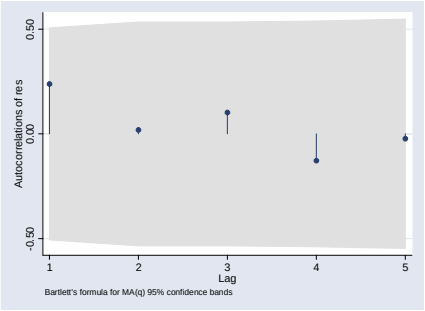
Malaysia



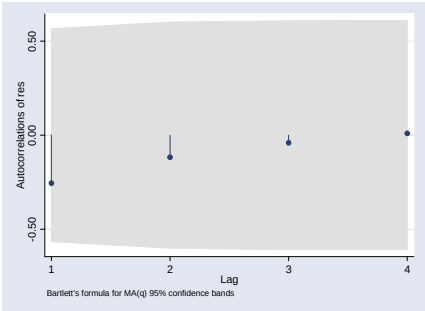
Philipines



Singapore



Thailand



Appendix 2.16 (Continued)

Model (7): Tertiary Spending as % of Total Government Education Spending

Summary of Residuals

	Mean	Std. Dev.	Freq
Indonesia	0	2.25	3
South Korea	0	1.77	15
Malaysia	0	2.59	18
Philippines	0	2.27	10
Singapore	0	4.04	18
Thailand	0	2.24	16
Total	0	2.68	80

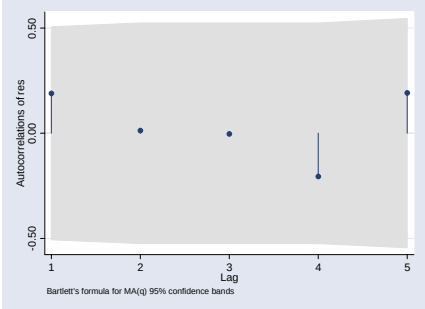
Analysis of Variance

Source	SS	df	MS	F	Prob>F
Between Groups	0	5	0	0	1
Within Groups	566.75	74	7.66		
Total	566.75	79	7.17		

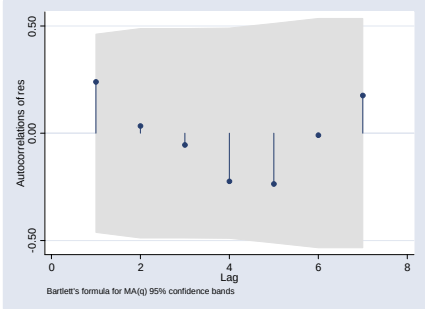
Bartlett's Test for Equal Variances: chi2(5)=12.02 Prob>chi2=.04

Autocorrelation of Residuals:

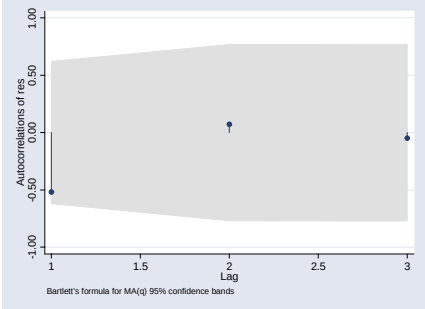
South Korea



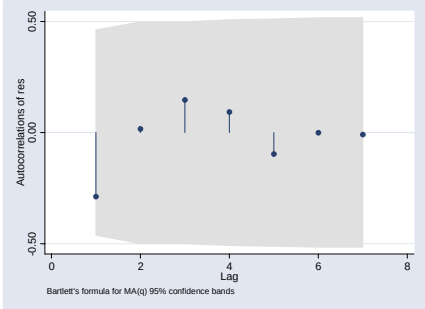
Malaysia



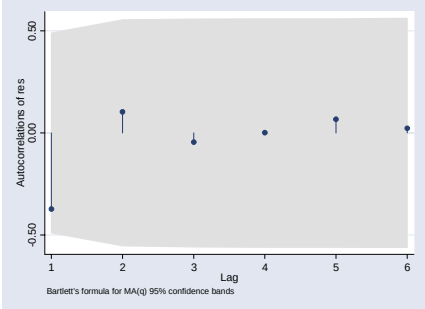
Philippines



Singapore



Thailand



Appendix 2.16 (Continued)

Model (8): Tertiary Spending as % of GDP(log)

Summary of Residuals

	Mean	Std. Dev.	Freq
Indonesia	0	0.29	3
South Korea	0	0.14	15
Malaysia	0	0.15	18
Philippines	0	0.19	10
Singapore	0	0.22	18
Thailand	0	0.17	16
Total	0	0.17	80

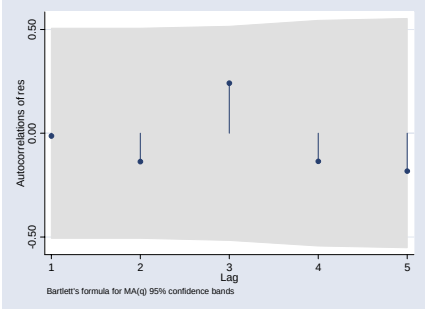
Analysis of Variance

Source	SS	df	MS	F	Prob>F
Between Groups	0	5	0	0	1
Within Groups	2.36	74	0.03		
Total	2.36	79	0.03		

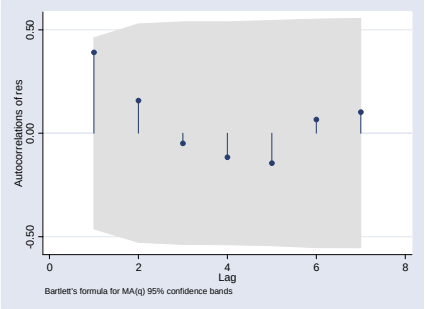
Bartlett's Test for Equal Variances: chi2(5)=5 Prob>chi2=.41

Autocorrelation of Residuals:

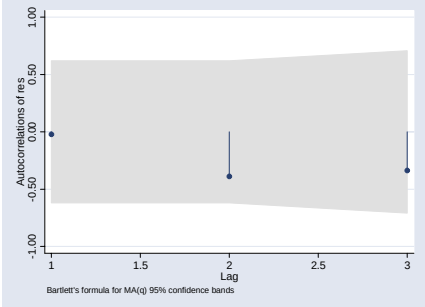
South Korea



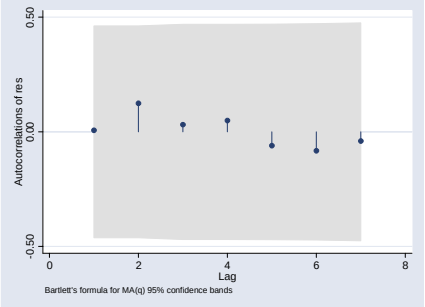
Malaysia



Philippines



Singapore



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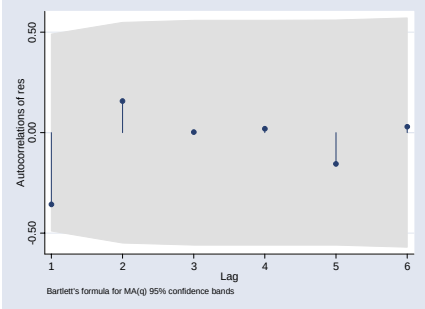


Indonesia

Appendix 2.16 (Continued)

Model (9): Tertiary Spending per student as % of GDP per capita (log)

Summary of Residuals

	Mean	Std. Dev.	Freq
Indonesia	0	0.15	3
South Korea	0	0.15	19
Malaysia	0	0.20	10
Philippines	0	0.17	7
Singapore	0	0.22	18
Thailand	0	0.45	10
Total	0	0.23	67

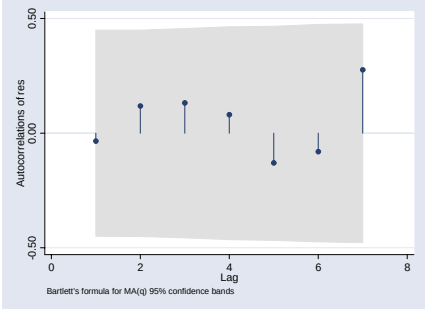
Analysis of Variance

Source	SS	df	MS	F	Prob>F
Between Groups	0	5	0	0	1
Within Groups	3.64	61	0.06		
Total	3.64	66	0.06		

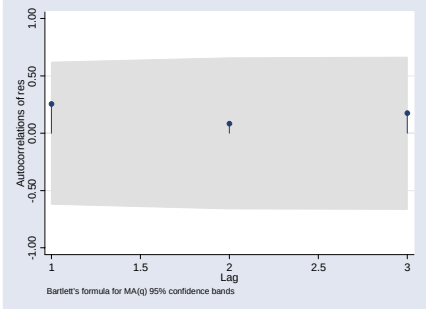
Bartlett's Test for Equal Variances: chi2(5)=18.38 Prob>chi2=.003

Autocorrelation of Residuals:

South Korea

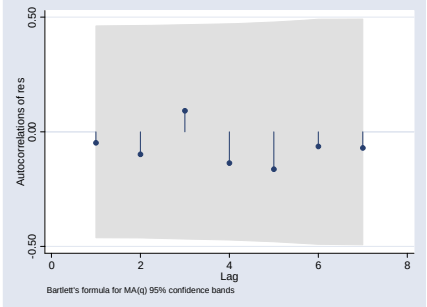


Malaysia

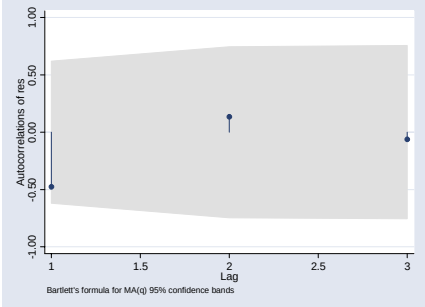


Philippines

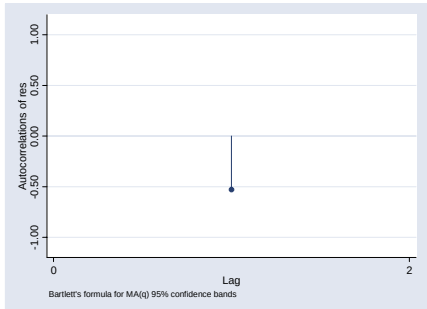
Singapore



Thailand



Indonesia



Appendix 3.1 Summary of Descriptive Statistics

GROSS ENROLMENT RATIO, PRIMARY				GELPRIM	
country	N	Mean	Std. Deviation	Minimum	Maximum
PHL	30	109.86	3.58	102.00	117.00
IND	28	107.73	13.12	78.00	118.00
HK	27	106.58	7.66	93.96	122.00
SIN	26	106.17	6.77	91.00	115.00
KOR	33	103.30	5.12	93.96	111.00
TAW	28	100.40	0.67	99.37	101.77
MAL	30	96.46	3.80	92.00	103.43
THA	32	92.06	6.01	80.00	99.00
Total	234	102.61	8.79	78.00	122.00

GROSS ENROLMENT RATIO, SECONDARY				GELSEC	
country	N	Mean	Std. Deviation	Minimum	Maximum
TAW	28	91.15	8.16	73.55	99.61
KOR	33	82.20	17.50	34.00	102.01
PHL	29	68.39	9.32	48.00	83.98
HK	25	67.54	12.73	35.00	81.60
SIN	26	64.26	7.13	51.00	74.09
MAL	31	55.71	8.62	35.00	70.28
THA	28	37.93	18.17	16.00	82.77
IND	30	37.36	15.01	12.00	60.72
Total	230	63.12	22.07	12.00	102.01

GROSS ENROLMENT RATIO, TERITARY				GELTER	
country	N	Mean	Std. Deviation	Minimum	Maximum
KOR	31	39.21	24.88	8.02	85.42
TAW	28	33.35	16.60	15.70	72.37
PHL	22	27.04	4.54	18.75	36.33
THA	28	19.25	10.64	3.10	38.81
HK	23	17.29	7.84	6.86	30.79
SIN	20	17.21	11.54	6.76	43.82
MAL	30	9.74	7.88	1.99	29.26
IND	22	8.19	4.37	2.42	16.39
Total	204	22.05	17.02	1.99	85.42

NET ENROLMENT RATIO, PRIMARY				NELPRIM	
country	N	Mean	Std. Deviation	Minimum	Maximum
KOR	33	98.31	3.09	92.21	104.06
TAW	33	97.91	0.83	96.29	99.31
SIN	17	97.83	2.46	92.34	100.00
MAL	8	95.49	3.89	88.10	99.79
PHL	20	94.88	2.85	88.00	100.00
IND	26	91.46	10.46	66.00	99.00
HK	18	89.38	9.84	72.00	98.00
THA	10	80.89	6.00	68.00	86.80
Total	165	94.52	7.42	66.00	104.06

NET ENROLMENT RATIO, SECONDARY				NELSEC	
country	N	Mean	Std. Deviation	Minimum	Maximum
TAW	33	80.64	9.49	65.73	93.83
KOR	27	75.18	18.69	32.00	97.37
MAL	6	63.24	14.75	33.14	69.96
HK	16	57.06	13.27	29.00	74.00
SIN	8	53.88	3.64	49.00	58.00
PHL	21	52.06	4.66	44.00	59.27
IND	18	29.62	14.68	9.00	54.00
Total	129	62.33	21.27	9.00	97.37

Appendix 3.1 (Continued)

PORTION OF POPULATION WITH PRIMARY SCHOOL ATTAINED LP

country	N	Mean	Std. Deviation	Minimum	Maximum
THA	7	66.21	2.91	61.50	70.20
PHL	7	45.47	8.99	33.10	56.90
MAL	7	45.29	1.51	42.40	46.70
IND	7	44.59	12.14	30.40	63.50
SIN	7	32.86	6.58	23.50	40.80
TAW	7	32.50	6.05	24.20	40.30
HK	7	31.44	6.95	25.10	41.00
KOR	7	23.81	10.98	11.90	39.10
Total	56	40.27	14.39	11.90	70.20

PORTION OF POPULATION WITH SECONDARY SCHOOL ATTAINED LS

country	N	Mean	Std. Deviation	Minimum	Maximum
KOR	7	49.04	12.59	25.30	61.90
HK	7	44.71	7.53	32.50	50.80
TAW	7	39.91	6.57	28.80	46.20
SIN	7	35.81	2.14	33.90	39.80
PHL	7	29.07	9.15	14.70	40.60
MAL	7	27.57	7.15	16.60	36.20
IND	7	17.07	8.65	7.60	27.80
THA	7	10.84	2.83	6.90	15.10
Total	56	31.76	14.45	6.90	61.90

