Essays on Corporate Diversification and Internal Capital Markets

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Abstract

This thesis focuses on diversified firms and the effect of diversification on the efficiency of internal capital markets. In particular, the first chapter uses the passage of state antitakeover laws as exogenous agency shocks that increase managerial slack in order to test whether agency problems affect the efficiency of resource allocation in internal capital markets. Takeover market is one of the major disciplinary mechanisms on management, antitakeover laws reduce takeover threats and as a result exacerbate agency problems. By using antitakeover laws as exogenous agency shocks, this paper provides the first causal evidence that agency problems distort winner-picking behavior in internal capital markets in support of models with agency frictions. We estimate Q-sensitivity of investment models and compare the sensitivity of capital expenditures to industry investment opportunities, proxied by industry Q, for conglomerate segments and standalone firms. The main finding of the paper is that conglomerate segments become less responsive to investment opportunities following the adoption of antitakeover laws while there is no change in Q-sensitivity of investment of standalone firms. The decline in Q-sensitivity of investment is more pronounced for conglomerates with higher ex-ante likelihood of hostile takeovers. Furthermore, the adverse impact of antitakeover laws is smaller on conglomerates with alternative disciplinary mechanisms. In particular, financial leverage and concentrated institutional ownership as alternative governance mechanisms mitigate the negative impact of antitakeover laws on conglomerate firms. The decline in investment-Q sensitivity is also greater for conglomerates with higher diversity of investment opportunities consistent with the idea that internal power struggles lead to inefficient resource allocation in internal capital markets.

The second chapter investigates how industry concentration that a diversified firm operates affects the value of diversification and explores the strategic value of agency problems in product markets for conglomerates

that operate mainly in concentrated industries. I present evidence that conglomerates that operate mainly in concentrated industries have higher diversification values. Agency theories suggest that agency problems lead to value-destroying diversification; on the other hand, agency problems may create strategic value in product markets for conglomerates. Matsusaka and Nanda (2002) argue that investment flexibility and the ability to shift resources across divisions prevents conglomerates from committing credibly to a particular industry in case of competitive threats (commitment cost of internal capital markets). Their model suggest that agency problems could create strategic advantage as conglomerates with agency problems can credibly commit to aggressive investment strategies in case of increased competitive pressure instead of shifting resources to other divisions and exiting the threatened industry. I show that agency problems, on average, lead to greater diversification discount consistent with agency theories. In contrast, agency problems in concentrated conglomerates create strategic advantage and lead to greater diversification values consistent with the argument that these conglomerates can credibly commit to their industries when competitive threats arise.

The third chapter further investigates the effect of industry concentration on the value of diversification. In order to show that industry concentration has a causal impact on the value of diversification, I follow Fresard (2010) and use large import tariff reductions as exogenous competitive shocks. Concentrated conglomerates experience significant decline in their valuations when their segments are hit by competitive shocks. I further present segment-level evidence and show that concentrated conglomerates stay in the threatened industry and try to defend their market positions when their segments in less-competitive industries experience exogenous competitive shocks. These results suggest that concentrated conglomerates enjoy their market positions in less competitive industries and have higher valuations. When these concentrated conglomerates are hit by competitive shocks, their market positions in less-competitive industries weaken and their value of diversification decrease significantly. Concentrated conglomerates respond aggressively to competitive threats in order to defend their positions in less competitive industries.

Özet

Bu tez farklı segmentlerde faaliyet gösteren şirketleri ve bir şirketin faaliyette bulunduğu alanları çeşitlendirmesinin şirket içi kaynak dağılımının verimliliği üzerine etkisini incelemektedir. Birinci bölüm, Amerika Birleşik Devletleri'nde şirket devralmalarını zorlaştıran anti-devralma kanunlarını temsil problemini artıran dışsal şok olarak kullanarak temsil probleminin şirket içi kaynak dağılımının verimliliği üzerindeki etkisini incelemektedir. Amerika Birleşik Devletleri'nde şirket devralma piyasası şirket yöneticileri üzerinde ciddi bir disiplin mekanizmasıdır, anti-devralma kanunları ise şirket devralmalarını zorlaştırdığından şirket yöneticilerinin güçlerini artırmıştır ve bu da şirket içinde temsil probleminin ciddileşmesine neden olmuştur. Bu makale, anti-devralma kanunlarını dışsal temsil şoku olarak kullanarak, temsil sorununun şirket içi kaynak dağılımındaki verimliliği bozan bir neden olduğunu göstermektedir. Q-sensitivite modellerini kullanarak ve Tobin Q oranını endüstri yatırım fırsatlarını gösteren bir ölçü olarak kullanarak, çok-segmentli şirket (farklı segmentlerde faaliyet gösteren şirket) segmentleri ile tek alanda faaliyet gösteren tek-segmentli şirketlerin sermaye harcamalarının (yatırımlarının) endüstri yatırım fırsatlarına sensitivitelerini karşılaştırmaktayız. Ana bulgumuz çok-segmentli şirket segmentlerinin anti devralma kanunları sonrası endüstri yatırım fırsatlarına daha az duyarlı hale gelmesidir, tek-segmentli şirketlerde ise yatırım Q-sensitivitesinde hiçbir değişiklik yoktur. Yatırım Q-sensitivitesindeki düşüş kanunlar öncesinde daha yüksek devralma tehdidi bulunan çok-segmentli şirketlerde daha belirgindir. Ayrıca, kanunların olumsuz etkisi farklı kontrol mekanizmaları bulunan çok-segmentli şirketlerde daha azdır. Finansal borç ve yüksek kurumsal yatırımcı oranı alternatif kontrol mekanizmaları olarak anti-devralma kanunlarının çok-segmentli şirketler üzerindeki negatif etkisini azaltmaktadır.

İkinci bölüm çok-segmentli şirketlerin faaliyette bulunduğu sektörlerin endüstriyel yoğunlaşmasının çok-segmentli şirket değerleri üzerindeki etk-

