ESSAYS ON INTERNATIONAL TRADE, PROTECTIONISM AND FINANCIAL FLOWS

by

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ABSTRACT OF THE DISSERTATION

Essays on International Trade, Protectionism and Financial Flows

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This dissertation brings together three essays investigating the changing dynamics of international trade, protection and financial flows since the mid-1980s, a period marked by the beginning of sharp increases in the worldwide flows of goods and capital. In the first essay, I study empirically the effect of Indian Antidumping (AD) cases on trade flows from other countries. India files the highest number of AD cases in the world, with an outstanding majority of such cases resulting in protection for the domestic firms. I also look at the effect of AD cases on *trade diversion* from countries subject to or "named" in AD investigations to non-subject or "non-named" countries and conclude that Indian AD policy is effective. I use a unique dataset combining AD data from the WTO with trade data from Comtrade. The empirical model is estimated via the Arellano-Bond procedure.

The second essay builds on the first one. Here, I use a capital market event study to empirically analyze the effects of the huge level and extent of Indian AD protection; in efficient capital markets such gains should be immediately capitalized in the protected firms' stock prices. I also perform cross-section regressions to study the influence of key firm variables on market reaction. I use a unique dataset combining AD data from the WTO with firm level stock price data from the Bombay Stock Exchange. Results

indicate that there is no perceptible response from the Indian stock market to AD protection. The cross-section results corroborate this evidence.

Finally, the third essay looks at the remarkable upsurge in global capital flows since the mid-1980's and associated issues in the current account and net external position of countries. The growing divergence between the current account and changes in the net international investment position of countries is looked at empirically and investigated with the aid of a model of BoP accounting. I estimate a probit model of currency crises using annual BoP data for a panel of 84 countries and conclude that the identity between the current account and changes in the net international investment position holds only in theory.

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Dedication

To My Parents

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Chapter 1

Introduction

The mid-1980s marked a watershed in the realm of international economics. The dynamics of the world economic system was changing; more and more countries were opening up their economies and aspiring to join the open world of the global economy. All around the world, countries started abolishing administrative and legal controls on international flows of goods and capital in an attempt to become more open and prosper. This dissertation analyses in three essays some effects of this worldwide change that started in the mid-1980s.

While theses changes brought about some benefits for everyone involved, they were not without their share of costs and risks. Multilateral institutions like the GATT and WTO stepped forward to help countries realize their ambitions of integrating to a broader global system with a view to raising standards of living, ensuring full employment and a large and steadily growing volume of real income and effective demand. But that also meant the abolition of various forms of existing trade protection like tariffs and quotas.

Deprived of their traditional means to restrict foreign competition, countries turned their attention to antidumping duties, a provision incorporated in article VI of the 1994 GATT to help countries deal with dumping, a situation of international price discrimination where the price of a product when sold in the importing country is less than the price of that product in the market of the exporting country.

Note that the use of antidumping duties was not something new; it had existed since its first inclusion in the 1947 GATT agreement. But before the 1980s, the use of antidumping was confined to a handful of developed economies. From 1980 through 1985, only four users, namely, the US, the EU, Australia and Canada accounted for

more than 99% of all antidumping filings. But by the early 1990s, new users were filing about a quarter of these cases and by the mid-1990s, new users accounted for more than half of all antidumping cases filed.

One of the surprise proliferators of antidumping in the lesser developed world was India, which soon emerged as the leading user of the antidumping provision. Chapter 2 chronicles the emergence of India as the foremost user of antidumping and looks at the effects on the size and direction of India's foreign trade from an economy-wide macro viewpoint.

Chapter 3 builds on the findings of the previous essay and takes them a step further. What is worth noting about India's use of antidumping is that despite the high number of cases, an overwhelmingly large proportion of these cases results in duties against imports. And these duties are abnormally high too. Who benefits from such high duties? If the domestic firms do in fact benefit from the protection against import competition that the antidumping duties are expected to provide, then that should be reflected in their daily stock returns. This essay presents the evidence on whether Indian investors derive any gains from the affirmative antidumping cases filed by domestic firms.

The mid-1980s also saw a tremendous surge in the volume of international capital flows. As countries lifted capital account restrictions and dismantled other barriers to investing overseas, the level of activity in international financial markets increased remarkably. With the spurt in capital flows around the world, the theoretical identity between countries' stock of the current account and the changes in the flow of net foreign assets started to weaken and become less and less relevant. This is the topic of discussion in the third essay in Chapter 4.

Thus, this dissertation empirically analyses the economic effects of interdependence among the open economies of the world under the new global system of trade and financial flows.

Chapter 2

The Trade Effects of Indian Antidumping Actions

2.1 Introduction

In the last 25 years, there has been a spectacular growth in the number of Antidumping (AD) cases filed by the members of the World Trade Organization (WTO). As tariffs and other forms of trade protection were restrained following the original GATT agreement, AD emerged as *the* trade policy of choice for both developed and developing nations alike. During the period January 1995 to December 2004, WTO members initiated a total of 2646 AD cases, out of which 1656 (62.6%) resulted in measures of some sort[1]. These numbers themselves generate research interest in AD, even if we ignore its numerous political and economic effects. This paper looks at India and the trade effects of its AD actions.

The WTO defines *dumping*, in general, as a situation of international price discrimination, where the price of a product when sold in the importing country is less than the price of that product in the market of the exporting country. Dumping is defined in the Agreement on Implementation of Article VI of the GATT 1994 (The Anti-Dumping Agreement) as the introduction of a product into the commerce of another country at less than its normal value. Under Article VI of GATT 1994, and the Anti-Dumping Agreement, WTO Members can impose anti-dumping measures, if, after investigation in accordance with the Agreement, a determination is made (a) that dumping is occurring, (b) that the domestic industry producing the like product in the importing country is suffering material injury, and (c) that there is a causal link between the two. In addition to substantive rules governing the determination of dumping, injury, and

[1]Source: WTO

causal link, the Agreement sets forth detailed procedural rules for the initiation and conduct of investigations, the imposition of measures, and the duration and review of measures.

The rationales for AD laws have long been subject to analysis by economists as well as lawyers due to the legal underpinnings of the theory and practice of AD [see for instance, Viner (1923), Barcelo (1971), Trebilcock and Quinn (1979), Deardorff (1993), Durling and McCullough (2005)]. The most frequently offered economic justification for AD laws is that they protect the competitive process and the consumer from the monopoly power of foreign exporters. The first AD legislation can be traced back to Canada (1904). The modern history of AD, however, begins with the inclusion of AD provisions in the 1947 GATT agreement. Nevertheless, AD disputes were relatively few and far between till the 1980's. The early, pre-1980 major users of AD were confined to: the US, the EU, Australia, Canada, South Africa and New Zealand[2].

The emergence of AD as a major instrument for regulating imports did not go unnoticed by the developing countries, however. By the end of the 1980's, more than thirty developing countries had become signatories or observers of the GATT antidumping and countervailing duty codes[3]. Gradually, with more and more developing countries joining the AD bandwagon, there came a time when their filing of AD cases took over those of the developed world.

Foremost among these emerging non-traditional users of AD was India. During the period 1995-2004, India initiated 400 cases (the highest of all WTO members), followed by the US (354), the EC (303), Argentina (192), South Africa (173) and Australia (172)[4]. During the period 1995-2003, total 1511 AD measures were imposed by various members. Out of these, 371 measures were imposed by the developed countries accounting for about 25% and the remaining 1140 measures were (approximately 75%)

[2]The WTO records 2,745 initiations of AD cases between 1947 and end-1994. However, they also warn that the data for this period is neither complete nor reliable and hence not posted on their website. It was only after the Tokyo Round Anti-Dumping Code became operational that signatories to the Code were required to notify anti-dumping action. There were a number of GATT Contracting Parties which had active anti-dumping units, but did not notify the anti-dumping bodies of their actions.

[3]Source: Finger (1993)

[4]Source: WTO

were imposed by the developing countries[5].

With such a huge number of cases being filed, the effects of AD on trade are of great interest to us. How do AD initiations and/or measures affect the flow of trade from the exporting to the reporting country? Related to this question is the issue of 'trade diversion'. Since AD protection is country-specific, AD duties are levied only on imports from countries named in the petition, henceforth called "subjects". *Non-named* countries (henceforth "non-subjects") might actually benefit from AD actions against *subject* countries due to diversion of trade flows. For the US, a number of empirical studies have looked at the issue of import diversion as a result of AD policy. Prusa (1997) uses data at the product level for the US and finds that there is significant trade diversion from subject to non-subject countries, and this diversion is directly related to the duties imposed. In contrast, Konings, Vandenbussche and Springael (2001) find that the AD policy of the EU seems to be more "effective"[6] than that of the US.

This paper undertakes a similar systematic study for India. India, as discussed earlier, has been the leading initiator of cases in the last 10 years, surpassing even the US and the EU. Moreover, a very high percentage of these cases initiated by India have resulted in AD measures being slapped on the importers in the form of very high duties. What effect does this have on the trade flows to India from the countries named in the petitions? Do trade flows fall significantly in response to AD cases? What percentage of the trade is diverted from the subject to the non-subject countries? In light of that, could we call Indian AD policy *effective*[7]?

Using a unique dataset combining AD data from the WTO with trade data at the product level, I empirically investigate the changes in the size and direction of trade flows to India in response to AD legislation. I find that Indian AD law is moderately effective in limiting import competition to domestic traders. In the first three years

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[5]Source: Annual Report 2003-2004, Indian Ministry of Commerce and WTO

[6]Konings, Vandenbussche and Springael (2001) define the effectiveness of AD policy only in terms of the degree of diversion of imports from subjects to non-subjects. In their opinion, the "... amount of trade diversion induced by antidumping policy can reflect the effectiveness of antidumping policy as a tool for protection".

[7]There can potentially be two conditions under which an AD policy can be termed "effective"; if it reduces imports or if it helps in alleviating material injury. This paper does not address the latter.

after a case is filed, imports from subject countries fall by as much as 29 per cent. Non-subject countries, however, manage to mitigate some of this impact by increasing their trade flows to India by about 11 per cent in the 2 years after a case is filed, and hence, trade diversion does occur. But despite that, overall imports are observed to fall in response to Indian AD legislation.

The remainder of this chapter is structured as follows. Section 2 discusses the salient features of the unique case that is India. Section 3 looks at the trade effects fo Indian AD actions. The econometric model and estimation are presented in section 4. The results constitute section 5. Finally, section 6 concludes with a few comments.

2.2 The Case of India

India joined the AD bandwagon fairly late. While the national legislation on AD had been enacted in 1985, the first case of AD was initiated only in 1992. This initial sluggishness, however, was soon compensated by an avalanche of cases. Table 1 below shows that between 1995 and 2004, India initiated 400 cases against different countries– the maximum being against China (76), followed by the EC (35).

Indian AD law follows WTO standards and regulations. The relevant legislation is covered under the Customs Tariff (Identification, Assessment and Collection of Duty or Additional Duty on Dumped Articles and for Determination of Injury) Rules, 1985 and sections 9, 9A, 9AA, 9B and 9C of the Customs Tariff Act, 1975 as amended in 1995. A single authority, the Directorate General of Anti Dumping and Allied Duties (DGAD), under the Ministry of Commerce is designated to initiate necessary action for investigations and subsequent imposition of AD duties. A dumping investigation is normally initiated only upon receipt of a written application by or on behalf of the 'domestic industry'. In order to constitute a valid application, the domestic producers expressly supporting the application must account for *no less than 25%* of the total production of the like article by the domestic industry, and they must account for *more than 50%* of the total production of the like article by those expressly supporting or opposing the application. The Indian industry must be able to show that dumped

imports are causing or are threatening to cause 'material injury' to the Indian industry. The duration of investigation is usually 12 months, but it can be extended up to no more than 18 months. An AD duty once imposed, unless revoked, remains in force for 5 years from the date of imposition.

The legal paraphernelia notwithstanding, India *does* file an astoundingly high number of cases per year and what is also noteworthy is that *so many* of these cases result in very high duties. Let us look at the dataset I have assembled for estimation in this paper. India filed a total of 285 cases between 1992 and 2002 at an average of 25.9 cases per year(see Table 2).

Out of these 285 cases, ignoring the cases with missing data,

- There was some form of Preliminary duty in 212 cases (97.24%)
- There was some form of Final duties in 230 cases (96.23%)
- There was only one case in which evidence of "no dumping" was recorded finally
- There were only 2 cases in which evidence of "no injury" was recorded finally
- Only 6 cases were "withdrawn"
- The average Preliminary Duty was 80.91%
- The average Final Duty was 77.41%
- The highest absolute duty (both preliminary and final) recorded in the dataset is 693%[8] !!

With such high duties on an average and such a high percentage of cases resulting in duties, we can definitely expect some effects on trade. The following section investigates the trade effects of India's AD actions[9].

[8]This duty was recorded in a case against the People's Republic of China, which has been named the maximum number of times in all Indian petitions together.

[9]If data were available, an additional means of documenting the degree of protectionism implied by Indian AD law could be the percentage of material injury decisions that were affirmative on the basis of threat. Decisions based simply on threat rather than actual injury are indicative of a more protectionist regime. Hartigan, Kamma and Perry (1989) find the value of threat determinations to be greater than actual injury for US firms.

2.3 The Trade Effects of India's AD Actions

The Data

To examine the trade effects of AD cases, time series trade data for each AD case had to be constructed. To do this, I started by collecting the Harmonized System Codes or HS Codes[10] named for each of the 285 AD petitions filed by India in the period 1992–2002[11]. Depending on the year of the case, some of the products in some of the cases were identified by 8-digit HS codes, while some others had 6 or 4-digit codes. To reduce this discrepancy, I aggregated all the available codes to their 6-digit equivalent[12].

Once the HS codes were collected, import trade data for the products under investigation were extracted from the United Nation's Commodity Trade Statistics Database (COMTRADE), which stores annual international trade statistics, provided by over 130 countries, detailed by commodity and partner country; all values are converted to US dollars and metric units and the coverage dates as far back as 1962. Then time series for the products involved were constructed from 1992 to 2002. Imports were deflated using the CPI (1987 dollars).

The AD data was collected from the semi-annual reports submitted by India to the WTO's Committee on Anti-Dumping Practices. These reports are tabulated by the WTO and are available on the WTO website. For the purpose of these tables, each initiation and measure reported covers one product imported from one country. For this paper, I distilled the relevant AD information from these reports and merged that with the already created time series for imports to create the final dataset used for estimation.

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[10]The Harmonized System (HS), is an international method of classifying products for trading purposes. This classification is used by customs officials around the world to determine the duties, taxes and regulations that apply to the product.

[11]Source: Bown, Chad P., Global Antidumping Database Version 1.0, Brandeis University and Development Research Group, The World Bank

[12]To get to 6-digit codes from 4-digit ones, I included all the available 6-digit codes corresponding to a particular 4-digit code. For example, if corresponding to 1234 (a 4-digit code), we have three 6-digit codes 123401, 123402 and 123403, then we include all of them. It might be that out of these three, one did not get hit by an AD case and hence the inclusion of that might lead to underestimation of the effects of the cases. However, this distortion is likely to be minimal given the small number of cases treated this way.

Filing Behavior– A First Look at Imports

The set of countries subject to Indian AD investigations between 1992 and 2002 is quite large–about 40 countries comprising all major trading partners. While the majority of the cases are against the prominent developed countries like the US and the EC and the export-oriented growth countries such as South Korea and Taiwan, small countries such as Bangladesh and Iran have also been subject to AD investigations. As noted earlier, China leads the tally by a huge margin, followed only distantly by the EC. South Korea comes in third position. Table 3 below shows the countries most frequently named in AD petitions by India.

Before we delve into the details of the econometric results, let us take a cursory look at the import data over the period 1992-2002. One small complexity arises from the fact that due to the diversity of the AD cases, the volume of trade is in millions of dollars in some cases, while it is only a few thousand dollars in some other cases. To control for this variation, I plot normalized imports instead of just imports. Thus, the "normalized import" variable for a particular case in some year is the import value of that year divided by the import value in the year in which *that* case was initiated (year t_0). The year following initiation is thus t_1, the year after that t_2, and so on. The years preceding the initiation of the case are, similarly, t_{-1}, t_{-2}, and so on. Note that, for most of the cases, the investigation period is one year (maximum 18 months under unusual circumstances). Hence, depending on which month of the year the case was filed, it is being investigated during t_0 or t_1.

Subject Country Imports

First, look at the changes in the normalized imports of the *subject* countries in Figure 1. The trends look as one would expect. In general, when duties are levied, trade from the subject country is restricted. In the year t_0, that is, right after the case is filed and during the duration of investigation, imports drop by a large amount (91%) from the pre-petition level; by the next year t_1, imports have already started going up again (rise by 53%). However, they never regain their pre-petition high. Thus, these

findings suggest that AD duties do have a substantial impact on trade from the subject country, but the largest restriction seems to occur in the very short run. The fact that trade falls by the largest amount in year t_0 is consistent with Staiger and Wolak's (1994) finding that there is a substantial "investigation effect" of an AD petition— simply the threat of a high duty has a dampening effect on trade flows.

It might seem surprising that imports are back on the upward trend as early as t_1. How can subject imports grow when such high duties are levied? Prusa (1997) argues that while this result might appear strange on the surface, it, in fact, underscores a unique characteristic of AD protection. When the subject country raises its Indian market price by the full amount of the AD duty (without changing the home market price), it does not have to pay the assigned duty at all[13]. Thus the AD duty creates a *price floor* for the subject country's products. From that viewpoint, small duties might be beneficial for the subject country. The other key reason, Prusa (1997) argues, is that the competing firms typically find that competition forces them to cut their price. If instead, they can find another way to reduce the incentive to undercut their rivals, then they would be better off with higher prices. Thus the AD duty works as a government mandated price floor. A small duty will raise the subject country's AD-distorted price only slightly above the original price. Hence, in that case, the AD duty might serve to create desirable coordination benefits.

Imports From Non-Subject Countries

While AD investigations do have some restrictive impact on imports from subject countries, at least in the short run, countries not named in the petitions and hence not subject to the investigations might actually benefit by increasing their sales to India. This diversion of trade from subject to non-subject countries can offset the restrictive effects of AD. In Figure 2, we look at the normalized imports from non-subject countries and find that this diversion does indeed happen. Between t_0 and t_1, imports from non-subject countries jumped upwards by 78% on an average. This surge, however, was short run and by the end of t_2, their imports had fallen by about 21% from the initial

[13]It would, however, have to ask for an administrative review and another investigation would ensue

post-investigation peak. This is consistent with our observations in the case of the subject countries above.

Overall Imports

Finally, Figure 3 below shows the effect on imports from all source countries (both subject and non-subject). There are two broad trends worth noting. First, AD actions have a much *smaller* impact on overall imports than on subject country imports. For instance, between periods t_0 and t_1, overall imports fall by about 52%. While imports do go up from t_1 to t_2, the increase is only about 6.5%. Thus, it is true that the ability of non-subject countries to increase their imports to India somewhat dampens the restrictive effects of AD actions.

Secondly, the existence of trade diversion does not imply that AD duties have no effect at all on overall import trade. Overall imports *do* fall in response to AD legislation, albeit by a smaller amount, but still considerably so. Besides, even when overall imports grow, the rate of growth is much smaller than what we saw in the above two cases. Hence, we can conclude that Indian AD policies do have an overall restrictive effect on trade flows.

