WHY DO FIRMS ADOPT ESOPS? AN INDUSTRY PERSPECTIVE

By

PHELA TOWNSEND

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Douglas Kruse

And approved by

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ABSTRACT OF THE THESIS

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by PHELA TOWNSEND

Thesis Director:

Douglas Kruse

The past decades have witnessed overall growth in broad-based employee stock ownership plans among U.S. firms. However, in recent years ESOP growth has stagnated, and there has been limited research on why firms pursue employee ownership. This study revisits earlier work on predictors of employee ownership, expanding on previous studies that focus on firm-level predictors. I investigate whether industry characteristics can explain firm decisions to adopt employee stock ownership plans (ESOPs), exploring a critical variable of interest with important consequences for society: product market concentration.

I find that product market concentration, a proxy for firm market power, is indeed, a positive predictor, explaining inter-industry differences in ESOP prevalence. This study makes a unique contribution by using industry panel data to examine the extent to which product market concentration and other industry characteristics predict ESOP adoption, pushing the boundaries of current thinking on firm motives and environmental conditions predictive of firm ESOP adoption.

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Introduction

The phenomenon of rising product market concentration, caused by the growing consolidation of firms (Grullon et al., 2016) in recent decades, has received increasing attention from scholars, the media, and policy makers. As fewer firms increasingly dominate markets, they use their increased market power both to raise prices and to undermine or foreclose on smaller competitors, and this result is increased in the monopoly rents[1] for these dominant players. Grullon and colleagues (2016) found that between 1997 and 2012 more than seventy-five percent of U.S. industries became more concentrated, with a smaller number of larger firms accounting for most of the revenue.[2] Since 2000 while the number of publicly traded companies dramatically declined, resulting in an increase in profitability, more merger and acquisition opportunities, and higher stock market returns for surviving firms. The return on assets, which has significantly increased over the past twenty years, mainly due to the ability of firms to raise profit margins, suggests that market power—the ability to raise (and control) prices and profit margins—is becoming an increasingly important source of rent extraction (Appelbaum, 2017). Consequently, many have linked this rise in monopoly power to the

[1] Kanbur and Stiglitz (2015) provide an example of an increase in land rent. They consider an increase in demand for sea-front property on the French Riviera. As demand increases, the value of these properties rises; current owners of this fixed amount of land experience an increase in rents. If they have a tenant on the property, they will be able to charge a higher rent. Yet, even if they do not actually rent out their property, they will gain from the increase in land rent. This is because their wealth—embodied in the value of the land they own—increases. As their wealth increases, the command of these landowners over purchasing power will rise. However, as there has been no change in the ability of the economy to produce goods and services, no increase in GDP will result. The effect is purely distributional—a transfer of income, wealth and purchasing power to current owners of these sea-front properties. (Appelbaum, 2017) make sure this is cited- -not the other study.

[2] See Figure 1 in the Appendices for Grullon et al., (2016) summary of product market concentration levels by industry.

problem of the growing income and wealth gap (e.g. Baker and Salop, 2015; Stiglitz, 2017).

Nevertheless, this study is not only about product market concentration. It links this important phenomenon to the topic of shared capitalism, which ironically is a proposed solution to address the income and wealth gap, by examining the extent to which product market concentration affects the propensity of firms to share rents with workers through employee stock ownership plans (ESOPs). Using industry panel data on US firms, I conduct two analyses: (1) one with a broad set of industries, including but not limited to, manufacturing, utilities, finance and insurance, retail trade, and professional, scientific and technical services industries; and (2) another for Manufacturing industries only. The results from the analysis which includes all industries showed positive significant relationship between product market concentration and ESOP prevalence between industries, over the decade of 2002 to 2012 while the second analysis, focusing on manufacturing industries did not, suggesting that non-manufacturing firms are driving the result. I posit several explanations. Firms with market power use ESOPs to: (1) share rents with employees; or (2) maintain market power by investing in and "locking in" employees; or (3) ESOPs may lead to, or drive market power, as firms invest in ownership cultures or high performance work systems. This study makes an important contribution by showing the link between product market concentration and the prevalence of ESOPs in industries, and in doing so, pushes the boundaries of current thinking on the determinants of firm ESOP adoption.

Background on Employee Stock Ownership Plans

Employee stock ownership plans or ESOPs are the primary form of employee ownership in the United States.[3] The ESOP, as first designed in the Employee Retirement Income Security Act of 1974 (ERISA) by Senator Russell Long and Louis O. Kelso is a kind of employee benefit or retirement plan in which workers hold shares of stock in their employing firm (Blasi et al., 2013; SEC, 2008). Usually, the company sets up a trust fund, into which it contributes new or existing shares of its own stock, or cash from company earnings, to buy existing shares of stock. Alternatively, the ESOP can borrow or use credit with federal tax incentives to buy new or existing shares, which are distributed to the employees as the company repays the loan (Blasi et al., 2013: 218). As required by ERISA, company contributions to the trust are tax-deductible, within certain limits (NCEO, 2018). Regardless of how the plan acquires stock, workers do not buy the stock with their saving or wages, nor do they collateralize the loan,[4] as Congress designed ESOPs to encourage owners of private companies to transfer ownership to employees at no cost to the employees (Blasi et al., 2013: 218).

Fundamentally, an ESOP is group-incentive mechanism that encourages cooperation among employees, allowing them to share in company performance gains

[3] Employee ownership in the U.S. takes five broad forms and a number of combinations (NCEO, 2008c): (1) ESOPs, stock bonus plans and profit sharing plans primarily invested in employer stock; (2) 401(k) plans primarily invested in employer stock; (3) broad-based stock option plans; (4) stock-purchase plans; and (5) restricted stock grants (Kruse, 2002; Blasi, 2018).

[4] An ESOP is different from other non-retirement plans like employee stock options plans, which give employees the right to buy their company's stock at a set price within a certain period of time (SEC, 2008). In most instances, ESOPs consist of one of several components of the company's reward package.

and profits if the company does well.[5,6] In some cases, employees in ESOPs are entitled to vote on major company decisions, and have increased participation in workplace decisions. In theory, ESOPs and other forms of shared capitalism provide employees with additional incentives, such as "the right to share in the company's profits, access to information about the company's finances and operations and the right to participate in the management of the company… These incentives are "intended to bring about fundamental changes in employee attitudes and behavior, which may be reflected in a range of company-level outcomes such as improved productivity and financial performance" (Rousseau and Shperling, 2003: 3).

ESOPs offer advantages not only to employees but also to firms (e.g. Sesil et al., 2001).[7] By allowing workers at ESOP companies to share in the financial success of their companies, thereby improve their economic wellbeing, ESOPs directly address the crises of income and wealth inequality, and stagnating wages (Blasi et al., 2013; Wiefek, 2017). Employee-owners tend to have significantly higher income from wages and

[5] Profit sharing and employee ownership share many attributes as different forms of compensation schemes tied to company performance. However, there are some important distinctions. First, profit sharing focuses on the direct sharing of profits with employees, whereas stock ownership affects employees' asset portfolios through changes in stock price. Thus with stock ownership, strong performance in one period has the principal effect, not of increasing employee income, but of increasing wealth through the stock price. For more information on differences between ESOPs and other forms of employee ownership, see Blasi et al. (2013) or Kruse (2002).

[6] Many workers with shares of stock have a combination of forms. Often firms will combine forms of profit and gain sharing with employee stock ownership or options in order to motivate workers to benefit performance in the shorter and longer term. (See Blasi et al., 2013: 116-117)

[7] It has been well established in the employee ownership literature that firms adopt ESOPs to motivate and reward employees which leads to a variety of positive employee and broader organizational outcomes, including: employee satisfaction; organizational commitment/identification; employee motivation; attitudes toward union; perceived and desired employee participation/influence in decisions; satisfaction with an ESOP; and behavioral measures such as turnover, absenteeism, grievances, tardiness, and injuries.

greater job stability, and these relationships persist across demographic groups and over time (Wiefek, 2017). ESOP participants have more than two times as much in their retirement savings accounts as participants in comparable non-ESOP companies with defined contribution plans, according to the National Center for Employee Ownership (Wiefek, 2017). A Kurtulus and Kruse (2017) study, focusing on the longer term potential wealth effects of ESOPs found that median net household wealth for employee-owners is 92 percent higher than for non-employee-owners ($28,500 versus $14,831), with the exception of single mothers (Wiefek, 2017). Moreover, ESOP firms tend to grow faster than do similar non-ESOP firms.

As of 2016, there were more than 6,660 U.S. firms with ESOPs, with assets of nearly $1.4 trillion and over 10.8 million active ESOP participants (NCEO, 2018; U.S. Department of Labor Employee Benefits Security Administration, 2018).[8] About 1500 of ESOP firms are public companies, traded on stock exchanges like New York Stock Exchange (NYSE) or NASDAQ (Kruse, 2018). Therefore, although most ESOPs are in privately held firms of varying sizes (NCEO, 2018; Blasi et al., 2013), because most private sector employment—about two-thirds—is in public companies – most ESOP participants (about 80 percent) are in public firms. Today, the largest privately held ESOP firm in the US is Publix (with about 200,000 employees) and with an ESOP that is 59 percent of the company's stock (NCEO, 2018). An increasing number of ESOPs are majority or completely worker-owned, and not like the smaller, more modest, employee ownership stakes that are found in firms traded on stock exchanges (Blasi et al., 2013).

[8] Because some company may sponsor multiple ESOPs; the number of unique companies with an ESOP is approximately 6,460. See NCEO website at https://www.nceo.org/articles/employee-ownership-by-the-numbers.

Some have argued that ESOPs can be risky for workers and incentivize exploitative managerial behaviors and thus can be a "double-edged sword" (Aubert et al., 2013: 1). For example, despite the acclaimed benefits of ESOPs (Kruse, 2002), a common critique of ESOPs is while they are often used as a reward management tool, they are often adopted by firms for reasons that have little to do with the "spirit of employee ownership" but rather as a: legal loophole to protect and entrench inefficient management" (Freeman, 2007: 22); or, a tax advantage legally afforded to them participating in broad-based stick ownership, yet subsidized by taxpayers (Nasar and Reilly, 1989; Blasi et al., 2013). Critics have also documented that ESOPs are often poorly implemented without including practices that encourage increase worker involvement, often leading to subpar performance outcomes (Freeman, 2007: 22) and that ESOPs are a common device used to avoid hostile takeovers (Rauh, 2006).

Nevertheless, on the balance, the findings suggest that –when implemented well– ESOPs are worthwhile investments for firms across the U.S. economy and offer great promise for helping to reduce income inequality and wealth disparities among workers. To make good on this promise, however, more workers must become "employee owners," which means more firms must pursue employee ownership. Although fortunately in the past several decades have witnessed an overall growth in broad-based employee stock ownership among US firms (Kurtulus and Kruse, 2017: 33-35), in the last decade, the number of ESOP firms has been relatively flat (Kurtulus and Kruse, 2017: 33-35), a large majority of US workers do not have access to these plans, and ESOP prevalence still varies by industry (see Wiefek, 2017; Kurtulus and Kruse, 2017: 37-38). This suggests there is more to learn about the factors that predict ESOPs.

Study Motivation

If broader capital ownership is to be one potentially viable route to more widely shared prosperity, the prevalence of ESOP firms must increase. Expanding our understanding of the determinants or preconditions to ESOPs could help to further explain firm motives for participating in ESOPs, which can inform policies solution to stimulate ESOP adoption among firms. This study argues for pushing the boundaries of the current research on ESOPs, which focuses on firm-level characteristics, such as firm size, and capital intensity (e.g. Kruse, 1996; Kroumova and Sesil, 2006) to ask the question: why firms adopt ESOPs? Although the extant literature has provided important insights into which firms adopt ESOPs, the research has stagnated in recent years, losing ground to work that has primarily focused on the effects of employee ownership schemes on firms, employees, and society broadly. Taking account of disparate findings in the current employee literature as well as emerging economic trends (which will be discussed later), this study serves to be a timely contribution to the literature and for policy makers to revisit factors that shape ESOP prevalence. This study advances existing theory on by showing that industry environment can explain why firms adopt ESOPs; bridges empirical findings and theory on ESOPs, which is viewed by some as a "fringe" area of research (Freeman, 2007: 28) with theories of the firm from other more "mainstream" literature such as industrial organization economics and management strategy; and provides a path forward for exploring a host of other research questions.

Literature Review

Factors that Predict Employee Ownership Prevalence[9]

Employee ownership in the U.S. varies considerably (Ben-Ner and Jones, 1995; Reeves et al., 2010), and scholars cite a variety of factors (institutional, cultural and organizational) to explain the variation. Fiscal policies and unionization are common institutional factors that predict which firms will employee ownership schemes (Kruse, 1996; Reeves et al., 2010; Freeman, 2017). Historically, increases in employee ownership prevalence have followed the issuance of tax incentives particularly for public firms.[10] For example, after the mid-1970s, legislation encouraging ESOPs led to a dramatic rise in the number of ESOP companies (Conte and Lawrence, 1992), reaching peaks in 1993 and 2005—due to incentives from tax and accounting practices (Blasi et al., 2013). In the late 1980s, many public companies set up ESOPs, but when accounting rules changed in ways less favorable to ESOPs, many companies closed down their ESOPs and moved their contributions of stock to 401(k) plans or many firms adopted broad-based stock option schemes.[11] Later, after the expensing of stock options reduced their use, broad-based restricted stock plans became somewhat more common.