isini ve ağırlıklı olarak konsantrasyonu yüksek sektörlerde faaliyet gösteren çok-segmentli şirketlerde temsil probleminin stratejik değerini incelemektedir. Bu bölümdeki ilk bulgu, ağırlıklı olarak konsantrasyonu yüksek sektörlerde faaliyet gösteren çok-segmentli şirketlerin daha yüksek değeri olduğunu göstermektedir. Vekalet teorisine göre temsil problemi şirketlerde değer tahribatına neden olan çeşitlendirmenin, farklı alanlara yayılmanın ana sebeplerinden bir tanesidir; fakat, temsil problemi çok-segmentli şirketler için ürün pazarlarında stratejik değer yaratabilir. Matsusaka and Nanda (2002)'nın modeline göre çok-segmentli şirketlerdeki yatırım esnekliği ve bir segmentteki kaynakları kolayca başka segmentlere aktarabilme potansiyeli, çok-segmentli şirketlerin ürün pazarında oluşabilecek bir tehlike karşısında bu sektörlere bağlılığını zorlaştırmaktadır. Ürün pazarında potansiyel bir rakip tehlikesi karşısında çok-segmentli şirket bu sektördeki kaynaklarını kolayca başka bir segmente aktarabilir ve tehdit altındaki sektörü terk edebilir. Matsusaka and Nanda (2002)'nın modeline göre bu durumlarda temsil problemi çok-segmentli şirketler için stratejik değer yaratabilir; çünkü temsil problemi yüksek olan çok-segmentli şirketler rekabet baskısı arttığı zamanlarda kaynaklarını başka bir segmente aktarıp tehdit altındaki sektörden çıkmak yerine daha agresif yatırımlar yaparak bu sektöre bağlı olduklarını gösterebilirler. Bu bölümdeki bulgular, vekalet teorisi ile uyumlu olarak, temsil probleminin çok-segmentli şirketlerde genel olarak daha fazla değer kaybına neden olduğunu göstermektedir. Ancak, Matsusaka and Nanda (2002)'nın modeli ile uyumlu olarak, temsil problemi ağırlıklı olarak konsantrasyonu yüksek sektörlerde faaliyet gösteren çok-segmentli şirketlerde stratejik avantaj yaratarak bu şirketlerde daha yüksek değerlere neden olmaktadır.

Üçüncü bölüm endüstriyel yoğunlaşmanın çok-segmentli şirket değerlemeleri üzerindeki etkisini daha geniş ölçüde incelemektedir. Endüstriyel yoğunlaşmanın çok-segmentli şirket değerlemeleri üzerinde nedensel bir etkisi olduğunu göstermek amacıyla, Fresard (2010)'ın metoduna başvurularak, Amerika Birleşik Devletleri'nde gerçekleşen ithalat gümrük vergisi düşüşleri ürün pazarlarına dışsal rekabet şoku olarak kullanılmaktadır. Ağırlıklı olarak konsantrasyonu yüksek sektörlerde faaliyet gösteren çok-segmentli şirketlerin bir segmenti dışsal rekabet şokundan etkilendiği zaman, bu şirketlerin değerlerinde önemli bir düşüş olmaktadır. Bu bölümde ayrıca segment düzeyinde bulgular sunulmaktadır; ağırlıklı olarak konsantrasyonu yüksek sektörlerde faaliyet gösteren çok-segmentli şirketler dışsal rekabet şokundan etkilendiklerinde tehdit altındaki sektörden çıkmak

yerine konsantrasyonu yüksek olan sektörlerdeki piyasa pozisyonlarını korumak için daha agresif yatırım stratejileri benimsemektedirler.

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Chapter 1

Managerial Discretion and Efficiency of Internal Capital Markets

Abstract

This paper uses the staggered adoption of state-level anti-takeover laws to provide causal evidence on whether managerial agency problems affect the allocative efficiency of conglomerate firms. Increases in control slack lead to sharp declines in the Q-sensitivity of investment. The effects are more pronounced for conglomerate firms under stronger pressure from the corporate control market prior to the adoption of antitakeover laws as well as for conglomerate firms with greater financial slack, dispersion of ownership, and diversity of investment opportunities. Our findings establish a novel organizational channel through which takeover threats impact the efficiency of resource allocation in the economy.

1.1. Introduction

Do managerial agency problems affect the allocative efficiency of internal capital markets? This question is important for at least two reasons. First, much of corporate investment relies on the internal resources of firms. Second, the internal capital markets of conglomerate firms allow managers to make sizable transfers across different business units, effectively bypassing the allocative discipline of external capital markets.

Our empirical strategy builds on the long-held view of economists that corporate control markets mitigate agency problems by subjecting badly-managed firms to takeover threats (Manne, 1965; Jensen and Meckling, 1976). Following the approach pioneered by Garvey and Hanka (1999) and Bertrand and Mullainathan (1999), we use the staggered adoption of state-level antitakeover laws in the United States throughout the 1980s and 1990s as quasi-random shocks that increase slack in corporate control to test whether agency problems affect the efficiency of capital allocation in internal capital markets.

In thinking about how resource allocation decisions within a firm differ from those in the marketplace, several models of internal capital markets in the literature point to influence activities and power struggles in large organizations as fundamental sources of inefficiency in the resource allocation process (Rajan, Servaes, and Zingales, 2000; Scharfstein and Stein, 2000). While models with agency frictions differ in their setups and mechanisms, they share the general prediction that resources would be allocated less efficiently than a first-best benchmark involving pure profit maximization. In particular, they predict a form of corporate socialism in which weaker business units receive more capital resources than they deserve at the expense

of stronger business units due to residual agency problems. In contrast, neoclassical models of internal capital markets (Maksimovic and Phillips, 2002) leave no role for agency problems; they instead introduce other modeling ingredients that can generate seemingly socialistic investment patterns with endogenous organizational form.

Differentiating between the alternative agency-based and neoclassical views empirically has proven difficult because both views predict varying degrees of lessened winner-picking behavior in internal capital markets (Stein, 1997) due to different model constraints and ingredients. We believe our paper is the first to provide causal evidence that managerial agency problems lessen the extent of winner-picking behavior at conglomerate firms.

Following the literature, our baseline specifications compare the investment behavior of conglomerate segments and standalone firms over time — before and after the passage of state-level antitakeover laws — by estimating the responsiveness of capital expenditures to industry investment opportunities as measured by industry Q. This empirical approach to gauging the degree of winner-picking behavior with so-called Q-sensitivity of investment is motivated by many models of internal capital markets. In the Appendix, we outline a simple model to further illustrate how a change in the Q-sensitivity of investment would result from a shift in management's focus between value maximization and corporate socialism around the passage of antitakeover laws. Also, we note that our empirical strategy of using antitakeover laws as quasi-random shocks combined with estimating within-firm changes in Q-sensitivity of investment helps address concerns in the literature about possibly biased

inferences due to mismeasurement of investment opportunities.

Our main finding in this paper is that conglomerate segments exhibit significantly lower Q-sensitivity of investment following the passage of antitakeover laws, while the investment behavior of standalone firms remains remarkably stable during the same time. The evidence on standalone firms helps address potentially unobservable changes in the determinants of investment responsiveness such as adjustment costs that happen to coincide with the passage of antitakeover laws as an alternative explanation. Figure 1, which plots the Q-sensitivity of investment of conglomerate segments and standalone firms in event time, shows that the change in the investment behavior of conglomerate segments occurs right around the passage of antitakeover laws. In terms of economic magnitude, the Q-sensitivity of investment drops by about 60 percent for conglomerate segments, implying a significant role for agency frictions in explaining inefficiencies in internal capital markets.

In addition, our cross-sectional tests point to several significant differences in the response of conglomerate firms to the passage of antitakeover laws. First, we find that the adoption of antitakeover laws had a larger negative impact on the Q-sensitivity of investment at conglomerates for which the corporate control market previously provided stronger discipline. Specifically, smaller conglomerates that had a higher ex-ante likelihood of becoming the target of an unwanted acquisition bid (Palepu, 1986) experienced larger declines in Q-sensitivity of investment. Second, the reduction in Q-sensitivity of investment was smaller for conglomerates with higher financial leverage and more concentrated ownership, suggesting that the presence of an alternative mechanism to discipline management reduces the

adverse effect of antitakeover laws on allocative efficiency in internal capital markets. Third, the drop in Q-sensitivity of investment was larger for conglomerates with greater diversity of investment opportunities, lending direct support to the prediction of Rajan et al. (2000) regarding the distortionary impact of internal power struggles on the efficiency of capital allocations within conglomerates.