The Effect on Unit Values and Quantities

Underlying the changes in imports are the changes in prices (unit values) and quantities. Since no price data were recorded directly, I constructed the series of unit values from import data (dollar values and quantities traded). Figure 4 shows the effect of AD actions on unit values (normalized to t_0 values) charged by the *subject* countries. As expected, unit values start rising sharply by the end of the investigation period t_1 and by period t_3, they have reached almost their pre-case high. We have to remember that unlike tariffs, the subject country can avoid paying AD duties if it raises its Indian market prices by the full duty amount. According to Prusa (1997), a mandated price floor that is only a small amount greater than current prices could easily allow the foreign firm to price like a Stackelberg leader— it is likely that the Indian industry

benefits from the increased prices charged by foreign firms, and hence, particularly in low duty cases, the AD duty provides coordination benefits for rivals.

In Figure 5, the effects on unit values from non-subject countries are depicted. They show a similar trend— as subject country unit values increase, so do unit values of non-subject countries. This corroborates the theoretical notion that the price effects of AD actions cascade to non-subject countries [Prusa (1997)]. Price increases in response to AD actions cause other foreign rivals to increase their prices.

Figures 6 and 7 depict the *quantity effect* of AD duties for subject and non-subject countries respectively. Once again, the results are exactly as expected. Between periods t_0 and t_1, traded quantities (also normalized to t_0 values) for subject countries fall substantially. While they do recover somewhat after period t_2, that recovery is not permanent, nor do the levels ever come close to the pre-investigation high. On the other hand, the non-subject countries seem to benefit from the loss of the subjects. Their quantities go up by significant amounts right after the case is filed.

2.4 The Model & Estimation

The Model

Since the dataset constructed is a dynamic panel, I use a Generalized Method of Moments (GMM) instrumental panel estimator, proposed by Arellano and Bond, on differenced data to capture the cross-country evidence as well as the temporal aspects of changing patterns in import flows, while keeping in mind the need for consistent estimators. To generalize, I estimate a model of the form

$$y_{i,t} = \delta_1 y_{i,t-1} + \delta_2 y_{i,t-2} + x'_{i,t}\beta + u_{i,t} \tag{2.1}$$

where $y_{i,t}$ is a variable measuring imports ($ values traded in this case) which depends on its own lag, δ_1 and δ_2 are scalars, $x'_{i,t}$ is the $1 \times K$ vector of explanatory variables and β is a $K \times 1$ vector.

We will assume that the error $u_{i,t}$ follow a *one-way error component* model

$$u_{i,t} = \mu_i + \nu_{i,t} \tag{2.2}$$

where $\mu_i \sim IID\left(0, \sigma_\mu^2\right)$ and $\nu_{i,t} \sim IID\left(0, \sigma_\nu^2\right)$ are independent of each other and among themselves. μ_i denote the individual-specific residual, differing across cases but constant for a given case. Thus the cross-section is identified by the cases, while the time series variation is driven by the annual observations on import trade before and after the AD petition.

Since $y_{i,t}$ is a function of μ_i, the lagged dependent variable $y_{i,t-1}$ is also a function of μ_i. Hence, $y_{i,t-1}$, a right-hand regressor in (2.1), is correlated with the error term. This renders the OLS estimator biased and and inconsistent even if the $\nu_{i,t}$ are serially uncorrelated. The standard way of estimating (2.1) via the fixed-effects (FE) estimator eliminates μ_i, but the FE estimator will be biased and potentially inconsistent since $y_{i,t-1}$ will be correlated with the FE-transformed residual by construction. A similar problem exists for $y_{i,t-2}$.

Arellano and Bond (1991) suggest a two-step GMM estimator that gives consistent estimates provided there is no second order serial correlation among the errors. To obtain consistent estimates of δ_1, δ_2 and β, we can take a first difference of equation (2.1) to eliminate the individual country-specific effect μ_i, which gives the following equation

$$\begin{aligned} y_{i,t} - y_{i,t-1} &= \delta_1 \left(y_{i,t-1} - y_{i,t-2}\right) + \delta_2 \left(y_{i,t-2} - y_{i,t-3}\right) \\ &+ \left(x'_{i,t} - x'_{i,t-1}\right)\beta + \left(\nu_{i,t} - \nu_{i,t-1}\right) \end{aligned} \tag{2.3}$$

By construction, $y_{i,t-1}$ and $y_{i,t-2}$ will be correlated with the transformed residual $\left(\nu_{i,t} - \nu_{i,t-1}\right)$, so we need to estimate the transformed equation (2.3) with instrumental variables (IV). There are a multitude of moment conditions that can be exploited

to derive instruments. For all time periods, both $y_{i,t-3}$ and lagged values of $x'_{i,t}$ are valid instruments. Arellano and Bond (1991) argue that additional instruments can be obtained if one utilizes the orthogonality conditions that exist between lagged values of $y_{i,t}$ and the disturbances $\nu_{i,t}$.

Arellano and Bond (1991) propose a test for the null hypothesis of no second order serial correlation between the errors of the first differenced equation (2.3). The importance of this test arises because the consistency of the GMM estimator relies on the condition that $E\left\lfloor \Delta\nu_{i,t}\Delta\nu_{i,t-2}\right\rfloor = 0$. This hypothesis is true if the $\nu_{i,t}$ are not serially correlated or follow a random walk. Under the latter situation, both OLS and GMM of the first-differenced version of (2.1) are consistent and Arellano and Bond (1991) suggest a Hausman-type test based on the difference between the two estimators. Additionally, they suggest Sargan's (1958) test of overidentifying restrictions. However, I use a "robust" version of the Arellano-Bond test that assumes heteroskedastic errors, and hence do not report the Sargan test statistic.

The Estimation

The basic specification used for the estimation is

$$\begin{aligned}
\ln x^{j}_{i,t_k} &= \alpha + \beta_0 \ln x^{j}_{i,t-1} + \beta_1 \ln x^{j}_{i,t-2} + \beta_2 \left(\ln FinalDuty_i \times t_0\right) \\
&+ \beta_3 \left(\ln FinalDuty_i \times t_1\right) + \beta_4 \left(\ln FinalDuty_i \times t_2\right) \\
&+ \beta_5 \left(\ln FinalDuty_i \times t_3\right) + \beta_6 \left(\ln FinalDuty_i \times t_4\right) \\
&+ \beta_7 Year_{t_k} + \epsilon_{i,t_k} \qquad (2.4)
\end{aligned}$$

The variable x^{j}_{i,t_k} denotes the value of imports for case i at time $t_k\,(k = 0, \ldots, 9)$, belonging to the country group j (subject, non-subject). Time is normalized in such a way that t_0 refers to the period of the initiation of the case, t_1 to the period of investigation, while periods t_2 through t_9 refer to the years following the outcome of the case. We expect to find a negative effect of antidumping policy on the imports of product i for the subject countries and a positive effect (implying *trade diversion* for

the non-subject countries).

The explanatory variables on the right hand side of equation (2.4) include the two immediate lags of the value of imports prior to the initiation of the case, in periods t_{-1} and t_{-2} respectively. We include these variables to control for the size effects of initial imports and for the evolution of imports prior to an antidumping legislation. This could be important, since the average total import value for subject countries is smaller than that for the non-subject countries as shown in Table 4.

The other expalanatory variables include five interacted duty terms of the form $(\ln FinalDuty_i \times t_p)$. These terms capture the staggered effect of the duty in the years following the initiation of a case, $(p = 0, \ldots, 4)$. Thus, for example, for each case i, the term $(\ln FinalDuty_i \times t_1)$ equals the value of the duty if the year is $t = 1$, while it is zero in all other years. Finally, we include calendar year dummies $(Year_{t_k})$ in the estimation to control for macroeconomic trends. This could be relevant if firms are more likely to file a petition during recessions, when dumping and injury are more likely to be demonstrated.

2.5 The Results

Subject Countries

The second column of Table 5 presents the Arellano-Bond estimates of equation (2.4) for the subject countries. The results are as expected– AD actions cause a drop in import values for the subjects as indicated by the negative signs of the coefficients. Given our specification, the estimated coefficients are the respective elasticities. Recall, that the average preliminary duty is about 81% while the average final duty is about 77%. The implication of such huge duties is that even with the relatively smaller-looking elasticities in table 5, the drop in trade will be significant.

In period t_0 itself, just after the initiation of the case, we can expect a drop in trade by about 7.4%. In the subsequent period t_1, the period of investigation, import values drop by another 11.8%; the year following that, after the decision has been made there is a 13.2% drop. That is equivalent to approximately a 29 per cent drop in trade

values in the first three years since initiation. While the values for the years after t_2 are not statistically significant, the signs continue to be negative indicating a decline in imports.

Non-Subject Countries

The results from the non-subject countries help characterize the extent of import diversion. As expected, the key elasticities in the third column of table 5 are positive in sign, indicating that non-subject countries do respond to the reduction in trade by subject countries by increasing their sales to the Indian market. In the year that the case is filed (period t_0), non-subject imports go up by more than 4.5 per cent. In the next period, t_1 , this increase is close to 7.5 per cent. In other words, in just 2 years since the filing, there is a hike in import values by 11.25 per cent. However, once again, the elasticites are smaller in value than anticipated. Thus we may conclude that while there is ample evidence of trade diversion, the extent of it is not so much as to mitigate the restrictive effects of the AD policy entirely. In this sense, we might say that Indian AD legislation is "effective". If import diversion were complete, all the expenses and efforts associated with the filing of cases might not be of any gain to the Indian industry.

All Countries

Table 5, column 4 presents the estimates for overall imports and bears out our claim that while trade diversion does exist, AD policy still manages to provide the Indian industry some protection. In the first year (period t_0), total imports fall by 4.1 per cent; in the subsequent years it falls by 5.7 per cent and 7.2 per cent (periods t_1 and t_2 respectively). While these numbers are not as big as those for just subject countries, they still amount to about a 16 per cent drop in overall imports in the 3 years since initiation.

A Note on the Size of the Trade Effects

It is true that given our preceding discussion regarding Indian AD, the estimated elasticities are somewhat smaller than expected and, therefore, so are the resulting

trade effects. Moreover, given the effort spent in negotiating preferential trade agreements involving tariff cuts far smaller than these duties, one would anticipate that the estimated elasticities would be larger. Prusa (2001) argues that in competitive markets one would expect a 10 per cent tariff to be a significant barrier.

Several hypotheses can be put forward to explain the relatively small estimates. First, as mentioned before, foreign firms may raise their Indian market price in response to the AD duty. In terms of the estimated impact on the value of trade, such price adjustments might diminish the measured impact of AD duties. Secondly, AD duties vary largely from case to case. Although the average final duty is 77%, the median duty is only 66%, suggesting that there are cases with rather high duties. In fact, the data shows that there are 18 cases with duties higher than 150%. The wide disparity in duties across cases might make the constant elasticity assumption inappropriate.

More importantly, in this particular case, the smallness of the effects might stem from the nature of the AD filing data and the estimation of equation (2.4). Specifically, I deem t_0 to be the period (year) of initiation of a case and t_1 as the period of investigation. The preceding year, t_{-1} then becomes the period prior to initiation and t_2 the period subsequent to initiation and investigation. The demarcation of periods in this way might cause a bias in the results.

While the above is true if the petition is filed in the last quarter of the year, it is not the case if it is filed in the first quarter. Additionally, the classification of t_0 and t_1 is ambiguous for petitions filed in the second and third quarters. Thus the periods t_0 and t_1 are somewhat corrupted by the timing of the filings; if a petition were filed at the end of the year, it may bias the results downward (accounting for the less than anticipated impact of the Indian AD policy).

To get a cleaner measure of the change between pre and post filing scenarios, the comparison should be t_2 to t_{-1}, i.e., the more important elasticity to look at after the estimation of equation (2.4) is thus β_4, which extracts the isolated effect on trade flows between pre-initiation and post-investigation periods. In fact, from Table 5 we find that subject country imports fall by 13.2 per cent in t_2, the largest drop among all 3 years t_0, t_1 and t_2. The drop in overall imports also happens to be the largest in the

period t_2, 7.2 per cent, as obtained from Table 7.

An Alternative Specification: Time Dummies

As discussed above, the elasticities estimated from the basic specification (2.4) by the Arellano-Bond procedure fall short of expectations. Using an alternative specification, I also estimate and report the coefficients using just a series of time dummies (normalized by t_0), in addition to the two lags of log imports. These estimates are reported in the second, third and fourth columns of Table 6 for subjects, non-subjects and overall imports respectively. The results are consistent with our basic findings noted earlier.

2.6 Concluding Comments

In this paper, I have documented the effects of Indian antidumping actions on Indian imports by using WTO and Comtrade data at the product (HS-code) level. With the dramatic increase in the number of developing countries resorting to AD actions in the last quarter of a century, it is interesting to check what impact they have on trade. The Indian evidence presented in this paper indicates that AD does have a significant restrictive impact on imports from subject countries. Trade diversion to non-subjects does water down the benefits to the Indian industry to some extent, but fails to wipe it out altogether so that, overall the AD policy of India helps to check unwanted imports and hence might qualify as "effective". The fact that almost 300 cases were filed in just about a decade leaves little doubt that Indian firms will continue to frequently use AD law to reduce import competition.

2.7 Tables for Chapter 2

Table 1: India vs Others 1995-2004

Australia	1	Macedonia	2
Austria	2	Malaysia	7
Bangladesh	1	Mexico	2
Belarus	1	Nepal	2
Belgium	2	Netherlands	1
Brazil	6	New Zealand	1
Bulgaria	1	Nigeria	1
Canada	5	Oman	1
China, P.R.	76	Philippines	1
Chinese Taipei	29	Poland	4
Czech Republic	4	Portugal	1
Denmark	1	Qatar	1
European Community	35	Romania	5
Finland	1	Russia	14
France	5	Saudi Arabia	5
Georgia	1	Singapore	18
Germany	10	South Africa	6
Hong Kong	6	Spain	4
Hungary	2	Thailand	16
Indonesia	15	Turkey	4
Iran	8	Ukraine	8
Italy	3	United Arab Emirates	5
Japan	20	United Kingdom	3
Kazakhstan	3	United States	21
Korea, Republic of	28	Venezuela	1

Table 2: Cases Filed by Year: 1992-2002

Year	Number of Cases
1992	8
1994	7
1995	6
1996	21
1997	13
1998	26
1999	65
2000	41
2001	75
2002	23
Total	285

Table 3: Countries Most Frequently Named: 1992-2002

Exporting Country	Number of Cases
China	55
EC	22
South Korea	20
Former USSR	19
Japan	19
China Taiwan	16
Singapore	14
USA	14

Table 4: Summary Statistics

Import	Statistic	Subject	Non-subject	Overall
\$ values at t_0	Mean Median	3618513 560317.2	28500000 3860403	54700000 1031760
Growth Rates (t_{-1} to t_0)	Mean Median	0.7202249 -0.0535377	0.2491674 0.0489441	0.4846962 0.0388892

Table 5: Arellano-Bond Estimates—Basic Specification

Variable	Subjects	Non-subjects	Overall
Direct Effects:			
Constant	0.106	0.025	-0.245
	(-0.102)	(-0.015)	(-0.107)**
Ln (Import Values in t-1)	0.397	0.302	0.427
	(0.064)***	(0.082)**	(0.056)***
Ln (Import Values in t-2)	0.077	0.149	0.088
	(0.041)*	(0.050)**	(0.037)**
Cross Effects: Ln Final Duty * Time Dummy			
$Ln(Duty) * t_0$	-0.074	0.046	-0.041
	(0.022)***	(0.023)*	(0.017)**
$Ln(Duty) * t_1$	-0.118	0.076	-0.057
	(0.038)***	(0.023)**	(0.028)**
$Ln(Duty) * t_2$	-0.132	0.056	-0.072
	(0.043)***	(-0.031)	(0.032)**
$Ln(Duty) * t_3$	-0.073	-0.013	-0.054
	(-0.06)	(-0.054)	(-0.044)
$Ln(Duty) * t_4$	-0.039	-0.018	-0.029
	(-0.071)	(-0.039)	(-0.048)

Standard Errors in parentheses. Calendar year dummies estimated, but not reported.
***, ** and * indicate significance at 1%, 5% and 10% respectively.

Table 6: Arellano-Bond Estimates—Alternative Specification

Variable	Subjects	Non-subjects	Overall
Direct Effects:			
Constant	-0.053	0.053	0.072
	(0.192)	(0.431)	(0.057)
Ln (Import Values in t-1)	0.415	0.352	0.442
	(0.063)**	(0.081)**	(0.054)**
Ln (Import Values in t-2)	0.079	0.169	0.086
	(0.040)	(0.049)**	(0.036)*
Years Following AD Petition (Time Dummies)			
t_0	-0.283	0.172	-0.142
	(0.0926)**	(0.089)*	(0.071)*
t_1	-0.483	0.258	-0.230
	(0.147)**	(0.093)**	(0.105)*
t_2	-0.564	0.161	-0.309
	(0.158)**	(0.106)	(0.114)**
t_3	-0.297	-0.149	-0.231
	(0.216)	(0.173)	(0.153)
t_4	-0.132	-0.136	-0.116
	(0.225)	(0.123)	(0.147)

Standard Errors in parentheses. Calendar year dummies estimated, but not reported.
** and * indicate significance at 1% and 5% respectively.