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[9] This section references the broader employee ownership literature, not solely ESOPs, which are the focus of this study.

[10] Tax benefits were the primary reason to adopt employee ownership plans in public firms in the USA. A lower tax bill leads directly to higher performance, reduces indirectly the cost of capital and increases cash flow from higher profits, allowing public firms to make more investments. For public firms, employee ownership may also reduce the threat of acquisition (Kaarsemaker, 2006).

[11] While an ESOP is a retirement plan in which the company contributes its stock for the benefit of the company's employees (SEC, 2008). U.S. based ESOP employees never buy or hold stock directly (SEC, 2008). ESOPs are different from other non-retirement plans such as employee stock option plans which give the employee the right to buy their company's stock at a set price within a certain period of time (SEC, 2008).

The relationship between unionization and employee ownership prevalence has not been as clear-cut, although several narratives have been advanced throughout the literature. In one view, unionists are against employee ownership schemes because they bring workers into competition with each other (violating the traditional union goal to "take wages out of competition"), and pose challenges for workers to monitor the definition and sharing of profits. Alternatively, actual or threatened unionization induces firms in less competitive industries to share a part of economic profits with their employees. A third view is that unions have negotiated ESOPs in exchange for wage concessions in distressed firms to allow workers to share in future recovery (Bell and Neumark, 1993). Although studies have shown positive (Jones and Pliskin 1991; Kim, 1993; Cheadle 1989), negative (e.g. Gregg and Machin 1988), or no association (Pendleton, 2005) between unionization and employee ownership, none of these studies have used U.S. national data. The most recent work on U.S. firms, using General Social Survey (GSS) individual level data (2014), shows that, based on proportion, there are more union members are "employee owners" than non-union members (Blasi, 2018; Kruse, 2018). However, to say there is a positive association between unionism and ESOP prevalence in the U.S. is misleading. Because of the small union density (about six percent of the private sector) (Bureau of Labor Statistics, 2018), today, there are overall more non-union employee owners than all union members in the U.S. Thus, the findings on the link between unionization and ESOP prevalence are, at best, inconclusive.

With respect to cultural factors, scholars argue that employee ownership prevalence depends on the laws, regulations, and philosophical predispositions of a country. While there are few cross-cultural studies, a meta-analysis by O'Boyle et al.,

(2016) indicate that culture influences employee ownership and ESOP prevalence. When comparing U.S. ESOP firms to those of the international community, they found that ESOP adoption tends to be motivated more by economic aims; greater short-term thinking among managers (Laverty, 1996); and greater arm's-length dealings with employees (Budd, 2010). Alternatively, in regions of Europe and Asia, adoption tends to be driven more by altruism, or collectivism. (Reeves et al., 2010). Also in support of this cultural view, some have theorized that employee participation in firm governance is especially value-enhancing for companies confronted with economic or financial distress in countries holding a stakeholder philosophy as opposed to those holding a shareholder philosophy, such as in the U.S. (Acharya et al., 2008; Galai and Weiner, 2008).

Finally, organizational factors – those affecting the firm's internal context (e.g. size, structure, intellectual capital, or performance indicators) – are most frequently examined in the literature. To summarize the available findings, Kruse (1996) found that firms adopt ESOPs for one or more of the following reasons: (1) to enhance workplace co-operation and productivity; (2) to increase compensation flexibility, (3) to discourage unionization, or gain concessions from unions; (4) to gain tax incentives to have easy access to capital, or (5) to avoid hostile takeovers. Moreover, ESOP firms are associated with the organizational characteristics such as larger size, higher R&D expenditures, and higher variability of profits. Kroumova and Sesil (2006) found that higher intellectual capital among workers was linked to higher employee ownership prevalence. With respect to capital intensity, scholars (Poole 1989; Cahuc and Dormont, 1992; Kruse, 1996) have found support for a positive relationship, whereas others have found a negative (Jones and Kato, 1993; Jones and Pliskin, 1991, cited by Kruse, 1996), or no

relationship at all (Biagioli, 1993; Jones and Pliskin, 1991, cited by Kruse 1996). Overall, however, no group of reasons appear to offer strong support for what firms will adopt ESOP plans. In light of these gaps in the literature, there is significant value in taking a broader view and looking beyond the firm to identify potential factors that predict ESOP prevalence.

Industry Environment as a Predictor of Firm Behavior

The fundamental idea of this study is that the industry environment is an important determinant of whether firms will adopt ESOPs. Indeed, this notion that broader institutional forces, such as industry or market conditions, shape firm behaviors is long established. Scholars have studied how firm discretion and flexibility is constrained or enabled by industry factors, or put differently, how managers within firms may organize and restructure work to gain more effective positioning in the (internal or external) "markets" in which they operate and compete (e.g. Dess et al., 1990; Hambrick and Abrahamson, 1995; DiMaggio and Powell, 2000; Pfeffer, 2003). Industrial relations scholars have also examined this idea. Dunlop (1958) recognized the importance of the environment's influence on employment practices, arguing that management as well as labor and government actors make decisions in response to changes in markets, technology, and societal power relations. Kochan et al. (1984) proposed a framework that emphasized the role of the external environment, stressing the strategic choices made by management (and to a lesser extent labor and government) as being critical for understanding firm decision-making. Colvin (2003) found that the rise of individual employment rights litigation in the 1990's was a key factors influencing the increase in

prevalence of mandatory arbitration procedures in nonunion workplaces. He argued that organizations adopted their "own internal institutional structures" in order to exclude influences from the external institutional environment and thereby safeguard managerial power and control over the organization" (Colvin, 2003: 389).

Beyond the industrial relations literature, Lieberson and O'Connor (1972) found that industry profitability was more predictive of firm profitability than general economic factors or changes in leadership. Additionally, when comparing pharmaceutical and phonograph industries, Hirsch (1975) found that even though these industries shared similar characteristics with respect to technology and other operational aspects, they still experienced widely varying levels of industry profitability. Specifically, pharmaceutical industry firms' ability to control distribution and wholesale prices, patents and copyright statutes, and external gatekeepers had determined the industry's consistently higher profitability.

An industry level framework relies on what is often referred to as the market-based view ("MBV") of the firm (Porter, 1980). The MBV, or the "outside-in" perspective (Bea and Haas, 2005), explains a firm's performance in terms of the external industry structure and the strategic conduct of competitors within the industry (e.g. Bea and Haas, 2005; McGahan and Porter, 1997) as opposed to the Resources-Based View ("RBV"),[12] (i.e. the "inside-out" perspective), which focuses on internal, firm-specific resources and capabilities to explain firm performance. The MBV presupposes that a

[12] The resource-based view (RBV) explains a firm's competitive advantage through its distinctive combination of rare resources, which are inimitable to competitors and valuable for the specific purpose of the firm. See Barney (1986a).

firm's competitive advantage arises as a function of its superior positioning against other players in an industry, and the structure of industries, the effects of concentration on competition, and the boundaries between firms and markets, are some of the factors that explain the strategic choices of firm (Mason, 1939; Porter, 1981; Bain, 1956; Hoskisson et al., 1999; Stigler, 1968). Under this view, managers' decisions to adopt workplace practices and policies—including HR/IR practices and work systems—depend largely on 1) their views of the competitive landscape, and 2) the extent of the pressures that result from the industry landscape or changes in the industry landscape.[13]

It is worth noting, however, that the MBV is not without limitations (Knecht, 2014). A considerable body of research has debated the relative importance of industry versus firm context. Some authors have argued that factors other than industry characteristics may have a similar or even greater influence on firm performance; that industry effects play only a minor role compared to firm-specific effects when explaining inter and intra-industry firm performance differences (see Rumelt, 1991; Schmalensee, 1985; Roquebert, et al., 1996; and McGahan and Porter, 1997).

Nevertheless, the industry perspective still has practical and theoretical value for several reasons. First, some contend that the MBV lacks explanatory power and is not capable of fully explaining the performance differentials between firms. This argument has some legitimacy; however, performance differentials among firms are not the same as behavioral differentials. While industry environment may not explain performance

[13] Datta et al, (2005) examined how industry characteristics affect the relative importance and value of high-performance work systems. Liu et al (2014) explored the link between industry capital structure and human capital investment.

outcomes, it may explain managerial practices or strategies, which are more proximal to environment (Hambrick and Abrahamson, 1995; Messersmith et al., 2011).[14] Second, analyzing the industry environment opens the door to new theoretical questions that may point to new, yet to be examined, measures, as this current study purports. Finally, taking an industry focus does not mean that industry context is superior to firm context, or that industry effects have similar or greater influence on firm behaviors and performance. As Wernerfelt (1984: 171) writes, perspectives that focus on industry structures, compared to those that focus on firm specific resources, are just "two sides of the same coin" and are not mutually exclusive.

Why Product Market Concentration Matters

As U.S. markets have consolidated dramatically over the last two to three decades (Grullon et al., 2016), concerned academics, policymakers and the media, have paid closer attention to the controversial effects of rising product market concentration. Defined as "the extent to which a small number of firms account for a large proportion of economic activity, such as total sales, assets or employment, in a particular industry or market," product market concentration is a function of the number of firms and their respective shares of the industry's total production, capacity, or reserves (OECD,

[14] Influenced by the idea of the "black box" – that there are mediating variables that affect the link between HPWS and performance outcomes – I am suggesting that because the relationship between industry and performance is more distal than the relationship between industry and managerial decision-making. In other words, there are likely a different set of variables mediating the relationship between industry conditions and performance than there are between industry conditions and managerial decision-making.

1993).[15] It is also a measure of industry (or market) competition,[16] which is positively related to the rate of profit in an industry (or market) (Bain, 1956; Bikker and Haaf, 2002). This phenomenon The number of mergers and acquisitions has skyrocketed, increasing from less than 2,000 in 1980 to roughly 14,000 per year since 2000 (Grullon et al., 2016).

While the economic impact of rising concentration is evident in broad economic data, its consequences—which touch many aspects of society, from how much we pay for goods and services, to how much we earn, to how we access information—are, indeed, far from theoretical (Steinbaum et al., 2018). A growing body of contemporary research points to a growing list of key indicators of concentrated industries. This list includes, but is not limited to: higher consumer prices (Gutierrez and Philippon, 2017; Kwoka, 2013; De Loecker and Eeckhout, 2017); lower wage growth (Song et al.; 2015); greater "common ownership" (Azar, Schmalz, and Tecu, 2016);[17] lower rates of new firm entry

[15] Market or industry concentration (also often referred to as seller concentration) which measures the relative position of large enterprises in the provision of specific goods or services such as automobiles or mortgage loans. The rationale underlying the measurement of industry or market concentration is the industrial organization economic theory, which suggests that, other things being equal, high levels of market concentration are more conducive to employers engaging in monopolistic practices, which leads to misallocation of resources and poor economic performance. Market concentration in this context is one possible indicator of market power.

[16] According to the industrial organization literature, concentration is useful as an economic tool because it reflects the degree of competition in the market. Tirole (1988: 247) notes that Bain's (1956) original concern with market concentration was based on an intuitive relationship between high concentration and collusion.

[17] Common ownership refers to the increasing role of institutional investors in capital markets, which has exacerbated the lack of competition and the rise of prices in consumer markets. For example, firms like Vanguard and BlackRock own large fractions of all main "competitors" in the technology, drug store, banking, and airlines industries.

(Furman, 2016);[18] lower corporate investment (Gutierrez and Philippon, 2016; Barkai, 2016);[19] fewer jobs (Konczal and Steinbaum, 2016); and higher wage dispersion among workers (Stiglitz, 2012, 2017). At the same time, the largest firms are thriving. Gutierrez and Phillipon (2017) document that since 1980, profitability has increased for the largest firms while remaining constant for small ones. The gap between the profitability of median and high-performing firms has increased dramatically with time, and this trend of consistently high returns has been maintained year over year (see Furman and Orszag, 2015; De Loecker and Eeckhout, 2017).

In light of the heightened importance of product market concentration, this study examines the extent to which product market concentration affects a firm's propensity to adopt ESOPs. Is product market concentration predictive of ESOP prevalence? It is well-documented that in less competitive industries, firms with the greatest market power share rents with workers in the form of wages (Furman and Orszag, 2015; Appelbaum, 2017; Margolis and Salvanes, 2001). A study of the U.S. manufacturing sector showed that changes in industry rents were a very important component of wage determination, whereas changes in worker quality were largely irrelevant (Esetãvo and Tevlin, 2003). However, what about ESOPs? While ESOPs are also a form of compensation, ESOPs are not included in wages. In fact, employers that adopt ESOPs tend to add ownership to

[18] This suggests that it has become harder for new companies—facing larger, often predatory incumbents—to overcome barriers to entry.