We conduct several tests to examine the robustness of these results. First, following Karpoff and Wittry (2018), we drop firms that either lobbied for the adoption of antitakeover laws or opted out of coverage by the laws, because in those cases, treatment cannot be considered exogenous or effective for the firms involved. To further isolate the effect of antitakeover laws, we drop firm-year observations prior to 1982 of those firms that were already protected from takeover threats by so-called first-generation antitakeover laws, which were ultimately invalidated by a U.S. Supreme Court decision in 1982. Second, following Cain, McKeon, and Solomon (2017), we focus on a subset of antitakeover laws that had the most negative impact on ex-post takeover rates. Third, to address the concern that measurement error in investment opportunities as proxied by industry Q could lead to spurious and biased results (Whited, 2001), we use the high-order cumulant estimator proposed by Erickson, Jiang, and Whited (2014) as well as an alternative Q proxy including intangible capital as advanced by Peters and Taylor (2017). The results of all these tests confirm our main finding that the passage of antitakeover laws led to large reductions in the Q-sensitivity of investment for conglomerate segments.

Our paper contributes causal evidence on whether managerial agency problems matter for the workings of internal capi-

tal markets. Because neoclassical models with endogenous organizational form based on heterogeneity in managerial talent (Maksimovic and Phillips, 2002) or organizational capabilities (Matsusaka, 2001) can produce sluggish winner-picking behavior as predicted by models of internal capital markets with agency frictions (Rajan et al., 2000; Scharfstein and Stein, 2000; Ozbas, 2005), previous evidence on the investment behavior of conglomerate firms have been interpreted as being consistent with both views. Our empirical strategy uses increases in control slack following the passage of antitakeover laws to test directly for the presence of agency frictions in the allocation of resources within firms. In addition, the relatively large magnitude of our causal estimates reinforces the importance of agency frictions in models of internal capital markets, and complements the structural estimates of Matvos and Seru (2014).

Our work follows previous research in using antitakeover laws as shocks to corporate control to shed light on the nature of managerial preferences. The main conclusion from that line of research is that managerial behavior appears most consistent with "quiet-life" preferences (Bertrand and Mullainathan, 1999, 2003) — uncontrolled managers prefer to avoid personally difficult decisions such as shutting down old plants or containing employees' wage demands. Our main finding that uncontrolled managers engage in less winner-picking is also consistent with quiet-life preferences if managers find it personally costly to turn down requests for resources from undeserving business units due to social ties, internal politics, and so forth.

Our paper is also related to the literature on mergers and acquisitions, and specifically research that views the takeover market as a source of managerial discipline (Manne, 1965) in

addition to reallocating assets to their best uses in the economy (Jovanovic and Braguinsky, 2004). Our analysis integrates those two views of the takeover market, and establishes a new channel through which the takeover market drives the efficiency of resource allocation in the economy — reductions in the threat of takeovers lead to reductions in the efficiency of internal capital markets where much of resource allocation takes place in the economy.

Last but not least, our paper is related to the literature on the diversification discount (Lang and Stulz, 1994; Berger and Ofek, 1995; Campa and Kedia, 2002; Graham, Lemmon, and Wolf, 2002; Mansi and Reeb, 2002; Villalonga, 2004) and the view that internal governance forces (Denis, Denis, and Sarin, 1997; Hoechle, Schmid, Walter, and Yermack, 2012) as well as external market conditions (Matvos and Seru, 2014; Kuppuswamy and Villalonga, 2016) matter for the relative efficiency of conglomerate and standalone forms of organization. Our causal empirical strategy for agency problems is unique to this strand of literature and strengthens the agency interpretation of much evidence.

The rest of the paper is organized as follows. Section 2 provides a description of state-level antitakeover laws and firm-level takeover defenses. Section 3 describes the data and provides summary statistics. Section 4 examines the impact of antitakeover laws on the Q-sensitivity of investment of standalone firms and conglomerate segments. Section 5 presents robustness checks. Section 6 presents cross-sectional heterogeneity in the effect of antitakeover laws. Section 7 examines the performance of conglomerate firms. Section 8 concludes the paper.

1.2. Background on Antitakeover Laws

In this section, we provide a brief history of antitakeover laws and summarize empirical evidence on how those laws affect hostile takeover rates and managerial decisions. More detailed discussions are available in a number of papers, including Catan and Kahan (2016), Cain et al. (2017), and Karpoff and Wittry (2018).

1.2.1. The Williams Act

The history of antitakeover legislation dates back to the Williams Act that was enacted in 1968 in response to a wave of coercive cash tender offers in the 1960s. Prior to the Act, hostile bidders could quietly accumulate shares on the open market or make cash tender offers to shareholders, a substantial majority of which were uninformed individual investors, on a compressed timetable with little or no disclosure. Whereas federal securities laws provided disclosure requirements for proxy fights and stock-for-stock exchanges to help shareholders make informed decisions in control contests, no laws applied to cash tender offers. The Act was introduced by the United States Congress to fill this legal gap (Sautter, 2016).

Among other things, the Act and a subsequent amendment in 1970 require investors to report stock accumulations by filing a disclosure statement with the SEC within ten days of acquiring a beneficial ownership of more than 5% in a public company, to indicate whether they are seeking to acquire control of the company, and to disclose further information if the intent is to acquire control. In addition, investors are subject to disclosure requirements prior to any tender offer if it would lead

to a greater than 5% beneficial ownership. Cain et al. (2017) find that while there was no significant change in the incidence of hostile takeovers following the passage of the Williams Act, the likelihood of a hostile bid conditional on an acquisition was significantly diminished.

The literature considers several other developments to also have had a significant impact on the market for corporate control since the Williams Act. First, institutional shareholders with stronger incentives and better resources to stay informed and to actively participate in governance gradually replaced individual shareholders. Second, states adopted antitakeover statutes making it difficult for their home corporations to be acquired without management's approval. Third, companies began devising their own takeover deterrents such as poison pills and staggered boards.

1.2.2. First-generation Antitakeover Laws

Researchers often refer to state antitakeover statutes that were adopted before 1982 as first-generation laws, and those that were adopted after 1982 as second-generation laws. First-generation laws were invalidated by a United States Supreme Court decision (*Edgar v. MITE Corp.*) on June 23, 1982; before 1982, those laws provided firms incorporated in 38 different states protection against unwanted acquisitions bids (Karpoff and Wittry, 2018) although it is also worth noting that several lower courts had already invalidated some of the first-generation laws before the Supreme Court decision.