2.8 Figures for Chapter 2

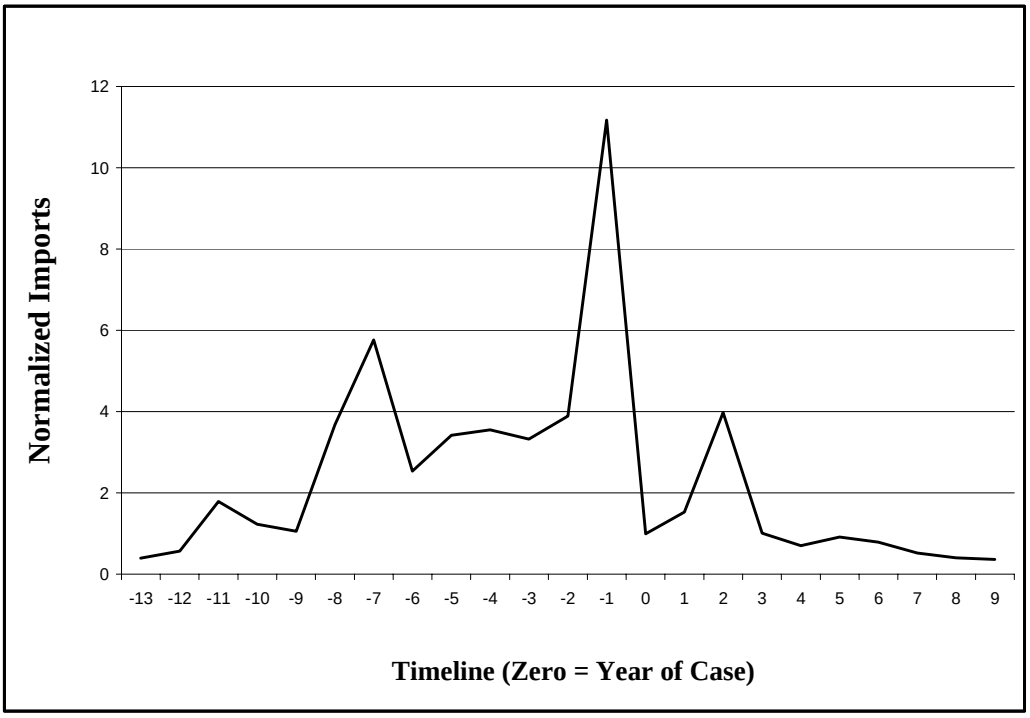


Figure 1: Value of Imports (Subject Countries Only)

Figure 2: Value of Imports (Non-Subject Countries Only)

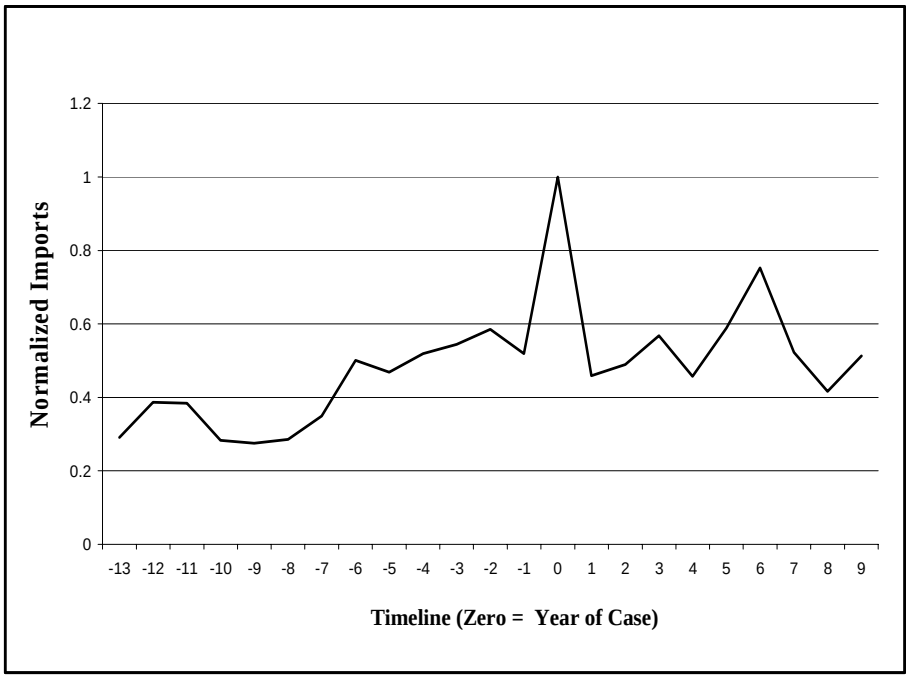


Figure 3: Value of Imports (All Countries)

Figure 4: Unit Values (Subject Countries Only)

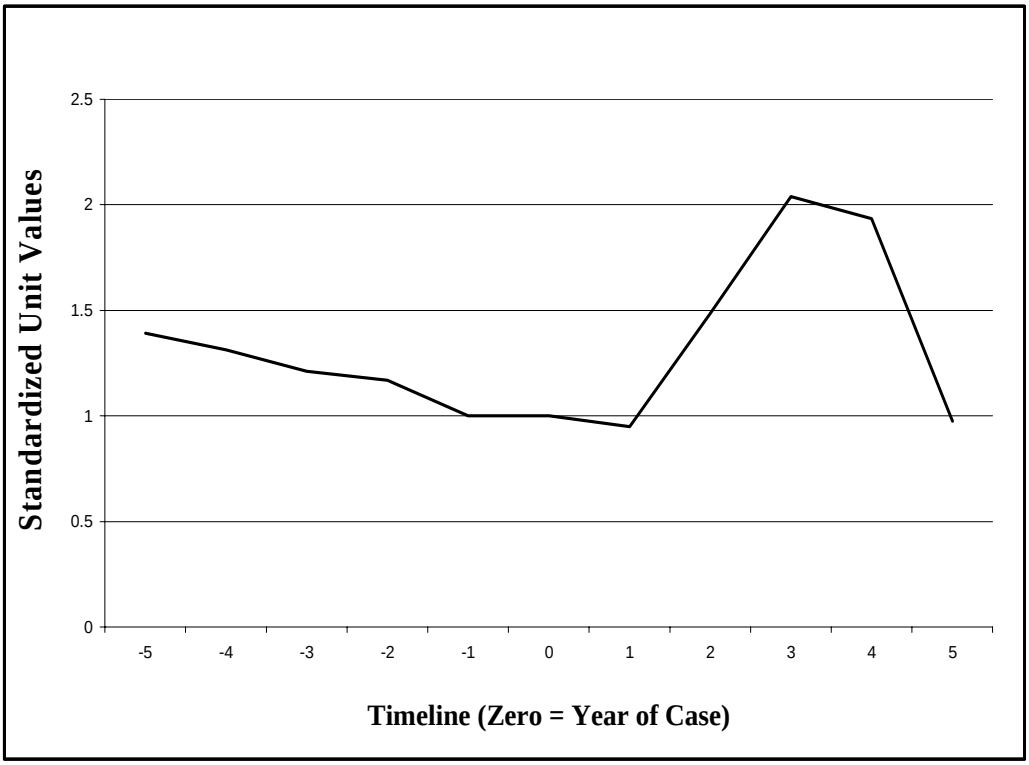


Figure 5: Unit Values (Non-Subject Countries Only)

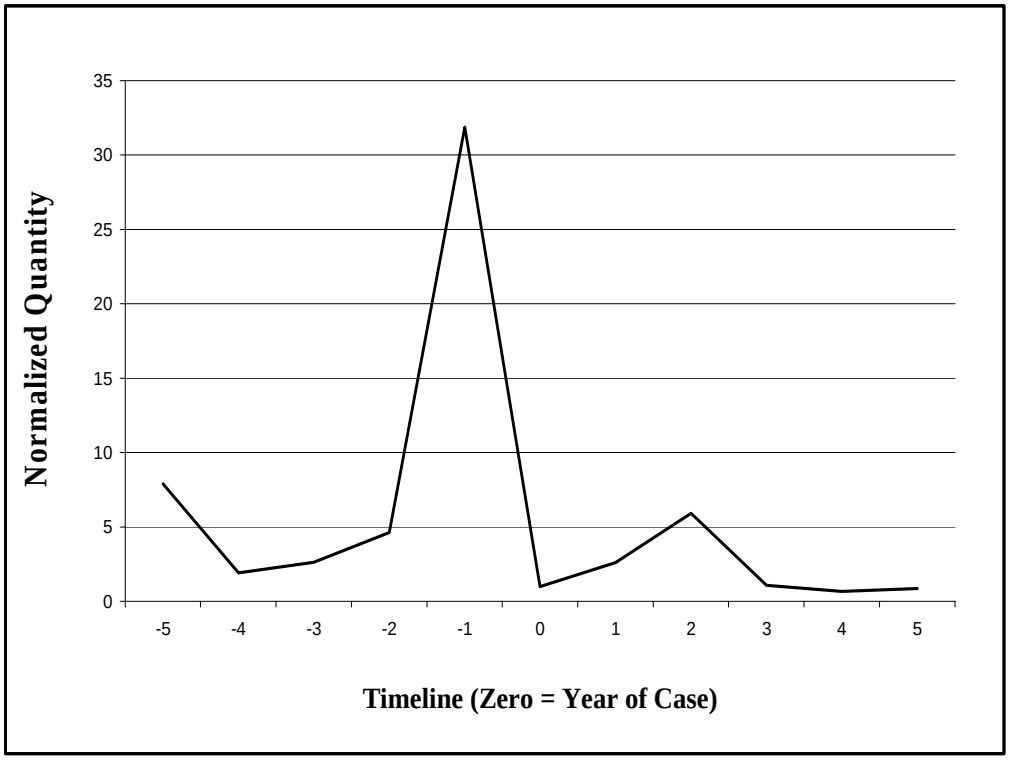


Figure 6: Quantity (Subject Countries Only)

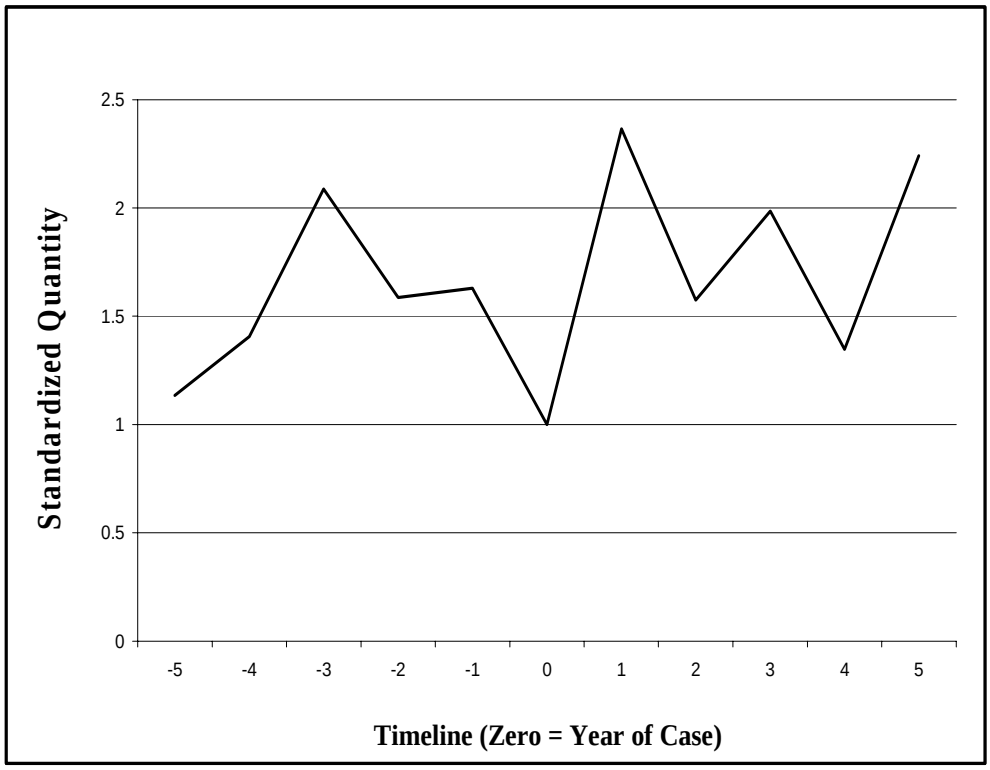


Figure 7: Quantity (Non-Subject Countries Only)

Chapter 3

Stock Market Response to Administered Protection: Evidence from India

3.1 Introduction

Economists have long been concerned with the welfare effects of restrictions on free trade. The welfare consequences of an *ad valorem* tariff are well known, especially in the case of perfectly competitive markets. Domestic producers gain from the protection received, but at the expense of a broad class of consumers. Antidumping (AD) trade protection involves an *ad valorem* duty. Theoretically, such protection should thus result in an increase in the protected firms' expected profits. Further, under efficient capital markets this increase should immediately be capitalized in the firms' stock prices, causing an immediate wealth gain for the firms' stockholders. In this paper, I attempt to test the validity of this argument by looking at the Indian stock market and its response to trade protection in the form of AD duties.

In the last 25 years, there has been a spectacular growth in the number of Antidumping (AD) cases filed by the members of the World Trade Organization (WTO). As tariffs and other forms of trade protection were restrained following the original GATT agreement, AD emerged as *the* trade policy of choice for both developed and developing nations alike. During the period January 1995 to June 2006, WTO members initiated a total of 2938 AD cases, out of which 1875 (63.8%) resulted in measures of some sort[1]. One of the surprise proliferators of AD among the non-traditional users has been India, which filed an outstanding number of 448 cases (the highest) during the above period. Furthermore, Indian AD cases almost always result in some sort of

[1]Source: WTO

protection being granted to the domestic firm(s) filing the petition(s)[2]. Add to this the fact that the average Preliminary Duty is 80.91%, while the average Final Duty is 77.41%.

Despite such an aggressive AD policy, we know very little about the effects of Indian AD protection at the firm level[3]. In particular, there has been no effort to ascertain how beneficial and valuable AD protection actually is to the protected industries. This paper addresses that deficiency by focusing directly on the firms petitioning for AD protection. I use the capital market event study method to assess the impact of a specific event on a firm's common stock. Common stock returns have been used frequently in finace and economics to measure the effects of regulation on individual firms. Schwert (1981) discusses this method of analysis in detail and provides an extensive survey.

A number of previous studies have focused on the benefits that accrue to domestic producers protected by AD duties. Hartigan, Kamma, and Perry (1989) use a capital market event study methodology to examine whether non-steel US AD petitions in the early half of the 1980s led to positive abnormal stock returns for the petitioning firms. Although they generally find statistically significant effects on the petitioners' stock returns from affirmative AD decisions, the authors conclude that relief is valuable to these firms only when the USITC has determined that they are threatened with injury from imports priced below fair value; when there is evidence of actual injury, relief from dumping is of very limited value. In essence, considering the entire process, relief from dumping is only beneficial if it comes before the industry has incurred damage. Their findings thus imply that domestic firms must manifest a more rapid response to unfair trade practices through earlier filing of petitions and the USITC must be even more willing to make affirmative decisions on the basis of threat in future detrminations. Mahdavi and Bhagwati (1994) and Hughes, Lenway, and Rayburn (1997) use a similar approach to examine events surrounding the US trade dispute in semiconductors with Japan in the mid-1980s, including the AD cases that led to the Semiconductor Agreement. Neither study finds much impact from the AD investigation events, but

[2]see Chapter 1 of this dissertation.

[3]Chapter 1 of this dissertation looks at the trade effects of Indian AD actions at the country level.

significant positive abnormal returns for US firms from the Semiconductor Agreement. Lenway, Rehbein, and Starks (1990) use daily stock prices to find that steel firms captured a statistically significant percentage of economic rents created by a particular trade restriction called the Trigger Price Mechanism.

Last, but not the least, Hartigan, Perry, and Kamma (1986) use weekly stock price data to assess the effects of escape clause petitions filed under the U. S. Trade Act of 1974. They conduct a capital market event study to analyze the effects of protection decisions and follow up with cross-section regressions to understand the role of firm-specific variables. They conclude that while protection is beneficial to beleaguered industries, the extent of such benefits is quite narrowly circumscribed and is conditional on internal variables for each firm. My research is rather similar to this study in terms of methodology, but differs in terms of its use of a previously unexploited dataset from a non-traditional user of AD, namely, India.

India, as discussed earlier, has been the leading initiator of AD cases in the last 10 years, surpassing even the US and the EU. Moreover, a very high percentage of these cases have resulted in AD measures being slapped on the importers in the form of very high duties. What effect does this have on the common stocks of the Indian firms filing the petitions? Do they earn positive abnormal returns as a result of the AD protection awarded? In light of that, how *valuable* is such AD protection to the Indian firms?

I combine daily stock price data from the Bombay Stock Exchange with AD data from the WTO and perform an event study to check for any abnormal returns received by the beneficiaries of protection. My results indicate that there is no evidence in general of domestic firms earning significantly higher returns than normal. Secondly, I use cross-section regressions and firm-specific variables to capture the importance of AD protection to the petitioner firms. Again, I find no response from the daily stock returns to indicate that domestic firms find AD protection valuable. Thus, there seems to be little economic justification behind the numerous cases filed; AD is just another strategy used by Indian firms to insulate themselves from foreign competition.

The remainder of the paper is structured as follows. Section 2 discusses the Indian context; section 3 presents the data. The event study analysis and its results are

presented in section 4. In section 5, I discuss the cross-section analysis and the results from that. Finally, section 6 concludes with a few comments.

3.2 The Case of India

AD and Its Enforcement

The WTO defines *dumping*, in general, as a situation of international price discrimination, where the price of a product when sold in the importing country is less than the price of that product in the market of the exporting country. Dumping is defined in the Agreement on Implementation of Article VI of the GATT 1994 (The Anti-Dumping Agreement) as the introduction of a product into the commerce of another country at less than its normal value. Under Article VI of GATT 1994, and the Anti-Dumping Agreement, WTO Members can impose anti-dumping measures, if, after investigation in accordance with the Agreement, a determination is made (a) that dumping is occurring, (b) that the domestic industry producing the like product in the importing country is suffering material injury, and (c) that there is a causal link between the two. In addition to substantive rules governing the determination of dumping, injury, and causal link, the Agreement sets forth detailed procedural rules for the initiation and conduct of investigations, the imposition of measures, and the duration and review of measures.

The first AD legislation can be traced back to Canada (1904). The modern history of AD, however, begins with the inclusion of AD provisions in the 1947 GATT agreement. India joined the AD bandwagon fairly late. While the national legislation on AD had been enacted in 1985, the first case of AD was initiated only in 1992. This initial sluggishness, however, was soon compensated by an avalanche of cases.

Indian AD law follows WTO standards and regulations. The relevant legislation is covered under the Customs Tariff (Identification, Assessment and Collection of Duty or Additional Duty on Dumped Articles and for Determination of Injury) Rules, 1985 and sections 9, 9A, 9AA, 9B and 9C of the Customs Tariff Act, 1975 as amended in 1995. A single authority, the Directorate General of Anti Dumping and Allied Duties

(DGAD), under the Ministry of Commerce is designated to initiate necessary action for investigations and subsequent imposition of AD duties. A dumping investigation is normally initiated only upon receipt of a written application by or on behalf of the 'domestic industry'. In order to constitute a valid application, the domestic producers expressly supporting the application must account for *no less than 25%* of the total production of the like article by the domestic industry, and they must account for *more than 50%* of the total production of the like article by those expressly supporting or opposing the application. The Indian industry must be able to show that dumped imports are causing or are threatening to cause 'material injury' to the Indian industry. The duration of investigation is usually 12 months, but it can be extended up to no more than 18 months. An AD duty once imposed, unless revoked, remains in force for 5 years from the date of imposition.

Capital Markets

The genesis of the Indian capital market, and the stock market in particular can be traced back to the 1860s. The opening of the Suez Canal led to a tremendous increase in exports to the United Kingdom and the United States. Several companies were formed during this period and many banks came to the fore to handle their business. With many of these registered under the British Companies Act, the Native Share & Stock Brokers Association came into existence in 1875. Today it is known as the Bombay Stock Exchange (BSE) and has the distinction of being Asia's oldest stock exchange.

Since then, the stock market in the country has passed through both good and bad periods. The journey in the 20th century has not been an easy one. Till the decade of eighties, there was no measure or scale that could precisely measure the various ups and downs in the Indian stock market. The BSE in 1986 came out with the index Sensex that subsequently became the barometer of the Indian stock market. The growth of equity markets in India has been phenomenal in the decade gone by. Right from early nineties the stock market witnessed heightened activity in terms of various bull and bear runs. The financial liberalization of the country in the early to mid-1990s also contributed to these fluctuations. Post-liberalization the National Stock Exchange of

India Limited (NSE) was established in 1992 to provide stronger fundamentals and better investment opportunities to the investors.

Currently there are 23 stock exchanges in India. Capital markets and securities transactions are regulated by the Capital Markets division of the Department of Economic Affairs under the Ministry of Finance. The Securities and Exchange Board of India (SEBI) supervises all capital market transactions.

3.3 The Data

AD Data

The time period used in the analysis is from January 1, 1995 to December 31, 2005. For this period, AD data was collected from the Global Antidumping Database (version 2.0) maintained by Chad P. Bown and available online. This data collection project was funded by the Development Research Group of the World Bank and Brandeis University. While still preliminary, it goes beyond existing, publicly-used sets of antidumping data in a number of fundamental ways. It is a first attempt to use original source national government documentation to organize information on products, firms, the investigative procedure and outcomes of the historical use (since the 1980s) of the antidumping policy instrument across large importing country users.

I collected from this database details of each case filed by India in the time period mentioned, including the dates of initiation, and the dates preliminary and final measures were announced (the event dates). The database also provided the names of the Indian firms filing these petitions and the corresponding products (identified by their Harmonized System or HS codes[4]) for which the cases were initiated. To handle firms with multiple filings, each firm-case combination was assigned a unique identifier.

[4]The Harmonized System (HS), is an international method of classifying products for trading purposes. This classification is used by customs officials around the world to determine the duties, taxes and regulations that apply to the product.

Stock Market Data

Once the domestic firms had been identified, the next step was to gather data on their daily stock prices from 01/01/95 to 12/31/05; for this I used Bloomberg data sources. The Bloomberg Professional Service provides real-time and historical financial market data from different countries around the world. This data can be accessed using their proprietary high-end computer system, the Bloomberg Terminal. Each firm is identified by its unique ticker symbol, a combination of letters used to reference a particular stock on the Bombay Stock Exchange (BSE). See Table 4 below for the list of firms and their ticker symbols used in this paper.