[19] Gutierrez and Philippon (2016) document that corporate investment is low compared to what employers' market values would predict, and that this lowered investment corresponds to more consolidated industries. Further, Barkai (2016) documents that while corporations have paid out less of their revenue as wages; they have also spent less on capital assets like machines, offices, and software, further increasing their profits.

paying normal market levels of pay, [20] and almost all of the studies examining whether ESOPs substitute wages showed that ESOPs do not come at the expense of workers, either as lower wages, or other forms of compensation.[21] Thus, while it could be the case, indicators productive of higher wages may not be the same as those predicting the presence ESOPs. Put another way, a firm's incentives to share rents, as wages, may not be the same as those for sharing rents as ESOPs. Consequently, this raises the primary for analysis: do firms with market power in less competitive industries also have tendency to participate in ESOPs? Can product market concentration help to explain the prevalence of ESOPs?

Exploring this potential relationship is important for two reasons. First, to the extent that rising product market concentration continues to be a common fixture of the U.S. economy, it is necessary to further unpack and examine the links between this phenomenon and market dynamics and firm behaviors, which ultimately affect workers. Second, the research overwhelmingly shows that product market concentration has played a key role in distributing capital, and so, wealth. Thus, it is beneficial to explore potential connections between product market concentration and ESOP prevalence, particularly as they are a mechanism of capital re-distribution. What would it mean for firms, for workers, and for the economy and society, if product market concentration predicts ESOP prevalence?

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[20] A comprehensive study of all ESOP adoptions over 1980-2001 found that employee wages apart from the ESOP either increased or stayed constant after adoption, so that ESOP contributions was an add-on to existing pay. (Handel and Gittelson, 2003)

[21] There are a few exceptions where workers gave wage concessions for ownership (see Bell and Neumark, 1993).

Theoretical Framework

To theorize the relationship between concentration and ESOP prevalence, I adopt an industry analysis framework, assuming imperfect competition among firms as higher concentration reflects imperfect (lower) competition. In a perfect competition setting, firms sell identical products and services; they do not control market prices; market share per firm is small; firms and customers have perfect knowledge about the industry; and, no barriers to entry or exit exist. In this setting, firms have little choice but to keep wages at the competitive level. Surplus (profit) is often reinvested to remain in competition with other firms. If any of these conditions are unmet, competition is considered to be "imperfect."

Conversely, in an imperfect competition setting, firms compete to attain a "privileged" market position and inhibit the market's inherent tendency to move toward perfect competition equilibrium (Porter, 1980). This superior positioning allows firms to extract surplus above profits, or economic "rents," by intentionally limiting production below competitive levels (Weigl, 2008). Theoretically, if there is perfect competition, there are no economic rents because competition drives prices down to their floor. Therefore, instead of being a price-taker in a perfectly competitive arena, the superior positioning allows the dominant firm to be a price-setter, retaining some control over price and increase returns, because competition has been curbed (Knecht, 2014).

Comparison between Perfect and Imperfect Market Competition Settings

Perfect Competition	Imperfect Competition
• Perfect industry knowledge among customers and firms (i.e. low information asymmetries) • Identical or similar products and services • Firms are price-takers, and do not control market prices • Smaller differentials in market share per firm • Low to no market entry or exit barriers • Firms reinvest surplus (profit) to remain competitive with other firms	• Imperfect industry knowledge among customers and firms (i.e. high information asymmetries) • Highly differentiated products and services • Firms are price-setters, and control market prices • Greater differentials in market share per firm • High market entry or exit barriers • Dominant firms extract economic "rents" (income above profits)

Product Market Concentration as a Predictor of ESOPs

Certainly, in both perfect and imperfect competitive contexts, firms pursue strategies aimed at producing goods and services to maximize profitability. However, in imperfect markets, a successful firm strategy is focused more on achieving and maintaining profitability, rather than obtaining a superior market position to maintain control over price (or other structural and institutional characteristics) (Weigl, 2008, Makhija, 2003). Given this, if product market concentration, in fact, predicts ESOP prevalence, (or said differently) if dominant firms with market power are more likely participate in ESOPs, one can expect to happen through one, or a combination of, several possible mechanisms.

First, as previously discussed, dominant firms in concentrated industries are likely to be better positioned to share rents with their workers in the form of higher wages compared to non-dominant firms (Pugel, 1980; Margolis and Salvanes, 2001; Autor et al., 2008; Furman and Orszag, 2015). Therefore, one might expect that dominant firms are also more likely to adopt ESOPs, given that ESOPs are a more "efficient" form of rent-sharing than paying higher wages, as they do not involve the expensive "upfront" commitment that raising wages requires.[22] And, while ESOPs are tax-favored for employees like other pension plans, evidence suggests that they drive employee

[22] ESOPs may be considered forms or rents, themselves. While Ricardo (1817) originally defined economic rents as payments for goods, services or for work in employment that exceed the competitive price, later authors have broadened the definition or interpretation. Robert Tollison (1982) referred to economic rents as "excess returns" above the "normal levels" that are generated in competitive markets – a return in excess of the resource owner's opportunity cost. Similar to Tollinson, Sorenson (2000) defines them as "payments to assets that exceed the competitive price or the price sufficient to cover costs and therefore [exceed] what is sufficient to bring about the employment of the asset" (Mihalyi and Szelenyi, 2016, citing Sorenson, 2000). Given this interpretation, it would follow that rent-producing assets, would not only include patents, licenses, credentials, access to loans to start new businesses, but also ESOPs.

commitment more than other forms of compensation such as pension plans, or even wage raises and stock options (e.g. Pierce et al., 1991).

Second, firms may use ESOPs because they "lock in" employees through: (1) vesting, like all pension plans; and, (2) greater employee organizational identification and commitment, which tends to be engendered through employee ownership (or by combining employee ownership with other high performance work system features), encouraging specific skill-building and greater employee involvement (Kruse, 2002). Furthermore, as firms invest in the "ownership cultures" characteristic of many ESOP firms, to attract and retain talent—both through the promise of higher compensation, as an efficiency wage (Marshall, 1892), and the appeal of being an employee "owner," which, in turn, can enhance a firm's reputational value, increasing its attractiveness and in the market (Turban and Cable, 2003).

Third, to the extent that ESOPs are implemented as a part of a broader "high road" strategy (e.g. Appelbaum et al., 2000), or a part of a high performance work system (HPWS), dominant firms may have more resources available to invest in HPWS's that may not be available to non-dominant competitors. Typically, implementing HPWS's means firms must incur higher transaction costs. Through HPWS practices, responsibility and leadership is distributed to employees, and managers take on, or accept, conditions of reduced management discretion, limited short run power, and potentially higher labor costs (Barbash, 1984). Thus, a dominant firm that has greater capacity (via greater resources) is better positioned than a non-dominant firm to invest in, and cultivate, human capital, which (1) drives "human capital rents," in turn, driving "firm- rents" (Campbell, et al., 2012; Chadwick, 2017) and (2) potentially creates an

inimitable resource, giving the dominant firm a competitive advantage (Barney, 1991). In sum, ESOPs, especially those bundled with HPWS's can be a differentiator for firms, as they drive productivity and innovation and therefore growth (Blasi et al., 2016; Kruse et al., 2010).

Finally, a reverse story, based on the "inside out" perspective, may be true. Rather product market concentration predicting ESOP prevalence, ESOPs may, in fact, be predictive of product market concentration; that is, instead of a dominant firm using ESOPs to achieve even more market power, ESOPs may drive a firm's productivity, thereby contributing to the firm's dominant position, or market power. Based on this line of argument, ESOPs help to improve performance by increasing workplace cooperation and information-sharing, and decreasing labor-management conflict, and this better performance leads to higher firm profitability and growth (Sesil et al., 2001). The higher performance, would translate into greater advantage and future opportunities for investments (in firm assets and resources, like human capital, technology, networks) that would, in turn, contribute to market power (Porter, 1980).

Data and Methodology

Data

Data were collected from the following sources:

(1) Information on industry characteristics, such as product market concentration, value of shipments, was collected from U.S. Economic Census Bureau reports. The Economic Census provides official measures of output for industries and geographic areas, key source data for the Gross Domestic Product (GDP), and other indicators of

economic performance. The Economic Census is conducted every five years, collecting data for years ending in "2" and "7."

(2) Occupation, wage, and employment information was collected from the U.S. Bureau of Labor Statistics (BLS) Occupational Employment Statistics (OES) reports. The OES program produces employment and wage information annually for over 800 occupations as well as national occupational estimates for specific industries.

(3) Unionization information was collected from the Union Membership and Coverage Database, which provides private and public sector labor union membership, coverage, and density estimates compiled from the monthly household Current Population Survey (CPS) (Hirsch and MacPherson, 2003).

(4) Data on ESOPs was sourced from the Department of Labor's Form 5500 Series reports, filed annually with the federal government. The Form 5500 is an ERISA requirement for all health and welfare plans. All private sector employers, including corporations, S-corporations, LLCs, sole proprietorship, partnerships, and non-profits that sponsor insured and self-insured plans subject to ERISA have a filing requirement if they are large plans with 100 or more plan participants as of the first date of the plan year.

All data were combined into a panel predicting factors associated with ESOP prevalence among public and privately-held firms in U.S. industries. The initial sample of "ESOP industries" (as in those industries with ESOP firms) was comprised of (1,263) industry-observations—421within each year, 2002, 2007, and 2012. These years were chosen based on the availability of Economic Census data. Form 5500 filings determined the ESOP industries. Once the Form 5500 data were matched to industry characteristics

from the Census Bureau, the sample size decreased, due to missing Census Bureau data for certain industries, leaving a panel of 1,054 total observations over the three years: 353, 343, and 358 industry-observations in 2002, 2007, and 2012, respectively. Given the missing Census Bureau data, several major industries were not included in the data set: agriculture, mining, and construction (11, 21, and 23 NAICS). While this may pose some selection bias, it is only minimal as ESOPs do not typically occur in these industries. A list of all industries included in the data set appears in Figure 4 of the Appendices.

Measures of Dependent and Independent Variables

Dependent Variable:

ESOP Prevalence (%) was calculated as the number of employees participating in ESOPs, divided by the number of employees in an industry.

Independent Variables:

Product market concentration is measured in two ways[23,24]:

[23] MacKay and Phillips (2005, p. 1439) point out that because industry concentration measures calculated by the U.S. Census are used by regulatory agencies such as the Department of Justice. These measures are likely to be the most appropriate to study product market issues.

[24] Given assertions in earlier studies (e.g. Ali et al., 2009; Grullon et al, 2016) about the distinctions between measuring product market concentration using the product market HHI versus market share, I estimated a pairwise correlation between market share (50) and HHI measure which was r=.70. (See table 1i in Appendices.) I also compared the baseline model using the market share (50) measure to the product market HHI measure. I found that the slope coefficient (β) for market share (50) was 0.0019 and the p-value was 0.149. Corresponding z-statistics were 1.46 and 1.85, respectively, which does not reflect a major difference. Although these measures are both indicators of market power, what likely explains the difference in slopes are the differences in concentration calculations. The market share measure reflects the value of shipments of the largest firms, whereas, the product market HHI reflects the

(1) ***Market share (%)***, a proxy of market power, measured the share of value shipments accounted for by the 4, 8, 20, and 50 largest firms for industries. The Census Bureau uses value of shipments as a proxy of primary business activity. Thus, the market share for the four largest firms represented the share of value of shipments for the four largest firms in an industry.

(2) ***Herfindahl-Hirschman Index (Product Market HHI)***, also a proxy of market power, measured the distribution of market shares among the 50 largest firms in the industry, giving more weight to larger firms. It measured the size of firms in relation to the industry and is an indicator of the amount of competition among the firms (Hirschman, 1964).[25] The range in this study was 5.8 to 3560.7.

Occupational Concentration (HHI) is developed from the Herfindahl-Hirschman index, and measures the distribution of employment by occupation groups within industries. The values can range from close to zero (equal representation of all occupation groups) to 10,000 (unequal representation of occupation groups). The range in this study is 139.3 to 6,197.7. A low occupational HHI reflects an equal representation

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weighted market shares of the 50 largest firms in an industry (Hirschman, 1945; Herfindahl, 1950). Nevertheless, the most salient implication of these findings is that concentration, in the case of both measures, positively and significantly predicts ESOP prevalence.

[25] HHI is calculated by squaring the market share of each firm competing in a market, and then summing the resulting numbers, and can range from close to zero to 10,000. For example, a market consisting of four firms with market shares of thirty percent, thirty percent, twenty percent, and twenty percent has an HHI of 2600 ($30^2 + 30^2 + 20^2 + 20^2 = 2600$). See FTC Merger Guidelines for current information on how HHI is measured and applied.

(i.e. a more diverse mix) of all occupation groups within an industry, whereas high occupational HHI reflects an unequal representation (i.e. a less diverse mix) of all occupation groups within an industry.[26] A low score means greater occupational heterogeneity among workers, and a high score is greater occupations homogeneity among workers in an industry.