As Jarrell and Bradley (1980) explain, first-generation laws included provisions that (i) required bidders to alert the management of the target company before announcing a tender offer

and hold longer tender periods than in the past; (ii) allow state commissioners to evaluate the legality of tender offers upon request by the target company, and seek injunction in state courts if deemed necessary; and (iii) hold the bidder liable for damages from violations of the disclosure and administrative procedures established under the law. These provisions gave managers more time to prepare defenses against unwanted bids or to solicit alternative bids. They also increased bidders' expected costs.

Past studies provide mixed evidence on the extent of takeover protection provided by first-generation laws. On the one hand, consistent with first-generation laws increasing bidders' expected costs in hostile takeovers, Jarrell and Bradley (1980) find that takeover premiums increased significantly following the adoption of those laws. On the other hand, Cain et al. (2017) find no significant relation between first-generation laws and the incidence of hostile takeovers.

1.2.3. Second-generation Antitakeover Laws

Recent studies that examine the causal effect of managerial slack on corporate policies commonly use the staggered adoption of second-generation antitakeover laws for empirical identification.[1] We use the same identification strategy to study the effect of managerial slack on the efficiency of resource allocation within firms.

As Karpoff and Wittry (2018) explain, there are five major types of second-generation laws: (i) business combination (BC) laws, (ii) control share acquisition (CS) laws, (iii) fair price (FP) laws, (iv) directors' duties (DD) laws, and (v) poison pill (PP)

[1]Table A1 of Karpoff and Wittry (2018) provides a summary of 75 empirical papers that use the passage of antitakeover laws for identification.

laws. Table 1.1 lists the adoption years of those laws by state.

BC laws, also known as "freeze-out" laws, prevent a large shareholder from engaging in any business combination (e.g., significant asset purchase or merger) with the target firm for a specified number of years unless the business combination is pre-approved by the shareholders and the board of directors of the target company. *CS laws* require a large shareholder seeking to obtain a significant fraction of the voting rights in the company (e.g., 20% or 50%) to receive approval from the majority of the remaining shareholders (excluding the officers of the company). *FP laws* require a bidder to either receive a super-majority shareholder approval or pay the highest share price paid during a specified period of time before the beginning of a tender offer. *DD laws*, also known as constituency laws, give directors the right to reject a tender offer that is not in the best interest of non-investor stakeholders (e.g., employees or customers) even if the transaction is attractive to the company's shareholders. *PP laws* grant firms the right to adopt poison pills as takeover defenses.

There is no consensus in the literature on which of these laws offer the greatest protection from unsolicited takeovers and how different types of laws interact with each other (Catan and Kahan, 2016; Karpoff and Wittry, 2018; Cain et al., 2017). Rather than making an assumption about the relative importance of the different types of laws, in our main specifications, we assume that state-level takeover protection becomes effective in the year the first second-generation law is passed. Our selection of the treatment event is in part motivated by Cheng, Nagar, and Rajan (2004) who argue that only the enactment of the first law can be considered truly exogenous since the passage of

one law may stimulate the passage of other types of laws. As a robustness check, we estimate our baseline models using the three legal events that Cain et al. (2017) identify as having the most negative impact on ex-post takeover rates: the passage of *FP* laws, the adoption of the Unocal standard, and the assumption of labor contracts. Finally, following Karpoff and Wittry (2018), we check the robustness of our results to (i) the exclusion of firm-year observations in which first-generation antitakeover laws were effective, (ii) the exclusion of firms that lobbied for the passage of their states' antitakeover laws or opted out of coverage by the laws, (iii) the exclusion of firms incorporated in Tennessee and Georgia where some of the laws became effective only for companies that chose to opt into coverage, (iv) controlling for important court decisions that either provided additional takeover protection or influenced the effectiveness of pre-existing state laws. We also examine whether pre-existing firm-level takeover protections such as poison pills mitigate the effect of state antitakeover laws.

1.3. Data and Summary Statistics

Our segment-level data come from Compustat historical segment files, which provide coverage going back to 1976. The segment files provide annual accounting information such as sales, assets, capital expenditures, operating profits, and depreciation at the segment level. In addition, we obtain annual firm-level data from Compustat industrial files. As is standard practice, we cross-validate annual segment sales with annual firm-level sales and drop observations for which the sum of segment sales is not within 25 percent of the firm's total sales. We

further exclude segment observations with (i) name "other", (ii) incomplete data on sales, assets, capital expenditures, depreciation, or operating profits, (iii) anomalous accounting data (zero depreciation, capital expenditures greater than sales or assets, negative capital expenditures), and (iv) firm-level sales less than $20 million in 1982 dollars using the Bureau of Labor Statistics producer price index for finished goods (WPUSOP3000). Moreover, we exclude segments with a missing SIC code, a one-digit SIC code of 6 (financial firms) or 9 (government firms) and a two-digit SIC code of 49 (regulated utilities). Furthermore, we drop firms incorporated outside of the United States and firms with missing information on their state of incorporation. We end our sample in 2006 because the last state antitakeover law is passed in 2005 and the financial crisis occurs in 2007 and 2008. These selection criteria yield 48,810 segment-year observations for 7,189 standalone (or single-segment) firms and 66,286 segment-year observations for 3,132 conglomerate (or multi-segment) firms over the period from 1977 through 2006. Table 1.2 provides descriptive statistics for standalone firms and conglomerate segments in our sample. Segment capital expenditure is Compustat segment item CAPXS. Segment cash flow is the sum of operating profits (OPS) and depreciation (DPS). We scale both measures by segment sales. To reduce the potential influence of outliers on our results, we winsorize both ratios at the top and bottom 1 percent of their full sample distributions. We compute Tobin's Q for standalone firms following the data definition of Kaplan and Zingales (1997) and bound it above at 10 by dividing the market value of assets by the sum of 0.1 times the market value of assets and 0.9 times the book value of assets to reduce the effect of potential measurement error in the book

value of assets (Ozbas and Scharfstein, 2010). The market value of assets is equal to the book value of assets (AT) plus the market value of common equity (CSHO x PRCC_F) less the book value of common equity (CEQ) and balance sheet deferred taxes (TXDB). Industry Q in a given year is the median Tobin's Q of standalone firms operating within the same two-digit SIC code industry in that year (one-digit SIC codes are too broad to form industries and there can be too few standalone firms operating in a given three-digit SIC code industry; the alternative of using the narrowest SIC grouping with a sufficient number of standalone firms has the disadvantage of introducing time-varying measurement error in industry Q). Firm age equals the natural logarithm of one plus the number of years since the firm is first listed in Compustat.

Table 1.2 shows that standalone firms are on average younger than conglomerate firms. They are also smaller than conglomerate segments as measured by sales ($767 million versus $845 million). In addition, they are less profitable than conglomerate segments as measured by the cash flow to sales ratio (10.9 percent versus 13.1 percent), and they tend to operate in industries with better investment opportunities than conglomerate segments do as proxied by industry Q (1.39 versus 1.29).