The specific source considered was the BSE-500 index, covering all 20 major industry groups in the Indian economy and representing nearly 93% of the total market capitalisation on the BSE (including the firms on my database). For daily data on the representative *market portfolio*, I used the Sensex[5] index maintained by the BSE. First compiled in 1986, Sensex is a basket of 30 constituent stocks representing a sample of large, liquid and representative companies. The base year of Sensex is 1978-79 and the base value is 100.

From the stock prices and the Sensex values, I computed the daily stock returns for each firm and the daily market return respectively. Those were then merged with the event dates data above to complete the base dataset for the event study.

Data for the Cross-section Regressions

To run the cross-section regressions (described later in section 4) I needed some more data to construct the firm-specifc regressors. One of the requirements was production/output data for each of the products named in the petitions. However, while the AD and trade data on these products is stored by HS codes, the total ouptut data for the same products is stored according to various other codes[6]. For my research, I

[5]Due to is wide acceptance amongst the Indian and international investors, Sensex is regarded to be the pulse of the Indian stock market. As the oldest index in the country, it provides time series data over a fairly long period of time (from 1979 onwards). It is calculated using the "Free-float Market Capitalization" methodology.

[6]Some of the more popular product classification codes include ISIC, SITC and usSIC.

collected output data from the United Nations' Industrial Statistics Database at the 3- and 4-digit level of ISIC code (INDSTAT 4, 2006, ISIC Revision 3). This ouput data was then matched with the corresponding products from the AD cases via the HS-ISIC Concordance[7].

Finally, export-import data by HS codes was collected from The Export-Import Data Bank (version 6.0 TRADESTAT) maintained by the Indian Ministry of Commerce.

3.4 The Capital Market Event Study

Method and Estimation

An event study measures the economic impact of an event on the value of a firm[8]. The efficient markets/rational expectations hypothesis states that security prices reflect all available information. Hence changes in regulation result in a current change in security prices, and the price change is an unbiased estimate of the value of the change in future cash flows to the firm.

The purpose of the event study is to examine whether the promise of protection (in the form of initiation of an AD case) or actual protection (in the form of AD duties on imports) affects the price of the domestic firms' common stock. In other words, I attempt to find whether a firm seeking and/or receiving protection earns *abnormal returns*, returns significantly above or below those that would have been predicted given the firm's normal relationship with market. This normal relationship is modeled by the well known *market model*. The market model is a statistical model which relates the return of any given security to the return of the market portfolio. The model's linear specification follows from the assumed joint normality of the asset returns. For any secutity i the market model is

[7]The concordance between HS and ISIC codes can be obtained from tables in the Annexes of the Industrial Commodity Statistics Yearbook published by the UN. A more detailed concordance is maintained by Cristina Gamboa and is available online at Jon Haveman's webpage for Industry Concordances.

[8]See MacKinlay (1997) for an excellent survey of this method as used in economics and finance.

$$R_{it} = \alpha_i + \beta_i R_{mt} + \epsilon_{it} \tag{3.1}$$

where $E(\epsilon_{it}) = 0$ and $Var(\epsilon_{it}) = \sigma^2_{\epsilon_i}$.

R_{it} is the continuously compounded rate of return for security i in period t (calculated for each firm using the BSE-500 data);

α_i is a constant;

β_i is the systematic risk of security i;

R_{mt} is the continuously compounded rate of return for the market portfolio (Sensex) in period t;

ϵ_{it} is a disturbance term with the usual properties.

To measure and analyze abnormal returns, returns are indexed in event time using τ. Defining $\tau = 0$ as the event date, I choose $\tau = -3$ to $\tau = 3$ as the *event window*. Although the event being considered is an announcement on a given date, it is typical to set the event window length to be larger than one; in this case I choose a 7-day event window. This facilitates the use of abnormal returns around the event day in the analysis.

The *estimation window* is chosen to constitute $\tau = -253$ to $\tau = -4$, i.e., a span of 250 days prior to the event window. This is representative of the average number of trading days in a year (excluding weekends and holidays). It is typical for the estimation window and the event window not to overlap to ensure that only the abnormal returns capture the event impact.

Under general conditions, ordinary least squares (OLS) is a consistent estimation procedure for the market model parameters. These parameter estimates are generated by estimating equation (3.1) for observations within the estimation window. Thus the sample abnormal return is

$$AR_{i\tau} = R_{i\tau} - \hat{\alpha}_i - \hat{\beta}_i R_{m\tau} \tag{3.2}$$

The abnormal return is the residual or the disturbance term of the market model calculated on an out of sample basis. AR_{it} is thus an estimate of the abnormal performance for firm i in period t. Under the null hypothesis, H_0, that the event has no impact on the behavior of the returns (mean or variance), the distributional properties[9] of the abnormal returns can be used to draw inferences over any period within the event window.

The abnormal return observations must be aggregated in order to draw overall inferences for the event of interest. So the next step is to construct the Cumulative Abnormal Return (CAR) for each firm by summing the abnormal returns over the event window (i.e. $\tau = -3$ to $\tau = 3$). Given the null distributions of AR_i and CAR_i, tests of the null hypothesis can be conducted.

The null hypothesis is that the seeking of protection (AD case initiation) by a firm and subsequent administrative decisions (preliminary and/or final duties awarded) have no effect on the marekt value of firm i's common stock, i.e. that $CAR_i = 0$.

Results from the Event Study

The initial analysis was conducted by constructing and examining the statistical significance of CAR_i for the i-th firm in response to the event of an AD case being filed, i.e., the event dates were taken as the dates of initiation of the AD cases in the sample. As pointed out by Finger (1981), the act of filing such a petition may be of greater significance than the decision itself due to the harassment involved. In the macro context too, it has been observed that imports from countries named in the petitions fall significantly right after a case is filed. This is known[10] as the "investigation effect"-– simply the threat of an impending duty has a dampening effect on import flows. Moreover, since the majority of Indian AD cases result in affirmative decisions in favor of the petitioner(s), the event of filing may be construed by investors as protection in the near future, and hence may have a bearing on the daily returns of the firms.

[9]See MacKinlay (1997), section 5.B to know more about these porperties.

[10]due to Staiger and Wolak (1994).

Table 1 below presents the CARs and their statistical significance levels. Interestingly, note that *none* of the firms exhibit CARs that differ significantly from zero and we fail to reject H_0[11]. The initiation of an AD case by a domestic firm does not lead to any abnormal returns being earned by the stockholders on the market. In other words, the market does not believe that the case itself might lead to any benefits to the firm in the future.

Hence, the next step was to repeat the exercise by changing the event date to the date of announcement of the Preliminary Decision resulting from the investigation. A preliminary measure of protection might signal a better guarantee of being awarded (or not awarded) final protection than just the initiation of the case. The results from this event study are shown in Table 2 below. Once again, *none* of the firms exhibit CARs significantly different from zero.

Finally the event sudy was performed using the dates on which Final Decisions were notified. Table 3 below lists the CARs from the firms in response to those. Only one firm exhibits a CAR significantly different from zero, all other firms show total non-response as before. The firm Century Enka Limited (identified by its ticker symbol "cenk") reacted significantly. This reaction, however, was negative ($CAR = -0.0547649$ with a t-statistic of -2.809982), although an inspection of the AD data reveals that the decision from the corresponding case was affirmative — the investigating agency imposed a specific AD duty on the imports of Partially Oriented Yarn from South Korea and Turkey.

The reaction of this firm is contrary to the conventional wisdom that when protection is awarded to a domestic firm it should earn positive abnormal returns. One possible explanation is that protection was very valuable to this firm; however, the market may have anticipated more protection than was actually granted, and was disappointed with the eventual decision.

Even when we repeat the event study for all domestic firms together as a group, the

[11]The absolute value of the test statistic must be greater than 1.96 to be able to reject H_0 and conclude in favor of the existence of abnormal returns.

results[12] stand, we fail to reject H_0.

The sensitivity analysis results reported in Appendix A at the end of the chapter fail to change the picture of overall non-response.

Possible Explanations of the Non-response

The overall result, therefore, from these event studies remains that daily stock returns of domestic firms do not show any perceptible response that can be attributed to the benefits they receive in the form of AD protection. One conclusion which may be drawn from this result is that the trade protection expected by the market from these cases is not very valuable to the firms seeking such protection. Alternatively, the protection may be valuable, but is generally outweighed by an associated *information effect* (for example, an affirmative decision resulting from an AD filing may be interpreted by the market as an indication that the firm is in more serious difficulty than previously believed).

Further, it is possible that the firms that we have studied were laggards to begin with and were earning less-than-normal returns; AD protection just helped them to become efficient enough to start earning normal returns. However, the standard event study methodology is not very well designed to pick up such effects. One way to work around this is to compare returns pre-protection and post-protection. This is normally not done as the impact might be due to an overall improvement in the stock market.

We may also be contending with some data/sample bias since the sample includes only the firms big enough to be publicly traded. It could be argued that there are many small firms that are not publicly traded but still benefit from AD protection. A similar critique applies to the case of the United States as well; however, in those cases we do observe perceptible movements in abnormal returns to traded firms.

There is also a political economic explanation; the firms filing the cases are the ones that are guaranteed protection anyway–AD just happens to be the means to such protection. Hence their stock prices fail to exhibit any reaction. It is noteworthy

[12]Regressions performed but not reported for the entire group, for all 3 sets of event dates mentioned

that despite having legislation since 1985, the first Indian AD case was not filed until early 1992, soon after the liberalization of 1991 which abolished many of the previous means of trade restriction and protection. AD thus might have just taken the place of protection being offered by the government in a different guise.

Also, stock prices are expected to reflect the benefits from trade protection under *efficient* markets. Although there have been no peer-reviewed systematic studies of the efficiency of the Indian stock market, available research suggests that capital markets in India might not satisfy the condition of efficiency under most circumstances[13]. This might be an additional explanation of the above results.

My personal explanation for the results is that the investors, i.e. the stockholders are not concerned enough about the outcomes of these cases and the lack of response in the daily returns is really reflecting the lack of response from the investors. A couple of observations about the Indian capital markets and businesses prompt me to venture this explanation. First, despite the large number of AD cases filed by India, the share of the country's overall trade affected by these filings is quite insignificant. For many of the larger firms filing the petitions, the product involved in the case is usually one of the many that they sell in the domestic market and their overall revenue or profit will not fluctuate much based on the outcome of the case. Secondly, depsite the strides made by the Indian stock markets in recent years, the markets are still quite underdeveloped compared to the big international bourses. The average investor on the street has very limited access to round the clock market information and might be relatively unaware of the facts and figures of the specific AD cases filed by the domestic firms.

Finally, although previous and contemporary related literature has used OLS to estimate the market model and generate the abnormal returns, there may be crucial volatility in the daily market data that is ironed out in the process of assuming mean-zero normal errors. We should separately take into account periods of high and low

[13]Pandey (2003) uses data from the National Stock Exchange (NSE) to find the Indian stock market inefficient. Amanulla and Kamaiah use data from the Bombay Stock Exchange (BSE) for the period 1987:1 1994:5. The results from price integration tests support that the Indian stock market is efficient in a semi-strong form. The evidence from the causality test, however, provides only marginal support for market efficiency.

volatility to test the response of each individual firm to the event. One way of implementing the heteroskedasticity in errors is to use a GARCH specification to estimate abnormal returns from the market model where the test statistic is calculated by using a firm specific standard error rather than the average one for the whole sample. This issue is briefly looked at in Appendix B below.

3.5 The Cross-section Regressions

Method and Estimation

To further ascertain the value of AD protection to domestic firms, in this section, we ran a series of regressions using firm-specific data. The dependent variables were the abnormal returns, AR_i for each firm. The explantory variables were designed to capture the importance of the petitioned products to the industry and the extent of penetration of the domestic market by imports. As mentioned in section 3, I used both trade data and production data using the HS-ISIC concordance tables.

For the product sold by firm i, the Import Penetration Ratio (IPR) was calculated as

$$IPR_{it} = \frac{Imports_i t}{Output_{it} + Imports_{it} - Exports_{it}} \tag{3.3}$$

The importance of the petitioned products to the domestic industry was captured by two variables. The first, $S1$, was constructed to measure net operating profits from sales of the petitioned products as a proportion of total sales. The second, $S2$, was sales of the petitioning firm as a proportion of total industry sales of the product. All three variables were expected to be positively related to the AR_i.

Results

Table 5 below displays the results from the cross-section regressions. The dates of

Final AD Decisions were used as event dates in running these regressions. The coefficients from all three variables, $S1$, $S2$ and IPR were positive as expected. However, note that none of these are significant. In other words, these firm-specific variables fail to explain the observed behavior of the abnormal returns. This is consistent with the findings from the previous section — the Indian capital market does not exhibit perceptible reaction to AD protection awarded to domestic firms seeking such prtotection[14]. Based on these results, there is no evidence to suggest that AD protection is important to the domestic firms.

3.6 Concluding Comments

This paper provides a time series and cross-section analysis of the welfare effects of AD protection sought by Indian firms. Using data for daily returns to common stock prices of domestic firms, the time series analysis concludes that the Indian stock market does not react in any way to AD protection and no abnormal gains are made by the protected firms or passed on to the investors. The cross-section analysis incorporates variables internal to each firm to explain the behavior of their stock returns and to evaluate the importance of AD protection to the petitioners. Once again, the daily returns fail to establish the valuability, if any, of AD protection to the firms seeking it.

The primary conclusion emerging from this research is that even if AD protection is beneficial to the Indian firms, these benefits are not reflected by the Indian capital markets. This is rather a sobering conclusion for the advocates of AD protection — markets in the world's largest user of AD fail to provide economic justification for such aggressive protectionist policy. As Stiglitz (1997) argues, there is essentially no connection between national welfare considerations and AD protection. It is simply a modern form of protection. All but AD's staunchest supporters agree that AD has nothing to do with keeping trade "fair". Given the substantial revisions to the GATT/WTO regulations over the past 30 years, AD is merely a trade policy to improve the competitive position of the complainant against other companies. The fact that almost 450

[14]The findings of this section are contrary to what Hartigan, Perry and Kamma (1986) conclude on the basis of their cross-section regerssions.

cases were filed in slightly more than a decade leaves little doubt that Indian firms will continue to frequently use AD law to reduce import competition.

3.7 Appendix A: Sensitivity Analysis

To test for the robustness of the results of the event study, I repeated the regressions by varying the size of the event window. Increasing the size of the event window (to allow for more information to filter through to the investors) does not change the results in any way; I still find universal non-response.

Reducing the size of the event window to 3 (i.e. including 1 day before and after the event date), however, generates abnormal returns for a very small number of firms. Table 6 below presents the results when the event study is conducted with 80 firm-case unique combinations using the initiation of the AD case as the event. There is evidence of abnormal returns being earned in only 8 cases, still a surprisingly low number.

Table 7 contains the results for the same event study (i.e. event window of 3 days) but using the date of notification of the final decision as the event date. Once again, we reject H_0 in favor of abnormal returns in only 8 of the cases.

The overall understanding of the Indian stock market changes little in response to these results. The fact that some firms' daily returns do respond to the event suggests that investors and stock prices may take note of the case filing or decision immediately after it happens, but eventually this does not register a big enough change in their investment decisions.

3.8 Appendix B: Heteroskedastic Errors and GARCH

In this appendix, I revisit the event study, but this time I use heteroskedastic errors instead of linear errors; using a general measure of variance for the entire portfolio might wash away fluctuations in individual securities. In particular, the abnormal return is derived by regressing returns on the market return using a GARCH (1,1) model. Table 3.8 reports the results using GARCH and date of AD filing as an event. None of the firms exhibit any abnormal returns. Table 3.9 repeats the exercise with the date of final AD decision; this time one of the firms shows evidence of earning abnormal return. So, essentially, the baseline results remain unchanged.

The other problem with assuming that an event has an identical effect on all firms

is that in the case that an event has differing effects on firms, the variance of returns may increase and common methods may fail. This is the case of the often-ignored event induced variance bias. Brown, Harlow and Tinic (1988, 1989) have shown that some events may cause changes in both risk and return for individual securities due to a temporary change in the firm's systematic risk, leading to a temporary increase in the variance of the abnormal returns accompanying the mean shift.

One way of dealing with this problem could be to use the standardized-residual method, which still assumes that security residuals are uncorrelated. However, the abnormal returns are now standardized i.e. divided by the daily standard errors and the standardized return thus obtained is used to test for effects on stock prices. This prevents securities with large variances from dominating the test. An examination of the standardized residuals for the sample of firms used reveals no absolute pattern of reaction. However, there is definitely greater response than obtained from the traditional method. This method offers potential for rigorous follow-up in future experiments in the field. Figures 3.1 through 3.10 show the standardized return for ten firms in response to the event of initiation of an AD case. Although all the firms in the sample are relatively large, these ten firms include some very large firms and some not so large ones to generate as general and idea as possible. Also, I have made an effort to select firms so that there is some variety in what they produce. Standardized returns are presented along the vertical axis against the time horizon on the horizontal; I look at the response of the standardized returns starting 200 days before the event and ending 60 days after it.

The behavior of the standardized returns in these figures is intended to help us further characterize the firm's performance. For example, if a firm was indeed a laggard prior to receiving AD protection we would expect to see a jump from mostly negative returns to positive returns close to the event. However, this is not seen in any of the cases depicted in Figures 3.1 through 3.10.

There is, however, significant variation in the responses of the different firms' standardized returns. Three of the firms (in Figures 3.2, 3.3 and 3.4) have standardized returns that fluctuate within the range of positive 1 to negative 1. There are five firms

(in Figures 3.1, 3.6, 3.7, 3.9 and 3.10) that have standardized returns greater than 5, while the remaining firms show fluctuation greater than 1 but less than 5. In particular, Reliance Industries Limited (RIL) in Figure 3.7, one of the biggest names of the Indian corporate sector, shows the highest fluctuation in standardized return, close to 8. But note that this jump-off happens long before the actual event, which in itself seems to cause no noteworthy fluctuation. This might be due to the possibility that the firm internalized the information that it was applying for AD protection before the actual event by having access to some sort of inside information.