One reason for including occupational HHI as a control in the analysis was to test whether industries where workers are highly similar are also more likely to adopt ESOPs given Hansmann's (1990) similar arguments at the firm level. Hansmann argued that employee ownership works best when there is minimal opportunity for conflicts of interest among employee-owners, saying "Viability is severely compromised when workers who share ownership play diverse roles in the firm" (p. 1784). While Hansmann's work was theoretical, rather than empirical, this idea that ESOPs are more successful in homogenous workplaces, where the likelihood of internal conflict is minimal, has some validity (Cox and Blake, 1991). It is also possible that firms may adopt ESOPs to take advantage of existing synergies among similarly skilled workers, as skill homogeneity among workers allows for greater sharing of knowledge and information and opportunities for learning (Collins and Smith, 2006), which, in turn, would may offer fertile ground for ESOPs to drive a firm's productivity.

[26] I also tested a measure, largest occupation group, calculated as the number of employees in the largest occupation group in an industry, divided by the number of all employees in an industry. A high occupation group percent reflects a low heterogeneity of occupation groups within an industry. While not reported in the regression tables, this measure yielded similar results as that of the occupational HHI measure.

Another motivation for investigating occupational HHI was to build on recent research, linking occupational concentration to the widening income inequality gap (Card et al., 2013; Barth et al., 2014; Song, et al., 2015). Handwerker and Spletzer (2015) conducted an establishment level study examining the effects of occupational concentration on wage distribution. They found that establishments with higher occupational concentration paid lower wages, even after controlling for employee occupation, geography, establishment size, and other detailed measures of industry, and this effect occurred across both low-wage and high-wage occupations, suggesting that establishments are increasingly becoming more specialized in certain tasks and engaging in greater contracting out of other tasks (Abraham and Taylor, 1996; Schmieder and Goldschmidt, 2015). In keeping with these findings on trends in occupational concentration, it provokes new questions about its relationship to ESOP prevalence. For instance, rising occupational concentration, which lends to greater specialization and externalization of work activities, is pervasive among firms today (Kalleberg, 2000; Weil, 2014; Appelbaum, 2017), is there a potential relationship between ESOP prevalence?

Average establishment size (number of employees) was measured as the total number of industry employees, divided by the number of industry establishments in an industry. Because larger firm size is positively associated with ESOP prevalence (Kruse, 1996), it was necessary to include a measure of the size of the firm in the model to minimize "larger firm" bias.

The Census Bureau data on manufacturing industries provides a measure for "firm" size while it does not provide one for non-manufacturing industries. Note,

however, that while there is a conceptual distinction between “establishment” and “firm,”[27] I found a relatively high correlation between average firm size and average establishment size (r=0.84), which allows average establishment size to be a reasonable proxy for average firm size, which can also be generalizable to manufacturing industries. Thus, while using average establishment size instead of average firm size in the analysis for all industries was not ideal, given the relatively high correlation between the two measures, it stands as a reasonable proxy for firm size.

Under ERISA, ESOPs are legally required to be broad-based. Therefore, it is safe assume that the number of firm ESOP participants and firm total employment are highly correlated with one another. Using the available data on the number of employees participating in small, medium, and large ESOPs, (which again can be a proxy for firm size, given the ERISA requirement), I performed a robustness check to verify that large, not small or medium ESOPs, were driving the product market concentration-ESOP relationship. I found a significant relationship between product market concentration, measured as market share (4), and the percent of employees in large ESOPs in an industry (β =.0012, $p<.001$).[28] Conversely, the relationships between product market

[27] See Sadeghi et al. (2016) and Sarokin (2018). Although they have similar meanings, "firm" and "establishment" have distinct meanings. A firm is typically an organizational entity used to refer to the word "company” and can exist in one location or have many locations. An establishment commonly refers to a single location and refers to the familiar use of the word "facility." According to Sarokin (2018), “a single firm often consists of many separate establishments. The U.S. Census Bureau defines "firm," as one or more establishments under common ownership within the same state and same industry. This definition allows the Census Bureau to count the number of firms in an individual state and in individual industry sectors. However, it also requires the agency to count companies that operate in more than one state or one sector as separate firms.”

[28] Using the product market HHI measure, for large ESOPs, β =.0002 and $p<.001$. For medium ESOPs, β = -6.51e-07 and p=0.253; and for small ESOPs, β = -4.48e-07 and p=0.411. These small coefficient values are to be expected since the total numbers of employees in small ESOPs (in small firms) are relatively small as

concentration and the percent of employees in medium (β = -6.93e-06, p=0.262) and small (β = 9.69e-06, p= 0.309) ESOPs, were not statistically significant.

Average payroll ("pay")[29] (in 000's of dollars) was calculated as the total industry payroll divided by the sum of all employees within an industry.[30]

I included pay in the model to determine whether product market concentration would predict ESOP prevalence, "above and beyond" pay. First, average pay for workers in ESOP firms is often higher than those in non-ESOP firms (e.g. Freeman, 2007; Wiefek, 2017). Moreover, workers in more concentrated industries tend to earn higher wages due to wage-sorting, unionization, rent sharing, or a combination of those factors (Pugel, 1980; Belman and Weiss, 1988; Krueger and Summers, 1988; Barth et al. 2014; Furman and Orszag, 2015; Song et al. 2015). Therefore, by controlling for pay I was able to test whether product market concentration (and not pay) was, in fact, driving the relationship between market concentration and ESOP prevalence.

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comparison to those in large ESOPs (in large firms); and, the coefficient reflects the effect of adding one employee in a small ESOP in an industry.

[29] "'Payroll' as defined by the Census Bureau includes all forms of compensation, such as salaries, wages, commissions, dismissal pay, bonuses, vacation allowances, sick-leave pay, and employee contributions to qualified pension plans paid during the year to all employees. This includes amounts paid to officers and executives; for unincorporated businesses, it does not include profit or other compensation of proprietors or partners. Payroll is reported before deductions for social security, income tax, insurance, union dues, etc. This definition of payroll is the same as that used by the Internal Revenue Service (IRS) on Form 941 as taxable Medicare Wages and Tips (even if not subject to income or FICA tax), which does not include the qualified retirement plans. For more information, see https://www.census.gov/programs-surveys/economic-census/about/faq/faq-manufacturing.html#par_textimage_1179710913.

[30] As a test, I also measured this in logarithmic form; however, the results were not significantly different, so I opted to forego using log.

Unionization (%) was measured as the percent of workers in an industry who are members of a union.[31] I included unionization as a control, given the mixed findings on the relationship between unionization and ESOPs, the dearth of U.S.-based research, and previous evidence showing that in imperfect markets, unions are associated with higher pay (Pugel, 1980).

Methodology

I performed two sets of analyses: one for all industries and one for manufacturing industries (31-33 NAICS). The basic approach was to estimate a linear regression panel model to probe the effect of several explanatory variables on ESOP prevalence, where industry i was observed at several time periods *t*:

$$\boldsymbol{Y_{it}\ (ESOP\ Prevalence) = \mu_t + \beta_{it}\ (Product\ Market\ Concentration) + X_{it} + \gamma z_i + \alpha_i + \varepsilon_{it},}$$

where Y_{it} was the presence of ESOPs in industry *i*, year *t*; μ_t was an intercept term that varies across time, but not across cases. X_{it} was a vector of the time-variant control variables, industry *i*, and year *t*; z_i was a vector of the time-invariant explanatory variables; β and γ were the coefficients for X_{it} and z_i, respectively. However, no time-invariant variables were explicitly tested in the study. α_i was the effect of all time-invariant, unobservable variables, and ε_{it} was a random error that varied across cases (industries) and across time.

[31] The share of unions covered in a collective bargaining agreement was tested as well, the key distinction being that in the former case, employees have voting rights whereas in the latter they do not.

Regression Model Key

Y_{it}	ESOP prevalence
i	Industry
t	Year
μ_t	Intercept, varies across time
X_{it}	Time-variant control variables
β	Coefficient for time-variant
γ	Coefficient for time-invariant
z_i	Time-invariant control variables (none are explicitly studied)
α_i	Unobserved effects of all time-invariant variables
ε_{it}	Random error term, varies across cases and time

I used random and fixed effects because the data were drawn from a hierarchy of different populations whose differences relate to that hierarchy (Laird et al., 1982). I was interested in "within-industry" change over time.[32] In this case, the "hierarchy" levels are years.

Random Effects

The random effects model stipulates that α_i, which represents "unobserved heterogeneity" between industries, is to be treated as randomly occurring and uncorrelated with (or more strongly statistically independent of) the observed explanatory

[32] For robustness, a Hausman test was performed with both measures of product market concentration and both yielded a significant result. With the market share (4) measure used in the analysis including all industries, p=0.000. With the occupational HHI measures used in the manufacturing industries analysis, p=0.0007.

variables (Allison, 2009).[33] Some examples of sources of unobserved heterogeneity might be technology (Cherchye et al., 2018), local economic environments, or managerial quality (Gormley and Matsa, 2013). Significant results in a random effects model can highlight differences both between and within industries, contrary to a fixed effects model, which only estimates differences within industries. Random effects do not, however, explain why effects differ from one another, although effects can differ in the case of a fixed-effects model as well (Rumelt, 1991). To perform this regression I used a generalized least squares (GLS) method.

Fixed Effects

To determine whether these effects persisted over time and were completely separate from unobserved firm effects, I also used "fixed effects" to estimate the model. By introducing fixed effects, I minimized the chance that omitted variables were driving the relationship between the independent variables and ESOP prevalence. I controlled for everything that was constant or fixed in an industry. This removed the effects of differences between industries, leaving only the effects of differences within industries to analyze. In essence, the industries served as their own controls, which allowed for any

[33] Given that I am examining the varying impacts of product market HHI among industries over time, I expected that issues of heteroscedasticity and autocorrelation would present in the data. One can assume that the variability of concentration will be unequal across industries (heteroscedasticity) and that the random error in one year is linked to the error in the following year (autocorrelation) because as industries evolve, it is fair to assume that past effects will reasonably affect future effects. Subsequently, I verified this conducting a scatter plot of ESOP prevalence on product market HHI. To control for this bias (see Figures 2 and 3 in Appendices), I used the "vce(cluster)" command in Stata, which specifies that the standard errors be robust to heteroscedasticity and autocorrelation as well as allow for intragroup correlation—essentially, relaxing the usual requirement that the observations be independent. That is to say, the observations are independent across industries (clusters) but not necessarily within industries. While this is, indeed, a more rigorous test, I think it speaks to the strength of the findings.

effects associated with omitted variables to be the same at each point in time. Although I did not explicitly measure time-invariant variables, they can still be assumed to have an (unobserved) effect on the dependent variable (Allison, 2009), which is why they were partialled out. The key assumption under the fixed effects model is that unobserved heterogeneity, α_i, may be correlated with all explanatory variables, so the variables are not independent of one another. Therefore, an insignificant result in a fixed effects model would mean that inter-industry differences would likely account for most of the variation in ESOP prevalence whereas intra-industry differences would not.

To perform the fixed effects regression, I used a demeaning variables procedure commonly used for linear regression models analyzing quantitative dependent variables, when *T* is greater than or equal to two (Allison, 2009). The "within-subject" means for all explanatory variables were subtracted from the observed values of the variables, and within each industry, the demeaned variables all ended up having a zero mean. All "between-industry" variability, which would have contributed to omitted-variable bias was removed, leaving only "within-industry" variability. Time dummies for years 2007 and 2012 were also included in the model as a more conservative test to control for year effects.

Results

To sum, the hypotheses for analysis were:

1) Industries with higher product market concentration will be more likely to adopt ESOPs, and;

2) There will be a positive relationship between product market concentration and ESOP prevalence over time.

For this to occur, the product market concentration measures must be positively related to the percent of employees participating in ESOPs in industries. This relationship must be significant between and/or within industries. For the relationship to present over time there must be significant evidence of within-industry variability.

Analysis for All Industries

Using Random Effects

Table 2 presents the results of the explanatory variables on industry ESOP prevalence for all industries using random effects. I used a stepwise approach to test whether the results from the basic model are maintained at each stage after the inclusion of additional variables. First, I estimated a simple "baseline model" showing a univariate regression between market share of the four largest firms in an industry and ESOP prevalence. Additionally, as a check, I tested the market share variables for the 8, 20, and 50 largest firms to verify whether the relationship held. They were also positive and significant. (Refer to Column 1 in Table 2 for market share (4) and columns 2, 3, and 4 for market share, 8, 20, and 50.)

The relationship between product market concentration, measured as the market share (4), and industry ESOP prevalence is positive and highly significant (β =.0013, p=.001). A one-percentage point increase in market share (4) was associated with a 0.13 percentage point increase in ESOP prevalence. The model explained 6 percent of overall variability (r^2 =.0608); 1.5 percent of "within-industry" variability (r^2 =.0152); and 5.4

percent of "between-industry" variability (r^2 =.0543). While these were relatively small values for r-squared r^2, when accounting for effect size—a 50 percent move along the quartile range (i.e. from 25th to 75th quartile)[34]—there was a notable change in number of employees. Specifically, there was a 3.7 percent change in ESOP prevalence,[35] which is equivalent to adding, approximately an average of 9,526 ESOP employees in an industry.[36] Therefore, product market concentration, as a predictor of ESOP prevalence, appeared to have both statistical and practical significance.