PORTION OF POPULATION WITH HIGH SCHOOL ATTAINED LH

country	N	Mean	Std. Deviation	Minimum	Maximum
PHL	7	17.09	4.86	9.60	23.20
KOR	7	13.76	8.01	4.60	26.30
TAW	7	11.99	5.14	5.80	19.60
HK	7	8.06	4.28	2.60	13.30
THA	7	5.41	3.81	1.00	10.90
SIN	7	5.11	2.76	1.90	10.00
MAL	7	2.96	1.41	1.50	5.20
IND	7	1.67	1.60	0.40	4.50
Total	56	8.26	6.65	0.40	26.30

AVERAGE YEARS OF SCHOOL, TOTAL SCHOOL

country	N	Mean	Std. Deviation	Minimum	Maximum
KOR	7	8.49	2.19	4.91	10.84
HK	7	8.18	1.24	6.31	9.41
TAW	7	7.44	1.19	5.31	8.76
PHL	7	6.75	1.18	4.76	8.21
SIN	8	6.31	1.14	5.05	8.60
MAL	7	5.46	1.07	3.90	6.80
THA	7	5.13	0.98	4.03	6.50
IND	7	3.87	0.77	2.87	4.99
Total	57	6.45	1.91	2.87	10.84

AVERAGE YEARS OF SCHOOL, MALE SCHOOLM

country	N	Mean	Std. Deviation	Minimum	Maximum
KOR	7	9.47	2.08	5.97	11.68
HK	7	9.01	0.95	7.62	9.94
TAW	7	8.49	1.09	6.55	9.56
SIN	8	6.92	1.09	6.01	9.30
PHL	7	6.75	1.13	4.85	8.24
MAL	7	6.43	0.80	5.18	7.40
THA	7	5.55	0.95	4.52	7.03
IND	7	4.48	0.70	3.60	5.52
Total	57	7.13	1.96	3.60	11.68

Appendix 3.1 (Continued)

AVERAGE YEARS OF SCHOOL, FEMALE SCHOOLF

country	N	Mean	Std. Deviation	Minimum	Maximum
KOR	7	7.52	2.29	3.88	10.01
HK	7	7.31	1.54	4.98	8.86
PHL	7	6.75	1.23	4.67	8.18
TAW	7	6.28	1.36	3.88	7.91
SIN	6	6.15	1.14	4.86	8.10
THA	7	4.71	1.02	3.49	5.98
MAL	7	4.49	1.36	2.58	6.20
IND	7	3.27	0.85	2.16	4.47
Total	55	5.80	1.95	2.16	10.01

RATIO OF BOYS TO GIRLS IN PRIMARY AND SECONDARY SCHOOL GPI

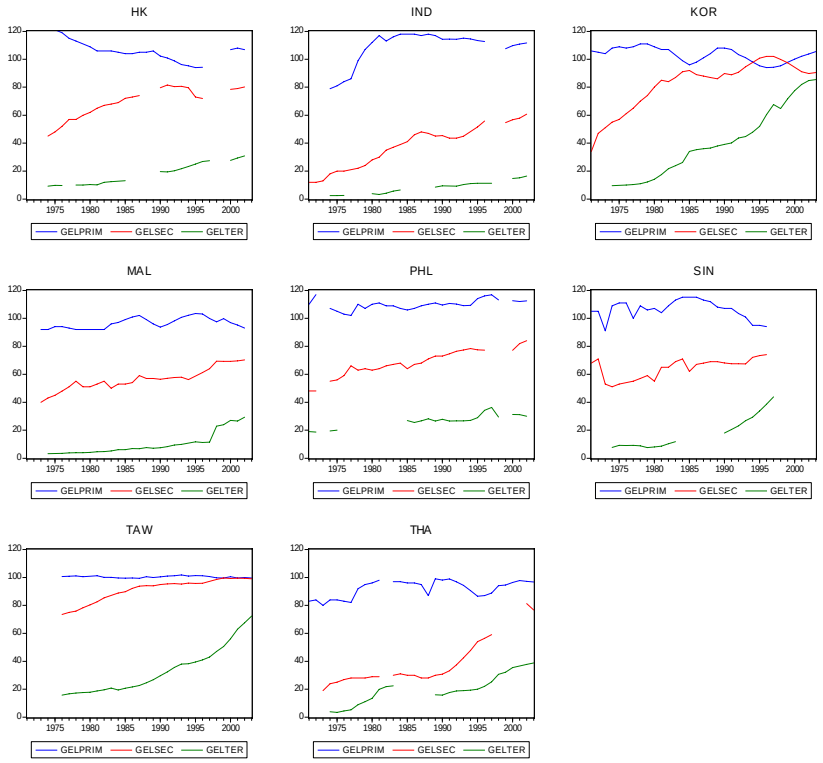
country	N	Mean	Std. Deviation	Minimum	Maximum
PHL	17	100.39	1.79	97.70	104.20
MAL	24	100.26	5.76	82.60	106.40
KOR	24	98.23	3.22	88.80	100.80
SIN	16	95.79	2.28	88.70	98.70
THA	9	94.52	3.68	87.10	98.00
TAW	33	93.06	3.02	85.92	96.26
IND	21	90.33	5.58	77.50	98.00
HK	18	84.82	38.70	1.01	105.30
Total	162	94.74	13.98	1.01	106.40

RATIO OF BOYS' AVERAGE SCHOOLING TO THAT OF GIRLS SCHRATIO

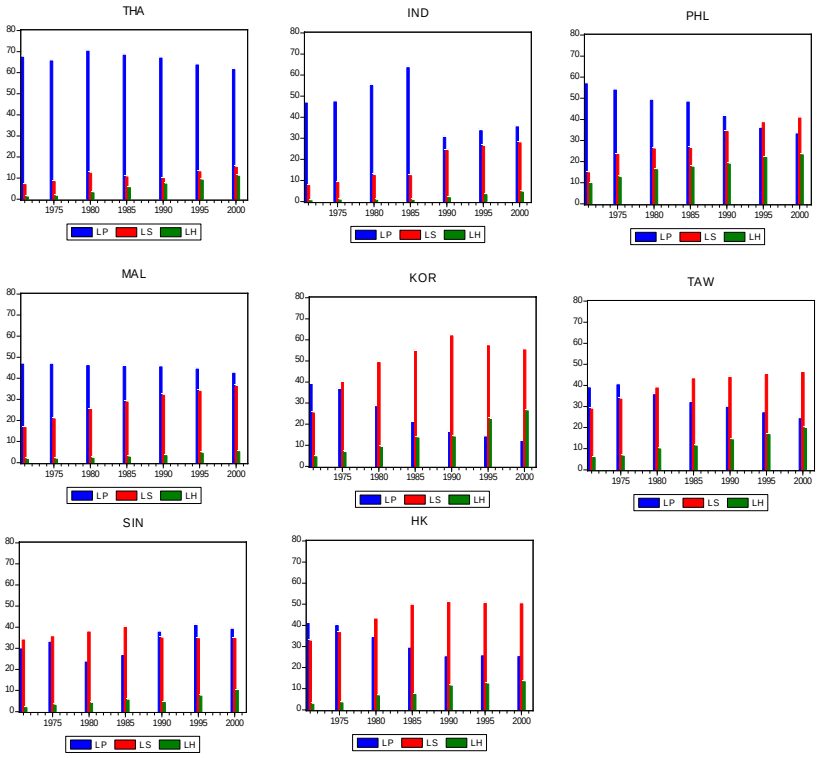
country	N	Mean	Std. Deviation	Minimum	Maximum
PHL	7	1.00	0.03	0.96	1.03
THA	7	0.84	0.06	0.74	0.91
SIN	7	0.81	0.08	0.67	0.89
HK	7	0.80	0.09	0.65	0.89
KOR	7	0.78	0.08	0.65	0.86
TAW	7	0.73	0.08	0.59	0.83
IND	7	0.72	0.08	0.60	0.81
MAL	7	0.69	0.13	0.50	0.84
Total	56	0.80	0.12	0.50	1.03

Appendix 3.2 Time Trends of the Education Outcome Variables

Gross School Enrollment at Primary, Secondary and Tertiary Levels

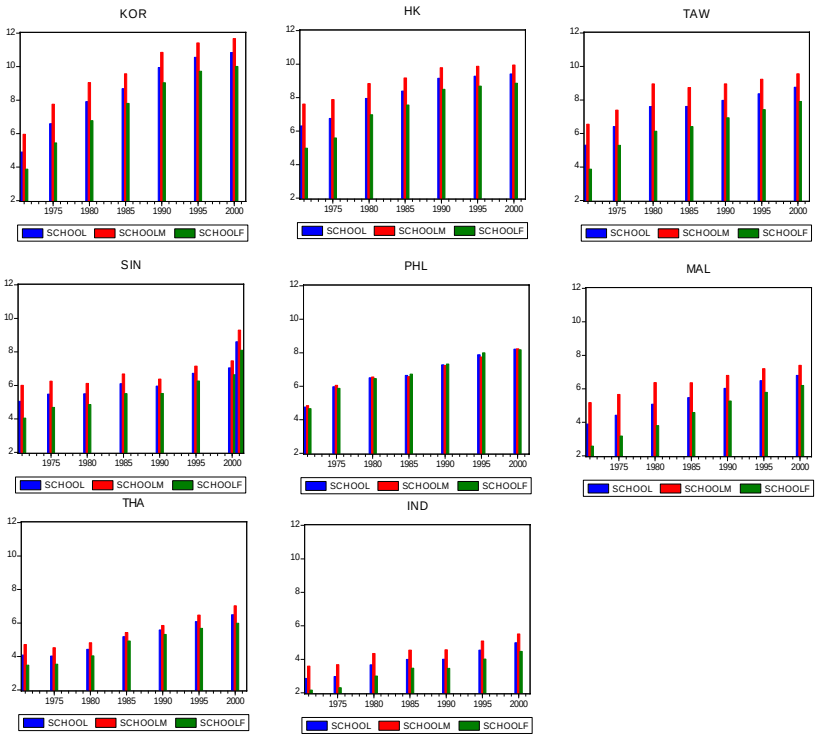


% of Population (15 and above) with Primary, Secondary and Tertiary School Attained

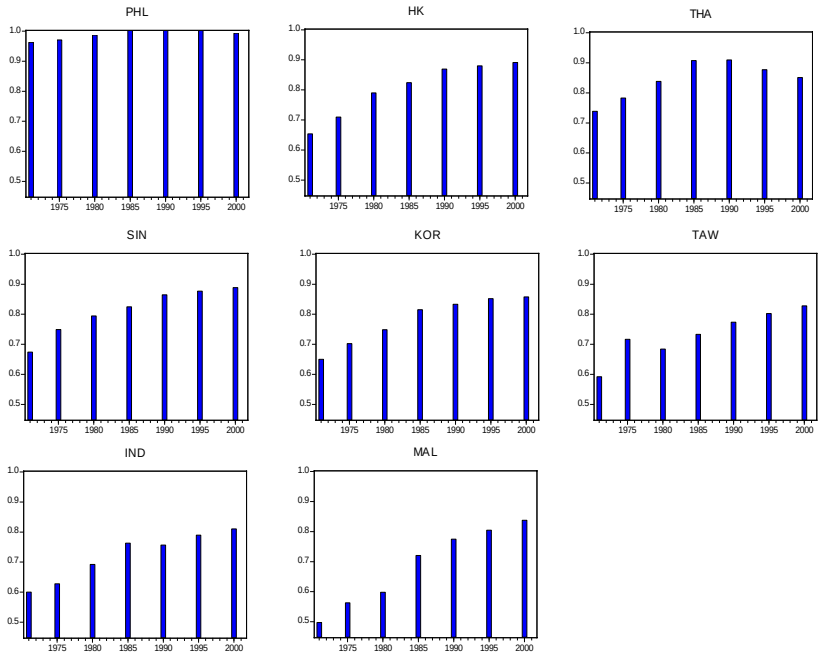


Appendix 3.2 (Continued)

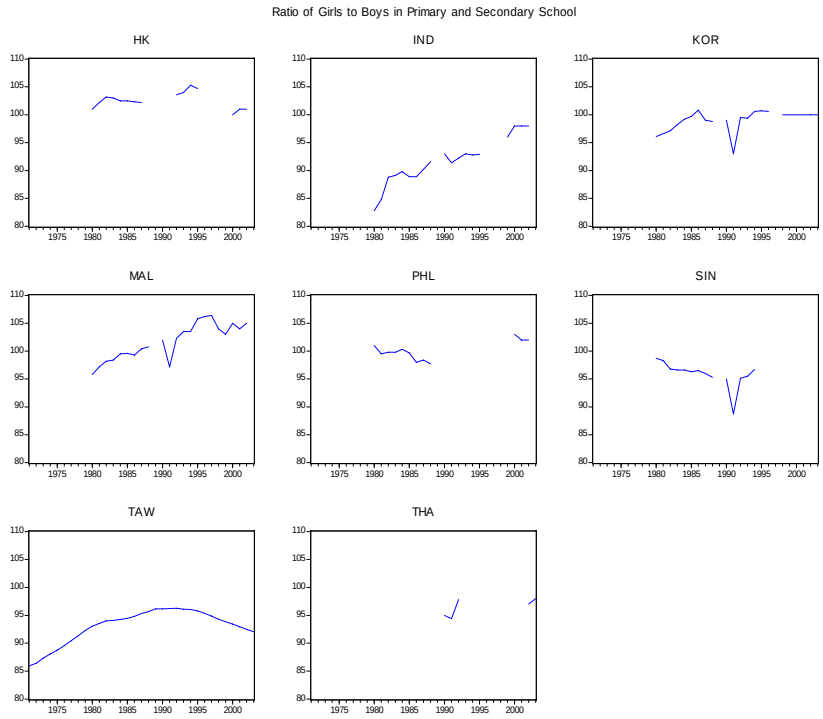
Average Years of School (Total, Male and Female)



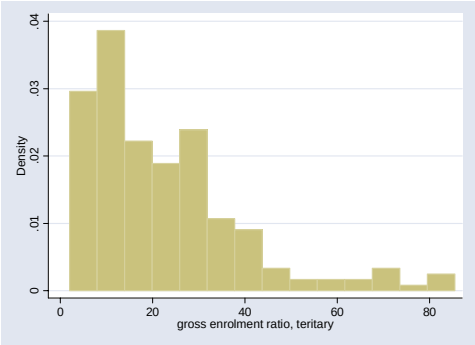
Ratio of Average Years in School, Girls to Boys

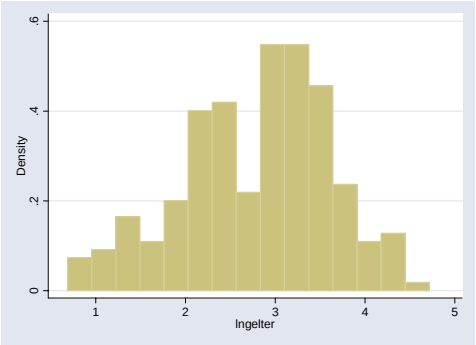


Appendix 3.2 (Continued)