3.8 Tables for Chapter 3

Table 3.1: Results from Event Study—Date of Initiation

Company Id	Event Date	CAR	t-Statistic	Company Id	Event Date	CAR	t-Statistic
apnt	16-Nov-99	-0.0031437	-0.0255248	ipca	23-Jul-01	-0.0384598	-0.8920787
apnt	22-Nov-01	0.0003116	0.0030297	ipca	16-Jul-03	-0.0257486	-0.2489283
artd	29-Jul-99	0.0431426	0.1507016	ipcl	20-Dec-96	0.001556	0.0205776
artd	8-Feb-01	0.1036517	0.3469753	ipcl	30-Jul-98	-0.0747295	-0.3334932
atlp	27-Aug-02	-0.0121788	-0.0470241	ipcl	26-Mar-99	-0.0879726	-0.5325114
bhel	20-May-99	-0.047783	-0.2436654	ipcl	28-Jul-99	-0.0846283	-0.4277921
bilt	17-Jun-03	-0.0826047	-1.259978	irs	25-Jan-99	0.2538067	0.4474681
cenk	26-Feb-99	0.0561318	0.1032404	irs	25-Jun-01	0.0274796	0.2501708
cenk	10-Nov-00	-0.0013949	-0.0118541	irs	20-Aug-01	0.0730401	0.4177184
cenk	20-Aug-01	-0.0270858	-0.5104983	mhs	20-May-99	0.0198223	0.2834208
cenk	29-Oct-03	-0.0555426	-0.2305391	nocil	29-Jul-99	-0.0562018	-0.2536258
chlr	12-Jan-01	-0.0630757	-0.435329	nocil	12-Jun-00	-0.0095773	-0.0301312
chlr	2-Nov-01	-0.0031307	-0.0188642	nocil	21-Nov-01	0.0083167	0.1113167
dcw	5-Jul-99	-0.0082559	-0.0616789	nocil	31-Jan-02	-0.0545968	-0.2051473
dcw	26-May-00	0.0528929	0.2161611	nocil	7-Jul-04	-0.0168512	-0.0686964
dcw	14-May-02	-0.0893372	-0.3721451	nocil	17-Aug-04	0.0130378	0.2944928
dcw	8-Oct-02	0.0504081	0.1710633	np	19-Mar-01	-0.0030868	-0.0184024
dfpc	20-Sep-02	0.0051367	0.048215	np	2-Jul-01	-0.017115	-0.1729551
esrgj	6-Oct-97	-0.2620539	-1.297429	np	24-Jan-02	0.0426268	0.5479197
esrgj	25-Sep-02	-0.0527511	-0.1984681	rcf	6-Sep-96	-0.0241178	-0.2143576
flxi	30-May-01	0.0288693	0.0899161	rcf	4-Nov-99	-0.1479998	-0.5426998
galk	13-Jun-00	0.0438783	0.2195466	rcf	2-Nov-01	-0.0987821	-0.1953976
galk	7-Feb-01	0.2127386	0.9755974	ril	20-Dec-96	-0.043653	-1.145012
galk	14-May-02	0.0024369	0.0182901	ril	22-Apr-99	0.0978329	0.2792103
galk	19-Dec-02	-0.134472	-0.5938953	ril	10-Nov-00	-0.0180322	-1.225582
galk	19-Feb-03	-0.0493055	-0.1542077	ril	25-Jun-01	0.0553231	0.5097521
gnfc	20-Sep-02	-0.0381762	-0.3972377	ril	20-Aug-01	-0.0280321	-0.4983632
grasim	26-May-00	0.2344292	0.5087448	sail	6-Oct-97	0.0411966	0.2205312
grasim	6-Dec-00	-0.0074539	-0.0329537	sail	25-Sep-02	-0.0378988	-0.2506118
grasim	14-May-02	0.0094368	0.0699025	srf	26-Feb-99	-0.0311417	-0.0981149
grasim	8-Oct-02	-0.0286557	-0.6734834	srf	19-Aug-02	-0.0341168	-0.3746481
gsfc	22-Sep-03	-0.0806187	-0.7408867	srf	19-Feb-03	-0.0196389	-0.2391158
gsfc	8-Oct-03	0.061059	0.2038874	srf	29-Oct-03	-0.0297734	-0.2732282
heg	30-Sep-96	-0.1336117	-0.3590014	tata	6-Oct-97	-0.006405	-0.1763233
hoc	13-Sep-99	0.0250008	0.1394428	tata	20-May-99	-0.0365247	-0.1623142
hoc	29-May-00	0.1058831	0.2675681	tata	25-Sep-02	-0.0184586	-0.5350676
hoc	15-Feb-02	0.2131198	0.3550541	ttch	5-Jul-99	-0.0213595	-0.1028084

Table 3.2: Results from Event Study—Date of Preliminary AD Decision

Company Id	Event Date	CAR	t-Statistic	Company Id	Event Date	CAR	t-Statistic
apnt	31-Mar-00	-0.0012592	-0.0063441	ipcl	4-Sep-97	-0.0441451	-0.2578444
apnt	15-Feb-02	-0.0189699	-0.09744	ipcl	7-Apr-99	-0.0480965	-0.3108135
artd	3-May-01	-0.1401464	-0.514043	ipcl	13-Oct-99	0.0016768	0.0279371
artd	31-Oct-01	0.0025773	0.0256126	irs	27-Sep-99	0.1781573	0.4826265
atlp	17-Jan-03	0.024241	0.1885827	irs	23-Nov-01	0.0040193	0.0246222
bhel	10-Nov-99	-0.001085	-0.0212754	irs	16-Jan-02	0.1457471	0.2275972
cenk	30-Mar-01	-0.0066424	-0.043971	mhs	10-Nov-99	0.0487116	0.1484768
cenk	30-Jun-04	0.0298381	0.1948206	nocil	3-Dec-99	-0.0848425	-0.2066741
cenk	23-Nov-01	-0.0450105	-0.4686963	nocil	29-Jul-02	0.0659597	0.0871146
chlr	5-Apr-02	-0.0147869	-0.1888728	nocil	5-Feb-02	-0.0358713	-0.1353473
chlr	21-Mar-01	0.0010559	0.0055321	np	30-Apr-02	-0.0575018	-0.583147
dcw	18-Jan-02	0.1061803	0.280746	np	6-Jun-01	-0.025422	-0.2790524
dcw	8-Jan-03	-0.0313339	-0.2267758	np	25-Sep-01	-0.0439108	-0.8080997
dcw	18-Nov-99	-0.100524	-0.2746705	rcf	6-Apr-00	-0.125706	-0.3242431
dfpc	7-Apr-03	0.0453826	0.7402859	rcf	7-May-97	0.2898	0.3246045
esrgj	17-Jun-98	-0.0157303	-0.055666	rcf	1-Feb-02	0.0299961	0.1108263
fag	6-May-03	0.0212115	0.2402275	ril	23-Nov-01	-0.0359773	-0.3406282
flxi	14-Aug-01	-0.0825481	-0.5364746	ril	22-Oct-99	0.1041658	0.6532626
galk	26-Jun-03	0.0517626	0.1014765	ril	16-Jan-02	-0.0635211	-0.5439178
galk	30-Apr-03	0.3022654	0.4934802	ril	4-Sep-97	-0.0098572	-0.0923177
galk	9-Apr-01	0.0416899	0.501043	ril	30-Mar-01	0.019615	0.2769501
galk	2-Jan-01	0.078207	0.2884804	sail	17-Jun-98	0.2112309	0.386667
gnfc	7-Apr-03	0.0498589	0.7987577	srf	26-Jun-03	0.0112186	0.1465639
grasim	8-Jan-03	0.0126362	0.2593956	srf	5-Oct-99	-0.1650916	-0.5133237
grasim	18-Jan-02	-0.0043948	-0.0438622	srf	24-Dec-02	-0.0150944	-0.4129051
grasim	22-Feb-01	-0.0429751	-0.2445762	srf	30-Jun-04	-0.0055361	-0.0250247
heg	9-Jun-97	0.0789317	0.2898666	tata	17-Jun-98	-0.0443356	-0.4067392
hoc	8-Mar-00	0.0271747	0.0523659	tata	10-Nov-99	-0.0118354	-0.1807646
hoc	24-Jun-02	-0.0078213	-0.0139918	tata	6-May-03	0.0144214	0.1410374
ipcl	10-Nov-99	-0.0132038	-0.1064163	ttch	18-Nov-99	-0.0336216	-0.3666691

Table 3.3: Results from Event Study—Date of Final AD Decision[1]

Company Id	Event Date	CAR	t-Statistic	Company Id	Event Date	CAR	t-Statistic
apnt	13-Nov-00	0.0020148	0.010244	gsfc	7-Oct-04	0.0482199	0.1982218
apnt	8-Oct-02	-0.0243681	-0.362792	heg	27-Mar-98	0.1451132	0.920952
artd	14-Jul-00	-0.0765526	-0.2704998	hoc	28-May-01	-0.0516853	-0.2496687
artd	21-Jun-02	0.0120953	0.122277	hoc	13-Feb-03	0.0065307	0.1144386
artd	5-Feb-02	0.021412	0.1367774	hoc	31-Aug-00	0.0548117	0.1161541
atlp	25-Aug-03	-0.0539305	-0.2989321	ipca	12-Jul-02	0.0516645	0.4870322
bhel	19-May-00	0.0773925	0.3379783	ipca	15-Jul-04	0.0333488	0.3384502
bilt	15-Dec-04	0.0173793	0.1559528	ipcl	11-Jul-00	0.0416533	0.2826333
cenk	9-Mar-05	-0.0362481	-0.4571663	ipcl	19-Mar-98	0.0060416	0.0611804
cenk	4-Jan-02	-0.0623012	-0.6951147	ipcl	24-Mar-00	-0.0121551	-0.0336964
cenk	22-Feb-00	-0.1827459	-0.5073975	ipcl	25-Jun-99	-0.0669133	-0.8854257
cenk	16-Aug-02	-0.0547649	-2.809982	irs	24-Dec-02	-0.0302953	-0.3382405
chlr	31-Jan-03	-0.0253815	-0.2942585	irs	21-Jan-00	0.008808	0.0245262
chlr	7-Dec-01	-0.0082053	-0.1167908	irs	16-Aug-02	-0.1034092	-0.6268789
dcw	4-Aug-03	-0.0628608	-0.3629295	mhs	19-May-00	0.004865	0.1547312
dcw	1-Oct-03	0.0377773	0.3636404	np	18-Mar-02	-0.0179399	-0.1591621
dcw	11-Jul-00	-0.2028065	-0.3335662	np	1-Jul-02	-0.0424684	-0.6611592
dcw	14-May-01	-0.105749	-0.1703615	np	23-Jan-03	-0.0129788	-0.1152095
dcw	7-Oct-02	0.0045968	0.013117	rcf	28-Oct-02	-0.0806359	-0.3722297
dfpc	19-Mar-04	-0.0865114	-0.5622522	rcf	5-Jan-98	0.0851646	0.2056695
esrgj	18-Nov-98	0.07914	0.2833625	rcf	3-Nov-00	0.0843989	0.2145581
fag	19-Mar-04	-0.0172921	-0.1812716	ril	20-Apr-00	0.1888458	0.7197785
flxi	26-Jun-02	-0.0092411	-0.0215455	ril	24-Dec-02	0.0105627	0.2363615
fnxp	20-Aug-04	-0.0231212	-0.2992478	ril	19-Mar-98	-0.0048438	-0.0667998
galk	18-Aug-04	0.047416	0.1659619	ril	7-Jan-02	0.0678288	0.2821892
galk	16-Apr-01	-0.0312536	-0.3123492	ril	16-Aug-02	0.0033278	0.0646344
galk	10-Aug-01	-0.073438	-0.6433139	sail	18-Nov-98	-0.0489483	-0.1050606
galk	16-Jan-04	-0.144587	-0.7215013	srf	18-Aug-04	0.0259684	0.2170659
galk	4-Aug-03	-0.0392383	-0.2938144	srf	9-Mar-05	0.030909	0.1002213
gnfc	19-Mar-04	-0.101749	-0.5286015	srf	14-Aug-03	0.0531902	0.5192106
grasim	1-Oct-03	-0.0098324	-0.0904116	srf	22-Feb-00	-0.0641229	-0.295124
grasim	4-Aug-03	0.0374556	0.2394315	tata	19-Mar-04	-0.0222542	-0.1650503
grasim	30-Aug-01	-0.0361913	-0.2792836	tata	19-May-00	0.1834429	0.9933621
grasim	14-May-01	-0.0008571	-0.0082335	tata	18-Nov-98	0.0388566	0.3322026
grasim	7-Oct-02	-0.022728	-0.7612286	ttch	11-Jul-00	0.0411807	0.2147129
gsfc	16-Sep-04	-0.0963703	-1.033505				

[1] Shaded indicates significant at the 95% confidence level.

Table 3.4: Indian Firms and their Stock Market Tickers

Domestic Firm	Ticker
Aarti Drugs Limited	artd
Asian Paints Limited	apnt
Atul Private Limited	atlp
Bharat Heavy Electricals Limited	bhel
BILT Chemicals Limited	bilt
Century Enka Limited	cenk
Exide Industries Limited	chlr
DCW Limited	dcw
Deepak Fertilizers and Petrochemicals Corporation Limited	dfpc
Essar Steel Gujarat Limited	esrgj
FAG Bearings India Limited	fag
Flex Industries Limited	flxi
Finolex Industries Private Limited	fnxp
Gujarat Alkalies and Chemicals Limited	galk
Gujarat Narmada Valley Fertilizers Company Limited	gnfc
Gujarat State Fertilizers and Chemicals Limited	gsfc
Grasim Industries Limited	grasim
HEG Limited	heg
Hindustan Organic Chemicals Limited	hoc
Indian Petrochemicals Corporation Limited	ipcl
IPCA Laboratories Limited	ipca
Indo Rama Synthetics Limited	irs
Maharashtra Seamless Limited	mhs
National Organic Chemicals Industries Limited	nocil
Nicholas Piramal India Limited	np
Rashtriya Chemicals and Fertilizers Limited	rcf
Reliance India Limited	ril
Steel Authority of India Limited	sail
SRF Limited	srf
TATA Iron & Steel Company Limited	tata
TATA Chemicals Limited	ttch

Table 3.5: Results from Cross-section Study—Date of Final Decision

	Regressor			
	S1	S2	IPR	Constant
Coefficient	0.059687167	0.000004588	0.00068041	-0.009653164
(Standard Error)	(0.047286280)	(0.000028405)	(0.001906203)	

Table 3.6: Results from Sensitivity Analysis—Date of Initiation[2]

Company ID	Event Date	CAR	t-statistic	Company ID	Event Date	CAR	t-statistic
apnt	16-Nov-99	-0.00411	-0.05522	ipca	23-Jul-01	-0.01727	-1.83848
apnt	22-Nov-01	0.00819	0.13600	ipca	16-Jul-03	-0.02425	-0.43740
artd	29-Jul-99	0.06558	0.43243	ipcl	20-Dec-96	-0.01950	-0.74108
artd	8-Feb-01	0.05598	0.35590	ipcl	30-Jul-98	-0.05550	-0.71520
atlp	27-Aug-02	0.02030	0.13793	ipcl	26-Mar-99	-0.06937	-23.032
bhel	20-May-99	-0.02743	-0.23185	ipcl	28-Jul-99	-0.00054	-0.00984
bilt	17-Jun-03	-0.04792	-1.47999	irs	25-Jan-99	0.13704	0.45236
cenk	26-Feb-99	0.16254	0.76597	irs	25-Jun-01	-0.01754	-1.33307
cenk	10-Nov-00	-0.03512	-1.94548	irs	20-Aug-01	0.01977	0.39877
cenk	20-Aug-01	-0.01373	-5.38149	mhs	20-May-99	-0.00053	-0.18274
cenk	29-Oct-03	0.01709	0.17436	nocil	29-Jul-99	-0.07176	-1.19698
chlr	12-Jan-01	-0.03833	-1.16240	nocil	12-Jun-00	0.06491	0.49775
chlr	2-Nov-01	-0.03870	-0.73947	nocil	21-Nov-01	-0.00015	-0.00375
dcw	5-Jul-99	0.01463	0.74901	nocil	31-Jan-02	-0.01970	-0.13330
dcw	26-May-00	-0.00173	-0.01295	nocil	7-Jul-04	0.00075	0.00508
dcw	14-May-02	-0.02274	-0.18078	nocil	17-Aug-04	0.02115	4.44725
dcw	8-Oct-02	0.10770	1.61743	np	19-Mar-01	0.01127	0.12640
dfpc	20-Sep-02	0.01180	0.70929	np	2-Jul-01	-0.02635	-3.83310
esrgj	6-Oct-97	-0.08748	-0.53147	np	24-Jan-02	0.03128	0.68452
esrgj	25-Sep-02	-0.01087	-0.08627	rcf	6-Sep-96	-0.02821	-55.995
flxi	30-May-01	0.10597	1.23663	rcf	4-Nov-99	-0.09117	-0.67784
galk	13-Jun-00	0.08333	1.91144	rcf	2-Nov-01	-0.01615	-0.07292
galk	7-Feb-01	0.12780	1.45619	ril	20-Dec-96	-0.00781	-14.416
galk	14-May-02	0.00737	0.09219	ril	22-Apr-99	-0.02368	-0.61815
galk	19-Dec-02	-0.12145	-1.62267	ril	10-Nov-00	-0.00721	-1.10241
galk	19-Feb-03	0.02163	0.14247	ril	25-Jun-01	0.00506	0.08283
gnfc	20-Sep-02	-0.03008	-0.47944	ril	20-Aug-01	0.00008	0.00392
grasim	26-May-00	0.22622	75.24217	sail	6-Oct-97	0.05249	1.27129
grasim	6-Dec-00	-0.03150	-0.27393	sail	25-Sep-02	-0.05928	-1.34824
grasim	14-May-02	0.02114	0.28378	srf	26-Feb-99	-0.00184	-0.02155
grasim	8-Oct-02	-0.01082	-0.67974	srf	19-Aug-02	-0.01263	-0.33717
gsfc	22-Sep-03	-0.02747	-0.53750	srf	19-Feb-03	-0.01409	-0.28471
gsfc	8-Oct-03	0.07636	0.72450	srf	29-Oct-03	-0.04683	-1.40188
heg	30-Sep-96	-0.16430	-1.73274	tata	6-Oct-97	0.00802	1.11926
hoc	13-Sep-99	0.06377	27.64208	tata	20-May-99	-0.06234	-0.57725
hoc	29-May-00	0.04281	0.19704	tata	25-Sep-02	-0.00800	-0.73558
hoc	15-Feb-02	0.22122	0.67971	ttch	5-Jul-99	-0.05097	-0.40872

[2] Shaded indicates significant at the 95% confidence level.

Table 3.7: Results from Sensitivity Analysis— Date of Final Decision[3]

Company ID	Event Date	CAR	t-statistic	Company ID	Event Date	CAR	t-statistic
apnt	13-Nov-00	-0.02775	-0.20679	gsfc	16-Sep-04	-0.07891	-2.21496
apnt	8-Oct-02	-0.02150	-0.56315	gsfc	7-Oct-04	-0.00605	-0.13029
artd	14-Jul-00	-0.03785	-2.67256	heg	27-Mar-98	0.03034	2.00760
artd	21-Jun-02	-0.01216	-1.26420	hoc	28-May-01	-0.01975	-2.73087
artd	5-Feb-02	0.05002	0.83029	hoc	13-Feb-03	-0.00610	-0.64267
atlp	25-Aug-03	-0.03025	-0.30102	hoc	31-Aug-00	-0.06855	-0.65198
bhel	19-May-00	0.01293	0.07329	ipca	12-Jul-02	0.02503	0.67418
bilt	15-Dec-04	0.00537	0.12263	ipca	15-Jul-04	0.00885	0.22290
cenk	9-Mar-05	-0.03457	-2.11719	ipcl	11-Jul-00	0.06236	1.36773
cenk	4-Jan-02	-0.04442	-2.08433	ipcl	19-Mar-98	-0.02028	-0.55910
cenk	22-Feb-00	-0.12204	-0.59567	ipcl	24-Mar-00	-0.04312	-1.24624
cenk	16-Aug-02	-0.02572	-305.06280	ipcl	25-Jun-99	-0.03235	-1.19914
chlr	31-Jan-03	-0.02207	-13.34687	irs	24-Dec-02	-0.03763	-1.10032
chlr	7-Dec-01	-0.02045	-1.24016	irs	21-Jan-00	-0.01651	-0.11664
dcw	4-Aug-03	-0.01449	-0.56409	mhs	19-May-00	0.00469	0.45482
dcw	1-Oct-03	-0.00072	-0.01733	np	18-Mar-02	-0.01648	-0.54801
dcw	11-Jul-00	-0.14246	-0.42383	np	1-Jul-02	-0.00392	-0.16472
dcw	14-May-01	0.06775	0.42238	np	23-Jan-03	-0.02085	-1.39215
dcw	7-Oct-02	0.05123	0.87527	rcf	28-Oct-02	0.01287	0.42031
dfpc	19-Mar-04	-0.03120	-0.31040	rcf	5-Jan-98	0.09301	0.33281
esrgj	18-Nov-98	0.09644	0.72429	rcf	3-Nov-00	0.05914	0.38298
fag	19-Mar-04	0.00023	0.00502	ril	20-Apr-00	0.14292	0.98712
flxi	26-Jun-02	-0.13473	-1.90756	ril	24-Dec-02	0.00496	0.25236
fnxp	20-Aug-04	-0.02830	-0.75908	ril	19-Mar-98	-0.01548	-0.44828
galk	18-Aug-04	0.06272	0.39549	ril	7-Jan-02	-0.02713	-0.96684
galk	16-Apr-01	-0.03483	-1.91605	ril	16-Aug-02	0.00438	80.18862
galk	10-Aug-01	-0.02690	-0.46082	sail	18-Nov-98	0.07799	0.78975
galk	16-Jan-04	-0.07708	-0.51379	srf	18-Aug-04	-0.00410	-0.06761
galk	4-Aug-03	-0.01390	-0.12832	srf	9-Mar-05	0.05186	0.29727
gnfc	19-Mar-04	-0.02639	-0.28070	srf	14-Aug-03	0.04833	0.91234
grasim	1-Oct-03	-0.02590	-1.71540	srf	22-Feb-00	-0.01518	-0.12282
grasim	4-Aug-03	-0.00808	-0.09712	tata	19-Mar-04	0.00498	0.51340
grasim	30-Aug-01	-0.04223	-0.63787	tata	19-May-00	0.11430	1.43108
grasim	14-May-01	0.00858	0.17880	tata	18-Nov-98	0.05253	1.52164
grasim	7-Oct-02	-0.01326	-2.63802	ttch	11-Jul-00	0.07462	1.48707

[3] Shaded indicates significant at the 95% confidence level.