When expanding the baseline model (see Column 6 in Table 2) to include market share (4), also controlling for occupational concentration, average establishment size, unionization, and average pay, product market concentration remained a significant predictor of industry ESOP prevalence (β =.0012, p=.001). Additionally, occupational HHI (β =-.0000074, p=.002) was also a significant, but negative, predictor of industry ESOP prevalence. Thus, a one percentage point increase market share (4) yielded a 0.000757 decrease in industry ESOP prevalence, which is the same as removing 54 ESOP employees in an industry.

Average pay (β =.00078, p=.005) and average establishment size (β = -0.000024, p=.041) were also significant. Unionization, however, was not a significant predictor (β =.00027, p=.514). Compared to the initial baseline model, this model explained 10.7

[34] See Tables 1a-i for Summary Statistics.

[35] The effect size was calculated as: the product of the β coefficient of the independent variable (product market concentration) and the difference between the 25 and 75th percentile values of the dependent variable, ESOP prevalence. [0.00129 x (39.1-11) = 0.037.

[36] This was calculated as: the average number of employees in an industry (257,448) multiplied by the effect size (0.037).

percent of overall variability (r^2 =.1074), which was a 4.7 percent increase, most of which was explained through between-industry variability (r^2 =.1134). Overall, these results suggest that product market concentration is a significant predictor of ESOP prevalence and (combined with the aforementioned controls) explained almost 11 percent of the variation between industries.

Using Fixed Effects

To examine these relationships over time, I introduced fixed effects to the expanded version of the model which included all controls. (Refer to Table 3, column 6) for results. Under fixed effects, none of the relationships held, which suggested that product market concentration was only significantly predictive of ESOP prevalence between industries and not within industries over time.

Analysis for Manufacturing Industries

Following the same procedure used in the analysis for "all industries," I, again, took a stepwise approach to test the hypothesized relationships for only manufacturing industries. The sample size *n* was 85 in 2002 and 2007, and 89 in 2012. The manufacturing analysis[37] differed from the analysis for "all industries" in that I was able to test and compare models using both the market share and product market HHI

[37] Since more Census Bureau data were available for manufacturing industries, I was able to test the model with more control variables identified in the literature, including import penetration, export ratio, average company size, and average capital expenditure. See Appendices for results of analysis.

concentration measures. Table 4 and 5 show results for the random effects and fixed effects analyses, respectively.

Using Random Effects

Referring to Column 1 in Table 4, the baseline model which included only market share (4) and ESOP prevalence, showed that a one-point increase in market share (4) [38] was associated with a 0.28 increase in ESOP prevalence (β = .0028, p=.062). This is the as adding 9,465 ESOP employees to an industry.[39] Similarly, the baseline model with product market HHI was also significant. An increase in product market HHI by one-percentage point resulted in a 0.01 percentage point increase in ESOP prevalence (β = .0001, p=.058), or an addition of 338 ESOP employees, reflecting an effect size even smaller than that of the market share (4) measure.

Next, I tested both product market concentration measures, and included all controls. (For all results, refer to Columns 6 and 7 in Table 4.) With average establishment size,[40] average pay, and unionization included in the baseline model, the significant relationships for both product market concentration measures, market share (4) (β = .0017, p=.264) and product market HHI (β = .000079, p=.176) did not hold.

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[38] Market share (8) was also significant (at the 10% percent level), and market share 20 and 50 were insignificant. (Refer to Columns 2, 3, and 4 in Table 4.)

[39] The effect size was calculated as: the product of the β coefficient of the independent variable (product market concentration) and the difference between the 25 and 75th percentile values of the dependent variable, ESOP prevalence. [0.0029 x (40.40-17.70) = 0.227]. This was calculated as: the average number of employees in an industry (148,918) multiplied by the effect size (0.227).

[40] As mentioned earlier in the Data section, the manufacturing data also included an average company size measure. The model was also tested using this measure but there were no substantive changes to the results. So, I only included the average establishment size results for purposes of consistency across the two data sets.

Average pay and unionization were the only predictors that remained significant in both models with each product market concentration measure.

Using Fixed Effects

Finally, I introduced fixed effects to the expanded manufacturing model, including all controls, to estimate the hypothesized relationships within industries over time. (Refer to Columns 6 and 7 in Table 5.) Not too surprisingly, the results were similar to those of the fixed effects model for the analysis with all industries. Both measures of product market concentration were no longer significantly predictive of ESOP prevalence. Conversely, unionization and pay were significant, which demonstrates that explain some of the within-industry variation in ESOP prevalence over time.

Discussion

In this study, I examined the extent to which product market concentration in an industry predicted ESOP prevalence in the industry, over the decade of 2002-2012. I conducted two analyses: one which included all U.S. industries for which Census Bureau data were available and one for U.S. manufacturing industries. The results showed that higher product market concentration—reflecting the dominance of an industry's top performing firms—is significantly positively associated with higher ESOP prevalence and explains variation between industries, however, not within industries over time. When fixed effects were introduced to the model, controlling for occupational concentration, average pay, average establishment size, and unionization, product market

concentration was no longer a significant predictor. Alternatively, the analysis for manufacturing industries did not show this result; product market concentration was predictive of ESOP prevalence.

This study's core motivation was to broaden our understanding of determinants or preconditions to ESOPs by testing whether industry-level predictors should be included along with firm-level predictors the list of motives explaining why firms adopt ESOPs. Overall, these results show that industry predictors can offer something additional and meaningful to the story; the prove the central hypothesis that more concentrated industries (with less competition among firms) are more likely to have ESOP participants than less concentrated industries. Moreover, the results appear to be driven by the larger, more dominant, non-manufacturing firms within industries.

Although this study does not directly examine the mechanisms underlying this relationship, there are several explanations for why this might occur. An industry's level of product market concentration may be *one of several* determinants of a firm's decision to participate in an ESOP.

One explanation is *rent-sharing*. Previous research shows that in more concentrated industries, dominant firms (with strong financial positions and typically greater discretion) may opt to share rents with their workers in the form of higher than average wages (e.g. Autor et al., 2008; Furman and Orszag, 2015). This study's findings follow a similar line of argument: dominant firms may also participate in ESOPs as a form of rent-sharing. Simply put, having market power enhances firms' ability and freedom to make certain choices. The idea that firms with market power in a concentrated industry may be better positioned or "resourced" to adopt ESOPs than peer

firms with less market power is consistent with earlier works that found that firms seek to control their internal environments (by influencing employee attitudes and behaviors) or their external environments (by exploiting a market advantage) (Hirsch 1975; Pfeffer, 2003; Appelbaum, 2017), or a combination of both. Kruse (1996) was a seminal inquiry into the factors predicting firm ESOP adoption, arguing that flexibility is a reason that a firm may turn to an ESOP. The results of this study add to Kruse's argument, showing that a firm's decision to adopt an ESOP as a means to maintaining or achieving greater flexibility, may be shaped by the firm's broader industry conditions.

Second, an *employee retention* or (*incentive*) argument may explain these results. Firms may view ESOPs as a way to "lock-in" or retain workers through vesting, thereby engendering greater organizational commitment and identification with the firm (Kruse, 2002), to incentivize employees to stay in the organization. A third explanation is a *high performance work system* argument, wherein, firms implement ESOPs as part of a firm's HPWS, or bundle of high-road strategy work practices. Because firms with greater market power typically have greater flexibility to deploy resources than less dominant firms (Porter, 1980), they may be better positioned to develop human capital through investing in HPWS's, or "ownership" cultures, which can translate into higher productivity and potentially higher human capital and firm rents (Campbell, et al., 2012; Chadwick, 2017). Fourth, these results could support a reverse causation scenario. Because the current study does not specifically address causality, I was not able to pinpoint the direction of the relationship. Under this scenario, rather than product market concentration predicting ESOP prevalence, conversely, ESOPs could drive firm productivity and performance (Sesil et al., 2001), which, then—for those top performing

ESOP firms—could help to give rise to greater market dominance. To be clear, however, these results do not, by any means, purport that only large, dominant firms, are motivated to participate in ESOPs – and for the above speculated potential reasons – or that large firms will invest large percentages of company stock in ESOPs, or that smaller firms are motivated to adopt ESOPs and the possible reasons. In fact, the contrary is true: while about 80 percent of ESOP participants reside in large (publicly-held) firms, most *individual* ESOPs exist within small- to medium-sized (privately held), firms[41] (Blasi et al., 2013). Furthermore, large, public companies tend to invest only a small percentage of their overall company stock in ESOPs, as opposed to smaller firms that invest more substantial percentages (Blasi, 2018). About seventy percent of public companies have about less than five percent of their company stock in an ESOP; the average is around 2.3 percent.

A key implication of these results is that firm choices and behaviors may be constrained by environmental factors in more ways than those "on the ground" (e.g. managers and policymakers) may initially recognize. Recall that a motivation of this study was to expand the current thinking on firm motives for participating in ESOPs so as to be able to identify more policy pathways to increasing ESOP prevalence among firms. This study's findings suggest that ESOP advocates may need to look beyond the firm environment and consider a broader set of factors that may be shaping firm decisions. Doing this requires taking a more nuanced view and recognizing that policy interventions

[41] Today, the largest privately held ESOP firm in the US is Publix (with about 158,000 employees) and with an ESOP that is 59 percent of the company's stock (NCEO, 2017). An increasing number of ESOPs are majority or completely worker-owned, and not like the smaller, more modest, employee ownership stakes that are found in firms traded on stock exchanges (Blasi et al., 2013).

may need to be targeted, rather than a "one-size-fits-all," approach to account for the role of firm or industry characteristics in shaping firm incentives and behaviors. In other words, different policy levers may need to be activated (at different levels) to promote ESOP growth for firms in certain industries, or with different positioning in their respective industries. And, while focusing on the industry or firm context may explain firm decisions to varying degrees, both can have predictive value.

Beyond the provocative product market concentration results, the finding that occupational concentration was a significant negative predictor of ESOP prevalence was particularly illuminating. Hansmann (1990), in his earlier work, posited that employee ownership was likely to be found among firms employing workers who are occupationally similar (i.e. or having less diversity of skills among workers). Instead, the negative relationship in this study suggests that in concentrated industries among firms with a more homogenous (less diverse) occupational makeup among workers, there are more likely to be ESOP participants compared to industries with less skill homogeneity among workers. Put differently, in high product market concentration industries, firms are less likely to adopt ESOPs when their workers' skills are highly similar. On the one hand, one possible explanation for this could be that greater skill diversity among workers means there is a greater need for coordination and cooperation among workers. ESOPs are a monitoring mechanism, and firms may adopt them to cultivate greater information sharing, cooperation, and coordination among employees (e.g. Kruse, 1996). On the other hand, an explanation could be that a more diversely skilled workforce could mean less "substitutability" between workers, or said another way, a higher firm or industry reliance on certain skills. In this case, ESOPs may be offered as a part of a

HPWS or high-road work practices, or attractive reward and benefits packages (e.g. Appelbaum et al., 2000). Thus, firms may participate in ESOPs in order to retain talent or less interchangeable skills within and across industries.

Average pay and unionization were included as controls in both analyses, and in both, they predicted changes in ESOP prevalence between and within industries over time. The fact that average pay, on its own, was predictive is not too surprising given previous studies linking pay to ESOP adoption (Freeman, 2007; Wiefek, 2017; Kruse, 2002). However, these results serve to extend earlier findings on the relationship between product market or industry concentration and pay (Pugel, 1980; Margolis and Salvanes, 2001; Autor et al., 2008; Furman and Orszag, 2015) to include employee ownership participation as a potential outcome variable. The positive association between unionization and ESOP prevalence is not immaterial either. As discussed earlier, the results have been inconclusive as to the nature of the relationship between unionization and ESOPs, and no current work has substantively explore the relationship using U.S. data. Therefore, it is intriguing that in both sets of analyses, unionization—on its own—was not predictive of ESOP prevalence. However, when included in the model, with only product market concentration[42] and average pay, each time unionization was significant. Although thought-provoking, the reason for this is unclear. These results hint at a deeper probing and potential interactions between product market concentration

[42] Both measures of product market concentration were tested and in both cases unionization –when included with average pay – was a significant predictor of ESOP prevalence. This was also done under conditions of both random and fixed effects and the results were similar.

and unionization, or average pay, or a combination of these variables, and warrant further examination in the future.

Study Limitations

A central claim of this study is that industry-level conditions may explain some firms' motives to participate in ESOPs. However, relying on industry-level measures did present several challenges. First, it is not possible to disaggregate Census Bureau measures to delineate whether the firms in the sample are public- or privately-held. Accordingly, I was not able to directly pinpoint the private or public status of firms that constitute the product market concentration measures. Second, in the analysis for all industries, I used the *establishment size* measure to control for "large firm bias"[43] in lieu of having an adequate *firm size measure*, which was available for manufacturing industries. These two issues undoubtedly have statistical consequence and undoubtedly generated some measurement error (not atypical in studies that draw on industry-level data), however, they also have practical consequence. In the absence of having a way to determine the private and public status of firms, and having more definitive estimates of firm size, I was not able to ascertain the extent to which public or private firms are specifically contributing to the positive finding between product market concentration and ESOP prevalence. And although, a robustness test showed that it is, indeed, likely larger, more dominant, firms driving this relationship,[44] and public firms employ the

[43] Kruse (1996) found that larger firms were more likely to adopt ESOPs.