1.4. Antitakeover Laws and Internal Capital Markets

Our main research question is whether managerial agency problems lead to distortions in the allocation of the capital budget across multiple business units. Specifically, models of internal capital markets with agency problems predict a form of

corporate socialism in which weaker business units receive a bigger share of the firm's capital budget than they deserve at the expense of stronger business units. The literature has found evidence generally consistent with this prediction: conglomerate firms tend to allocate more resources to segments in low-Q industries and fewer resources to segments in high-Q industries, compared to standalone firms (Rajan et al., 2000; Ozbas and Scharfstein, 2010; Matvos and Seru, 2014). However, as noted earlier, neoclassical models that introduce heterogeneity in managerial talent and capabilities as a fundamental determinant of organizational form can also produce seemingly socialistic patterns in investment (Maksimovic and Phillips, 2002; Matsusaka, 2001).

Our empirical strategy is to use the passage of state antitakeover laws as a quasi-random shock to managerial slack to test the agency view. If agency problems arising from managerial slack distort internal capital market allocations, we would expect the distortions to intensify after the adoption of state antitakeover laws that increase managerial slack. Comparing conglomerate segments and standalone firms, we would expect (i) conglomerate segments to exhibit lower Q-sensitivity of investment following the adoption of state antitakeover laws, and (ii) the wedge between the Q-sensitivity of investment of conglomerate segments and standalone firms to widen since standalone firms do not allocate resources across multiple business units.

The most important feature of our empirical strategy from an identification standpoint is that different states adopted their second-generation antitakeover laws at different times. This allows us to cleanly estimate changes in investment behavior due to changes in agency problems with the plausible identifying as-

sumption that the staggered adoption of state-level antitakeover laws is orthogonal to other potentially omitted determinants across firms and over time. In addition, we can use firm fixed effects to control for time-invariant differences in the way firms allocate resources for reasons other than agency frictions. Put differently, firms serve as "controls" for themselves until they are "treated" with the passage of antitakeover laws in their respective states of incorporation. Similarly, we can use time fixed effects to control for general trends in the way firms allocate resources (perhaps due to changes in taxes, the business cycle, and so forth) because at any point in time, firms in states that have not yet passed antitakeover laws serve as "controls" for "treated" firms in states that have passed antitakeover laws.

In addition, we can use the impact of state antitakeover laws on the investment behavior of standalone firms as a benchmark for conglomerate segments to address the possibility of an unspecified antitakeover law effect (perhaps via changes in real or financial adjustment costs). In essence, standalone firms provide further economic identification for changes in investment behavior for reasons other than internal capital markets since there is no reason to believe that the staggered adoption of state antitakeover laws would be related to omitted differences that endogenously determine organizational form and investment behavior.

Equation 1.1 shows our baseline specification:

$$Investment_{ijt} = \beta_1 Post_{it} + \beta_2 Q_{ijt-1} + \beta_3 Post_{it} \times Q_{ijt-1} + \gamma X_{ijt} + \alpha_i + \lambda_t + u_{ijt} \tag{1.1}$$

Here, subscript i, j, and t denote firm, segment, and year, respectively; α_i and λ_t are firm- and year-specific fixed effects; X_{ijt} is a matrix of segment and firm characteristics including segment

cash flow-to-sales ratio and segment size as well as firm age; and u_{ijt} is the error term. The dependent variable, $Investment_{ijt}$, is the ratio of segment capital expenditure to sales. We scale capital expenditures with sales instead of assets because firms have less discretion in allocating sales across business units and there can be vintage effects with assets that are recorded at historical cost. $Post_{ijt}$ is an indicator variable that is equal to one after the adoption of one of the five major antitakeover laws in firm i's state of incorporation.[2] Q_{ijt-1}, our proxy for segment investment opportunities, is the median Q of standalone firms that operate in the segment's industry in year $t-1$. The main coefficient of interest in Equation 1.1 is β_3, the effect of state antitakeover laws on the Q-sensitivity of investment. We report standard errors that are heteroscedasticity-consistent and clustered at the firm level.[3]

Table 1.3 reports our baseline regression results for standalone firms (column 1) and conglomerate segments (column 2). An interesting first result is that the Q-sensitivity of investment for conglomerate segments is not smaller than that for standalone firms prior to the passage of state antitakeover laws. The coefficient estimate on Q_{ijt-1} for conglomerate firms (0.039 in column 2) is larger than the corresponding estimate for standalone firms (0.031 in column 1), but the difference test reported in column 3 indicates the two estimates cannot be statistically distinguished from each other (p-value = 0.415).

Turning to the effect of state antitakeover laws, we find no

[2] $Post_{ijt}$ changes from zero to one when antitakeover laws become effective during fiscal year t in firm i's state of incorporation. Also, our results are robust to excluding the observations in the first year that the antitakeover laws become effective.

[3] As discussed in the next section, our results are robust to clustering the standard errors at the state level.

discernible effect on the Q-sensitivity of investment for standalone firms. The coefficient estimate on $Q_{ijt-1} \times Post_{it}$ is small (0.001 in column 1) and statistically insignificant. We interpret this benchmark result as there being no "fundamental" effect of antitakeover laws (perhaps labor-, capital-, or adjustment-cost driven, or through technology and innovation) on standalone firms' Q-sensitivity of investment. Also, there is no evidence that the level of investment by standalone firms is affected. The coefficient estimate on $Post_t$ is positive (0.012 in column 1), but it is not statistically significant at conventional levels.

In contrast to evidence of little or no impact on the investment behavior of standalone firms, we find that the Q-sensitivity of investment for conglomerate segments is reduced by 0.025 ($Q_{ijt-1} \times Post_{it}$ in column 2), or by 64 percentage points relative to the pre-treatment level following the passage of antitakeover laws. In addition to being economically significant, the estimate is also statistically significant at the 1% level. As shown in column 3, a comparison of the estimates in columns 1 and 2 rejects the hypothesis that the change in the Q-sensitivity of investment is equal for standalone firms and conglomerate segments (p-value = 0.006).

Moreover, conglomerate segments invest unconditionally more after the adoption of state antitakeover laws as evidenced by a statistically significant coefficient estimate on $Post_t$ (0.047 in column 2). This estimate is also statistically different from the insignificant estimate for standalone firms (p-value = 0.007), as shown in column 3. Combined with the decline in the Q-sensitivity of investment for conglomerate segments, the regression evidence in column 2 shows a significant deterioration in the efficiency of resource allocation within the internal capital

markets of conglomerate firms. Following the adoption of state antitakeover laws, weaker business units operating in low-Q industries receive more resources at the expense of stronger business units operating in high-Q industries. The breakeven industry Q (the level of industry Q for which antitakeover laws result in no change in resource allocation) implied by the regression coefficients is 1.88 (= 0.047/0.025).

Overall, the evidence in Table 1.3 is broadly supportive of models with agency frictions in explaining inefficiencies in internal capital markets.

1.5. Robustness Checks

We conduct a battery of tests to check the robustness of the results in Table 1.3. This section provides a summary of our findings.