Table 3.8: GARCH Results—Date of Initiation

Company ID	Event Date	CAR	t-statistic	Company ID	Event Date	CAR	t-statistic
apnt	16-Nov-99	0.005	0.038	ipca	23-Jul-01	-0.040	-0.921
apnt	22-Nov-01	0.001	0.012	ipca	16-Jul-03	-0.025	-0.242
artd	29-Jul-99	0.085	0.280	ipcl	20-Dec-96	0.005	0.063
artd	8-Feb-01	0.103	0.346	ipcl	30-Jul-98	-0.072	-0.319
atlp	27-Aug-02	-0.004	-0.015	ipcl	26-Mar-99	-0.069	-0.421
bhel	20-May-99	-0.042	-0.207	ipcl	28-Jul-99	-0.044	-0.227
bilt	17-Jun-03	-0.083	-1.262	irs	25-Jan-99	0.257	0.454
cenk	26-Feb-99	0.059	0.108	irs	25-Jun-01	0.012	0.107
cenk	10-Nov-00	0.007	0.057	irs	20-Aug-01	0.059	0.346
cenk	20-Aug-01	-0.026	-0.498	mhs	20-May-99	0.020	0.286
cenk	29-Oct-03	-0.051	-0.216	nocil	29-Jul-99	-0.047	-0.211
chlr	12-Jan-01	-0.062	-0.442	nocil	12-Jun-00	0.005	0.015
chlr	2-Nov-01	-0.002	-0.014	nocil	21-Nov-01	0.014	0.191
dcw	5-Jul-99	0.047	0.301	nocil	31-Jan-02	-0.042	-0.153
dcw	26-May-00	0.054	0.218	nocil	7-Jul-04	-0.019	-0.078
dcw	14-May-02	-0.009	-0.040	nocil	17-Aug-04	0.011	0.229
dcw	8-Oct-02	0.075	0.252	np	19-Mar-01	-0.004	-0.022
dfpc	20-Sep-02	0.003	0.031	np	2-Jul-01	-0.016	-0.157
esrgj	6-Oct-97	0.151	0.669	np	24-Jan-02	0.045	0.592
esrgj	25-Sep-02	-0.039	-0.144	rcf	6-Sep-96	-0.046	-0.653
flxi	30-May-01	0.033	0.102	rcf	4-Nov-99	-0.108	-0.345
galk	13-Jun-00	0.049	0.243	rcf	2-Nov-01	-0.091	-0.177
galk	7-Feb-01	0.212	0.982	ril	20-Dec-96	-0.034	-0.826
galk	14-May-02	0.002	0.017	ril	22-Apr-99	0.100	0.287
galk	19-Dec-02	-0.123	-0.532	ril	10-Nov-00	-0.016	-0.426
galk	19-Feb-03	-0.041	-0.128	ril	25-Jun-01	0.052	0.488
gnfc	20-Sep-02	-0.047	-0.491	ril	20-Aug-01	-0.032	-0.575
grasim	26-May-00	0.231	0.504	sail	6-Oct-97	0.044	0.235
grasim	6-Dec-00	-0.016	-0.069	sail	25-Sep-02	-0.024	-0.163
grasim	14-May-02	0.009	0.067	srf	26-Feb-99	0.001	0.003
grasim	8-Oct-02	-0.027	-0.663	srf	19-Aug-02	-0.034	-0.380
gsfc	22-Sep-03	-0.084	-0.784	srf	19-Feb-03	-0.008	-0.097
gsfc	8-Oct-03	0.057	0.191	srf	29-Oct-03	-0.031	-0.280
heg	30-Sep-96	-0.141	-0.381	tata	6-Oct-97	-0.002	-0.044
hoc	13-Sep-99	0.045	0.249	tata	20-May-99	-0.033	-0.149
hoc	29-May-00	0.090	0.234	tata	25-Sep-02	-0.015	-0.413
hoc	15-Feb-02	0.221	0.370	ttch	5-Jul-99	-0.020	-0.097

Table 3.9: GARCH Results— Date of Final Decision[4]

Company ID	Event Date	CAR	t-statistic	Company ID	Event Date	CAR	t-statistic
apnt	13-Nov-00	0.0046	0.0234	gsfc	7-Oct-04	0.0440	0.1800
apnt	8-Oct-02	-0.0239	-0.3550	heg	27-Mar-98	0.1400	0.8890
artd	14-Jul-00	-0.0545	-0.1962	hoc	28-May-01	-0.0447	-0.2131
artd	21-Jun-02	0.0118	0.1193	hoc	13-Feb-03	0.0078	0.1249
artd	5-Feb-02	0.0439	0.2831	hoc	31-Aug-00	0.0599	0.1268
atlp	25-Aug-03	-0.0185	-0.0827	ipca	12-Jul-02	0.0553	0.5274
bhel	19-May-00	0.0729	0.3189	ipca	15-Jul-04	0.0330	0.3353
bilt	15-Dec-04	0.0195	0.1750	ipcl	11-Jul-00	0.0896	0.6153
cenk	9-Mar-05	-0.0355	-0.4512	ipcl	19-Mar-98	0.0065	0.0643
cenk	4-Jan-02	-0.0644	-0.7095	ipcl	24-Mar-00	-0.0133	-0.0368
cenk	22-Feb-00	-0.1686	-0.5899	ipcl	25-Jun-99	-0.0438	-0.5939
cenk	16-Aug-02	-0.0570	-2.8449	irs	24-Dec-02	-0.0239	-0.2615
chlr	31-Jan-03	-0.0165	-0.2189	irs	21-Jan-00	0.0294	0.0799
chlr	7-Dec-01	-0.0010	-0.0141	irs	16-Aug-02	-0.0957	-0.5714
dcw	4-Aug-03	-0.0619	-0.3622	mhs	19-May-00	0.0064	0.2863
dcw	1-Oct-03	0.0389	0.3760	np	18-Mar-02	-0.0173	-0.1618
dcw	11-Jul-00	-0.2148	-0.3529	np	1-Jul-02	-0.0379	-0.6252
dcw	14-May-01	-0.0987	-0.1586	np	23-Jan-03	-0.0147	-0.1311
dcw	7-Oct-02	0.0304	0.0868	rcf	28-Oct-02	-0.0675	-0.3297
dfpc	19-Mar-04	-0.0821	-0.5178	rcf	5-Jan-98	0.0622	0.1500
esrgj	18-Nov-98	0.0875	0.3133	rcf	3-Nov-00	0.1048	0.2642
fag	19-Mar-04	-0.0116	-0.1215	ril	20-Apr-00	0.2014	0.7716
flxi	26-Jun-02	0.0112	0.0262	ril	24-Dec-02	0.0183	0.3965
fnxp	20-Aug-04	-0.0275	-0.3356	ril	19-Mar-98	-0.0053	-0.0715
galk	18-Aug-04	0.0570	0.1987	ril	7-Jan-02	0.0605	0.2517
galk	16-Apr-01	-0.0229	-0.2180	ril	16-Aug-02	0.0030	0.0589
galk	10-Aug-01	-0.0710	-0.6221	sail	18-Nov-98	-0.0489	-0.1049
galk	16-Jan-04	-0.1279	-0.6455	srf	18-Aug-04	0.0257	0.2202
galk	4-Aug-03	-0.0391	-0.3001	srf	9-Mar-05	0.0256	0.0834
gnfc	19-Mar-04	-0.0926	-0.4748	srf	14-Aug-03	0.0495	0.4752
grasim	1-Oct-03	-0.0229	-0.2100	srf	22-Feb-00	-0.0513	-0.2422
grasim	4-Aug-03	0.0369	0.2181	tata	19-Mar-04	-0.0245	-0.1811
grasim	30-Aug-01	-0.0358	-0.2779	tata	19-May-00	0.1817	1.0124
grasim	14-May-01	-0.0008	-0.0076	tata	18-Nov-98	0.0393	0.3355
grasim	7-Oct-02	-0.0218	-0.7512	ttch	11-Jul-00	0.0453	0.2355
gsfc	16-Sep-04	-0.0946	-1.0248				

[4] Shaded indicates significant at the 95% confidence level.