[44] See page 28.

majority of ESOP participants whereas the majority of ESOP firms are small- to mid-sized (Blasi et al., 2013), without firm-level estimates, the only sufficient conclusion to draw from these results is that more concentrated industries are associated with more ESOP participants (not necessarily more ESOP firms).

Another methodological challenge was that the data did not allow for examining causality, another commonplace issue often cited in the employee ownership literature. While Granger (1969) and other causality tests were attempted in this study, they could not be successfully performed given the limitations of the sample data. With appropriate software, firm-level, or a multi-level panel, the causal relationship can be explored in future research. Finally, scholars across a variety of disciplines commonly use Census Bureau's NAICS designations to define industries.[45] However, establishing market or industry boundary is a not a perfect science (e.g. Rumelt, 1991; Laine, 1995), and consequently there is likely some measurement error than can be attributed imperfect boundary definition.

Future Directions

This study makes an important and unique contribution, opening the door for more research opportunities and avenues of inquiry. Several research studies would further illuminate both the potential linkages between industry (environmental) conditions and a firm's ESOP decision as well as the potential linkages between a firm's market and industry position within the industry and its ESOP decision. For example,

[45] In the process of collecting, tabulating, analyzing, and disseminating statistical data, the U.S. Census Bureau assigns and maintains only one NAICS code for each establishment based on its primary activity (generally the activity that generates the most revenue for the establishment).

one potential idea is to explore whether product market concentration is predictive of other forms of shared capitalism beyond ESOPs. While ESOPs are the most prevalent form in the U.S., there are other models that may be explored, such as profit or gainsharing, cooperatives, or even full employee-owned firms, which may yield similar or different results on product market concentration effects.

Another intuitive next step would be to examine both industry and firm conditions together and their interplay by doing a multi-level analysis. This study might also include identifying several high and low ESOP adoption industries to examine more descriptively whether industry-specific differences can explain the variation in ESOP prevalence. An analysis of this kind would mean including more robust data sources to expand and improve the measures used in this current analysis, as well as addressing the measurement error issues discussed herein, in particular, those relating to the insufficient data on firm size and public or private status. Additionally, a multi-level analysis could help determine whether the effect sizes changes (in number of ESOP employees) occur in public or private firms.

A third research opportunity is to probe the causal relationship between product market concentration and ESOP prevalence and to do more precise pinpointing of pre- and post-adoption trends (e.g. Kruse, 1996) and underlying mechanisms. Again, this study's findings, as they are, do not clarify the long debated question of whether successful firms are predisposed to adopting ESOPs, or whether ESOPs are foremost an antecedent to better performance. A study with more comprehensive and robust data could more assuredly answer this question. If using the appropriate firm-level data and measures, yielded similar results and product market concentration predicted ESOP

prevalence, this would not only support earlier findings that firms likely adopt ESOPs from a positive (performance) position but also it could give additional credence to the positive "productivity-ESOP," or even the less examined "profitability-ESOP" relationship (Kim, 1998). Having a better understanding of the causal direction would certainly inform the literature as to whether certain firms, in certain conditions, adopt ESOPs, thereby making a substantive contribution which also would reinforce the idea that external environment is an important determinant of firms' strategic choices (Kochan et al., 1984).

This study's focus on product market concentration highlights the importance of power dynamics both among firms in a market and between firms and workers. However, another future direction is to examine labor market concentration—a measure of monopsony power—and its relationship to ESOP prevalence. Worker bargaining power, like firm market power, is an important determinant of wages. In fact, a lineage of studies show that wage differentials across firms result from labor market competitiveness (e.g. Margolis and Salvanes, 2001). Landon (1970) posited that monopsony, more so than monopoly power, determined worker compensation levels in the newspaper industry. The rent-sharing argument presented in this study hinges on there being some immobility in labor. Furman and Orszag (2105) argue that the degree to which labor is perfectly mobile dictates the portion of rents going to workers, and sorts workers into firms according to their marginal products, leaving the full benefit of rents for capital. Baker (2015) asserts that the story of market power and firm rent extraction is less about capital versus labor and more about labor versus labor especially in tight labor markets. Therefore, while the findings on product market concentration are

revealing in themselves, having additional labor market data and information on labor (im)mobility[46] (an indicator of worker bargaining power) across firms and industries would shed more light on these questions relating to the relationship between firm market power and ESOPs as well as on firm decisions, broadly.

Another potential research contribution would be to measure profitability and margins more directly. Scholars have questioned the validity of various concentration ratios as well as market share measures (Grullon, 2016; Schmalensee, 1985). Even though IO scholars commonly use market share as a measure of market power, it does not necessarily reflect a firm's capabilities, especially in more competitive environments where there are more players.

Deeper probing the effects of occupational concentration on firm outcomes, is another potential opportunity, which could also inform current debates on emerging industry and market structure trends driving the changes in workforce distribution patterns. Abraham and Taylor (1996) and Schmieder and Goldschmidt (2015) theorized that increasing trends of firm specialization and externalization of work activities, have led to increased occupational concentration among firms. Handwerker and Spletzer (2015) found that wages were lower across both high and low-skilled occupations. Autor et al., (2008) and Autor and Dorn (2013) argued that industries may become more concentrated in occupations as firms invest in more technology to replace certain routine occupations. All of these explanations underscore the idea that occupational concentration increases as firms and industries become more specialized, or shed non-core, less valuable activities. They also point to the growing evidence of employers'

[46] See Landon (1970) and Robinson (1969).

increasing power over workers. Linking this back to this study's findings, the negative association between occupational concentration and ESOP prevalence could reflect a lack of firm motivation to invest in workers through ESOPs where workers are more similarly skilled. Alternatively, however, it could reflect prohibitive cost pressures on firms that constrain their ability to implement and invest in ESOPs. A study, which includes both firm and industry level measures of occupational concentration could help to draw more decisive conclusions. In short, issues relating to occupational concentration raise questions not only about determinants of ESOP prevalence but also the power dynamics shaping the employment relationship and how they evolve as firms and industries change.

Lastly, exploring other analytical methods and theoretical approaches would also offer tremendous insight into this question of which firms adopt ESOPs. In-depth qualitative and mixed methods studies that incorporate interviews with managers or initiators of ESOPs, members of trade and industry associations, or various experts on employee ownership tend to bring clarity that cannot be solely captured in a quantitative study. Institutional isomorphism theory (DiMaggio and Powell, 2000) suggests that there could be additional value in unpacking the more behavioral, sociological dimensions to explain the spread or diffusion of firm practices across industries. Firms that (1) face the same set of environmental conditions, (2) are dependent upon a single or several similar sources of support for vital resources, (3) face technological uncertainty or ambiguity, are more likely resemble one another and thus adopt similar strategies and practices, according to DiMaggio and Powell (2000). Just as innovation practices are diffused among firms in similar industries, networks, or geographic areas (e.g. Freeman, 1991; Robertson et al., 1996), management strategies and practices are as well (Jones et al.,

2003). Jones et al. (2003) in a study of manufacturing plants found that access to trade associations, chambers of commerce and informal business associations determined the level of firm access to information about technology, organization of work, and human resource management practices. Firms, especially large, public companies may adopt ESOPs to boost promote a good public perception and brand recognition, particularly as these types of companies are more likely to fall under greater public and regulatory scrutiny (DiMaggio and Powell, 2000). Despite the fact that ESOP stock percentages in public companies are relatively small, compared to their smaller peer ESOP companies, many of these companies end up on rankings as best places to work and see employee ownership as part of their benefits to workers.

Conclusion

In this study I examined the effect of product market concentration on ESOP prevalence, between and within industries over time from the years of 2002 to 2012. As theorized, higher levels of product market concentration were associated with higher ESOP prevalence. This study contributes to discussions on ESOPs in several ways. First, it enhances our understanding of the ways that market dynamics may shape firm behaviors, specifically compensation practices, and thus how they might contribute to organizational and worker outcomes. Second, the industry environment perspective, which was the basis for the study's central argument, has not been used in the employee ownership literature. As such, this study advances the current research on predictors of ESOPs, while also providing the foreground to explore the potential mechanisms that act as enablers (or barriers) to ESOP adoption, which may depend on industry environment

or a firm's position in the industry. Third, these results may inspire workplace and employment scholars to broaden their thinking on how contextual characteristics may affect the employment relationship. Fourth, it bridges the employee ownership literature with existing theories of the firm and recent findings on product market concentration from other distinct literature, such as industrial organization economics and strategy.

Although this study ostensibly tells a story about large firms with market power, as discussed earlier, society is increasingly being shaped by the behaviors of these powerful, monopolistic corporate actors (Stiglitz, 2017), which is an issue of increasing importance. A majority of the U.S. workers are employed by large firms (Francis, 2017) and from 2007 to 2017, the largest firms were responsible for 48 percent of net job growth, according to the Bureau of Labor Statistics (2018). Management scholar Peter Drucker (1962) writes about the role "big business" has long played in society:

> "Big business is expected to maintain (and where necessary, restore) America's ability to compete in the world market…" American society looks to big business to "change deeply embedded–but outmoded–principles of American wage and job policy, [and] management [of these firms are] viewed as leaders in bringing about these changes…Big business is increasingly supposed to be a policy innovator, in addition to its more traditional role of innovator in technology and in business practices (e.g., in the distribution system or in organization)… The manageability of the large business enterprise itself is coming to be looked upon as definitely 'affected with the public interest,' rather than the 'private affair' of the individual company, its managers, and its stockholders."

Finally, this study's focus on product market concentration is not intended to suggest that market power is the only, or even the most important, factor in determining ESOP distribution. However, when considering effect size, increasing product market concentration by one percentage point is the equivalent of adding about nine thousand

ESOP participants in an industry.[47] This is nine thousand workers with improved access to job stability, greater income and wealth. However, there is an important question that proponents of ESOPs must ask. If industries remain relatively concentrated, and—as this study shows—ESOP participants are more likely to present in concentrated industries, it is probable that majority of ESOP participants will also be in a large, dominant company. However, as the extant literature suggests these are likely to be the same workers who are already relatively well compensated (Krueger and Summers, 1988; Furman and Orszag, 2015). Thus, academics and policymakers working on solutions aimed at expanding ESOP coverage –and focusing on enterprise-centered solutions) must not only consider the differences among firms (e.g. size, context, etc.) and how this shapes incentives and motives but also they must ask: what the desired future? Is the goal to increase the number of ESOP participants or the number of ESOP firms, or to increase the number of ESOP participants by increasing the number of ESOP firms? Each one of these goals has different yet has crucial implications (and pathways) for how we think about the future of the political economy and the viability of sustainable solutions to addressing the issue of income and wealth inequality.

[47] See pages 34-35 in the Results section.

Appendices

Figure 1. Increases in Concentration by Industry

INCREASES IN CONCENTRATION BY INDUSTRY			
Industry	Revenue Earned by 50 Largest Firms, 2012 (Billions $)	Revenue Share Earned by 50 Largest Firms, 2012	% Point Change in Revenue Share Earned by 50 Largest Firms, 1997-2012
Transportation and Warehousing	307.9	42.1	11.4
Retail Trade	1,555.8	36.9	11.2
Finance and Insurance	1,762.7	48.5	9.9
Wholesale Trade	2,183.1	27.6	7.3
Real Estate Rental and Leasing	121.6	24.9	5.4
Utilities	367.7	69.1	4.6
Educational Services	12.1	22.7	3.1
Professional, Scientific and Technical Services	278.2	18.8	2.6
Administrative / Support	159.2	23.7	1.6
Accommodation and Food Services	149.8	21.2	0.1
Other Services, Non-Public Admin	46.7	10.9	-1.9
Arts, Entertainment and Recreation	39.5	19.6	-2.2
Health Care and Assistance	350.2	17.2	-1.6

Note: Between 1997 and 2012, most U.S. industries became more consolidated.
Source: Grullon et al. (2016).