Appendix 3.3 Transforming Gross Tertiary School Enrolment





Appendix 3.4 Education Spending Outcome Models: Residual Analysis

Model (1): Primary Gross School Enrolment

Summary of Residuals

	Mean	Std. Dev.	Freq
Indonesia	0	2.95	24
South Korea	0	2.14	29
Malaysia	0	1.84	28
Philippines	0	2.43	25
Singapore	0	5.46	24
Thailand	0	3.66	27
Total	0	3.20	157

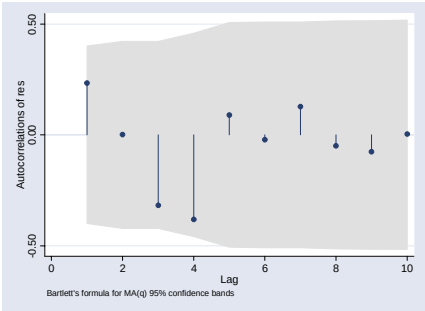
Analysis of Variance

Source	SS	df	MS	F	Prob>F
Between Groups	0	5	0	0	1
Within Groups	1594.93	151	10.56		
Total	1594.93	156	10.22		

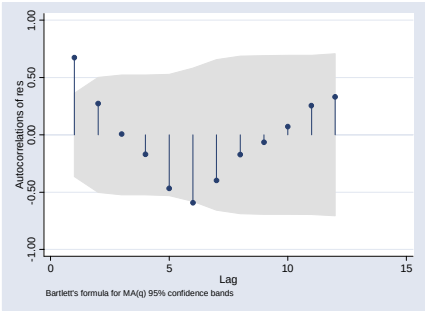
Bartlett's Test for Equal Variances: chi2(5)=41.95 Prob>chi2=0

Autocorrelation of Residuals:

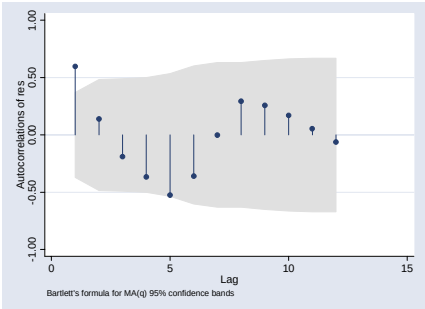
Indonesia



South Korea



Malaysia



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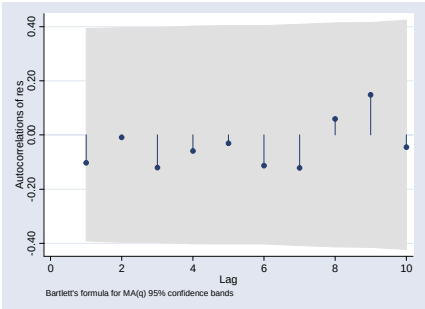
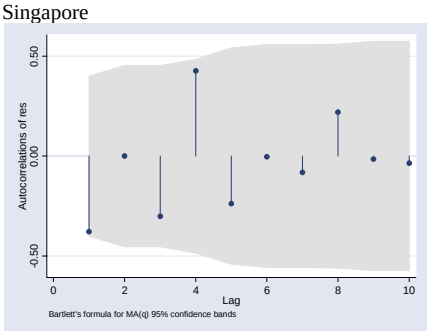
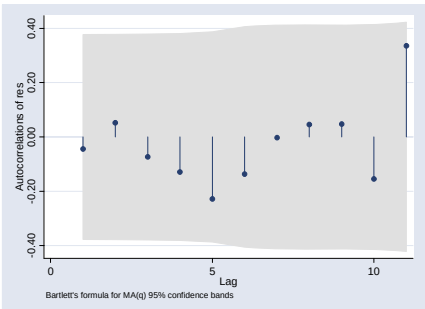


Singapore



Thailand



Appendix 3.4 (Continued)

Model (2): Secondary Gross School Enrolment

Summary of Residuals

	Mean	Std. Dev.	Freq
Indonesia	0	1.84	26
South Korea	0	2.63	29
Malaysia	0	2.14	28
Philippines	0	2.23	23
Singapore	0	3.61	24
Thailand	0	1.57	22
Total	0	2.39	152

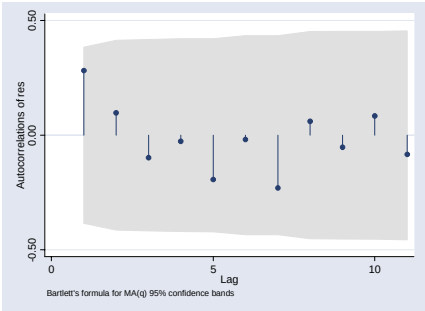
Analysis of Variance

Source	SS	df	MS	F	Prob>F
Between Groups	0	5	0	0	1
Within Groups	862.92	146	5.91		
Total	862.92	151	5.71		

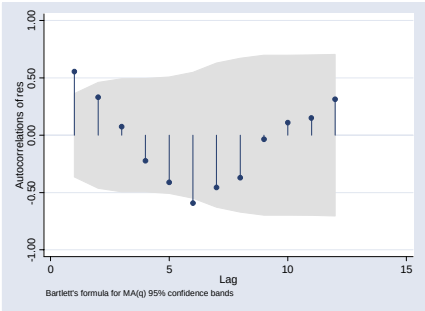
Bartlett's Test for Equal Variances: chi2(5)=20.1 Prob>chi2=.001

Autocorrelation of Residuals:

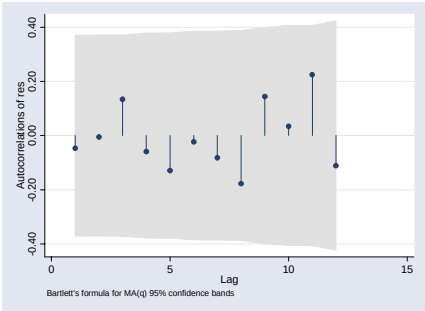
Indonesia



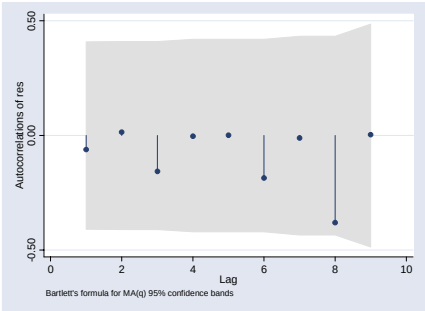
South Korea



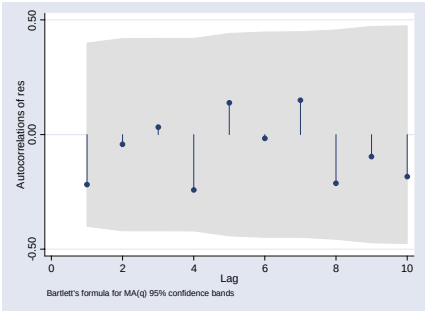
Malaysia



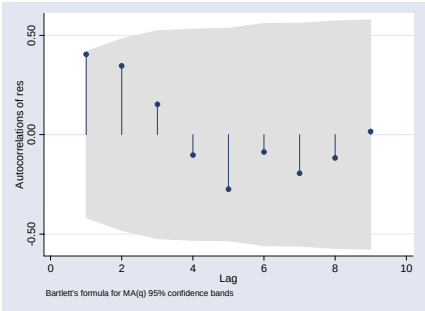
Philippines



Singapore



Thailand



Appendix 3.4 (Continued)

Model (3): Tertiary Gross School Enrolment (log)

Summary of Residuals

	Mean	Std. Dev.	Freq
Indonesia	0	0.11	15
South Korea	0	0.06	27
Malaysia	0	0.12	27
Philippines	0	0.09	15
Singapore	0	0.09	16
Thailand	0	0.13	21
Total	0	0.10	121

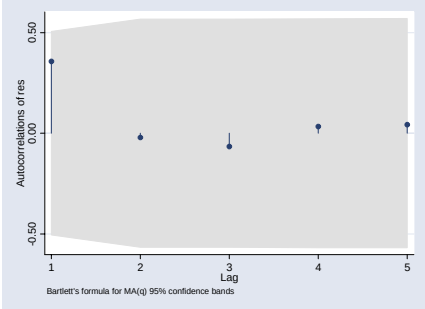
Analysis of Variance

Source	SS	df	MS	F	Prob>F
Between Groups	0	5	0	0	1
Within Groups	1.21	115	0.01		
Total	1.21	120	0.01		

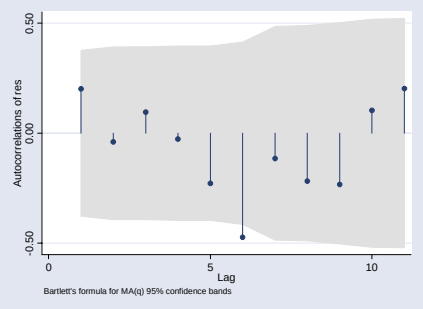
Bartlett's Test for Equal Variances: chi2(5)=15.44 Prob>chi2=.009

Autocorrelation of Residuals:

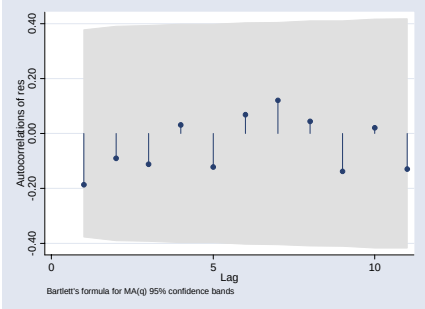
Indonesia



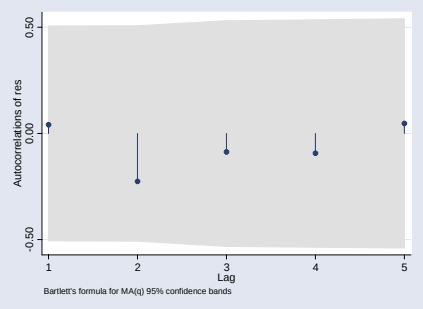
South Korea



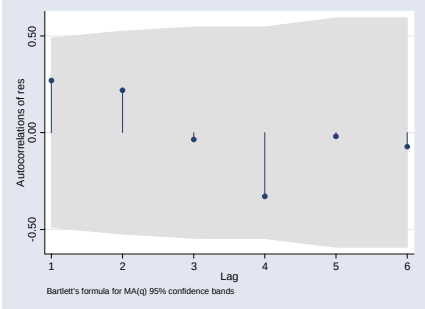
Malaysia



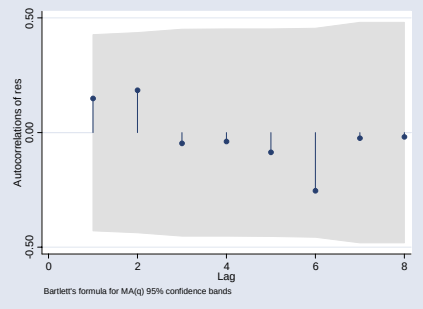
Philippines



Singapore



Thailand



Appendix 3.4 (Continued)

Model (4): % of Population with Primary School Attained

Summary of Residuals

	Mean	Std. Dev.	Freq
Indonesia	-8.21	10.03	6
South Korea	-12.48	3.36	6
Malaysia	-4.10	2.66	6
Philippines	1.62	1.49	6
Singapore	15.52	7.36	5
Thailand	10.23	2.70	6
Total	0.00	11.04	35

Analysis of Variance

Source	SS	df	MS	F	Prob>F
Between Groups	3287.31	5	657.46	22.2	0
Within Groups	858.89	29	29.62		
Total	4146.2	34	121.95		

Bartlett's Test for Equal Variances: chi2(5)=21.7 Prob>chi2=.001

Model (5): % of Population with Secondary School Attained

Summary of Residuals

	Mean	Std. Dev.	Freq
Indonesia	-1.07	3.99	6
South Korea	17.70	5.55	6
Malaysia	1.82	1.59	6
Philippines	4.41	1.08	6
Singapore	-18.81	3.03	5
Thailand	-7.18	2.05	6
Total	0.00	11.39	35

Analysis of Variance

Source	SS	df	MS	F	Prob>F
Between Groups	4101.32	5	820.26	76.74	0
Within Groups	309.97	29	10.69		
Total	4411.29	34	129.74		

Bartlett's Test for Equal Variances: chi2(5)=15.05 Prob>chi2=.01

Model (6): % of Population with Tertiary School Attained

Summary of Residuals

	Mean	Std. Dev.	Freq
Indonesia	2.12	1.98	6
South Korea	1.12	2.22	6
Malaysia	-3.80	1.33	6
Philippines	12.81	1.28	6
Singapore	-20.10	0.87	5
Thailand	4.50	1.30	6
Total	0.00	9.88	35

Analysis of Variance

Source	SS	df	MS	F	Prob>F
Between Groups	3246.56	5	649.31	259.11	0
Within Groups	72.67	29	2.51		
Total	3319.24	34	97.62		

Bartlett's Test for Equal Variances: chi2(5)=4.64 Prob>chi2=.46

Appendix 3.4 (Continued)

Model (7): Average Years of School (Total)

Summary of Residuals

	Mean	Std. Dev.	Freq
Indonesia	0.20	0.27	6
South Korea	1.62	0.25	6
Malaysia	-0.40	0.14	6
Philippines	1.75	0.19	6
Singapore	-4.72	0.24	5
Thailand	0.76	0.18	6
Total	0.00	2.11	35

Analysis of Variance

Source	SS	df	MS	F	Prob>F
Between Groups	150.17	5	30.03	651.48	0
Within Groups	1.34	29	0.05		
Total	151.51	34	4.46		

Bartlett's Test for Equal Variances: chi2(5)=2.72 Prob>chi2=.743

Model (8): Average Years of School (Male)

Summary of Residuals

	Mean	Std. Dev.	Freq
Indonesia	-0.12	0.25	6
South Korea	2.15	0.24	6
Malaysia	-0.01	0.19	6
Philippines	0.97	0.17	6
Singapore	-3.89	0.26	5
Thailand	0.26	0.20	6
Total	0.00	1.81	35

Analysis of Variance

Source	SS	df	MS	F	Prob>F
Between Groups	109.46	5	21.89	446.85	0
Within Groups	1.42	29	0.05		
Total	110.88	34	3.26		

Bartlett's Test for Equal Variances: chi2(5)=1.23 Prob>chi2=.938

Model (9): Average Years of School (Female)

Summary of Residuals

	Mean	Std. Dev.	Freq
Indonesia	0.54	0.32	6
South Korea	1.11	0.27	6
Malaysia	-0.78	0.19	6
Philippines	2.52	0.24	6
Singapore	-5.58	0.24	5
Thailand	1.27	0.18	6
Total	1.02	2.53	35

Analysis of Variance

Source	SS	df	MS	F	Prob>F
Between Groups	216.25	5	43.25	713.87	0
Within Groups	1.76	29	0.06		
Total	218.01	34	6.41		