Figure 3.1: Standardized Returns for Atul Limited

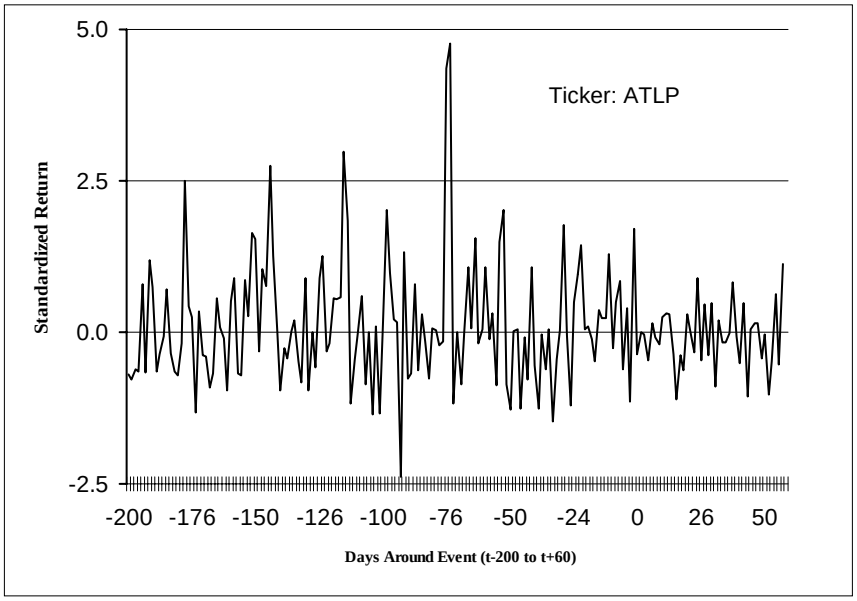


Figure 3.2: Standardized Return for Ballarpur Industries Limited

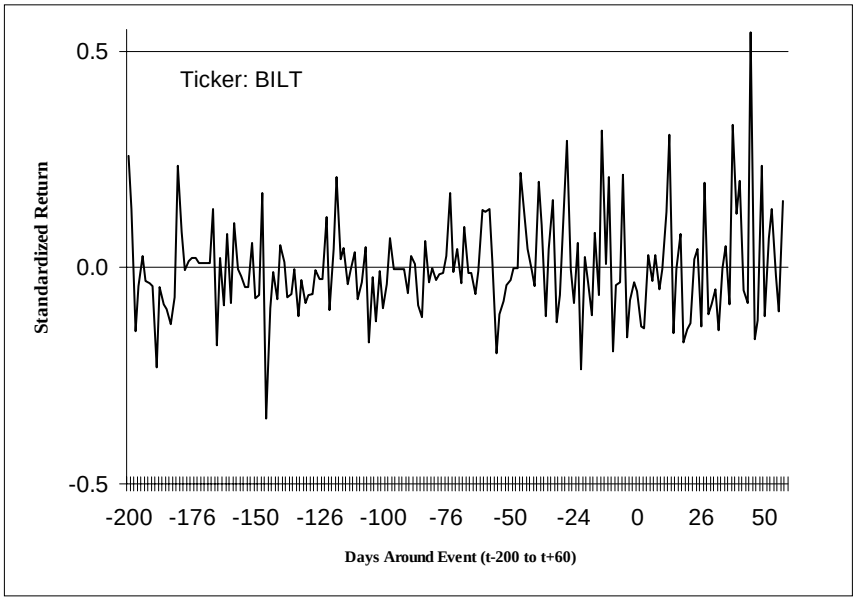


Figure 3.3: Standardized Return for DCW Limited

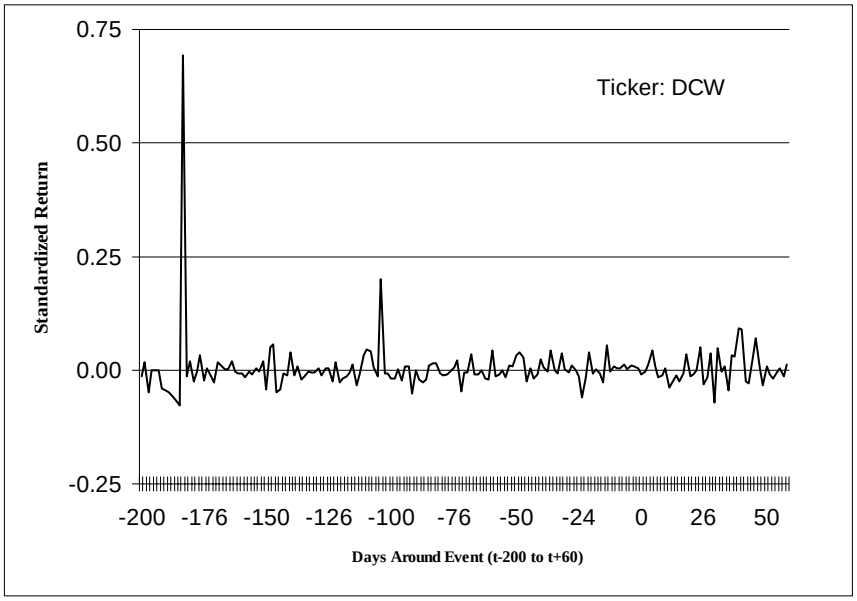


Figure 3.4: Standardized Return for FAG Bearings India Limited

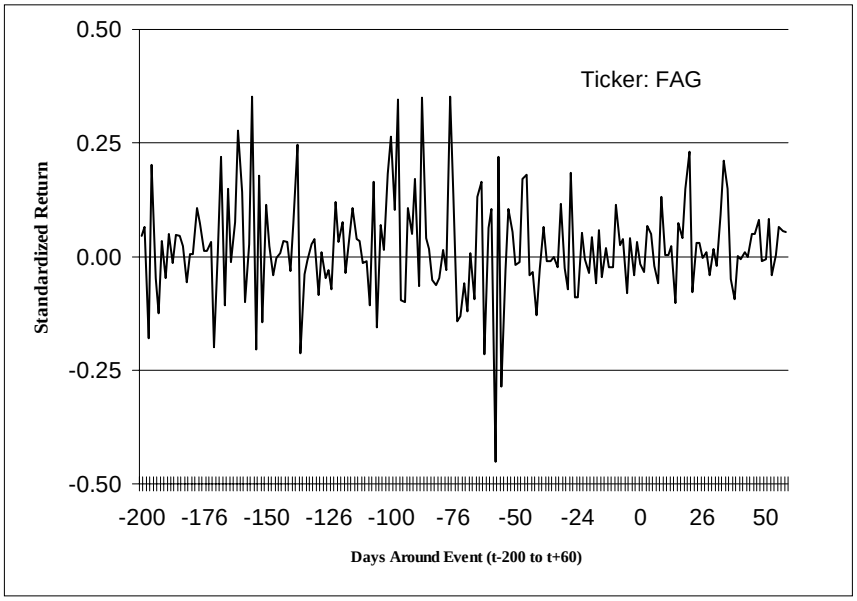


Figure 3.5: Standardized Return for HEG Limited

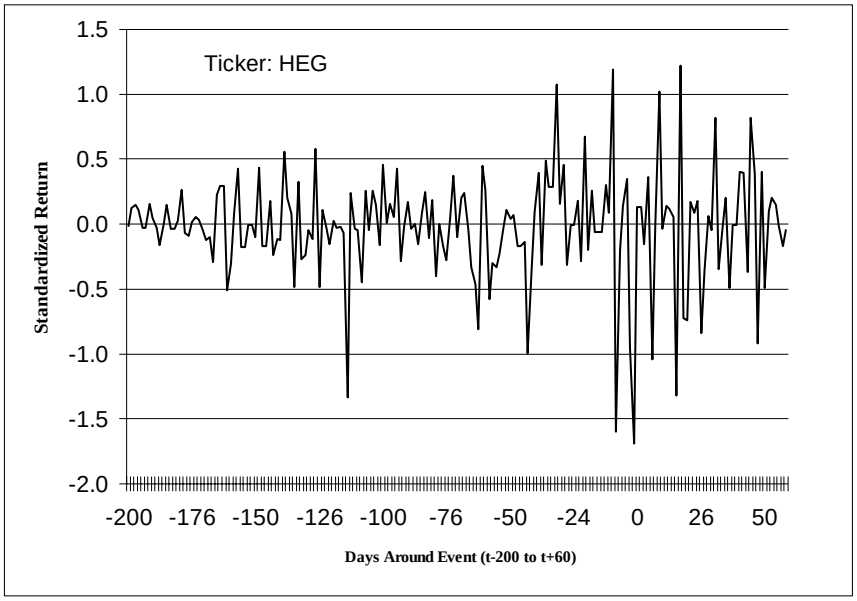


Figure 3.6: Standardized Return for Maharashtra Seamless Limited

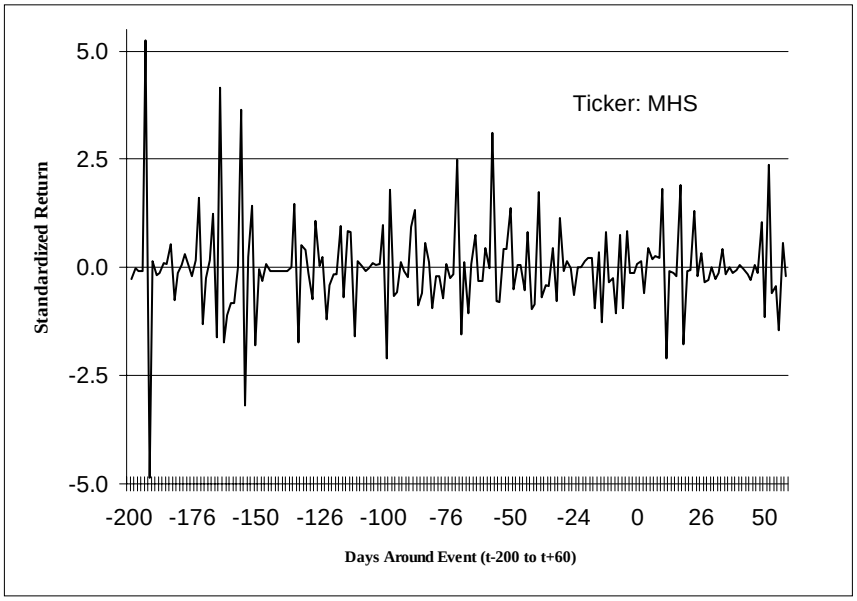


Figure 3.7: Standardized Return for Reliance Industries Limited

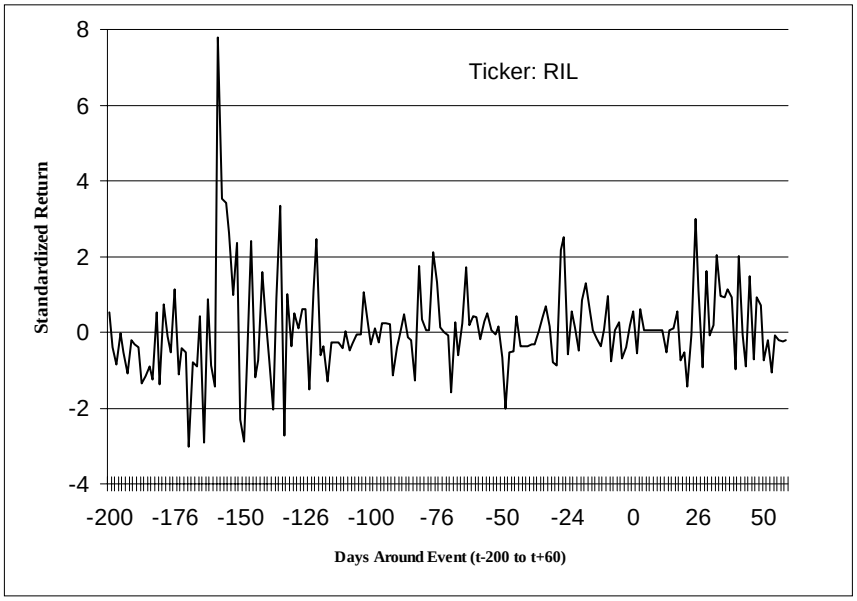


Figure 3.8: Standardized Return for Steel Authority of India Limited

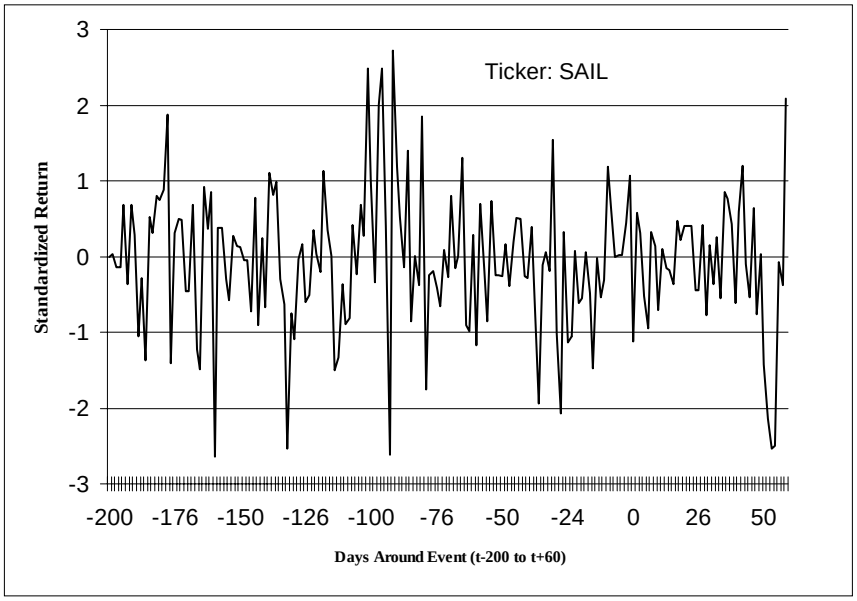


Figure 3.9: Standardized Return for Tata Chemicals Limited

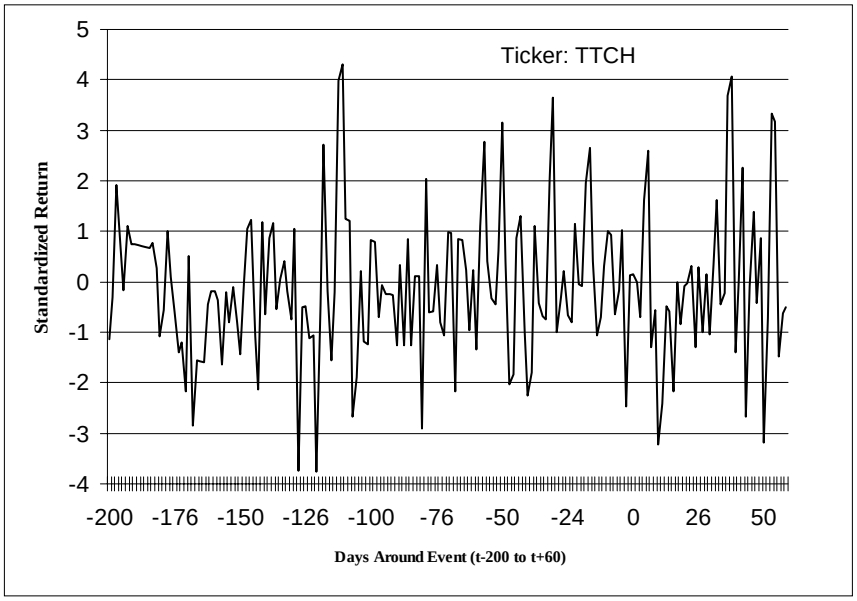


Figure 3.10: Standardized Return for Tata Iron & Steel Limited

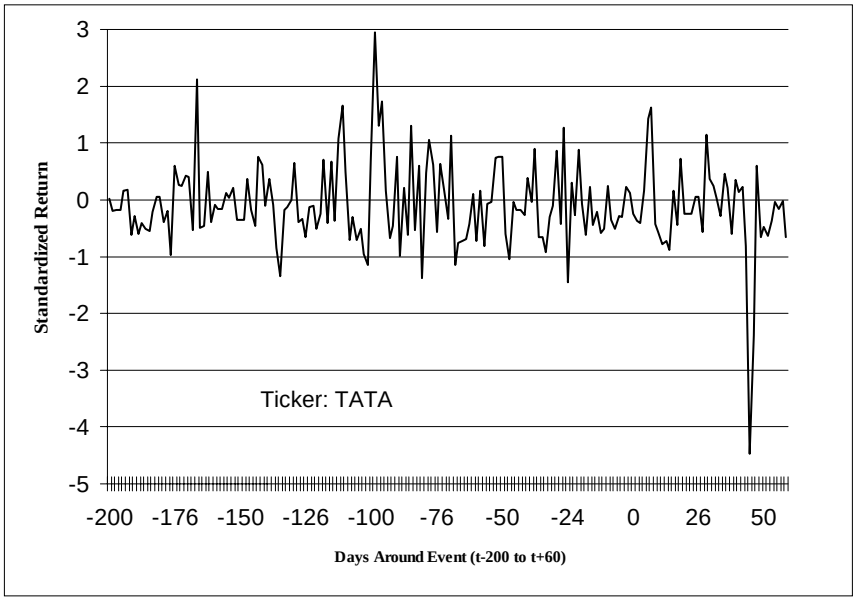
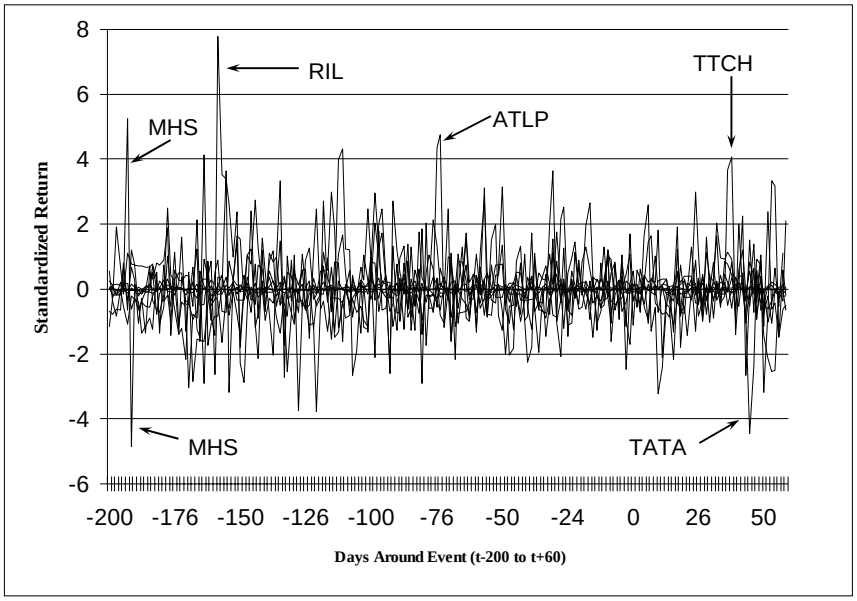


Figure 3.11: Standardized Returns for All Ten Firms Together



Chapter 4

The Current Account and Net Financial Flows

4.1 Introduction

One of the major issues in the field of international macroeconomics is that of global capital market integration and its effect on the international propagation of business cycles. The increase in international financial integration in the past couple of decades has been marked. The "external wealth"of a nation plays a critical role in determining the behavior of the trade balance, both through shifts in the desired net foreign asset position and the investment returns generated on the outstanding stocks of net foreign assets.

The *Balance of Payments* or BoP of a country systematically records all economic transactions that take place between the residents of that country and those of foreign countries. It has two main components: the current account and the capital account. While the current account records the export and import of goods and services and unilateral transfers, the capital account keeps record of all international transactions that involve a resident of the reporting country changing either his assets with or his liabilities to a resident of another country.

A country's current account balance over a period is the change in the value of its net claims on the rest of the world-the change in its net foreign asset position. The economic significance of the current account balance stems from its reflection of the changes in the net international investment position (NIIP) of a country. NIIP is a technical term portraying the difference between foreign assets owned by residents and domestic assets owned by foreign residents. However, in reality the current account balance and the changes in the NIIP of a country are found to diverge significantly in absolute terms. Although the current account balance measures the flow of new

net claims on foreign wealth that a country acquires by exporting more goods and services that it imports, this flow is not the sole factor causing a shift in a country's net foreign wealth position. Other major factors include valuation adjustments arising from changes in asset-prices and exchange rates. It thus becomes interesting to single out and examine the channels of these divergences.

Despite the overwhelming interest of the academia in the integration of world capital markets and the close monitoring of global capital flows, surprisingly little is known about the accumulated stocks of foreign assets and liabilities held by various countries, particularly in the developing world. This is a severe empirical constraint for several reasons. First, the level of net foreign assets is a key state variable in many open-economy models of growth and business cycles, and a fundamental determinant of external sustainability. Secondly, many of the benefits of international financial integration are tied to gross holdings of foreign assets and liabilities, which are not captured by net flow data. Thirdly, the composition of international investment positions between equity (portfolio and FDI) and debt may be important in understanding vulnerability to external shocks and the degree of international risk sharing.

In this paper, I attempt to investigate whether the theoretical identity between the current account balance and the changes in the NIIP of a country holds in practice or not. I start with a simple look at the correlation coefficient between the two for a set of 67 countries and discover that for an overwhelming majority of countries, the correlation between CA and ΔNIIP drops abruptly in response to the surge in international capital flows in the mid-1980's.

To further probe the relation between the Current Account and NIIP of countries, I estimate a Probit model of currency crashes. The model is first estimated using the Current Account as a regressor and then by substituting the change in NIIP for the Current Account. If the theoretical equality between them holds, we would have obtained more or less the same coefficients from both sets of regressions. However, not only are the coefficients different, but there are other measurable differences between the two sets of results, thereby validating our expectation that CA does not equal ΔNIIP in practice. This has important policy implications, especially for countries like

the U.S. which run persistent Current Account deficits.

The remainder of the paper is structured as follows. Section 2 presents an empirical model of BoP accounting that establishes some basic facts about CA and ΔNIIP. The drop in correlation between CA and ΔNIIP is recorded in section 3. The econometric model and estimation are presented in section 4; section 5 presents the data. The results constitute section 6. Finally, section 7 concludes with a few comments.

4.2 An Empirical Model of BoP Accounting

A country's net external position is the sum of net claims of domestic residents on non-residents. External assets and liabilities are classified into three main categories in BoP statistics: foreign direct investment (FDI), portfolio equity (EQ), and debt instruments (DEBT). Foreign exchange reserves (FX) are kept separate although they belong in the debt category. Following Lane and Milesi-Ferretti (2001) and letting A stand for assets (outflows) and L for liabilities (inflows), the net external position (or net foreign assets, NFA) of a country is given by:

$$\begin{aligned} NFA_t &= FDIA_t^* + EQA_t^* + DEBTA_t^* + FX_t \\ &- FDIL_t^* - EQL_t^* - DEBTL_t^* \end{aligned} \tag{4.1}$$

where FDI^*, EQ^* and $DEBT^*$ are the stocks of foreign direct investment, portfolio equity and debt (assets or liabilities) and FX are the foreign exchange reserves. The FDI category follows the IMF definition and reflects a "lasting interest" of an entity resident in one economy in an enterprise resident in another economy. They then define:

$$\begin{aligned} \Delta FDI &= -(\Delta FDIA + \Delta FDIL) \\ \Delta EQ &= -(\Delta EQA + \Delta EQL) \\ \Delta DEBTL &= -(\Delta PDL + \Delta OL + \Delta IMF + \Delta EF) \end{aligned}$$

$$\Delta DEBTA = -(\Delta PDA + \Delta OA + \Delta EO) \tag{4.2}$$

where ΔFDI is net outflows of foreign direct investment,ΔEQ is net portfolio investment and $\Delta DEBTL$ and $\Delta DEBTA$ are the change in debt liabilities and assets respectively. They assume that net errors and omissions, EO, capture unrecorded capital flows. From the above definitions and using those of the IMF, Lane and Milesi-Ferretti obtain:

$$CA = \Delta EQ + \Delta FDI + \Delta DEBTA - \Delta DEBTL - \Delta KA + \Delta FX \tag{4.3}$$

The cumulative current account between dates s and t equals the cumulative value of flows on the RHS of equation (4.3):

$$\begin{aligned} ACUMCA_s(t) &= \sum_{s}^{t} CA_t \\ &= DEBTA_s(t) - DEBTL_s(t) + EQ_s(t) \\ &+ FDI_s(t) + FX_s(t) - KA_s(t) \end{aligned} \tag{4.4}$$

where $X_s(t)$ is the cumulative value of ΔX between dates s and t.

If the period between s and t is sufficiently long and/or initial external assets or liabilities negligible, cumulative flows provide a reasonable estimate of the underlying net foreign asset position (NFA) given by equation (4.1):

$$NFA \approx ACUMCA + KA \tag{4.5}$$

where KA denotes the Capital Account.

Using eqn (4.4), we can approximate (4.1) as follows:

$$\begin{aligned} NFA(t) &\approx NFA(s-1) + \sum_{s}^{t} CA_t + KA_s(t) \\ &= NFA(s-1) + DEBTA_s(t) - DEBTL_s(t) + EQA_s(t) + EQL_s(t) \\ &+ FDIA_s(t) - FDIL_s(t) + FX_s(t) \end{aligned} \tag{4.6}$$

Equation (4.6) highlights two alternative methods of estimating NFA. The first consists of cumulating the current account, adjusting for the capital account balance (which reflects primarily net capital transfers, rather than increases in indebtedness). Lane and Milesi-Ferretti call this NFA measure adjusted cumulative current account (ACUMCA). In the sections below I use the ACUMCA figures to measure NIIP. The second method consists of adding up the individual stock estimates for debt, portfolio equity, FDI and reserves. This, they call adjusted cumulative flows (ACUMFL).

The main problem of implementing this model, however, is the non-availability of reliable data. Although for most industrial countries, sources like the IMF and OECD collect data on estimates of stocks of foreign assets and liabilities, coverage starts only in the early eighties. The corresponding measure of net foreign assets is called the International Investment Position (IIP). For developing countries, however, comprehensive stock data are generally available only for external debt and foreign exchange reserves; IIP availability is limited, especially along the time series dimension. Besides, cross-country comparisons are not always meaningful since methodologies used to estimate equation (4.1) often differ across countries.

To overcome the shortcomings of available data, Lane and Milesi-Ferretti (2001) construct a dataset on external assets and liabilities of 67 industrial and developing countries for the period 1970-1998. They use stock data, when available, supplemented by cumulative flows data, with appropriate valuation adjustments keeping in mind the increasing role of portfolio equity and FDI flows. The fundamental BoP identity states that the current account, net financial flows and changes in foreign exchange reserves sum to zero, with a term capturing "net errors and omissions" acting as the balancing item. Financial flows can be divided between FDI, portfolio equity and debt flows, plus

a term capturing capital account transfers, which include debt forgiveness and other transactions that do not give rise to a corresponding asset or liability. The evolution of net claims on the rest of the world is dictated by the flows of new net claims–which equal the current account balance net of capital transfers TR_t^k –and by capital gains and losses KG on existing claims

$$\Delta NFA_{it} = CA_{it} + TR_{it}^k + KG_{it} \tag{4.7}$$

4.3 Current Account versus Changes in NIIP: An Empirical Regularity

Look at Figure 1 first. It plots the US Current Account Deficit and the U.S. Net International Investment Position (NIIP)[1]. According to Figure 1, since the mid-1980s the United States has experienced considerable persistent deficits in its current account and a steady and sharp depletion of its NIIP. Many will argue that eliminating the current account and the depletion of the NIIP is the first and foremost economic priority, justifying proposals for not only increased trade restrictions but also regulations to limit foreign investment in the United States. Further, they posit that should policies prove inadequate in eliminating the imbalance in the current account and the resulting deterioration of the NIIP, the nation faces soaring interest rates, a plunging dollar, and a recession when the flow of foreign funds to the U.S. ultimately dries up.

The current account balance is the value of net flow of trade in goods and services and unrequited transfers. One of the components of trade in services is investment income, including such items as accrued interest and capital gains and losses. These investment income elements are quite significant. Official figures of the NIIP may be erroneous since they fail to reflect the effects of market prices on important components of domestic investments abroad and foreign investments at home and this may in fact be an important cause of the sizeable divergence between the current account and the

[1]CA refers to the Current Account, NIIP is an estimate of the net external asset position based on the Adjusted Cumulative Current Account, ACUMCA of Lane and Milesi-Ferretti (2001).

NIIP. To further validate the mismatch between the two, I present in Table 1 the correlations between the Current Account and the changes in the NIIP (as measured by the first differences of the ACUMCA) for a sample of 67 countries.

It can be seen from Table 1 that for the majority of countries, the correlation value has gone down significantly after 1985, which is roughly the time when the rapid increment in global capital flows happened.

The literature usually refers to "mid 1980s"as the breakpoint when the major surge in global financial flows happened. In Table 1, I use the year 1985. This is also illustrated by an econometric aside where I check for the abrupt break in the correlation by using a "rolling window"of 5 years to find out the exact breakpoint. The results from the aside are shown in Table 2 below and support the "mid 1980s"hypothesis. There is a sudden break in 1985-89, which has the mid-point 1987.

The change (or the drop) in correlation is more pronounced in the case of just the OECD member countries than for the overall sample. To see this more clearly, look at Table 3. This is expected, since the more advanced western members of the OECD have experienced a relatively larger share of the increasing capital flows.

4.4 The Model and Estimation

The Model

The above results generate sufficient interest in the possibility that the theoretical identity between CA and NIIP might not hold up to rigorous econometric testing. To confirm the suspicion we need to devise a setup that involves both CA and ΔNIIP, where they can be substituted for each other to generate comparable sets of results. For this purpose, I use a model of *currency crises*.