Figure 2. Heteroscedasticity between Market Share (4) and ESOP Prevalence

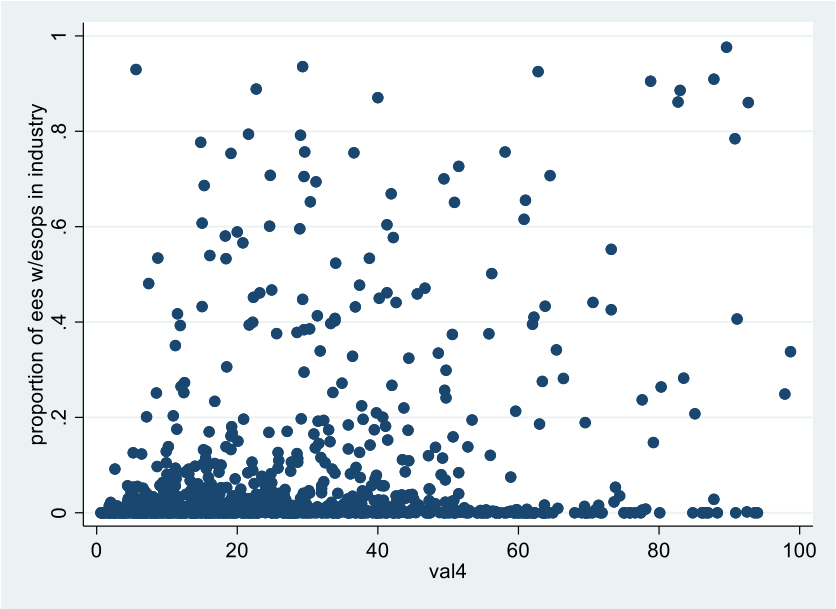

Figure 3. Heteroscedasticity between HHI and ESOP Prevalence

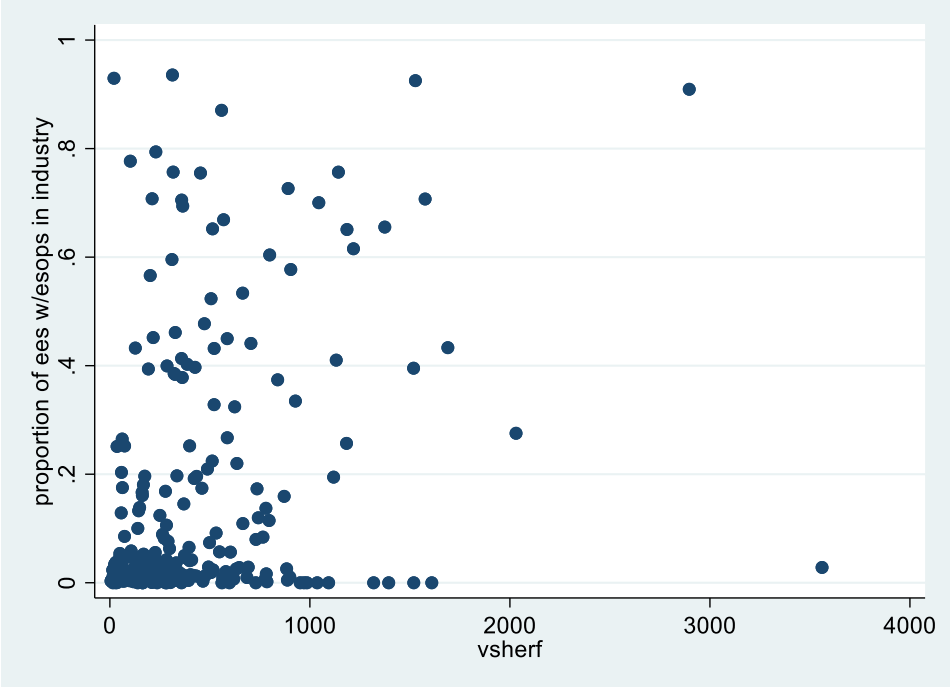

Figure 4. List of Industries Included in Analyses

Sector by 2- Digit NAICS Code

Sector 2-Digit NAICS	*Sector Name*
22	Utilities
31-33	Manufacturing
42	Wholesale trade
44-45	Retail Trade
48-49	Transportation and warehousing
51	Information
52	Finance and Insurance
53	Real Estate, Rental, and Leasing
54	Professional, Scientific, and Technical Services
55	Administrative and Support and Waste Management and Remediation Services
61	Educational Services
62	Health Care and Social Assistance
71	Arts, Entertainment, and Recreation
72	Accommodation and Food Services
81	Other Services (except Public Administration)

Figure 5. Industries with more than 75% participants in large ESOPs (in Years 2002, 2007, and 2010)

NAICS	Industry
	2002
312120	Breweries
522298	All other non-depository credit intermediation
322100	Pulp, paper, and paperboard mills
452900	Other general merchandise stores
339900	Other miscellaneous manufacturing
541519	Other computer related services
324110	Petroleum refineries
336100	Motor vehicle manufacturing
335900	Other electrical equipment and component manufacturing
	2007
322100	Pulp, paper, and paperboard mills
336410	Aerospace product and parts manufacturing
444110	Home centers
541519	Other computer related services
452900	Other general merchandise stores
312200	Tobacco manufacturing
315990	Apparel accessories and other apparel manufacturing
336100	Motor vehicle manufacturing
339900	Other miscellaneous manufacturing
312120	Breweries
523110	Investment banking and securities dealing
324110	Petroleum refineries
335900	Other electrical equipment and component manufacturing
	2012
334200	Communications equipment manufacturing
325900	Other chemical product and preparation manufacturing
333200	Industrial machinery manufacturing
452900	Other general merchandise stores
312200	Tobacco manufacturing
312110	Soft drink and ice manufacturing
325500	Paint, coating, and adhesive manufacturing
541519	Other computer related services
339900	Other miscellaneous manufacturing
324110	Petroleum refineries’
335900	Other electrical equipment and component manufacturing
315990	Apparel accessories and other apparel manufacturing

Note: Industry names are based on 3-digit NAICS labels

Table 1a-i. Summary Statistics

Table 1a. All Industries, For All Years

	N	Mean	Standard Deviation	Minimum	25% Quartile	Median	75% Quartile	Maximum
ESOP Prevalence (%)	1,054	0.07	0.17	0	0	0	0.04	0.98
Market share (4) (%)	1,079	27.20	20.87	1	11	22	39.10	99.90
Market share (8) (%)	1,079	34.90	23.66	1	16.2	29	50	100
Market share (20) (%)	1,083	44.77	25.63	1.40	23.70	41	65.30	100
Market share (50) (%)	1,084	54.19	26.64	2.30	32.30	53	77	100
HHI (points)	259	436.21	463.42	5.80	144	298	568.70	3,560.70
Occupational HHI (points)	1,118	0.11	0.11	0	0	0	0.14	0.62
Unionization (% membership)	1,259	8.03	10.68	0	1.6	4	10.30	82.50
Average pay ($1,000)	1,070	42.03	28.08	7.15	25.38	38	50.29	377.58
Average establishment size (# of employees)	1,070	202	377	6	39	86	223	6,031

Note: All monetary variables are measured in real terms.

Table 1b-d. All Industries, By Year

Table 1b. All Industries, 2002

Year 2002

	ESOP Prevalence (%)	Market share (4) (%)	Market share (8) (%)	Market share (20) (%)	Market share (50) (%)	HHI (points)	Occupational HHI (points)	Unionization (% membership)	Average pay ($1,000)	Average establishment size (# of employees)
N	353	355	356	357	358	85	377	417	357	357
Mean	0.07	26.83	34.34	44.19	53.69	422.56	0.12	8	35.33	214
Standard Deviation	0.15	20.77	23.95	25.86	27.37	413.02	0.11	10	19.71	439
Minimum	0.00	0.80	1.40	2.20	3	9.20	0.01	0.00	7.15	7
25% Quartile	0.00	10.30	14.20	22	29	139.00	0.04	1.60	23.02	41
Median	0.01	21.20	29.40	42	54.9	298.40	0.07	4.40	32.94	87
75% Quartile	0.04	39.50	49.55	65.10	76.40	558.50	0.16	11.00	42.59	217
Maximum	0.93	99	99	100	100	2,323.50	0.62	80	232.19	6,030

Note: All monetary variables are measured in real terms.

Table 1c. All Industries, 2007

Year 2007

	ESOP Prevalence (%)	Market share (4) (%)	Market share (8) (%)	Market share (20) (%)	Market share (50) (%)	HHI (points)	Occupational HHI (points)	Unionization (% membership)	Average pay ($1,000)	Average establishment size (# of employees)
N	343	359	359	359	359	85	372	421	350	350
Mean	0.07	27.41	35.03	44.74	53.92	417.83	0.12	8.92	42.67	206
Standard Deviation	0.17	21.10	23.71	25.76	26.56	402.71	0.11	12.28	28.86	361
Minimum	0.00	0.60	0.90	1.40	2.30	5.80	0.01	0.00	8.88	6
25% Quartile	0.00	11.20	16.20	23.90	31.90	146.40	0.05	1.80	26.41	40
Median	0.01	21.80	29.40	41.60	52.70	310.40	0.07	4.10	39.03	88
75% Quartile	0.04	39.50	50.30	65.30	76.60	531.30	0.16	10.50	50.09	244
Maximum	0.98	97.90	99.00	100.00	100.00	2030.70	0.61	66.20	377.58	4273

Note: All monetary variables are measured in real terms.

Table 1d. All Industries, 2012

Year	2012									
	ESOP Prevalence (%)	*Market share (4) (%)*	*Market share (8) (%)*	*Market share (20) (%)*	*Market share (50) (%)*	*HHI (points)*	*Occupational HHI (points)*	*Unionization (% membership)*	*Average pay ($1,000)*	*Average establishment size (# of employees)*
N	358	365	364	367	367	89	369	421	363	363
Mean	0.08	27.35	35.32	45.37	54.93	466.81	0.08	6.94	48.01	48
Standard Deviation	0.18	20.78	23.39	25.33	26.05	557.26	0.10	9.33	32.60	33
Minimum	0.00	0.70	1.00	1.80	3.10	7.50	0.02	0.00	9.06	9
25% Quartile	0.00	12.40	17.50	24.90	34.50	161.40	0.03	1.60	28.50	29
Median	0.01	21.10	29.75	40.60	52.70	283.40	0.05	3.50	43.10	43
75% Quartile	0.04	37.90	50.10	65.30	77.60	586.70	0.08	8.80	56.71	57
Maximum	0.94	99.90	100.00	100.00	100.00	3560.70	0.52	82.50	339.06	339

Note: All monetary variables are measured in real terms.

Table 1e. Manufacturing Industries, For All Years

	N	*Mean*	*Standard Deviation*	*Minimum*	*25% Quartile*	*Median*	*75% Quartile*	*Maximum*
ESOP Prevalence (%)	244	0.156	0.23	0	0.01	0.04	0.197	0.94
Market share (4)	259	29.80	16.39	3.70	17.70	27.90	40.40	87.80
Market share (8)	259	40.67	19.13	5.20	26.60	40.10	53	93.60
Market share (20)	259	55.04	20.82	8.40	41.60	55.20	68.50	98.60
Market share (50)	259	68.13	20.03	13.40	56.70	69.90	82.50	99.90
HHI (points)	259	436.21	463.42	5.80	144	298.40	568.70	3560.70
Occupational HHI (points)	259	0.053	0.04	0.02	0.03	0.04	0.053	0.27
Unionization (% membership)	259	12.21	8.81	0	5.50	10.30	17.40	60.10
Average pay ($1,000)	256	45.83	13.71	15.51	37.46	44.07	54.00	112.12
Average company size (# employees)	256	92.47	126.27	12.74	32.81	55.60	89.50	893.46

Note: All monetary variables are measured in real terms.

Table 1f. Manufacturing Industries, 2002

Year	2002					
	ESOP Prevalence (%)	*HHI (points)*	*Occupational HHI (points)*	*Unionization (% membership)*	*Average pay ($1,000)*	*Average firm size (# of employees)*
N	353	85	377	417	357	87
Mean	0.07	422.56	0.12	8.22	35.33	100
Standard Deviation	0.15	413.02	0.11	10.13	19.71	129
Minimum	0.00	9.20	0.01	0.00	7.15	14
25% Quartile	0.00	139.00	0.04	1.60	23.02	39
Median	0.01	298.40	0.07	4.40	32.94	64
75% Quartile	0.04	558.50	0.16	11.00	42.59	99
Maximum	0.93	2323.50	0.62	79.90	232.19	724

Note: All monetary variables are measured in real terms.

Table 1g. Manufacturing Industries, 2007

Year	*2007*					
	ESOP Prevalence (%)	*HHI (points)*	*Occupational HHI (points)*	*Unionization (% membership)*	*Average pay ($1,000)*	*Average firm size (# of employees)*
N	353	85	372	421	350	84
Mean	0.07	417.83	0.12	8.92	42.67	94
Standard Deviation	0.17	402.71	0.11	12.28	28.86	116
Minimum	0.00	5.80	0.01	0.00	8.88	13
25% Quartile	0.00	146.40	0.05	1.80	26.41	37
Median	0.01	310.40	0.07	4.10	39.03	59
75% Quartile	0.04	531.30	0.16	10.50	50.09	92
Maximum	0.98	2030.70	0.61	66.20	377.58	663

Note: All monetary variables are measured in real terms.

Table 1h. Manufacturing Industries, 2012

Year	*2012*					
	ESOP Prevalence (%)	*HHI (points)*	*Occupational HHI (points)*	*Unionization (% membership)*	*Average pay ($1,000)*	*Average firm size (# of employees)*
N	358	89	369	421	363	89
Mean	0.08	466.81	0.08	6.94	48.01	87
Standard Deviation	0.18	557.26	0.10	9.33	32.60	133
Minimum	0.00	7.50	0.02	0.00	9.06	13
25% Quartile	0.00	161.40	0.03	1.60	28.50	30
Median	0.01	283.40	0.05	3.50	43.10	48
75% Quartile	0.04	586.70	0.08	8.80	56.71	83
Maximum	0.94	3560.70	0.52	82.50	339.06	893

Note: All monetary variables are measured in real terms.