Bartlett's Test for Equal Variances: chi2(5)=2.12 Prob>chi2=.832

Appendix 3.4 (Continued)

Model (10): Ratio of Girls to Boys in Primary and Secondary School

Summary of Residuals

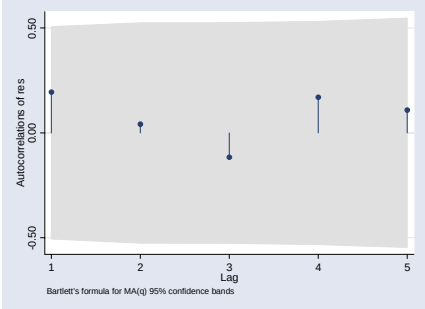
	Mean	Std. Dev.	Freq
Indonesia	0.00	1.14	15
South Korea	0.00	1.94	17
Malaysia	0.00	1.54	19
Philippines	0.00	0.84	9
Singapore	0.00	2.15	12
Total	0.00	1.58	72

Analysis of Variance

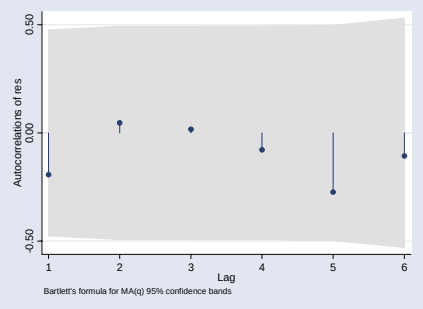
Source	SS	df	MS	F	Prob>F
Between Groups	0	4	0	0	1
Within Groups	177.41	67	2.65		
Total	177.41	71	2.5		

Bartlett's Test for Equal Variances: chi2(5)=10.51 Prob>chi2=.033

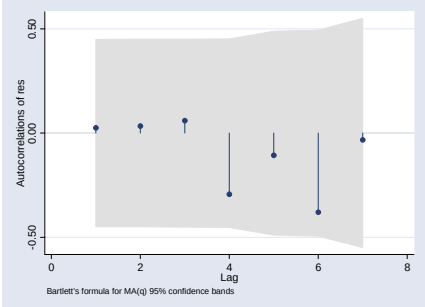
Indonesia



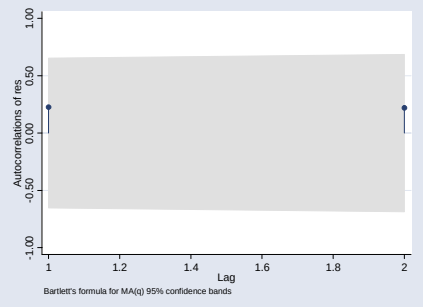
South Korea



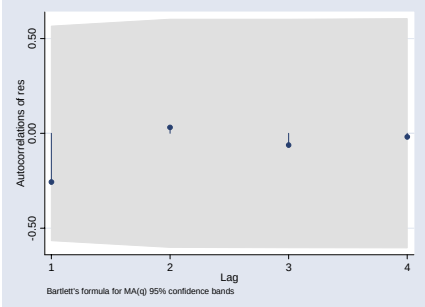
Malaysia



Philippines



Singapore



Appendix 3.4 (Continued)

Model (11): Ratio of Average Years of School, Girls to Boys

Summary of Residuals

	Mean	Std. Dev.	Freq
Indonesia	0.07	0.04	6
South Korea	-0.09	0.03	6
Malaysia	-0.14	0.04	6
Philippines	0.27	0.03	6
Singapore	-0.34	0.01	5
Thailand	0.16	0.03	6
Total	0.00	0.20	35

Analysis of Variance

Source	SS	df	MS	F	Prob>F
Between Groups	1.34	5	0.27	273.65	0
Within Groups	0.03	29	0.001		
Total	218.01	34	0.04		

Bartlett's Test for Equal Variances: chi2(5)=8.12 Prob>chi2=.15

Bibliography

Achen, Christopher H. 2000. “Why Lagged Dependent Variables Can Suppress the Explanatory Power of Other Independent Variables”, Working Paper for the Annual Meeting of the Political methodology Section of the American Political Science Association, UCLA, July20-22, 2000.

Acemoqlu, Daron, James A. Robinson, and Thierry Verdier. 2003. “Kleptocracy and Divide-and-Rule, A Model of Personal Rule”, NBER Working Paper # 10136, Dec. 2003.

Alesina, Alberto, Nouriel Roubini and Gerald D.Cohen. 1997. *Political Cycles and the Macroeconomy*. Cambridge: MIT Press.

Adams, Don. 2002. “Education and National Development: Priorities, Policies, and Planning.” In *Education in Developing Asia Series.* Asian Development Bank.

Adnan, Airil Haimi and Smith Edwin. 2001. “The Social Function of Education in a Developing Country: the Case of Malaysian Schools and the Role of Malaysian Teachers.” *Intercultural Education* 12 (3): 326-337.

Adsera, A. and C. Boix. 2002. “Trade, Democracy and the Size of the Public Sector: The Political Underpinning of Openness.” *International Organization* 56 (2): 229-262.

Ahmad, Anuar. 2004. “The Making of a ‘Good Citizen’ in Malaysia: Does History Education Play a Role?” In *Citizenship Education in Asia and the Pacific: Concepts and Issues*, eds. W.O. Lee, David L. Grossman, Kerry J. Kennedy and Gregory P. Fairbrother. Hong Kong: Kluwer Academic Press, 195-214.

Ai, Joy Chew O. 1998. “Civics and Moral Education in Singapore: Lessons for Citizenship Education?” *Journal of Moral Education* 27 (4): 505-525.

Ainsworth, Martha, Kathleen Beegle, and Andre Nyamete. 1995. “The Impact of Female Schooling on Fertility and Contraceptive Use: A Study of Fourteen Sub-Saharan Countries.” *World Bank Economic Review* 10 (1): 85-122.

Akoojee, Salim and Simon McGrath. 2004. “Assessing the Impact of Globalization on South African Education and Training: A Review of the Evidence So Far.” *Globalization, Societies and Education* 2 (March): 25-45.

Alvarez, Michael R., Geoffrey Garrett, and Peter Lange. 1991. “Government Partisanship, Labor Organization, and Macroeconomic Performance.” *The American Political Science Review* 85 (June): 539-556.

Alvarez, Mike, Jose Antonio Cheibub, Fernando Limongi and Adam Przeworski. 1996 "Classifying Political Regimes." *Studies in Comparative International Development* 31 (Summer): 3-36.

Ames, Barry. 1987. *Political Survival: Politicians and Public Policy in Latin America*. Berkley: University of California Press.

Anderson, T.W. and Cheng Hsiao. 1981. "Estimation of Dynamic Models with Error Components." *Journal of the American Statistical Association* 76 (September): 598-606.

Andreosso-O'Callaghan, Bernadette. 2003. "Human Capital, Education and Growth: China and India Compared." *China Report* 39 (Jan-Mar): 39-56.

Andrikopoulos, Andreas, Ioannis Loizides and Kyprianos Prodromidis. 2004. "Fiscal Policy and Political Business Cycles in the EU." *European Journal of Political Economy* 20: 125-152.

Asian Development Bank. *Key Indicator Series*. Various years.

Apodaca, Clair. 2002. "The Globalization of Capital in East and Southeast Asia." *Asian Survey* 42 (6): 883-905.

Ashton, David, Francis Green, Donna James and Johnny Sung. 1999. *Education and Training for Development in East Asia*. New York: Routledge.

Aspalter, Christian. 2002. *Democratization and Welfare State Development in Taiwan*. Burlington: Ashgate Publishing Company.

Aspalter Christian ed. 2001. *Understanding Modern Taiwan*. Burlington: Ashgate Publishing.

Avelino, George, David S. Brown and Wendy Hunter. 2005. "Globalization, Democracy and Social Spending in Latin America, 1980-1999." *American Journal of Political Science* 49 (July): 625-641.

Avelino, George. 2000. "Economic Crisis, Democratization, and Social Expenditures in Latin America, 1980-94." Ph. D. dissertation. Stanford University.

Aziz, Arfah A. and Tow Yow Chew. 1980. "Malaysia." In *Schooling in the ASEAN Region*, eds. Neville T. Postlethwaite and, Murray R. Thomas. New York: Pergamon Press.

Baker, Frederick J. 1999. "Civic Development in Thailand: A Beginning Look at Its Relationship to Formal and Informal Education." Educational Resource Information Center, U.S. Department of Education.

Baltagi. Badi H., Seuck Heun Song, Byoung Cheol Jung, and Won Koh. 2003. “Tesing for Serial Correlation, Spatial Autocorrelation and Random Effects Using Panel Data.” Working Paper.

Banerjee, Anindya ed. 1993. *Co-integration, Error Correction and Econometric Analysis of Non-stationary Data.* New York: Oxford University.

Banks, Aurthur S. Various editions. *Political Handbook of the World*. The Research Foundation of the State University of New York.

Barr, Michael D. 2003. “Perpetual Revisionism in Singapore: the Limits of Change.” *The Pacific Review* 16 (1): 77-97

Barro, Robert J, 1991. "Economic Growth in a Cross Section of Countries." *The Quarterly Journal of Economics* 106(May): 407-43.

Barro, Robert J. and Jong-Wha Lee. 2000. “International Data on Educational Attainment: Updates and Implications.” CID Working Paper no. 42, April 2000.

Baum, Matthew A and David A Lake. 2003. “The Political Economy of Growth: Democracy and Human Capital.” *American Journal of Political Science* 47 (April): 333-347.

Beck, Nathaniel. 1991. “Comparing Dynamic Specifications: The Case of Presidential Approval.” *Political Analysis* 3 (1): 51-87.

Beck, Nathaniel and Jonathan N.Katz. 1995. “What to do and (not to do) with Time-Series Cross-Section Data.” *The American Political Science Review* 89 (September): 634-647.

Beck, Nathaniel and Jonathan N. Katz. 1996. “Nuisance vs. Substance: Specifying and Estimating Time-Series-Cross-Section Models.” *Political Analysis* 6: 1-36.

Beck, Nathaniel. 2001. “Time-Series-Cross-Section Data: What Have We Learned in the Past Few Years?” *Annual Review of Political Science* 4: 271-93

Beck, Nathaniel and Jonathan N. Katz. 2001. “Throwing out the Baby with the Bath Water: A Comment on Green, Kim, and Yoon.” *International Organization* 55 (Spring): 487-495.

Beck, Nathaniel and Jonathan N. Katz. 2004. “Time-Series-Cross-Section Issues: Dynamics.” Working Paper.

Becker, Gary S., Kevin M. Murphy and Robert Tamura. 1990. “Human Capital, Fertility and Economic Growth.” *Journal of Political Economy* 98 (5): 12-37.

Bellows, Thomas J. 1970. *The People's Action Party of Singapore: Emergence of A Dominant Party System*. New Haven: Yale University Southeast Asia Studies.

Benefo, Kofi Darkwa and Paul T. Schultz. 1994. "Determinants of Fertility and Child Mortality in Cote d'Ivoire and Ghana." World Bank Publication. 1994 May.

Benabou, R. 1996a. "Equity and Efficiency in Human Capital Investment: The Local Connection." *Review of Economic Studies* 63: 237-64.

Benabou, R. 1996b. "Heterogeneity, Stratification and Growth: Macroeconomic Implications of the Community Structure and School Finance." *American Economic Review* 86 (3): 584-609.

Berger, Suzanne and Richard K. Lester eds. 2005. *Global Taiwan: Building competitive Strengths in A New International Economy*. Armonk: M.E. Sharpe.

Bils, Mark and Peter J.Klenow. 2000. "Does Schooling Cause Growth?" *The American Economic Review* 90 (December): 1160-1183.

Birdsall, Nancy. 1999. "Education, the People's Assets." Center on Social and Economic Dynamics Working Paper No. 5, Washington, DC.

Blau, P.M. and O.D. Duncan. 1967. *The American Occupational Structure*. New York: Free Press.

Blaug, Mark. 1968. *The Economics of Education*. Harmondsworth: Penguin.

Bodenstein, T., T. Plumper and G. Schneider. 2003. "Two Sides of Economic Openness: Non-tariff Barriers to Trade and Capital Controls in Transition Countries, 1993-2000." *Communist and Post-Communist Studies* 36 (June): 231-43.

Boix, C. 1998. *Political Parties, Growth and Equality: Conservative and Social Democratic Economic Strategies in the World Economy*. New York: Cambridge University Press.

Bollen, A. Kenneth. 1990. "Political Democracy: Conceptual and Measurement Traps." *Studies in Comparative International Development* 25 (Spring): 7-24.

Boon, Goh Chor and, Saravanan Gopinathan. 2005. "History Education and the Construction of National Identity in Singapore." In *History Education and National Identity in East Asia*, eds. Edward Vickers and Alisa Jones. New York: Routledge.

Booth, Anne. 2003. "Education and Economic Development in Southeast Asia: Myths and Realities." In *Southeast Asian Paper Tigers?* ed. K.S. Jomo. New York: Routledge, 2003

Bosworth, Barry and Susan M.Collins. 2003. “The Empirics of Growth: An Update, Working Paper.” Brookings Institute, September 2003

Bowles, Samuel and Herbert Gintis. 1976. *Schooling in Capitalist America: Educational Reform and the Contradictions of Economic Life*. New York: Basic Books.

Bowles, Samuel and Herbert Gintis. 2002. "Schooling in Capitalist America Revisited." *Sociology of Education* 75 (January): 1-18.

Bray, Mark and W.O.Lee. 2001. *Education and Political Transition: Themes and Experiences in East Asia*. Hong Kong: Comparative Education Research Center.

Brown David. 1999. “Reading, Writing, and Regime Type: Democracy’s impact on Primary School Enrollment.” *Political Research Quarterly* 52 (December): 681-707.

Brown, David. 2002. “Democracy, Authoritarianism and Education Finance in Brazil.” *Journal of Latin American Studies* 34 (February): 115-141.

Brown, David. 2004. “Democracy and Gender Inequality in Education: A Cross-National Examination.” *British Journal of Political Science* 34 (January): 137-152.

Brown, David and Wendy Hunter. 1999. “Democracy and Social Spending in Latin America, 1980-92.”*American Political Science Review* 93 (4): 779-790.

Brown, David S. and Wendy Hunter. 2004. “Democracy and Human Capital Formation, Education Spending in Latin America, 1980-1997.” *Comparative Political Studies* 37(September): 842-64.

Brown, Graham K. 2007. “Making Ethnic Citizens: The Politics and Practice of Education in Malaysia.” *International Journal of Educational Development* 27: 318-330.

Brown, Phillip and Hugh Lauder. 1996. “Education, Globalization and Economic Development.” *Journal of Education Policy* 11: 1-24.