1.5.1. Exogeneity of treatment

As Karpoff and Wittry (2018) explain, state antitakeover laws are not exogenous for firms that lobbied for the adoption of those laws, and do not apply to firms that opted out of coverage by the laws. Exogeneity is also violated when antitakeover laws require firms to opt into coverage. To minimize concerns about endogenous treatment as well as potential measurement error in treatment status, we estimate our baseline specification after excluding lobbyists, opt-outs, and 173 firms incorporated in Tennessee and Georgia where some antitakeover laws require companies to opt into coverage. We obtain the list of companies that lobbied for the passage of their states' antitakeover laws from Gartman (2000) who identified a total of 46 lobbyists in 23

different states. In most cases, the lobbyists were targets of an actual or rumored acquisition bid. The list of firms that opted out of antitakeover laws comes from the Risk Metrics Governance database which indicates that 171 firms in our sample opted out of at least one state antitakeover law for one calendar year or more during 1990-2006. As shown in Panel A of Table 1.4, the exclusion of lobbyists, opt-outs, and firms incorporated in Tennessee and Georgia does not have any discernible effect on our results, which mitigates potential concerns with endogenous treatment.[4]

1.5.2. First-generation state antitakeover laws

Karpoff and Wittry (2018) argue that accounting for the existence of first-generation state antitakeover laws could reverse inferences made in studies focusing on second-generation laws, especially those studies using data from before 1982. To address this concern, we estimate our baseline models excluding firm-years in which first-generation laws were effective. Karpoff and Wittry (2018) consider all first-generation laws to be effective until the United States Supreme Court decision in *Edgar v. Mite* on June 22, 1982. However, Cain et al. (2017) argue that in 12 states, those laws were already overturned by federal court decisions prior to 1982. When coding the years during which the first-generation laws were effective, we rely on the

[4]Catan and Kahan (2016) argue that state antitakeover laws should be considered endogenous for most firms since firms choose their state of incorporation and they have the option to reincorporate to a state that offers a level of antitakeover protection that best suits their needs. However, as Karpoff and Wittry (2018) explain, reincorporations are costly and take time, making antitakeover laws effective at least in the short term. Also, reincorporations are uncommon. When reincorporations happen, companies typically reincorporate to their headquarter states instead of reincorporating to states with manager-friendly takeover laws (Cain et al., 2017).

dates provided by Cain et al. (2017). As shown in Panel B of Table 1.4, we find that the exclusion of firm-year observations in which first-generation antitakeover laws were effective does not alter the sign, significance, or size of our key coefficient estimates.

1.5.3. Most effective legal changes

Cain et al. (2017) find that state-level *BC*, *CS*, and *PP* laws had no discernible impact on ex-post hostile takeover rates. Instead, they find that hostile takeovers decreased significantly after three legal changes: the adoption of *FP* laws, the assumption of labor contracts, and the adoption of the Unocal standard. In Table 1.5, we use these three legal changes to identify the year of treatment. In Panel A, we define the treatment year based on the earliest of the three legal changes. In Panels B through D, we examine the effect of each legal change individually. As shown, we find in all four panels that the Q-sensitivity of the investment for conglomerate segments is significantly diminished following the legal changes. For standalone firms, only the adoption of *FP* laws has a significant negative effect on the Q-sensitivity of investment. In all four panels, we find that the decline in investment-Q sensitivity is greater for conglomerate segments than it is for standalone firms. Taken together, these results support our main finding that the loss of discipline provided by the corporate control market reduced the efficiency of internal capital markets.

1.5.4. Measurement error in Q

Whited (2001) notes that the divergence between unobservable marginal Q and its empirical proxies may distort inferences made about the efficiency of internal capital markets using investment-Q models. Our focus in this paper is on within-firm *changes* in the sensitivity of segment investment to industry Q following the adoption of antitakeover laws. To the extent that the amount of measurement error in industry Q as a proxy for marginal Q remains the same around the passage of antitakeover laws (and there is no clear reason to expect the amount of measurement error to change around exogenous antitakeover laws), or more conservatively, measurement error does not increase more for conglomerate firms than it does for standalone firms, inferences based on our baseline specification will remain valid. Nonetheless, we address the measurement error concern using the cumulant estimators proposed by Erickson et al. (2014) which exploits information contained in the third- and higher-order cumulants of the data and produces consistent regression estimates. Using this approach, we find that following the adoption of state antitakeover laws, the Q-sensitivity of investment decreases by about 40 percentage points for conglomerate segments relative to the pre-treatment level (significant at the 1% level) whereas the Q-sensitivity of investment for standalone firms increases slightly as before. Our inferences are also unchanged if we use an alternative measure of Q including intangible capital as examined by Peters and Taylor (2017). These results suggest that neither the measurement error in industry Q as a proxy for marginal Q nor the change in measurement error around the passage of antitakeover laws is a threat to our main inferences. These results are not reported in a table for

brevity but are available upon request.

1.5.5. Clustering

Past studies that examine the effect of state antitakeover laws on firm outcomes cluster regression standard errors either at the firm level (Atanassov, 2013; Cain et al., 2017) or at the state level (Bertrand and Mullainathan, 2003; Giroud and Mueller, 2010; Karpoff and Wittry, 2018). Following the first set of papers, we cluster the standard errors of our baseline regressions at the firm level to account for serial correlation in firms' resource allocation and investment decisions. However, because our treatment variable, $Post$, is defined at the state level, as a robustness check, we also cluster the standard errors at the state level. We find that while the standard errors of the variables $Post$ and $Post \times Q$ increase slightly with state-level clustering, the significance levels of all the regression coefficients remain the same. Put differently, whether we cluster regression standard errors at the firm level or at the state level does not affect our conclusions.

1.6. Cross-sectional Tests

In this section, we explore several sources of cross-sectional variation to shed light on how the adoption of state antitakeover laws reduced the efficiency of internal capital markets. To investigate potential mechanisms, we proceed as follows: (i) divide the sample of conglomerate segments into subsamples based on a proxy for the mechanism, (ii) estimate equation (1.1) for each subsample, and (iii) compare the coefficient estimates on $Q_{ijt-1} \times Post_{it}$, representing the change in internal capital market efficiency.

Our first set of tests are aimed at validating the idea that the adoption of antitakeover laws decreased the efficiency of internal capital markets precisely at those conglomerate firms that used to benefit from the disciplinary pressure provided by the corporate control market. Building on the inverse relation between firm size and probability of a hostile takeover that has been documented in the literature (Palepu, 1986; Morck, Shleifer, and Vishny, 1988), we divide our sample of conglomerate firms into size terciles (small, medium and large) based on total firm sales in the year prior to the adoption of antitakeover laws. We expect the drop in the efficiency of internal capital markets following the adoption of antitakeover laws to be more pronounced at smaller conglomerates that used to operate under a higher ex-ante likelihood of a hostile takeover.