Table 1i. Pairwise Correlations of ESOP Prevalence and Explanatory Variables

	ESOP prevalence	*Market share (4)*	*Market share (8)*	*Market share (20)*	*Market share (50)*	*HHI*	*Occupational HHI*	*Average pay*	*Unionization*	*Average establishment size*
ESOP prevalence	1 1,054									
Market share (4)	0.2482*** 0.0000 1,049	1 1,079								
Market share (8)	0.2628*** 0.0000 1,049	0.9623*** 0.0000 1,077	1 1,079							
Market share (20)	0.2891*** 0.0000 1,053	0.9094*** 0.0000 1,079	0.9568*** 0.0000 1,079	1 1,083						
Market share (50)	0.2993*** 0.0000 1,054	0.8308*** 0.0000 1,079	0.8998*** 0.0000 1,079	0.9546*** 0.0000 1,083	1 1,084					
HHI	0.3039*** 0 244.0000	0.9246*** 0 259	0.8680*** 0 259	0.7910*** 0 259.0000	0.7041*** 0 259.0000	1 259.0000				
Occupational HHI	-0.1534*** 0.0000 1,054	0.0844*** 0.0056 1,079	0.0433 0.1555 1,079	0 0.7567 1,083	-0.0638* 0.0357 1,084	0.0372 0.5516 259	1 1,118			
Average pay	0.2032*** 0.0000 1,054	0.1598*** 0.0000 1,065	0.2174*** 0.0000 1,065	0.2752*** 0.0000 1,069	0.3092*** 0.0000 1,070	0.3068*** 0.0000 256	-0.3265*** 0.0000 1,070	1 1,070		
Unionization	0.1448*** 0.0000 1,050	0.0958*** 0.0017 1,075	0.1162*** 0.0001 1,075	0.1598*** 0.0000 1,079	0.1928*** 0.0000 1,080	0.2825*** 0.0000 259	-0.0005 0.9865 1,114	0.0112 0.7140 1,066	1 1,259	
Average establishment size	-0.0957* 0.0019 1,054	-0.1989*** 0.0000 1,065	-0.2170*** 0.0001 1,065	-0.2371*** 0.0000 1,069	-0.2233*** 0.0000 1,070	0.4119*** 0.0000 256	-0.0261*** 0.3932 1,070	0.0367 0.2302 1,070	0.0155 0.6137 1,066	1 1,070

Note: significance levels – *** p<0.01, ** p<0.05, * p<0.1

Table 2. Analysis for All Industries, with Random Effects

	(1)	(2)	(3)	(4)	(5)	(6)
Market share (4)	0.00129***				0.00127***	0.00124***
	-0.000365				-0.000361	-0.000373
Year (2007)	0.0101**	0.0110**	0.0111**	0.0114**	0.00991*	0.00407
	-0.0051	-0.00502	-0.00504	-0.00503	-0.0051	-0.00559
Year (2012)	0.0166***	0.0173***	0.0166**	0.0164**	0.0159**	0.00381
	-0.00627	-0.00658	-0.00654	-0.0065	-0.00627	-0.00697
Market share (8)		0.00109***				
		-0.000367				
Market share (20)			0.00118***			
			-0.000304			
Market share (50)				0.00128***		
				-0.000257		
Average Establishment Size					-0.000023**	-0.000024**
					-0.0000107	-0.0000118
Occupational HHI						-0.00000740***
						-0.000233
Unionization						0.000275
						-0.000422
Average Pay						0.000780***
						-0.000275
Constant	0.0336***	0.0300**	0.0153	-0.000842	0.0391***	0.0191
	-0.0107	-0.0122	-0.012	-0.0117	-0.0112	-0.0133
Observations	1,049	1,049	1,053	1,054	1,049	1,045
Number of naics	367	367	367	367	367	367

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 3. Analysis for All Industries, with Fixed Effects

	(1)	(2)	(3)	(4)	(5)	(6)
Market share (4)	0.000367				0.000403	0.000391
	-0.000354				-0.000364	-0.000366
Year (2007)	0.0112**	0.0124**	0.0124**	0.0122**	0.0110**	0.00999*
	-0.00504	-0.00494	-0.00494	-0.00492	-0.00506	-0.00575
Year (2012)	0.0184***	0.0200***	0.0200***	0.0195***	0.0180***	0.0150**
	-0.00629	-0.00665	-0.00664	-0.00659	-0.00633	-0.0074
Market share (8)		-0.000325				
		-0.000478				
Market share (20)			-0.000349			
			-0.000375			
Market share (50)				-9.69E-06		
				-0.000273		
Average Establishment Size					-0.0000121	-0.0000114
					-0.0000142	-0.0000146
Occupational HHI						-0.000000334
						-0.023
Unionization						-0.000284
						-0.000473
Average Pay						0.000208
						-0.000258
Constant	0.0522***	0.0724***	0.0763***	0.0616***	0.0539***	0.0495***
	-0.0105	-0.0162	-0.016	-0.0142	-0.0103	-0.0141
Observations	1,049	1,049	1,053	1,054	1,049	1,045
R-squared	0.019	0.021	0.021	0.02	0.02	0.021
Number of naics	367	367	367	367	367	367

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 4. Analysis for Manufacturing Industries, with Random Effects

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Market share (4)	0.00374*					0.00237*	
	-0.00131					-0.00143	
Year (2007)	0.0266	0.0254	0.0247	0.0247	0.0208*	-0.0135	-0.0143
	-0.0179	-0.0176	-0.0175	-0.0174	-0.0123	-0.0236	-0.0182
Year (2012)	0.0479**	0.0477**	0.0461*	0.0456*	0.0498***	-0.0301	-0.0206
	-0.0236	-0.0236	-0.0236	-0.0236	-0.0186	-0.0379	-0.0336
Market share (8)		0.00294**					
		-0.00123					
Market share (20)			0.00231				
			-0.00123				
Market share (50)				0.00211			
				-0.0012			
HHI					0.000108*		0.0000788
					-0.0000567		-0.0000572
Average Firm Size						0.0000583	0.0000815
						-0.000141	-0.0000967
Occupational HHI						-0.00000451	-0.0000109
						-0.256	-0.222
Unionization						0.00178	0.00253
						-0.00167	-0.00136
Average Pay						0.00698***	0.00657***
						-0.00223	-0.00223
Constant	0.0286	0.0218	0.0157	-0.000201	0.0922***	-0.229**	0.117***
	-0.0479	-0.056	-0.0698	-0.09	-0.0315	-0.0899	-0.038
Observations	247	247	247	247	244	247	244
Number of naics	87	87	87	87	87	87	87

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 5. Analysis for Manufacturing Industries, with Fixed Effects

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Market share (4)	0.000168					0.00218	
	-0.00203					-0.0021	
Year (2007)	0.0298*	0.0293*	0.0298*	0.0303*	0.0227*	-0.0113	-0.00997
	-0.0176	-0.0173	-0.0174	-0.0176	-0.0121	-0.0365	-0.0241
Year (2012)	0.0518**	0.0516**	0.0520**	0.0531**	0.0519***	-0.0402	-0.0206
	-0.0237	-0.0237	-0.0239	-0.0246	-0.0191	-0.068	-0.0485
Market share (8)		0.00098					
		-0.00193					
Market share (20)			-0.000533				
			-0.00206				
Market share (50)				-0.00133			
				-0.00263			
HHI					0.0000805		0.0000893
					-0.0000758		-0.0000767
Average Firm Size						-0.000108	-0.000025
						-0.000173	-0.000065
Occupational HHI						-0.0000349	-0.0000281
						-0.361	-0.282
Unionization						0.00299**	0.0019
						-0.00131	-0.00171
Average Pay						0.00668*	0.00764*
						-0.00352	-0.00437
Constant	0.0825	0.0936	0.163	0.224	0.0959**	-0.196	-0.233
	-0.0674	-0.0829	-0.113	-0.176	-0.0378	-0.147	-0.185
Observations	247	247	247	247	244	244	247
R-squared	0.051	0.049	0.048	0.048	0.087	0.145	0.088
Number of naics	87	87	87	87	87	87	87

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 6a and 6b. Analyses for Manufacturing Industries Including All Controls, with Random and Fixed Effects

Relationships between Product Market Concentration and ESOP Prevalence, when including average firm size, import penetration, and export penetration as controls: While I did not report results on the inclusion of average firm size, import penetration and exports in the manufacturing model, I did test various versions of this model to verify theories in the literature, and to test whether the product market concentration effect would remain. (Note: Time dummies were not included in this analysis.) With random effects, I found that average pay was the only significant predictor explaining variation in ESOP prevalence between industries and within industries although most of the variation was between industries. With fixed effects, I found that unionization, average pay, and average firm size were significant predictor explaining variation of ESOP prevalence with industries.

Average firm size (# of employees) is calculated as the total number of employees in an industry divided by the number of firms (as provided by the Census Bureau) in an industry.

International trade for which there are two measures, available only for manufacturing industries:

(1) **Import penetration (%)** is calculated as the total industry imports divided by the sum of shipments and total industry imports, minus total industry exports.

(2) **Export ratio (%)** is calculated as the total trade imports in an industry divided by the total industry shipments.

Table 6a. Analysis for Manufacturing Industries Including All Controls, with Random Effects

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Market share (4)	0.00285*					0.00276*		0.00184		0.00154	
	(0.00153)					(0.00152)		(0.00147)		(0.00160)	
Market share (8)		0.00231*									
		(0.00135)									
Market share (20)			0.00195								
			(0.00128)								
Market share (50)				0.00194							
				(0.00133)							
HHI					0.000108*		0.000105*		8.24e-05		7.55e-05
					(5.84e-05)		(5.80e-05)		(5.58e-05)		(5.75e-05)
Occupational HHI						-0.711***	-0.699***	-0.125	-0.115	-0.181	-0.174
						(0.224)	(0.205)	(0.232)	(0.217)	(0.245)	(0.236)
Unionization								0.00319***	0.00304**	0.00282**	0.00265**
								(0.00121)	(0.00119)	(0.00128)	(0.00124)
Average Pay								0.00565***	0.00561***	0.00566***	0.00557***
								(0.00150)	(0.00149)	(0.00160)	(0.00159)
Average Firm Size										0.000225	0.000235
										(0.000244)	(0.000227)
Import Penetration										0.180	0.233
										(0.808)	(0.821)
Export Ratio										-2.850	-2.746
										(3.119)	(3.082)
Constant	0.0802*	0.0715	0.0587	0.0341	0.116***	0.121**	0.155***	-0.176**	-0.155**	-0.173*	-0.157**
	(0.0468)	(0.0548)	(0.0698)	(0.0900)	(0.0311)	(0.0496)	(0.0361)	(0.0868)	(0.0782)	(0.0894)	(0.0795)
Observations	244	244	244	244	244	244	244	244	244	244	244
Number of naics	87	87	87	87	87	87	87	87	87	87	87

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 6b. Analysis for Manufacturing Industries Including All Controls, with Fixed Effects

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Market share (4)	0.000785					0.000898			0.00126	0.00140	
	(0.00204)					(0.00204)			(0.00202)	(0.00206)	
Market share (8)		0.000389									
		(0.00191)									
Market share (20)			-0.000258								
			(0.00196)								
Market share (50)				-0.000166							
				(0.00235)							
HHI					7.35e-05		7.51e-05	8.76e-05			8.39e-05
					(8.19e-05)		(8.11e-05)	(7.63e-05)			(7.87e-05)
Occupational HHI						-0.578**	-0.580**	-0.216	-0.227	-0.106	-0.102
						(0.265)	(0.247)	(0.251)	(0.271)	(0.197)	(0.191)
Unionization								0.00318**	0.00326**	0.00335**	0.00326**
								(0.00124)	(0.00128)	(0.00129)	(0.00125)
Average Pay								0.00546***	0.00539***	0.00515***	0.00523***
								(0.00176)	(0.00177)	(0.00182)	(0.00182)
Average Firm Size										-0.000571**	-0.000527**
										(0.000285)	(0.000258)
Import Penetration										-1.656	-1.485
										(1.121)	(1.216)
Export Ratio										4.100	3.761
										(3.839)	(4.068)
Constant	0.132**	0.140*	0.170	0.167	0.124***	0.158***	0.153***	-0.157	-0.154	-0.108	-0.109
	(0.0606)	(0.0774)	(0.107)	(0.160)	(0.0352)	(0.0601)	(0.0358)	(0.110)	(0.125)	(0.128)	(0.117)
Observations	244	244	244	244	244	244	244	244	244	244	244
R-squared	0.001	0.000	0.000	0.000	0.012	0.018	0.029	0.144	0.130	0.143	0.155
Number of naics	87	87	87	87	87	87	87	87	87	87	87

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

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