Buasuwan, Prompilai. 2003. *The Influences of Globalization and Decentralization on Preparing Thai Secondary Students for Civic Participation: A Case Study of Two Thai Communities*. Illinois: Loyola University of Chicago.

Bueno de Mesquita, Bruce, James D Morrow, Randolph M. Siverson and Alastair Smith. 2002. “Political Institutions, Policy Choice and the Survival of Leaders.” *British Journal of Political Science* 32 (October): 559-590.

Bueno de Mesquita, Bruce, Alastair Smith, Randolph M. Siverson and James D Morrow. 2003. *The Logic of Political Survival*. Cambridge, MA: The MIT Press.

Byung, Hyun Park. 1990. “The Development of Social Welfare Institutions in East Asia: Case Studies of Japan, Korea and the PRC.” PhD. Dissertation. School of Social Work, University of Pennsylvania.

Cameron, David. 1978. “The Expansion of the Public Economy: A Comparative Analysis.” *American Political Science Review* 72 (December): 1243-1261.

Carnoy, Martin. 2001. “Are Educational Reforms in Latin America Working? A New Look at Understanding Whether Education is Getting Better.” Working paper.

Case, William F. 2001. “Thai Democracy, 2001: Out of Equilibrium.” *Asian Survey* 41 (May-Jun): 525-547.

Chalio, Buripakdi and Mahakhan Pratern. 1980. “Thailand.” In *Schooling in the Asean Region,* eds. T. Neville Postlethwaite and R. Murray Thomas. New York: Pergamon Press.

Chan, Steve. 1997. "Democracy and Inequality: Tracking Welfare Spending in Singapore, Taiwan, and South Korea." In *Inequality and Democracy,* ed. Manus I. Midlarsky. London: Cambridge University Press.

Chan, Swee Heng and Helen Tan. 2006. “English for Mathematics and Science: Current Malaysian Language-in-education Policies and Practices.” *Language and Education* 20 (4): 306-321.

Chang, Han-Yin Johannes. 2003. “Culture, State and Economic Development in Singapore.” *Journal of Contemporary Asia* 33 (1): 85-105.

Chang, Tsangyao. 2002. “An Econometric Test of Wagner’s Law for Six Countries based on cointegration and Error-correction Modeling Techniques.” *Applied Economics* 34 (June): 1157-1169.

Checchi, Daniele. 2003. “Inequality in Incomes and Access to Education: A Cross-Country Analysis (1960-95).” *Labor* 17 (June): 153-201.

Chee, Chan Heng. 1991. “Political Developments, 1965-1979.” In *A History of Singapore*, eds.Ernest C.T. Chew and Edwin Lee. New York: Oxford University Press.

Chen, Lizhu (陳麗珠). 2000. “The Crisis and Turning Point of Education Finance in Taiwan (我國教育財政的危機与轉機).” Conference Proceedings, Education Fundamental Act Conference (教育基本法相關議題研討會), Taiwan.

Chen, Su-Chiao. 2006. “Simultaneous Promotion of Indigenization and Internationalization: New Language-in-education Policy in Taiwan.” *Language in Education* 20 (4): 322-337.

Chen, Tain-Jy. 2001. "Democratization and Trade Liberalization." In *Taiwan's Economic Success Since 1980,* eds. Mai, Chao-Cheng and Shih, Chien-Sheng. Northampton: Edward Elgar Publishing Inc.

Cheng, Tun-Jen. 2001a. "The Economic Significance of Taiwan's Democratization." In *Taiwan's Economic Success Since 1980,* eds. Mai, Chao-Cheng and Shih, Chien-Sheng. Northampton: Edward Elgar Publishing Inc.

Cheng, Tun-Jen. 2001b. "Transforming Taiwan's Economic Structure in the 20th Century." *The China Quarterly* 165 (March): 19-36.

Cheng, Y.C. and T. Townsend. 2000. "Educational Change and Development in the Asia-Pacific Region: Trends and issues." In *Educational Change and Development in the Asia-Pacific Region: Challenges for the Future,* eds. T. Townsend and Y.C. Cheng. The Netherlands: Swets & Zeitlinger.

Choi, In. 2001. "Unit Root Tests for Panel Data." *Journal of International Money and Finance* 20 (2): 249-272.

Chou, Ji. "Taiwan's Macroeconomic Performance Since 1980." In *Taiwan's Economic Success Since 1980,* eds. Mai, Chao-Cheng and Shih, Chien-Sheng. Northampton: Edward Elgar Publishing Inc.

Christian Aspalter. 2002. *Discovering the Welfare States in East Asia.* Westport, Conn.: Praeger.

Chu, Yun-Peng. 2001. "Liberalization Policies Since the 1980s." In *Taiwan's Economic Success Since 1980,* eds. Mai, Chao-Cheng and Shih, Chien-Sheng. Northampton: Edward Elgar Publishing Inc.

Chua, Beng-Huat. 1994. "Arrested Development: Democratization in Singapore." *Third World Quarterly* 15 (4): 665-668.

Chye, Tan Eu and Mohamed Ariff. 2001. "Structural Change in the Malaysian Manufacturing Industry." In *Modern Malaysia in the Global Economy,* ed. Colin Barlow. Northampton, MA: Edward Elgar.

Clark, William Roberts. 2005. "What's So Good About Democracy, A Research Note." Working Paper, April 15, 2005.

Coenders, Marcel and Peer Scheepers. 2003. "The Effect of Education on Nationalism and Ethnic Exclusionalism: An International Comparison." *Political Psychology* 24 (June): 313-343.

Colclough, Christopher and Samer Al-Samarrai. 2000. “Achieving Schooling for All: Budgetary Expenditures on Education in Sub-Saharan Africa and South Asia.”*World Development* 28 (11): 1927-1944.

Collier, David. 1993. “The Comparative Method. ” In *Political Science: The State of the Discipline II,* ed. Ada W. Finifter. Washington, D.C.: American Political Science Association.

Commission on Education Reform. 1996. “Report on Education Reform (教改會咨詢報告). ” Taiwan: Taipei, 1996.

Corrales, Javier. 1998. “The Politics of Education Reform Implementation: Bolstering the Supply and Demand, Overcoming Institutional Blocs.” Working Paper. Amherst College, Department of Political Science.

Council for Economic Planning and Development, Executive Yuan (行政院經濟建設委員會). *Manpower Development Plans (人力發展計劃)*. Taiwan: Taipei, Various Years

Crepaz, Markus M. and Ann W. Moser. 2004. “The Impact of Collective and Competitive Veto Points on Public Expenditures in the Global Age.” *Comparative Political Studies* 37 (April): 259-85.

Croissant, Aurel. 2004a. “From Transition to Defective Democracy: Mapping Asian Democratization.” *Democratization* 11 (December): 156-78.

Croissant, Aurel. 2004b. “Changing Welfare Regimes in East and Southeast Asia: Crisis, Change and Challenge.” *Social Policy & Administration* 38 (October): 504-524.

Croix, David de la and Matthias Doepke. 2003. “To Segregate or to Integrate: Education Politics and Democracy.” Working Paper, Dec. 2003.

Crouch, Luis. 2005. “The Hard Slog of Implementation: South African Reforms from Early Post-Apartheid to the Future.” Paper prepared for the World Bank-Research Triangle Institute Conference on Education Finance and Decentralization, Washington, D.C., January 2005.

Cukierman, A. and Y. Spiegel. 2003. “ When is the Median Voter Paradigm a Reasonable Guide for Policy Choices in a Representative Democracy? ” *Economics and Politics* 15(November): 247-284.

Fell, Dafydd. 2005. “Measuring and Explaining Party Change in Taiwan: 1991-2004.” *Journal of East Asian Studies* 5 (January-April): 105-133.

Daron, Acemoglu, James A. Robinson and Thierry Verdier. 2003. “Kleptocracy and Divide-and-rule: A model of Personal Rule.” NBER working paper, No. W10136.

De Boef, Suzanna and Jim Granato. 1999. “Testing for Cointegrating Relationships with Near-Integrated Data.” *Political Analysis* 8: 99-117.

Deininger, Klaus and Lyn Squire. 1996. “A New Dataset Measuring Inequality.” *World Bank Economic Review* 10 (3): 565-591.

Dion, Michelle. 2005. “Globalization, Political Institutions, and Social Spending Change in Middle Income Countries, 1980-1999. ”Working Paper, Feb. 2005.

Dixon, Chris. 1999. *The Thai Economy: Uneven Development and Internationalization.* New York: Routledge Press.

Easterly,William and Ross Levine. 2002. “It’s Not Factor Accumulation: Stylized Facts and Growth Models.” Working Paper, June 2002.

Eichengreen, Barry. 2001. “Capital Account Liberalization: What Do Cross-Country Studies Tell Us? “ *The World Bank Economic Review* 15 (3): 341-65.

Engelbrecht, Petra. 2006. “The Implementation of Inclusive Education in South Africa after Ten Years of Democracy.” *European Journal of Psychology of Education* 21 (3): 253-264.

Engerman, Stanley L., Elisa V. Mariscal and Kenneth L Sokoloff. 1998. “The Evolution of Schooling Institutions in the Americas, 1800-1925.” Working paper, University of California, Los Angeles.

Engle, Robert F. and C.W.J.Granger. 1987. “Co-Integration and Error Correction: Representation, Estimation, and Testing.” *Econometrica* 55 (March): 251-76.

Fox, John. 1997. *Applied Regression Analysis, Linear Models, and Related Methods.* Thousand Oaks: Sage Publications.

Franzese, RJ. 2001. *The Political Economy of Macroeconomic Policy in Developed Democracies.* New York: Cambridge University Press

Fry, Gerald W. 2002. “The Evolution of Education Reform in Thailand.” Paper presented at the Second International Forum, Department of Education Policy and Administration, University of Minnesota, 2002.

Garret, Geoffrey. 1995. “Capital Mobility, Trade and the Domestic Politics of Economic Policy.” *International Organization* 49 (4): 657-87.

Garret, Geoffrey. 2001. “Globalization and Government Spending Around the World.” *Studies in Comparative International Development* 35(4): 3-29.

Garrett, G. and D. Mitchell. 2001. “Globalization, Government Spending and Taxation in the OECD.” *European Journal of Political Research* 39 (2): 145-77.

Gastil, Raymond Duncan. 1990. "The Comparative Survey of Freedom: Experiences and Suggestions." *Studies in Comparative International Development* 25 (Spring): 25-50.

Geddes, Barbara. 1995. "The Politics of Economic Liberalization." *Latin American Research Review* 30 (2): 195-214.

Glewwe, Paul and Michael Kremer. 2005. "Schools, Teachers, and Education Outcomes in Developing Countries." Center for International Development at Harvard University, Working Paper No. 122, September 2005.

Goodman, Roger, Gordon White and Huck-ju Kwon. 1998. *The East Asian Welfare Model, Welfare Orientalism and the State.* New York: Routledge.

Goh, Chor Boon and S. Gopinathan. 2006. "The Development of Education in Singapore since 1965." Background paper prepared for the Asia Education Study Tour for African Policy Makers, June 18-30, 2006.

Gopinathan S. 1991. "Education." In *A History of Singapore,* eds. Ernest C.T. Chew and Edwin Lee. New York: Oxford University Press.

Gopinathan S. 1998. "Language Policy Changes 1979-1997: Politics and Pedagogy." In *Language, Society and Education in Singapore: Issues and Trends*, eds. S. Gopinathan, Anne Pakir, Ho Wah Kam and Vanithamani Saravanan. Singapore: Time Academic Press.

Gopinathan S. and Leslie Sharpe. 2004. "New Bearings for Citizenship Education in Singapore." In *Citizenship Education in Asia and the Pacific: Concepts and Issues*, eds. W.O. Lee, David L. Grossman, Kerry J. Kennedy and Gregory P. Fairbrother. Hong Kong: Kluwer Academic Publishers.

Gradstein Mark. 2003. "The Political Economy of Public Spending on Education, Inequality and Growth." World Bank Policy Research Working Paper 3162, November 2003.

Green, Francis, David Ashton, Donna James and Johnny Sung. 1999. "The Role of the State in Skill Formation: Evidence from the Republic of Korea, Singapore, and Taiwan." *Oxford Review of Economic Policy* 15 (1): 82-96.

Greene, William H. 2003. *Econometric Analysis*. New York: Macmillan.

Grossman, G.M. and Helpman, E. 2002. *Special Interest Press*. Cambridge, MA: MIT Press.

Haddad, Wadi D. 2004. *The Dynamics of Education Policy Making: Case Studies of Burkina Faso, Jordon, Peru and Thailand.* EDI Development Policy Case Series, No. 10, World Bank.

Haggard, Stephen. 1990. *Pathways From the Periphery: The Politics of Growth in the Newly Industrializing Countries*. Ithaca: Cornell University Press.

Haggard, Stephen and Robert Kaufman. 1995. *The Political Economy of Democratic Transitions*, Princeton: Princeton University Press.

Haggard, Stephen and Robert Kaufman, *Recrafting Social Contracts, Welfare Reform in Latin America, East Asia and Eastern Europe*, Forthcoming, 2008

Haiso, C. 1986. *Analysis of Panel Data*. New York: Cambridge University Press.

Hallinger, Philip and Pornkasem Kantamara. 2001. "Exploring the Cultural Context of School Improvement in Thailand." *School Effectiveness and School Improvement* 12 (4): 385-408.

Hannum, Emily and Claudia Buchmann. 2003. "The Consequences of Global Education Expansion." American Academy of Arts and Sciences: Project on Universal Basic and Secondary Educations.

Hansen, David O.and Archibald O. Haller. 1973. "Status Attainment of Costa Rican Males: A Cross-Cultural Test of a Model." *Rural Sociology* 38: 269-82.

Haupt, Alexander. 2005. "The Evolution of Public Spending on Higher Education in Democracy." Working Paper, November 2005.

Hausken, Kjell, Christian W. Martin and Thomas Plümper. 2004. "Government Spending and Taxation in Democracies and Autocracies." *Constitutional Political Economy* 15 (September): 239-59.

Hecock, Douglass R. 2006. "Electoral Competition, Globalization and Subnational Education Spending in Mexico." *American Journal of Political Science* 50 (October): 950-961.

Heston, Alan, Robert Summers and Bettina Aten. 2002. Penn World Table Version 6.1, Center for International Comparisons at the University of Pennsylvania (CICUP), October 2002.

Hewison, Kevin. 1997. *Political Change in Thailand: Democracy and Participation*. New York: Routledge Press.

Hicks, Alexander M. and Duane H. Swank. 1992. “Politics, Institutions and Welfare Spending in Industrialized Democracies, 1960-82.” *American Political Science Review* 86 (September): 658-674.

Hicks, Alexander. 1999. *Social Democracy and Welfare Capitalism: A Century of Income Security Politics.* Ithaca, N.Y.: Cornell University Press.