The results are reported in Panel A of Table 1.6. The sample in row 2 includes the segments of medium and small conglomerate firms in the middle and bottom size terciles, respectively. We consider conglomerate firms in the middle and bottom size terciles together as one group to have a segment-year sample that is comparable to the segment-year sample in row 1, which contains the segments of large conglomerate firms in the top size tercile. The Q-sensitivity of investment for the segments of large conglomerates remains relatively stable (the coefficient estimate -0.007 on $Q_{ijt-1} \times Post_{it}$ is insignificant in row 1) whereas the Q-sensitivity of investment for the segments of medium and small conglomerates drops significantly following the passage of antitakeover laws (the coefficient estimate -0.052 on $Q_{ijt-1} \times Post_{it}$ is significant at the 1% level in row 2). The difference between these coefficient estimates in rows 1 and 2 is also statistically significant (p-value = 0.003), supporting the hypothesis that the

negative impact of antitakeover laws on internal capital market efficiency was more pronounced for smaller conglomerates that used to operate under greater disciplinary pressure from the corporate control market before the law change.

We also examine whether the impact of antitakeover laws was muted for conglomerate firms with preexisting firm-level takeover defenses. Presumably, conglomerate firms with preexisting takeover defenses did not experience a material reduction in the likelihood of unwanted takeover bids following the passage of the laws.

As a firm-level measure of takeover defenses, we use Bill Schwert's data set on poison pills on his web site. Using those data, we divide our sample of conglomerate firms into two subsamples based on the existence of a poison pill prior to the passage of antitakeover laws. Panel B of Table 1.6 reports the results. The coefficient estimate on $Q_{ijt-1} \times Post_{it}$, representing the change in the efficiency of internal capital markets following the passage of antitakeover laws, is statistically insignificant for the segments of conglomerate firms with a poison pill (-0.020 in row 3) and significant for the segments of conglomerate firms without a poison pill (-0.027 in row 4). The negative impact of antitakeover laws on the efficiency of internal capital markets is greater for conglomerates without a poison pill as expected, but the difference between conglomerates with and without a poison pill is not statistically significant (p-value = 0.642) in part because the two samples are highly imbalanced with far fewer conglomerates with a poison pill (6,528 firm-year observations with a poison pill versus 59,758 firm-year observations without a poison pill). We also note that a zero effect is within the 90% confidence interval for conglomerate firms with a poison pill prior to the passage of

antitakeover laws.

We next examine whether financial leverage and concentrated ownership can serve as alternative sources of discipline on managers and effectively mitigate the loss of disciplinary takeover threats provided by the corporate control market after the passage of antitakeover laws. We report the results for these mechanisms in Table 1.7.

In Panel A, we divide our sample of conglomerate firms into quartiles based on market leverage (total book debt divided by total book debt plus the market value of equity) at the end of the fiscal year before the passage of antitakeover laws. The segments of conglomerate firms in the lowest leverage quartile exhibit larger declines in their Q-sensitivity of investment following the passage of antitakeover laws than the segments of conglomerate firms in the highest leverage quartile – the coefficient estimate on $Q_{ijt-1} \times Post_{it}$ is -0.056 for the segments of conglomerate firms in the lowest leverage quartile in row 1 and -0.004 for the segments of conglomerate firms in the highest leverage quartile in row 3. The difference between these two coefficient estimates is also statistically significant (p-value = 0.016). Importantly, the Q-sensitivity of investment remains stable for the segments of conglomerate firms in the highest leverage quartile, consistent with the notion that financial leverage can help alleviate agency conflicts (Jensen, 1986) and serve as a governance device to discipline management.

In Panel B, we examine whether the presence of concentrated owners plays a role in how conglomerate firms respond to the passage of antitakeover laws. As owners, institutional shareholders have greater incentives to monitor management than do retail shareholders since the benefits are more likely to ex-

ceed the costs with greater concentration of ownership (Grossman and Hart, 1980; Shleifer and Vishny, 1986). Thus, we expect conglomerate firms with high concentration of institutional ownership and naturally associated monitoring of management to show a muted response to the loss of disciplinary takeover threats provided by the corporate control market.

We obtain quarterly data on the ownership stakes of institutional investors with more than $100 million under management from Thomson Reuters 13-F files to construct a firm-level Herfindahl index of institutional ownership as a measure of ownership concentration. We then divide conglomerate firms into two groups of high and low ownership concentration based on the median value of the Herfindahl index of institutional ownership in the year before the passage of antitakeover laws.

The results in Panel B are broadly consistent with the notion that concentrated ownership can help partially offset the loss of discipline provided by the corporate control market. Specifically, we find that the segments of conglomerate firms with a lower Herfindahl index of institutional ownership exhibit a larger reduction in their Q-sensitivity of investment following the passage of antitakeover laws (the coefficient estimate on $Q_{ijt-1} \times Post_{it}$ -0.047 in row 4 versus -0.017 in row 5). The difference in the response estimates is also statistically significant at the 10% level.

Finally, we explore the idea that internal power struggles can underpin inefficient allocation of resources in internal capital markets due to diversity of investment opportunities. To test this mechanism, we follow Rajan et al. (2000) in measuring the diversity of investment opportunities at a conglomerate firm as the standard deviation of asset-weighted segment Q's divided by the equally-weighted average segment Q in the firm. With the

loss of disciplinary takeover threats following the passage of antitakeover laws, we expect the decline in the efficiency of internal capital markets to be more pronounced at conglomerate firms with greater within-firm diversity of investment opportunities.

In Table 1.8, we sort conglomerate firms into quartiles based on their within-firm diversity of investment opportunities in a given year since this is a highly time-varying measure. As expected, the segments of conglomerate firms in the highest diversity quartile exhibit the largest decline in their Q-sensitivity of investment – the coefficient estimate on $Q_{ijt-1} \times Post_{it}$ is -0.055 in row 4. In addition, the negative impact of antitakeover laws on the efficiency of internal capital markets is monotonic across the diversity quartiles, and there appears to be little or no impact on conglomerate firms in the lowest diversity quartile in row 1. The difference in the response of conglomerate firms in the lowest and highest diversity quartiles is also statistically significant (p-value = 0.004).

Overall, the results in this section show that the efficiency of internal capital markets dropped in economically predictable ways following the passage of state-level antitakeover laws. The adverse impact of the laws appears mostly at conglomerate firms that benefited from disciplinary takeover threats prior to the passage of the laws, lacked alternative sources of pressure on management, or had the structural makings to fuel wasteful influence activities and power struggles among managers. These cross-sectional results also serve as sensible checks to help address potential concerns that our main finding might be spurious.

1.7. Performance and Value of Conglomerate Firms

We finally examine whether the performance and value of conglomerate firms declined along with the efficiency of their internal capital markets following the passage of state-level antitakeover laws. While this is a natural question to ask, it is important to note that factors other than inefficient investment can also affect performance and value. In addition, it can be difficult to detect a firm-wide decline in performance if the composition of assets is slow to change with inefficient segment-level investment. Firm value is perhaps even more complicated because of the forward-looking nature of stock prices, making the staggered passage of antitakeover laws less reliable for empirical identification – if the passage of an antitakeover law by one state increases the probability that another state would also pass a similar law, that expectation would be priced in advance of treatment and contaminate before versus after comparisons of firm value.

To conduct our tests, we follow the narrowest SIC grouping approach of Berger and Ofek (1995) to benchmark the value and performance of conglomerate firms to comparable industry-matched portfolios of standalone firms. To mitigate attrition bias, we require sample conglomerate firms to have at least one firm-year observation before and after the law change.