Since the currency crises of the 1990s, macroeconomists in the academia, in the multilateral institutions and in investment banks have looked at models of currency crises with the objective of deciphering their causes, preferably before such crises happen. These models have focused on several variables including the level and currency

composition of foreign debt, the weakness of the domestic financial sector, the country's rate of change of the real exchange rate and almost invariably, the level of its current account. It is interesting to note, in passing, that different scholars do not seem to agree on the role of current account deficits in such currency crashes. Despite that a model of currency crises suits our objective well as it lends itself to the use of the current account and interchangeably, the change in NIIP as a regressor.

In an influential paper, Frankel and Rose (1996) empirically analyze the determinants of currency crashes. Their dataset included 105 countries for the period 1970-1991, and involved several external and domestic variables including the CA balance. Interestingly, the authors found that the CA Deficit was not significant, and in many of the regressions it even had the wrong sign. Edwards (2001) uses an almost identical dataset and almost all the same regressors to arrive at results supported by those of Frankel and Rose. He found that when a broad sample and the exact same regressors are used, the current account seems to play no role in major currency crashes. This is the case irrespective of the estimation technique used and whether the actual value of the current account deficit or a dummy for high deficits is included as a regressor. Even the incorporation of an independent variable that interacts the fiscal and CA deficits did not change the result.

My own analysis follows Frankel and Rose (1996) and Edwards (2001) closely in terms of the model setup and regressors. It differs in its objective, however; my goal is not to ascertain the determinants of currency crashes but rather to investigate the difference between CA and ΔNIIP.

Defining Currency Crises

Despite Krugman (2000) asserting that "there is no generally accepted formal definition of a currency crisis ... we know them when we see them"any model of currency crises and their identification must begin with the definition of the "crisis". Some authors like Edwards (1989), Frankel and Rose (1996) and Milesi-Ferretti and Razin (2000) have defined a crisis as a very significant depreciation of the domestic currency.

In particular, Frankel and Rose (1996) define a currency crash as a nominal depreciation of the currency of at least 25% that is also at least a 10% increase in the rate of depreciation. Others have defined a crisis as a situation where a country's currency is depreciated and/or its international reserves are depleted, thereby allowing for speculative attacks on the currency–see for example, Eichengreen, Rose and Wyplosz (1996), Goldstein et al (2000).

Most often, balance-of-payments crises are resolved through a devaluation of the domestic currency or the floatation of the exchange rate. But central banks can and, on occasion, do resort to contractionary monetary policy and foreign-exchange market intervention to fight the speculative attack. In these latter cases, currency market turbulence will be reflected in steep increases in domestic interest rates and massive losses of foreign-exchange reserves. Hence, an index of currency crises should capture these different manifestations of speculative attacks. Eichengreen et al (1996) and Kaminsky and Reinhert (1999) construct an index of currency market turbulence as a weighted average of exchange-rate changes and reserve changes.

Following Kaminsky and Reinhert (1999), Glick, Guo and Hutchinson (2004) define currency crises as "large"changes in a monthly index of currency pressure, measured as a weighted average of monthly real exchange rate changes and monthly (percent) reserve losses.

The exact definition or identification of a crisis is not of the utmost importance in this paper. Hence, I have adopted the broader currency pressure index definition of Glick et al (2004). To elaborate, this measure presumes that any nominal currency changes associated with the exchange rate pressure should affect the purchasing power of the domestic currency, i.e. result in a change in the real exchange rate (at least in the short run). This condition excludes some large depreciations that occur during high inflation episodes, but it avoids screening out sizable depreciation events in more moderate inflation periods for countries that have occasionally experienced periods of hyperinflation and extreme devaluation. Large changes in exchange rate pressure are defined as changes in their pressure index that exceed the mean plus two times the country-specific standard deviation, provided that it also exceeds 5 percent. The first

condition insures that any large (real) depreciation is counted as a currency crisis, while the second condition attempts to screen out changes that are insufficiently large in an economic sense relative to the country-specific monthly change of the exchange rate. For each country-year in their sample, they construct a binary measure of currency crises, as defined above (1 = crisis, 0 = no crisis). A currency crisis is deemed to have occurred for a given year if the change in currency pressure for any month of that year satisfies our criteria (i.e. two standard deviations above the mean as well as greater than five percent in magnitude). To reduce the chances of capturing the continuation of the same currency crisis episode, they impose windows on the data. In particular, after identifying each "large"monthly change in currency pressure, they treat any large changes in the following 24-month window as part of the same currency episode and skip the years of that change before continuing the identification of new crises.

The Regressors

The regressors used in the Probit estimation can be classified into four categories: (1) foreign variables like world interest rates; (2) domestic macroeconomic indicators like output, monetary and fiscal shocks; (3) external variables like the current account and the level of indebtedness; and (4) the composition of the debt. This classification is standard in related literature.

I use the following regressors in the estimation: (1) Net financial flows (concessional) as percentage of GDP; (2) Net financial flows (non-concessional) as percentage of GDP; (3) Private non-guaranteed as percentage of total external debt; (4) Short-term debt as percentage of total external debt; (5) FDI, net inflows as percentage of GDP; (6) Public and publicly guaranteed debt as percentage of GDP; (7) ratio of gross international reserves to GDP; (8) ratio of total external debt to GDP; (9) rate of growth of domestic credit; (10) rate of change of the real effective exchange rate; (11) rate of growth of GDP (annualized); (12) ratio of government expenditure to GDP; (13) world real interest rate; (14) the degree of openness of the economy, measured as imports plus exports over GDP; and (15) the current account deficit (or the change in NIIP). Most, but not all, of these regressors are comparable those used by Frankel and Rose (1996) and

Edwards (2001). The results, reported later, are not directly comparable however, since the datasets are somewhat different.

4.5 The Data

I use a dataset of 84 countries[2] (in all different stages of development) spanning 1975 to 1998. The currency crisis dates are collected from Glick et al (2004) for the majority of countries; for the countries in my database not covered by them I use the dataset of Bordo et al (2001) which is available online. Data for the regressor variables are all extracted from the World Development Indicators, 2000 CD-Rom, the only exception being government expenditure. Data for that is obtained from the International Financial Statistics (IFS) database maintained by the IMF. Finally, the NIIP or NFA data used is gathered from the pioneering External Wealth dataset constructed by Lane and Milesi-Ferretti and available on the web. I use Mark II of the dataset which covers an expanded set of countries for a longer time span.

4.6 The Results

The results from the Probit estimation of the currency crisis model are shown in Tables 5 and 6 below. Table 5 shows the results when we use the current account balance as a regressor. The findings are similar to those of Frankel and Rose (1996) and Edwards (2001); in particular, the current account balance is not significant in the occurrence of currency crises.

The results for the regression using ΔNIIP as a regressor in place of the CA balance are shown in Table 6. The coefficient is different in size as well as sign from the previous case; moreover, using ΔNIIP gives us a more realistic estimate.

The results from Tables 5 and 6 validate the initial premise of this paper; the equality between the current account balance and ΔNIIP is true only in theory. There is measurable disparity between the two in practice as evidenced by their dissimilar effect on currency crises.

[2]See Table 4 for a list of the countries included in the regressions.

The above results have significant implications for policy makers. In the context of financial crises, a frequently asked question is whether the current account "matters ". My results say "no". First of all, theoretically the sign of the coefficient of CA should be negative to imply that; secondly, the coefficient is not statistically significant. This is consistent with the conclusion reached by related literature e.g. both Frankel and Rose (1996) and Edwards (2001) reach similar conclusions. Generally speaking, there is no evidence to suggest that countries with a large current account deficit almost inevitably face a crisis.

On the other hand, the negative coefficient on the change in NIIP suggests that from a policy point of view, countries should try to ensure a flow of funds into the economy to lower the probability of a crisis. The disconnect between the CA and changes in the NIIP, therefore, imply that even with a current account deficit countries might be able to prevent a currency crisis of they can ensure an adequate inflow of foreign capital and/or prevent an excessive outflow.

4.7 Concluding Comments

In this paper, I have documented the widening divergence between the current account and net international investment positions of countries. The dramatic increase in international capital flows in the last quarter of century or so has had a major impact on this issue. The empirical evidence presented in this paper suggests that changes in the net foreign assets position of a country no longer accurately mirror its current account balance. A set of regressions using World Bank and IMF data on a sample of countries adds further confirmation to the empirical finding.

4.8 Tables for Chapter 4

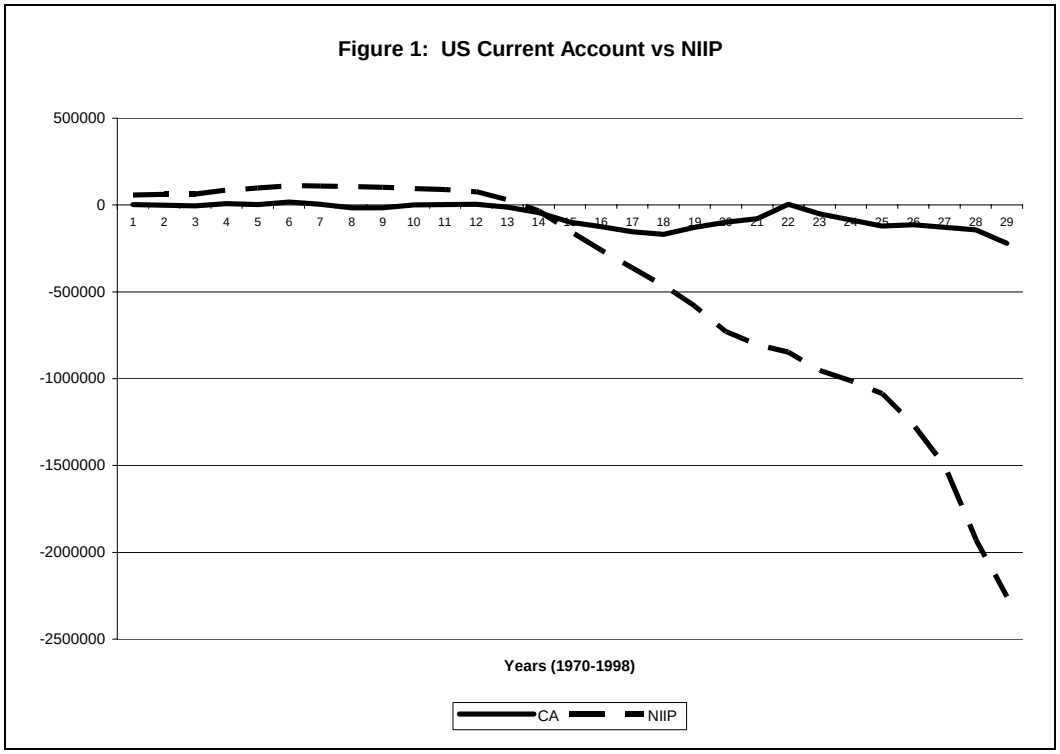


Table 1: Changes in Correlation between CA and Δ NIIP

Country	Correlation Overall	Correlation 1970-85	Correlation 1986-98
USA	0.76	0.94	0.62
UK	0.36	0.69	0.29
Austria	0.79	0.99	0.75
Belgium-Lux	0.34	0.92	-0.32
Denmark	0.88	0.96	0.78
France	0.47	0.94	0.42
Germany	0.87	0.74	0.87
Italy	0.95	0.93	0.94
Netherlands	0.41	0.98	0.21
Norway	0.79	0.99	0.64
Sweden	0.66	0.97	0.64
Switzerland	0.01	0.83	-0.36
Canada	0.33	0.83	0.51
Japan	0.88	0.99	0.49
Finland	0.09	0.97	0.09
Greece	0.39	0.96	0.49
Iceland	0.97	0.98	0.96

Country	Correlation Overall	Correlation 1970-85	Correlation 1986-98
Ireland	0.97	0.99	0.90
Portugal	0.96	0.97	0.96
Spain	0.45	0.97	0.24
Turkey	0.93	0.92	0.94
Australia	0.49	0.78	0.24
New Zealand	0.45	0.96	0.28
South Africa	0.76	0.97	0.32
Argentina	0.82	0.64	0.78
Bolivia	0.55	0.70	0.78
Brazil	0.67	0.84	0.64
Chile	0.68	0.94	0.58
Colombia	0.95	0.97	0.94
Costa Rica	0.58	0.72	0.46
Dominican Rep.	0.69	0.72	0.46
Ecuador	0.82	0.97	0.73
El Salvador	0.72	0.96	0.63
Guatemala	0.81	0.89	0.83
Mexico	0.43	0.90	0.24
Panama	0.95	0.95	0.95
Paraguay	0.87	0.92	0.85
Uruguay	0.79	0.74	0.86
Venezuela	0.86	0.76	0.94
Jamaica	0.19	0.28	0.09
Trinidad-Tobago	0.81	0.81	0.81
Israel	0.74	0.97	0.81
Oman	0.89	0.50	0.94
Syria	0.98	0.99	0.97
Egypt	0.50	0.89	0.30
Sri Lanka	0.89	0.99	0.61
Taiwan	0.88	0.99	0.48
Indonesia	0.36	0.99	0.61
Korea	0.92	0.98	0.93
Malaysia	0.37	0.99	0.42
Philippines	0.47	0.82	0.23
Singapore	0.94	0.83	0.93
Thailand	0.62	0.98	0.58
Algeria	0.67	0.89	0.56

Country	Correlation Overall	Correlation 1970-85	Correlation 1986-98
Botswana	0.92	0.84	0.74
Cote D'Ivoire	0.54	0.87	0.65
Mauritius	0.94	0.99	0.93
Morocco	0.71	0.99	0.48
Tunisia	0.68	0.98	0.56
Jordan	0.32	0.80	0.19
India	0.73	0.98	0.18
Pakistan	0.34	0.97	0.54
Zimbabwe	0.87	0.93	0.89
Kuwait	0.99	0.96	0.99
Saudi Arab	0.99	0.99	0.97
China	NA	NA	0.92

Table 2: Sudden Drop in Correlation in the Mid-1980's

Range	**Correlation Coefficient***
1970-74	0.46
1975-79	0.35
1980-84	0.99
1985-89	**-0.5**
1990-94	0.65
1995-98	0.91

Table 3: OECD Members vs All Countries

	Mean Correlation 1970-98	Mean Correlation 1970-85	Mean Correlation 1986-98
OECD Member countries	0.6232 (0.2926)	0.9232 (0.0835)	0.5100 (0.3792)
All 67 countries	0.6842 (0.2449)	0.8924 (0.1300)	0.5953 (0.3117)

Numbers in parenthesis are the Standard Deviations of the respective series of correlations.

Table 4:

Countries Included in the Regressions			
Argentina	Finland	Lao PDR	Romania
Australia	France	Madagascar	Senegal
Austria	Germany	Mali	Singapore
Bangladesh	Ghana	Malta	South Africa
Belgium	Greece	Mauritius	Spain
Bolivia	Guatemala	Mexico	Sri Lanka
Botswana	Guinea	Morocco	Swaziland
Brazil	Honduras	Mozambique	Sweden
Canada	Hong Kong	Myanmar	Switzerland
Chile	Hungary	Nepal	Syria
China	Iceland	Netherlands	Thailand
Colombia	India	New Zealand	Trinidad & Tobago
Costa Rica	Indonesia	Nicaragua	Tunisia
Denmark	Ireland	Nigeria	Turkey
Dominican Republic	Israel	Norway	Uganda
Ecuador	Italy	Pakistan	United Kingdom
Egypt	Jamaica	Panama	United States
El Salvador	Japan	Paraguay	Uruguay
Equatorial Guinea	Jordan	Peru	Venezuela
Ethiopia	Kenya	Philippines	Zambia
Fiji	Korea	Portugal	Zimbabwe

Table 5: Probit Results using Current Account Balance

Regressors	dF/dx	Std. Error	z	P>z	Confidence Interval*
Current Account (% of GDP)	0.0011046	0.0029174	0.48	0.634	-.004613 .006823
Net Financial Flows (Concessional) % of GDP	0.000039	0.0097098	0	0.997	-.018992 .01907
Net Financial Flows (Non-Concessional) % of GDP	0.0034419	0.0098456	0.4	0.687	-.015855 .022739
Private Nonguaranteed Debt (% of Total External Debt)	0.0052459	0.0086354	1.29	0.197	-.011679 .022171
Short-term Debt (% of Total External Debt)	-0.0005333	0.0024432	-0.23	0.819	-.005322 .004255
Foreign Direct Investment (% of GDP)	0.0020601	0.0038273	0.86	0.387	-.005441 .009561
Public and Publicly Guaranteed Debt (% of GDP)	0.0009681	0.002039	0.67	0.503	-.003028 .004964
Ratio of Gross International Reserves to GDP	-0.1877267	0.4377604	-0.65	0.515	-1.04572 .670268
Ratio of Total External Debt to GDP	-0.0605651	0.1504729	-0.5	0.614	-.355486 .234356
Rate of Growth of Domestic Credit	-0.010886	0.0062441	-0.63	0.528	-.023124 .001352
Rate of Change of the Real Effective Exchange Rate	-0.1145888	0.1763835	-1.42	0.155	-.460294 .231117
Rate of growth of GDP (annual)	-0.0047653	0.0072345	-1.59	0.113	-.018945 .009414
Ratio of Government Expenditure to GDP	-594.8571	1929.987	-0.3	0.766	-4377.56 3187.85
World Real Interest Rate	0.1188451	0.2867075	0.52	0.605	-.443091 .680781
Openness	-0.0000988	0.000574	-0.17	0.862	-.001224 .001026
obs. P	0.1287879				
pred. P	0.0334986	(at x-bar)			

* 95%; z and P>z are the test of the underlying coefficient being zero

Table 6: Probit Results using Changes in NIIP

Regressors	dF/dx	Std. Error	z	P>z	Confidence Interval*
Changes in NIIP (% of GDP)	-0.000955	0.0012221	-1.1	0.27	-.00335 .00144
Net Financial Flows (Concessional) % of GDP	-0.000611	0.0082862	-0.07	0.941	-.016852 .01563
Net Financial Flows (Non-Concessional) % of GDP	0.005819	0.0102584	0.69	0.492	-.014287 .025925
Private Nonguaranteed Debt (% of Total External Debt)	0.0043352	0.0057457	1.07	0.283	-.006926 .015597
Short-term Debt (% of Total External Debt)	0.0004083	0.0023569	0.17	0.861	-.004211 .005028
Foreign Direct Investment (% of GDP)	0.0003148	0.0014683	0.22	0.829	-.002563 .003193
Public and Publicly Guaranteed Debt (% of GDP)	0.0013877	0.0019214	0.94	0.348	-.002378 .005154
Ratio of Gross International Reserves to GDP	-0.1438133	0.3367782	-0.5	0.614	-.803886 .51626
Ratio of Total External Debt to GDP	-0.1039876	0.154941	-0.84	0.399	-.407666 .199691
Rate of Growth of Domestic Credit	-0.0102209	0.0060964	-0.87	0.383	-.02217 .001728
Rate of Change of the Real Effective Exchange Rate	-0.1126851	0.1219204	-1.42	0.155	-.351645 .126274
Rate of growth of GDP (annual)	-0.0054645	0.0058125	-1.85	0.064	-.016857 .005928
Ratio of Government Expenditure to GDP	-638.5814	1912.669	-0.31	0.756	-4387.34 3110.18
World Real Interest Rate	-0.0435253	0.2265893	-0.2	0.845	-.487632 .400582
Openness	-0.0001373	0.0005442	-0.25	0.8	-.001204 .000929
obs. P	0.1285714				
pred. P	0.0343672	(at x-bar)			

* 95%; z and P>z are the test of the underlying coefficient being zero

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