Hirschman, Charles. 1980. “Demographic Trends in Peninsular Malaysia, 1947-75.” *Population and Development Review* 6 (March): 103-125.

Hiscox, Michael J. and Scott Kastner. 2004. “Trade Policy Openness, Government Spending, and Democratic Consolidation: A Preliminary Analysis.” Paper presented at the annual meeting of the International Studies Association, Le Centre Sheraton Hotel, Montreal, Quebec, Canada, Mar 17, 2004.

Hlouskova, Jaroslava and Martin Wagner. 2005. “The Performance of panel Unit Root and Stationarity Tests: Results from A Large Scale Simulation Study.” Working Paper, March 2005.

Ho, Ming-sho. 2005. “Taiwan’s State and Social Movements Under the DPP Government, 2000-2004.” *Journal of East Asian Studies* 5 (3): 401-25.

Ho, Wai-chung. 2003. “Democracy, Citizenship and Extra-musical Learning in Two Chinese Communities: Hong Kong and Taiwan.” *Compare* 33 (June): 155-71.

Holliday, Ian and Paul Wilding. 2003. *Welfare Capitalism in East Asia*. New York: Palgrave Macmillan.

Horsky, Batia P. and Phyllis Ghim-Lian Chew. 2004. “Singapore: Schools in the Service of Society.” In *Balancing Change and Tradition in Global Education Reform*, ed. Iris C. Rotberg. Maryland: Scarecrow Education.

Hsieh, Wen-chyuan, Yu-wen Chou, Che-sheng Gai, Chien-chen Chang, and Chieng-hwa Kao (謝文全，周愚文，蓋浙生，張建成，高強華). 1999. *The Story of Taiwan (臺灣的故事*). Taiwan: Government Information Office.

Huang, Shixin and Zhiquan Ding (黃世鑫&丁志權). 1999. “A Study on Education Revenues and Expenditures: Reasons for Freezing Article 164 of the Constitution and Responses(我國教育經費籌措及運作之研究：憲法第一六四條凍結之因應).” Taiwan: Ministry of Education, June 1999.

Huber, Evelyne, Thomas Mustillo, and John Stephens. 2004. “Determinants of Social Spending in Latin America.” Paper delivered at the Meetings of the Society for the Advancement of Socio-Economics, Washington, D.C., July 8-11.

Huber, E. Ragin, C. and J. Stephens. 1993. “Social Democracy, Christian Democracy, Constitutional Structure and the Welfare State.” *American Journal of Sociology* 99 (3): 711-49.

Hurlin, Christophe and Mingnon Valerie. 2004. “Second Generation Panel Root Tests.” Working Paper, University of Paris X.

Hussey, Antonia. 1993. “Rapid Industrialization in Thailand 1986-1991.” *Geographical Review* 83 (January): 14-28.

Im, Kyung So, Hashem M. Pesaran and Yongcheol Shin. 2003. “Testing for Unit Roots in Heterogeneous Panels.” *Journal of Econometrics* 115 (1): 53-74.

Imai, Kunihiko. 2002. “The Impact of Globalization on Civil Liberties: Asian vs. Non-Asian States.” *International Journal of World Peace* 19 (March): 39-65.

Inkeles, Alex and David H. Smith. 1974. *Becoming Modern: Individual Change in Six Developing Countries*. Cambridge: Harvard University Press.

Inkeles, Alex ed. 1991. *On Measuring Democracy: Its consequences and concomitants*. New Brunswick: Transaction Publishers.

Iversen, Torben and David Soskice. 2001. “An Asset Theory of Social Policy Preferences.” *American Political Science Review* 95 (December): 875-893.

Iversen, Torben and Thomas Cusack. 2000. “The Causes of Welfare State Expansion: Deindustralization or Globalization?” *World Politics* 52 (April): 313-349.

Jonakin, Jon and Mark Stephens. 2004. “The Impact of Structural Adjustment on Government Spending and Debt in Latin America.” *Defence and Peace Economics* 15 (April):157-171.

Kam, Wong Poh. 1998. “Upgrading Singapore’s Manufacturing Industry.” In *Competitiveness of the Singapore Economy, A Strategic Perspective,* eds. Toh Mun Heng and Tan Kong Yam. Singapore: Singapore University Press.

Kam, Ho Wah and S. Gopinathan. 1999. “Recent Developments in Education in Singapore.” *School Effectiveness and School Improvement* 10 (1): 99-117.

Kamogawa, Akiko. 2003. “Higher Education Reform: Challenges towards a Knowledge Society in Malaysia.” *African and Asian Studies* 2(4): 545-63.

Kaufman, Robert R. and Alex Segura-Ubiergo. 2001. “Globalization, Domestic Politics, and Social Spending in Latin America: A Time-Series Cross-Section Analysis, 1973-97.” *World Politics* 53(July): 553-87.

Kaufman, Robert R. and Joan M. Nelson. 2004. “The Politics of Education Sector Reform.” In *Crucial Needs, Weak Incentives*, eds. Robert R. Kaufman and Joan M. Nelson. Baltimore: The John Hopkins University Press.

Katzenstein Peter. 1985. *Small States in World Markets*. Ithaca: Cornell University Press.

Keefer, Philip and Stuti Khemani. 2003. “Democracy, Public Expenditures, and the Poor.” World Bank Policy Research Working Paper 3164.

Keele, Luke. 2004a. “Not Just for Cointegration: Error Correction Models with Stationary Data.” Working Paper.

Keele, Luke. 2004b. “Social Capital, Government Performance, and the Dynamics of Trust in Government.” Working Paper, Oct. 14.

Keele, Luke and Nathan J. Kelly. 2005. “Dynamic Models for Dynamic Theories: The Ins and Outs of Lagged Dependent Variable.” Working paper, March 2003.

Kim, Dong Sung. 1996. “Social Welfare Policy in the East Asian and Latin American NICs: A Comparative Study of Social Welfare Variations.” Ph.D. Dissertation. University of Maryland.

Kim, Chae-Han. 1999. “Political Business Cycle in Korea.” In *Democracy and Korean Economy*, eds. Jongryn Mo and Moon Chung-In. Stanford: Hoover Institution Press.

King, Daniel E. 1992. “The Thai Parliamentary Elections of 1992: Return to Democracy in an Atypical Year.” *Asian Survey* 32 (December):1109-1123.

King, Daniel E. 1996. “Thailand in 1995: Open Society, Dynamic Economy, Troubled Politics.” *Asian Survey* 36 (February): 135-41.

King, Gary, James Honaker, Anne Joseph and Kenneth Scheve. 2001. “Analyzing Incomplete Political Science Data: An alternative Algorithm for Multiple Imputation.” *American Political Science Review* 95 (March): 49-69.

Kite, Cynthia. 2002. “The Globalized, Generous Welfare State: Possibility or Oxymoron?” *European Journal of Political Research* 41 (May): 307-343.

Kittel, Bernhard and Hannes Winner. 2005. “How Reliable is Pooled Analysis in Political Economy? The Globalization-welfare state Nexus Revisited.” European *Journal of Political Research* 44 (March): 269-93.

Koh, Aaron. 2004. “Singapore Education in ‘New Times’: Global/Local Imperatives.” *Discourse: Studies in the Cultural Politics of Education* 25 (September): 335-349.

Konstadakopulos, Dimitrios. 2004. *Learning for Innovation in the Global Knowledge Economy: A European and South-East Asian Perspective*. Portland, OR: Intellect.

Kraemer, Moritz. 1997. "Electoral Budget Cycles in Latin America and the Caribbean: Incidence, Causes, and Political Futility." Working Paper Series #354, Office of the Chief Economist, Inter-American Development Bank.

Kristensen, Ida Pagter and Gregory Wawro. 2003. "Lagging the Dog? The Robustness of Panel Corrected Standard Errors in the Presence of Serial Correlation and Observation Specific Effects." Working Paper.

Kuhonta, Erik M. 2003. "The Political Economy of Equitable Development in Thailand." *American Asian Review* 21 (Winter): 69-108.

Kuo, Chich-Heng. 1991. *International Capital Movements and The Developing World, The Case of Taiwan*. New York: Praeger Publishers.

Kuo, Eddie C.Y. and Linda Low. 2001. "Information Economy and Changing Occupational Structure in Singapore." *The Information Society* 17(4): 281-93.

Kwon, Huck-ju. 1998. "Democracy and the politics of social welfare: a comparative analysis of welfare systems in East Asia." In *The East Asian Welfare Model, Welfare Orientalism & the State*, eds. Roger Goodman, Gordon White and Huck-ju Kwon. London; New York: Routledge.

Kwon, Huck-ju. 2005. "Transforming the Developmental Welfare State in East Asia." *Development and Change* 36 (3): 477-97.

Kwon, Hyeok Yong. 2001. "The Politics of Public Spending in a 'Developmental State': South Korea, 1987-1997." Working Paper for delivery at the workshop, the Comparative Political Economy of Developed and Less Developed Countries, Yale Center for International and Area Studies, May 4-5, 2001, Yale University.

Laitin, David. 2002. "Comparative Politics: The State of the Subdiscipline." In *Political Science: The State of the Discipline*, eds. Ira Katznelson and Helen V. Milner. New York: Norton.

Lake, David A and Matthew A Baum. 2001."The Invisible Hand of Democracy: Political Control and the Provision of Public Services." *Comparative Political Studies* 34 (August): 587-621.

Lall, Sanjaya. 2000. "Technological Change and Industrialization in the Asian Newly Industrializing Economies: Achievements and Challenges." In *Technology, Learning & Innovation: Experiences of Newly Industrializing Countries*, ed. Linsu Kim and Richard R. Neolson. Cambridge: Cambridge University Press.

Lall, Sanjaya. 2001. *Competitiveness, Technology and Skills*. Northampton, MA: Edward Elgar.

Law, Wing-Wah. 1994. "The Higher Education Systems of the People's Republic of China and the Republic of China: A Comparative Study." Ph.D. dissertation. University of London: Institute of Education.

Law, Wing-Wah. 2002. "Education Reform in Taiwan: A Search for A 'National' Identity through Democratization and Taiwanization." *Compare* 32 (1): 61-81.

Law Wing-Wah. 2004. "Translating Globalization and Democratization into Local Policy: Educational Reform in Hong Kong and Taiwan." *International Review of Education* 50 (November): 497-524.

Leamer, Edward D. 1988. "Measures of Openness." In *Trade Policy Issues and Empirical Analysis*, ed. Roberts E. Baldwin. Chicago: University of Chicago Press.

Lee, Chi-Ming (Angela). 2004. "Changes and Challenges for Moral Education in Taiwan." *Journal of Moral Education* 33 (December): 575-95.

Lee, Hock Guan. 2005. "Affirmative Action in Malaysia." *Southeast Asian Affairs*: 211-228.

Lee, Michael H. and Saravanan Gopinathan. 2003. "Reforming University Education in Hong Kong and Singapore." *Higher Education Research and Development* 22 (2): 167-182

Lee, Molly N.N. 1999. "Education in Malaysia: Towards Vision 2020." *School Effectiveness and School Improvement* 10 (1): 86-98.

Lehmkuhl, David. 2005. *Communists in A Global Economy: Government Expenditure in Post-Communist Countries, 1991-2002.* Master Thesis, Rutgers University, New Brunswick.

Levin, Andrew, Chien-Fu Lin and Chia-Shang James Chu. 2002. "Unit Root Tests in Panel Data: Asymptotic and Finite Sample Properties." *Journal of Econometrics* 108 (1): 1-24.

Levinson, David and Karen Christensen. 2002. *Encyclopedia of modern Asia*. New York: Scribner.

Lewin, K. M. 1996. *Access to Education in Emerging Asia: Trends, Challenges and Policy Options. Research monograph for the Asian Development Bank.* Emerging Asia Development Review.

Lewis-Beck, Michael, Alan Bryman, Tim Futing Liao eds. 2003. *Encyclopedia of Social Science Research Methods*. Sage Publications.

Lijhart, Arend. 1971. "Comparative Politics and the Comparative Method." *The American Political Science Review* 65 (September): 682-93.

Lin, Chun-Hung A. and Peter F. Orazem. 2003. "Wage Inequality and Returns to Education in Taiwan, 1978-96." *The Journal of Development Studies* 39 (June): 89-108.

Lin, Tengyi(林腾蚁). 2000. "The Development of Taiwan's Vocational Education (台湾技职教育的发展)." Thesis Collection, Zhengzhou University Shengda School of Management (郑州大学升达经贸管理学院学术报告集). China: Zhengzhou.

Lindert, Peter H.. 2003. "Voice and Growth: Was Churchill Right?" *The Journal of Economic History* 63 (June): 315-350.

Lindert Peter H. 2004. *Growing Public: Social Spending and Economic Growth Since the Eighteenth Century*. Cambridge: Cambridge University Press.

Lin, Yuti (林玉體). 1989. "Party Education and University Movement (當化教育与校園運動)." In *Taiwan New Social Movements (臺灣新興社會運動)*, eds. Hsu ,cheng-kuang and Sung, Wen-li et al. Taipei: Chuliu Publication.

Lin, Zhongxiong (林中雄). 1998. *台湾经验一百年 Taiwan Jingyan Yibainian (The One Hundred Year Experience of Taiwanese Economy).* Taibei: Sanmin Publisher(三民書侷).

Lipset, Martin S. and Jason M. Lakin. 2004. *The Democratic Century*. Norman: University of Oklahoma Press.

Lopez, Ramon, Vinod Thomas and Yan Wang. 1998. "Addressing the Education Puzzle: The Distribution of Education and Economic Reforms." World Bank working paper #2031.

Lott, John R. Jr. 1999. "Public Schooling, Indoctrination and Totalitarianism." *The Journal of Political Economy* 107 (December): 127-157.

Lukas, Robert E. and Donald Verry. 1999. *Restructuring the Malaysian Economy*. New York: St. Martin's Press.

Mahadevan, Renuka. 2006. "Growth with Equity, the Malaysian Case." *Asia-Pacific Development Journal* 13(June): 27-52.

Malaysia: The First Malaysia Plan, National Printing Department, Kuala Lumpur, 1966
The Second Malaysia Plan, National Printing Department, Kuala Lumpur, 1971
The Third Malaysia Plan, National Printing Department, Kuala Lumpur, 1976

The Fourth Malaysia Plan, National Printing Department, Kuala Lumpur, 1981
The Fifth Malaysia Plan, National Printing Department, Kuala Lumpur, 1986
The Sixth Malaysia Plan, National Printing Department, Kuala Lumpur, 1991
The Seventh Malaysia Plan, National Printing Department, Kuala Lumpur, 1996
The Eighth Malaysia Plan, National Printing Department, Kuala Lumpur, 2001
The Ninth Malaysia Plan, National Printing Department, Kuala Lumpur, 2006

Manning, Chris. 1998. "Does Globalization Undermine Labor Standards? Lessons from East Asia." *Australia Journal of International Affairs* 52 (2): 133-147.

Mares, Isabela. 2005. "Social Protection Around the World: External Insecurity, State Capacity, and Domestic Political Cleavages." *Comparative Political Studies* 38: 625-51.

Maric, Alexandra Natalia. 2002. "Gender, Human Capital and Growth: Barro and Lee Revisited". Ph.D. dissertation. Claremont: University of California. 62 pages.

Marshall, Monty, Keith Jaggers, and Ted Robert Gurr. 2003. *POLITY IV*.

Mauro, Paolo. 1998. "Corruption and the Composition of Government Expenditure." *Journal of Public Economics* 69 (2): 263-79.

Mauzy, Diane K. and R.S. Milne. 2002. *Singapore Politics Under the People's Action Party*. New York: Routledge.

McCleary, Richard and Richard Hay Jr. 1980. *Applied Time Series Analysis for the Social Sciences*. Beverly Hills: Sage Publications.

McGuire, James W. 1999. "Labor Union Strength and Human Development in East Asia and Latin America." *Studies in Comparative International Development* 33 (Winter): 3-34.

McGuire, James W. 2001. "Social Policy and Mortality Decline in East Asia and Latin America." *World Development* 29 (October): 2673-97.

McGuire James W. 2003. "Democracy, Social Policy and Mortality Decline in Thailand." working paper, Department of Government, Wesleyan University.

Meltzer, Allan H. and Scott F. Richard. 1981. "A Rational Theory of the Size of Government." *The Journal of Political Economy* 89 (October): 914-927.

Meyer, John W., Francisco O. Ramirez and Yasemin Nuhoglu. 1992. "World Expansion of Mass Education, 1870-1980." *Sociology of Education* 65 (April): 128-49.

Meyer, John W., Francisco O. Ramirez, Richard Rubinson and John Boli-Bennett. 1977. "The World Educational Revolution, 1950-1970." *Sociology of Education* 50 (October): 242-258.

Milanovic Branko. 2000. "The Median-Voter Hypothesis, Income Inequality, and Income Redistribution: An Empirical Test with the Required Data." *European Journal of Political Economy* 16 (September): 367-410.

Mingat, Alain. 1998. "The Strategy Used by High-performing Asian Economies in Education: Some Lessons for Developing Countries." *World Development* 26 (April): 695-715.

Ministry of Education, Taiwan. *Education in the Republic of China*, Various Years.

Ministry of Education, Taiwan. 1998. *Education Reform Action Plan* (教育改革行動方案).

Mok, Ka-ho Joshua. 2000. "Reflecting Globalization Effects on Social Policy: Higher Education Reform in Taiwan." *Journal of Education Policy* 15 (6): 637-660.

Mok, Ka-ho, Joshua. 2001. "Academic Capitalization in the New Millennium: Marketization and Corporatization of Higher Education in Hong Kong." *Policy & Politics* 29 (3): 299-315.

Mok, Ka-ho Joshua. 2002. "From Nationalization to Marketization: Changing Governance in Taiwan's Higher-Education System." *Governance: An International Journal of Policy, Administration, and Institutions* 15 (April): 137-159.

Mok, Ka-ho Joshua. 2003. "Similar Trends, Diverse Agendas: Higher Education Reforms in East Asia." *Globalization, Societies and Education* 1 (July): 201-221.

Morris, Paul and Anthony Sweeting.1995. *Education and Development in East Asia*. New York: Garland Publication.

Mosley, Layna. 2000. "Room to Move: International Financial Markets and National Welfare States." *International Organization* 54 (Autumn): 737-773.

Mukherjee, Bumba. 2003. "Political Parties and the Size of Government in Multiparty Legislatures." *Comparative Political Studies* 36 (6): 699-728.

Munck, Gerardo L. and Jay Verkuilen. 2002. "Conceptualizing and Measuring Democracy, Evaluating Alternative Indices." *Comparative Political Studies* 35 (February): 5-34.

Mukhopadhaya, P. 2003. “Trends in Income Disparity and Equality Enhancing (?) Education Policies in the Developing Stages of Singapore.” *International Journal of Educational Development* 23: 37-56.

Mundle Sudipto. 1998. “Financing Human Development: Some Lessons from Advanced Asian Countries.” *World Development* 26 (4): 659-72.

Munro-Kua, Anne. 1996. *Authoritarian Populism in Malaysia*. New York: St. Martin’s Press.

Murray, David. 1996. “The 1995 National Elections in Thailand: A Step Backward for Democracy?” *Asian Survey* 36 (April): 361-75.

Nakornthap, Silaporn. 1986. *Educational Policy and Politics in Thailand: A Case Study of Education Reform, 1973-77*. Florida: The Florida State University.

Neher, Clark. 1995. “Democratization in Thailand.” *Asian Affairs* 21 (Winter):195-209.

Neher, Clark. 1992. “Political Succession in Thailand.” *Asian Survey* 32 (July): 586-605.

Nelson, Joan M. 1990. *Economic Crisis and Policy Choice, the Politics of Adjustment in the Third World.* Princeton: Princeton University Press.

Nelson, Joan M. 2006. “Does Democracy Prepare Better Social Service?” Working Paper.

Niles Kimberly J. 2001. “Economic Adjustment and Targeted Social Spending: The Politics of Poverty Alleviation in the Developing World.” Ph.D. Dissertation. University of California at Los Angles, 199 pages.

Nordhaus, William. 1975. “Political Business Cycle.” *Review of Economic Studies* 42 (April): 1969-90.

Odedokun, M. O. and Jeffery I. Round. 2004. “Determinants of Income Inequality and its Effects on Economic Growth: Evidence from African Countries.” *African Development Review* 6 (September): 287-327.

Olson, M. 1982. *The Rise and Decline of Nations: Economic Growth, Stagnation and Social Rigidities.* New Haven, CT: Yale University Press.

Olson, Mancur. 1993. “Dictatorship, Democracy, and Development.” *American Political Science Review* 87 (September): 567-576.

Ono, Hiroshi. 2005. “Digital Inequality in East Asia: Evidence from Japan, South Korea, and Singapore.” *Asian Economic Papers* 4 (3): 116-139.

Pampel, Fred C. and John B. Williamson. 1989. *Age, Class, Politics, and the Welfare State*. Cambridge: Cambridge University Press.

Pathmanand, Ukrist. 2001. "Globalization and Democratic Development in Thailand: The New Path of the Military, Private Sector, and Civil Society." *Contemporary Southeast Asia* 23 (April): 24-43.

Perotti, Roberto. 1993. "Political Equilibrium, Income Distribution and Growth." *The Review of Economic Studies* 60 (October): 755-776.

Persson, Torsten, and Guido Tabellini. 2000. *Political Economics: Explaining Economic Policy*. Cambridge, MA: The MIT Press.

Phongpaichit, Pasuk and Chris Baker. 2002. *Thailand: Economy and Politics* (second edition). New York: Oxford University Press.

Pitiyanuwat, Somwung and Siridej Sujiva. 1999. "Civics Education in Thailand." *International Journal of Social Education* 14 (1): 42-51.

Plomp, Tjeerd, Ronanld E. Anderson, Nancy Law and Andreas Quale eds. 2003. *Cross-national Information and Communication Technology: Policy and Practices in Education*. Greenwich, Connecticut: Information Age Publishing.

Plumper, Thomas, Vera E. Troeger and Philip Manow. 2005. "Panel Data Analysis in Comparative Politics: Linking Method to Theory." *European Journal of Political Research* 44 (March): 327-354.

Plumper Thomas and Vera E. Troeger. 2007. "The Estimation of Time-Invariant Variables in Panel Analyses with Unit Fixed Effects." Working paper. Online at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=565904, accessed June 8, 2007.

Pong, Suet-ling. 1999. "Gender Inequality in Educational Attainment in Peninsular Malaysia." In *Gender, Education and Development: Beyond Access to Empowerment*, eds. Christine Heward and, Sheila Bunwaree. New York: Zed Books Ld.

Prammanee, Noppadol. 2003. "A Critical Analysis of Adoption and Utilization of the Internet in Thailand for Educational Purposes." *First Monday* 8 (January). http://www.firstmonday.org/issues/issue8_1/prammanee/index.html, accessed June 8, 2007.

Pritchett, Lant. 1999. "Where Has All the Education Gone?" Working Paper, revised December 21, 1999. World Bank.

Przewoski, A. and F. Limongi. 1993. "Political Regimes and Economic Growth." *Journal of Economic Perspectives* 7 (Summer):51-69.

Przeworski, Adam, Michael E. Alvarez, Jose Antonio Cheibub and Fernando Limongi. 2000. *Democracy and Development: Political Institutions and Well-Being in the World, 1950-1990.* MA: Cambridge University Press.

Psacharopoulos, George. 1994."Returns to Investment in Education: A Global Update." *World Development* 22(9):1325-43.

Psacharopoulos, G. and H.A. Patrinos. 2002. "Returns to Investment in Education: A Further Update."World Bank, Policy Research Working Paper, No. 2881.

Qin, Mengqun (秦夢群). 2005. "An Analysis on Taiwan's Subsidizing Policy to Private Universities（我國獎補助私立大學政策之分析)." *Education Information and Research (教育資料与研究*) (Taiwan) 63 (April): 37-62.

Quinn, Dennis. 1997. "The Correlates of Change in International Financial Regulation." *American Political Science Review* 91 (September): 531-551.

Rasiah, Rajah. 2003. "Manufacturing Export Growth in Indonesia, Malaysia and Thailand." In *Southeast Asian Paper Tigers?* ed. K.S.Jomo. New York: Routledge.

Ramesh, M. and Mukul G. Asher. 2000. *Welfare Capitalism in Southeast Asia*. New York: St. Martin's Press.

Ramirez, Francisco O. 1989. "Reconstituting Children: Extension of Personhood and Citizenship." In *Age Structuring in Comparative Perspective*, eds. David Kertzer and K. Warner Schaie. Hills-dale, NJ: Lawrence Erlbaum Associates.

Rao, M. Govinda. 1998. "Accommodating Public Expenditure Policies: the Case of Fast Growing Asian Economies." *World Development* 26 (4): 673-694.

Reinikka, Ritva and Jakob Svensson. 2004. "Local Capture: Evidence from a Central Government Transfer Program in Uganda." *The Quarterly Journal of Economics* 119 (2): 678-704.

Reuveny, Rafael and Quan Li. 2003. "Economic Openness, Democracy and Income Inequality." *Comparative Political Studies* 36 (June): 575-601.

Ritchie, Bryan K. 2005. "Progress Through Setback or Mired in Mediocrity? Crisis and Institutional Change in Southeast Asia." *Journal of East Asian Studies* 5: 273-313.

Rivera, Berta and Luis Currais. 2004. "Public Health Capital and Productivity in the Spanish Regions: A Dynamic Panel Data Model." *World Development* 32 (5): 871-885.

Rodrik, Dani. 1997. *"Has Globalization Gone Too Far?"* Washington DC: Institute for International Economics.

Rodrik, Dani. 1998. “Why do More Open Economies Have Bigger Governments?” *Journal of Political Economy* 106 (October): 997-1032.

Romer, Paul. 1986. "Increasing Returns and Long-Run Growth." *Journal of Political Economy* 94 (October): 1002-1037.

Rosnani, Hashim. 1996. *Education Dualism in Malaysia*. New York: Oxford University Press.

Rudra, Nita. 2002. “Globalization and the Decline of the Welfare State in Less Developed Countries.” *International Organization* 56 (Spring): 411-445.

Rudra, Nita and Stephen Haggard. 2005. “Globalization, Democracy and Effective Welfare Spending in the Developing World.” *Comparative Political Studies* 38 (November): 1015-1049.

Rogoff, Kenneth. 1990. “Equilibrium Political Budget Cycles.” *American Economic Review* 80 (March): 21-36.

Sachs, Jeffrey D., Andrew Warner, Anders Åslund; Stanley Fischer. 1995. “Economic Reform and the Process of Global Integration.” Brookings Papers on Economic Activity: 1-118.

Salai-Martin, Xavier. 1997. “I Just Ran Two Million Regressions.” *American Economic Review* 87 (2): 178-183.

Sakellaiou, Chris. 2003. “Rates of Return to Investments in Formal and Technical/Vocational Education in Singapore.” *Education Economics* 11(1): 73-87.

Schady, Norbert R. 2000. “The Political Economy of Expenditures by the Peruvian Social Fund (FONCODES), 1991-1995.” *American Political Science Review* 94 (June): 289-304.

Schafferer, Christian. 2003. *The Power of the Ballot Box, Political Development and Election Campaigning in Taiwan*. New York: Lexington Books.

Schultz, T. W. 1961. “Investment in Human Capital,” *American Economic Review* 51 (1): 1-17.

Segura-Ubiergo, Alex. 2002. “Globalization, Domestic Politics and the Welfare State in the Developing World: Latin America in Comparative Perspective.” PhD Dissertation. Columbia University.

Sharpe, L. and S. Gopinathan. 2002. “After Effectiveness: New Directions in the Singaporean System?” *Journal of Education Policy* 17(2): 151-166.

Siegle, Joseph T., Michael M. Weistain and Morton H. Halperin. 2004. “Why Democracies Excel.” *Foreign Affairs*, September/October.

Sloan, John and Kent L. Tedin. 1987. “The Consequences of Regime Type for Public Policy Outputs.” *Comparative Political Studies* 20 (April): 98-124.

Spring, Joel. 1998. *Education and the Rise of Global Economy*. Mahwah, NJ: Lawrence Erlbaum Associates, Inc.

Stasavage David. 2005a. “Democracy and Education Spending in Africa.” *American Journal of Political Science* 49 (April): 343-358.

Stasavage, David. 2005b. “The Role of Democracy in Uganda's Move to Universal Primary Education.” *Journal of Modern African Studies* 43 (1): 53-73.

Steinmo, Sven. 2002. “Globalization and Taxation: Challenges to the Swedish Welfare State.”*Comparative Political Studies* 35 (September): 839-862.

Stiglitz, Joseph E. 1996. “Some Lessons from East Asian Miracle.” *World Bank Research Observer* 11 (2): 151-78.

Stimson, James A. 1985. “Regression in Space and Time: A Statistical Essay.” *American Journal of Political Science* 29 (4):914-47.

Stock, J. and M. Watson. 1988. “Variable Trends in Economic Time-Series.” *Journal of Economic Perspectives* 2(3): 147-74.

Stockton, Hans. 2001. “Political Parties, Party Systems, and Democracy in East Asia, Lessons from Latin America.” *Comparative Political Studies* 34 (1): 94-119.

Stroup, Michael D. 2007. “Economic Freedom, Democracy and the Quality of Life.” *World Development* 35 (1): 52-66.

Sullivan, John L. and Stanley Feldman. 1979. *Multiple Indicators, an Introduction*. Sage University Publications.

Sung, Johnny. 1998. “Developmental Corporatism and the Process of change in Vocational Education and Training: the Singaporean Experience.” In *Changing Vocational Education and Training: An International Comparative Perspective,* eds. Ian Finlay, Stuart Niven and Stephanie Young. New York: Routledge.

Swank, Duane. 1998. “Funding the Welfare State: Globalization and the Taxation of Business in Advanced Market Economies.” *Political Studies* 46 (4): 671-692.

Taiwan, Council for Economic Planning and Development. 1980. "Manpower Plan in Ten Year Plan for Economic Development, Republic of China Taiwan (1980-89) (中華民國臺灣經濟建設十年計劃－人力發展部門計劃)."

Taiwan, Council for Economic Planning and Development. 1986. "Medium- and Long-Term Manpower Development Plan, Republic of China Taiwan (1986-00) (中華民國臺灣經濟建設人力發展部門中長期計劃)."

Taiwan, Council for Economic Planning and Development. 2007a. "Industrial Policy on the Way to Competitiveness (邁向競爭優勢的產業發展政策)." Online at http://www.cepd.gov.tw/business/business_sec3.jsp?businessID=3461&parentLinkID=3&linkid=69, accessed June 8, 2007.

Taiwan, Council for Economic Planning and Development. 2007b. "Blueprint for the Economic Development of a Green Silicon Island (綠色硅島經濟發展藍圖)." Online at http://www.cepd.gov.tw/business/business_sec3.jsp?businessID=483&parentLinkID=1&linkid=183, accessed June 8, 2007.

Taiwan, Council for Economic Planning and Development. 2007c. "The Second Manpower Development Plan in the New Century (2005-2008)(新世紀第二期人力發展計劃)." Online at http://www.cepd.gov.tw/business/business_sec3.jsp?businessID=2095&parentLinkID=8&linkid=91, accessed June 8, 2007.

Tan, Jason. 1997. "The Rise and Fall of Religious Knowledge in Singapore Secondary Schools." *Journal of Curriculum Studies* 29 (5): 603-924.

Tan, Jason. 1998. "The Marketisation of Education in Singapore: Policies and Implications." *International Review of Education* 44 (1): 47-63.

Tan, Peng Boon. 1997. "Human Resource Development for Continued Economic Growth, the Singapore Experience." Paper presented at the ILO workshop on Employers Organizations in Asia-Pacific in the Twenty-First Century, Turin, Italy, May 5-13, 1997.

Tanzi, Vito. 2002. "Globalization and the Future of Social Protection." *Scottish Journal of Political Economy* 49 (1):116-127.

Tarrow, Sidney. 1995. "Bridging the Quantitative-Quantitative Divide in Political Science." *American Political Science Review* 89 (2): 471-474.

Tavits, Margit. 2004. "The Size of Government in Majoritarian and Consensus Democracies." *Comparative Political Studies* 37 (3): 340-59.

Temple, Jonathan R.W. 2001. "Generalizations that aren't? Evidence on Education and Growth." *European Economic Review* 45: 905-918.

Teokul, Waranya. 1999. “Social Development in Thailand.” *ASEAN Economic Bulletin* 16 (3): 360-372.

Terai, Kimiko. 2004. “Redistribution Under Proportional Representation.” *Social Choice & Welfare* 22 (2): 371-389.

Thailand, Ministry of Education. 1999. *The 1999 National Education Act.*

Thailand, National Economic and Social Development Board.
The Second National Economic and Social Development Plan (1967-71), Bangkok, 1967
The Third National Economic and Social Development Plan (1972-76), Bangkok, 1972
The Fourth National Economic and Social Development Plan (1977-81), Bangkok, 1977
The Fifth National Economic and Social Development Plan (1982-86), Bangkok, 1982
The Sixth National Economic and Social Development Plan (1987-91), Bangkok, 1987
The Seventh National Economic and Social Development Plan (1992-96), Bangkok, 1992
The Eighth National Economic and Social Development Plan (1997-01), Bangkok, 1997
The Ninth National Economic and Social Development Plan (2002-06), Bangkok, 2002

Thomas, R. Murray, Goh Kim Leong and R.W. Mosbergen. 1980. “Singapore.” In *Schooling in the ASEAN Region,* eds. T. Nevilie Postlethwaite and Thomas R. Murray. New York: Pergamon Press.

Thongthew, Sumlee. 1999. “Education Development in Thailand.” *School Effectiveness and School Management* 10 (1):118-24.

Tilak, Jandhyala B.G. 1994. *Education for Development in Asia*. Thousand Oaks: Sage Publications.

Tilak, Jandhyala B.G. 1997. “Effects of Adjustment on Education: A Review of Asian Experience." *Prospects* 27 (1): 85-107.

Trocki, Carl A. 2006. *Singapore: Wealth, Power and the Culture of Control*. New York: Routledge.

Tsang, Steve. 1999. “Transforming a Party-State into a Democracy.” In *Democratization in Taiwan,* eds. Steve Tsang and Tun-jen Cheng. Hong Kong: Hong Kong University Press.

Turrini, Alessandro. 1998. “Endogenous Education Policy and Increasing Income Inequality between Skilled and Unskilled Workers.” *European Journal of Political Economy* 14 (2): 303-26.

UNESCO, World Education Forum. April 2000. Dakar, Senegal.

UNESCO Principal Regional Office for Asia and the Pacific. 1995. “National Profiles in Technical and Vocational Education in Asia and the Pacific.” Thailand: Bangkok.

Vanhanen, Tatu. 2000. “A New Dataset for Measuring Democracy, 1810-1998.” *Journal of Peace Research* 37 (2): 251-265.

Vasil, Raj. 2000. *Governing Singapore, A History of National Development and Democracy*. Australia: Allen & Unwin.

Velayutham, Selvaraj. 2004. “Affect, Materiality, and the Gift of Social Life in Singapore.” *Sojourn* 19 (1): 1-27.

Verma, Vidhu. 2002. *Malaysia: State and Society in Transition*. Boulder: Lynn Rienner Publishers.

Vidovich, Lesley and Tom O’Donoghue. 2003. “Global-local Dynamics of Curriculum Policy Development: A Case-Study from Singapore.” *The Curriculum Journal* 14 (Autumn): 351-370.

Wah, Francis Loh Kok. 2002. “Developmentalism and the Limits of Democratic Discourse.” In *Democracy in Malaysia,* eds. Wah, Francis Loh Kok and Khoo, Boo Teik. Richmond, Surrey: Curzon Press.

Wallerstein, Michael and Karl O. Moene. 2001a. “Inequality, Social Insurance, and Redistribution.” *American Political Science Review* 95 (4): 859-874.

Wallerstein, Michael and, Karl O. Moene. 2001b. “Targeting and Political Support for Welfare Spending.” *Economics of Governance* 2 (1): 3-24.

Wallerstein, Michael and Karl O. Moene. 2003. “Earnings Inequality and Welfare Spending: A Disaggregated Analysis.”*World Politics* 55 (4): 485-516.

Wang, Jiann-Chyuan and Mai, Chao-Cheng. 2001. “Industrial Development Strategy and Structural Transformation.” In *Taiwan’s Economic Success Since 1980*, eds. Chao-Cheng Mai and Chien-Sheng Shih. Morthampton: Edward Elgar.

Wang, Li-yun. 1996. “Higher Educational Expansion in Taiwan from 1950 to 1994: Patterns and Explanations.” Paper presented at the Annual Meeting of the Association for the Study of Higher Education (Memphis, TN, October 31-November 3, 1996).

Wang, Ru-jer. 2003. “From Elitism to Mass Higher Education in Taiwan: The Problems Faced.” *Higher Education* 46 (3): 261-287.

Wang, Shu-Twu(王仕圖). 2003. “The Social Welfare Policy in the Political Party Substitution: An Analysis of the Senior Citizens’ life Allowance of Middle-to-low Income Households(政黨輪替下的社會福利政策：以“中低收入戶老人生活津貼爲例”).” *Taiwan Social Welfare Journal* 4: 79-105. (http://www.sinica.edu.tw/asct/asw/journal/TJSW4_4.pdf)

Warren, E. 1977. *The Memoirs of Chief Justice Earl Warren.* Madison Books.

Wasi, Prawase. 2002. "An Overview of Political Issues." In *Reforming Thai Politics*, ed., Duncan McCargo. Copenhagen, Denmark: Nordic Institute of Asian Studies.

Wawro, Gregory. 2002. "Estimating Dynamic Panel Data Models in Political Science." *Political Analysis* 10 (1): 25-48.

Westerlund, Joakim. 2005. "Testing for Error Correction in Panel Data." Working Paper. Downloadable at http://ideas.repec.org/p/dgr/umamet/2006055.html, accessed June 8, 2007.

Wettasinghe,Cyraine Marrisa. 2002. "A descriptive study of the change and learning patterns of Singapore government primary school teachers in relation to the integration of information technology in education." Ed.D. Dissertation. The George Washington University. 139 pages.

White, Gordon and Roger Goodman. 1998. "Welfare Orientalism and the Search for an East Asian Welfare Model." In *the East Asian Welfare Model: Welfare Orientalism and the State*, eds. Roger Goodman, Gordon White and Huck-ju Kwon. New York: Routledge, 1998.

Wibbels, E. 2003. "Global Imperatives and Domestic Priorities: Internationalization, Business Cycles, and Social Spending in Latin America." Working Paper, University of Washington, Seattle.

Wilson, Sven E. and Daniel M. Butler. 2004."A Lot More to Do: The Promise and Peril of Panel Data in Political Science." Working Paper, Feb. 2004.

Wintrobe, Ronald. 1998. *The Political Economy of Dictatorship*. Massachusetts: Cambridge University Press.

Wong, Joseph. 2004. *Healthy Democracies, Welfare Politics in Taiwan and South Korea*. Ithaca, Cornell University Press.

Wong, Joseph. 2005. "Adapting to Democracy: Societal Mobilization and Social Policy in Taiwan and South Korea." *Studies in Comparative International Development* 40 (3): 88-111.

Wong, Soon Teck. 1993. "Education and Human Resource Development.", in *Challenges and Responses: Thirty Years of the Economic Development Board*, eds. Linda Low, Toh Mun Heng, Soon Teck Wong, Tan Kong Yam and Helen Hughes. Singapore: Times Academic Press.

Woo, Jennie Hay. 1991. “Education and Economic Growth in Taiwan, A Case of Successful Planning.” *World Development* 19 (8):1029-1044.

Wooldridge, Jeffrey. 2001. *Economic Analysis of Cross Section and Time Series Data.* Massachusetts: MIT Press.

World Bank. 1993. “The East Asian Miracle: Economic Growth and Public Policy.” World Bank Policy Research Report.

World Bank, Thailand. 2001. Secondary Education for Employment, Volume I: A Policy Note.

Wu, Yu-Shan. 2005. “Taiwan’s Domestic Politics and Cross-Strait Relations.” *The China Journal* 53 (January): 35-60.

Xue, Xiaohua (薛曉華). 1996. *Civil Education Reform Movement in Taiwan (臺灣民間教育改革運動)*. Taiwan, Taipei: Qianwei Publishing(前衛出版社).

Yang, Jae-jin. 2000. “The 1999 Pension Reform and A New Social Contract in South Korea.” Ph.D. Dissertation. Rutgers University.

Yang, Yi-Rong. 1994. “Education and National Development: The Case of Taiwan.” *Chinese Education & Society* 27 (6): 7-22.

Yap, O. Fiona. 2004. “Agenda Control, Budgetary Process, and Democracy: Effects on Government Spending in the Asian-Newly Industrialized Countries.” Paper presented at the annual meeting of the International Studies Association, Le Centre Sheraton Hotel, Montreal, Quebec, Canada, Mar 17, 2004 Online.

Yap, O. Fiona. 2005. *Citizen Power, Politics and the “Asian Miracle”*. Boulder: Lynne Rienner Publishers.

Yeung, Henry Wai-chung. 1999. “Regulating Investment Abroad: The Political Economy of the Regionalization of Singapore.” *Antipode* 31 (3): 245-273.

Zhen, Tianxi, Huanmo Yu and Piji Zhang (鎮天錫，余煥模&張丕繼). 1983. *The Formulation and Implementation of Manpower Policy (人力政策的形成与實施)*. Taiwan, Taipei: Lianjing Publishing Company(聯經出版事業公司).

Zheng, Guangpu and Jiachun Tong (鄭光甫&童甲春). 1996. “The Current Distribution of Education Spending and Directions for Reform (教育資源分配現狀檢討及改革方嚮).” Education Reform Committee, The Executive Yuan (行政院教育改革審議委員會), Taiwan.

Zhong, Qinghan. 1988. *Study on the Relationship between Education and Economic Development (教育与经济发展之研究)*. Taipei: Youshi Wenhua Publishing (幼狮文化事业公司).

Zhu, Jingyi and Jiahui Ye (朱敬一，葉家興). 1994. “Private Education in Taiwan: Examination of Current Status and Policy Recommendations (臺灣的私人興學－現狀檢討与政策建議).” Paper presented at the National Civil Education Reform Conference (全國民間教育改革會議), Jan. 8, 1994.

Curriculum Vitae

Jing Chen

EDUCATION

2000 – 2007 Political Science Department, Rutgers University, New Brunswick, NJ
Major Field: Comparative Politics
Minor Fields: International Relations and Political Theory
M.A. in Political Science awarded May 2004
Ph.D. in Political Science awarded October 2007

Statistics Department, Rutgers University, New Brunswick, NJ
M.S. in Statistics awarded May 2005

Summer 2007 The Interuniversity Consortium for Political and Social Research, The University of Michigan, Ann Arbor, Michigan
Program Certificate in Quantitative Methods of Social Research

1996 - 2000 School of International Studies, Beijing University, Beijing, P.R.China.
B.A. in International Relations awarded June 2000

1998 - 2000 Chinese Center for Economic Research, Beijing University, Beijing, P.R.China
B.A. in Economics awarded June 2000

PROFESSIONAL EXPERIENCE

2005 – 2007 Graduate Assistant, the Chair's Office, Political Science Department, Rutgers University. Sensitively assisted with departmental work.

Summer 2005 Intern, Examination and Testing Section, United Nations Headquarters, New York. Assisted analyzing the UN national recruitment exam scores. Conducted statistical training for section staff. Monitored, marked and updated Chinese Editorial Assistant Recruitment Tests.

2002 – 2005 Teaching Assistant, Political Science Department, Rutgers University. Taught the discussion sections of 01:790:102 Introduction to International Relations.

2002 – 2004 Research Assistant for Prof. Robert R. Kaufman, Political Science Department, Rutgers University. Collected and analyzed data using Excel, SPSS, R, and STAT for the project "Comparing Welfare Systems in Latin America, Eastern Europe and East Asia".

2001 – 2003 Consultant, Center for Middle Eastern Studies, Rutgers University. Coordinated two cultural exchange projects with China on the theme "The Impacts of Globalization".