Table 1.9 reports the results for measures of excess value (market-to-sales ratio) in column 1 and performance (EBITDA-to-sales ratio) in column 2. In Panel A, the regressions have no firm or year fixed effects. The constant term is robustly negative and statistically significant at conventional levels in both

columns, consistent with the results about conglomerate firms in the literature. The coefficient estimate on $Post_{it}$ is negative and large relative to the constant term for the market-to-sales ratio in column 1. However, none of the coefficient estimates on $Post_{it}$ are statistically significant. In Panel B, the regressions have firm and year fixed effects. The coefficient estimate on $Post_{it}$ remains negative for the market-to-sales ratio in column 1, and becomes negative for the EBITDA-to-sales ratio in column 2. Overall, there is no statistically detectable decline in the value and performance of conglomerate firms (benchmarked to comparable industry-matched portfolios of standalone firms) around the passage of antitakeover laws.

1.8. Conclusion

This paper is the first to provide causal evidence that agency problems matter for the allocation of resources within conglomerate firms and affect the functioning of internal capital markets. Using the staggered adoption of state-level antitakeover laws as quasi-random shocks that reduced takeover threats and increased managerial discretion, we find that the resource allocation decisions of conglomerate firms, but not standalone firms, became less sensitive to investment opportunities, consistent with models of internal capital markets featuring agency problems (Rajan et al., 2000; Scharfstein and Stein, 2000).

Our analysis builds on previous work that has used the passage of antitakeover laws to understand the nature of managerial preferences. To the extent managers dislike turning down resource requests in general, our main finding that conglomerate firms exhibit less winner-picking behavior following the adoption

of antitakeover laws is consistent with previous evidence on the reluctance of managers to make decisions that they may personally find costly such as shutting down old plants (Bertrand and Mullainathan, 2003) or containing employees' wage demands (Bertrand and Mullainathan, 1999).

The causal evidence in this paper provides an important and unique insight by speaking to alternative economic arguments that have been advanced about the investment behavior of conglomerate firms, and specifically their low Q-sensitivity of investment relative to standalone firms. The difference in investment behavior potentially can arise due to either heterogeneity in managerial talent or agency problems in internal capital markets. Our estimates point to economically large declines in Q-sensitivity of investment at conglomerate firms following reductions in disciplinary threats from the takeover market, and support the view that agency problems in internal capital markets are important for understanding the investment behavior of conglomerate firms.

Further research into the specific nature of agency problems would aid in the design of organizational structures and processes to improve the efficiency of internal capital markets within conglomerate firms. Given the significant amount of resources that are allocated in internal capital markets and away from the invisible hand of external capital markets, this line of inquiry represents an important area for future research.

Appendix A. A Model of Internal Capital Markets

This section outlines a model of internal capital markets. The model provides a framework to think about the effect of anti-takeover laws on allocative efficiency within firm boundaries.

Suppose that a firm has two business units index by $i \in \{1, 2\}$. For each business unit i, the cash flow generated net of investment I_i is given by $\theta_i f(I_i)$ where θ_i is the productivity of the business unit and f is a concave production function ($f' > 0, f'' < 0$) satisfying the usual Inada conditions. The firm has a CEO who has authority over allocating the firm's limited resources K to the business units. The CEO cares about the value of the firm to the extent motivated by compensation as well as corporate control and labor market consequences of firm performance as parametrized by α. At the same time, the CEO has a preference for corporate socialism in allocating the firm's resources. The preference for corporate socialism could directly reflect the CEO's personal preferences or indirectly arise from internal power struggles as in Rajan, Servaes, and Zingales (2000) or influence activities as in Scharfstein and Stein (2000). As a parsimonious representation, the CEO favors low productivity business units at the expense of high productivity business units. This preference is parametrized by γ in the CEO's resource allocation problem.

The CEO's program is then

$$\max_{\{I_1, I_2\}} \alpha \sum_{i=1}^{2} \left(\theta_i f\left(I_i\right)\right) - \gamma \sum_{i=1}^{2} \left(\theta_i - \bar{\theta}\right) I_i$$

$$s.t. \quad I_1 + I_2 \leq K$$

where $\bar{\theta} = \frac{\theta_1+\theta_2}{2}$ is the average level of productivity in the firm.

Without loss of generality, assume that the first business unit is the stronger business unit in the sense that it is more productive than the second business unit, $\theta_1 > \theta_2$. Also for simplicity, assume that the resource constraint binds, so $I_2 = K - I_1$.

It is instructive to examine the CEO's resource allocation problem if the focus were purely on firm value and there was no preference for corporate socialism with $\gamma = 0$. The first-order condition with respect to I_1 is then

$$\theta_1 f'(I_1) = \theta_2 f'(K - I_1),$$

implying a solution in which there is greater investment in the stronger business unit, $I_1^* > K - I_1^* = I_2^*$.

When there is corporate socialism $\gamma > 0$, the first-order condition with respect to I_1 becomes

$$\alpha\theta_1 f'(I_1) = \alpha\theta_2 f'(K - I_1) + \gamma(\theta_1 - \theta_2).$$

Relative to the case with $\gamma = 0$, the solution entails a decrease in investment in the stronger business unit $I_1^{**} < I_1^*$ as well as an increase in investment in the weaker business unit $I_2^{**} > I_2^*$ since $\frac{\gamma}{\alpha}(\theta_1 - \theta_2) > 0$. In other words, allocative efficiency declines relative to the case with no preference for corporate socialism. This result is related to the main comparative static that we derive immediately below.

We are interested in how the passage of antitakeover laws affects allocative efficiency in internal capital markets. In terms of the model, a reduced takeover threat leads the CEO to put less weight on firm value, which translates to a lower α. Clearly, this is equivalent to a higher γ because what matters to the CEO is the relative weight $\frac{\gamma}{\alpha}$.

Differentiating the first-order condition to obtain the comparative static $\partial I_1/\partial\alpha$,

$$\alpha\theta_1 f''(I_1)\frac{\partial I_1}{\partial\alpha}+\theta_1 f'(I_1)=-\alpha\theta_2 f''(K-I_1)\frac{\partial I_1}{\partial\alpha}+\theta_2 f'(K-I_1)$$

$$\frac{\partial I_1}{\partial\alpha}=\frac{\theta_2 f'(K-I_1)-\theta_1 f'(I_1)}{\alpha\theta_1 f''(I_1)+\alpha\theta_2 f''(K-I_1)}$$

From the first-order condition, the numerator equals $-\frac{\gamma}{\alpha}(\theta_1-\theta_2)<0$. The denominator is also negative with $f''<0$, so $\partial I_1/\partial\alpha>0$. Similarly, it is straightforward to show that $\partial I_2/\partial\alpha<0$. These together imply that allocative efficiency increases with α, the weight that the CEO puts on firm value. That is, when α increases, more resources flow to stronger business units.

Our main tests concern the effect of antitakeover laws on allocative efficiency. Formally, the test entails a reduction in α, which the model predicts would lead to a reduction in allocative efficiency.

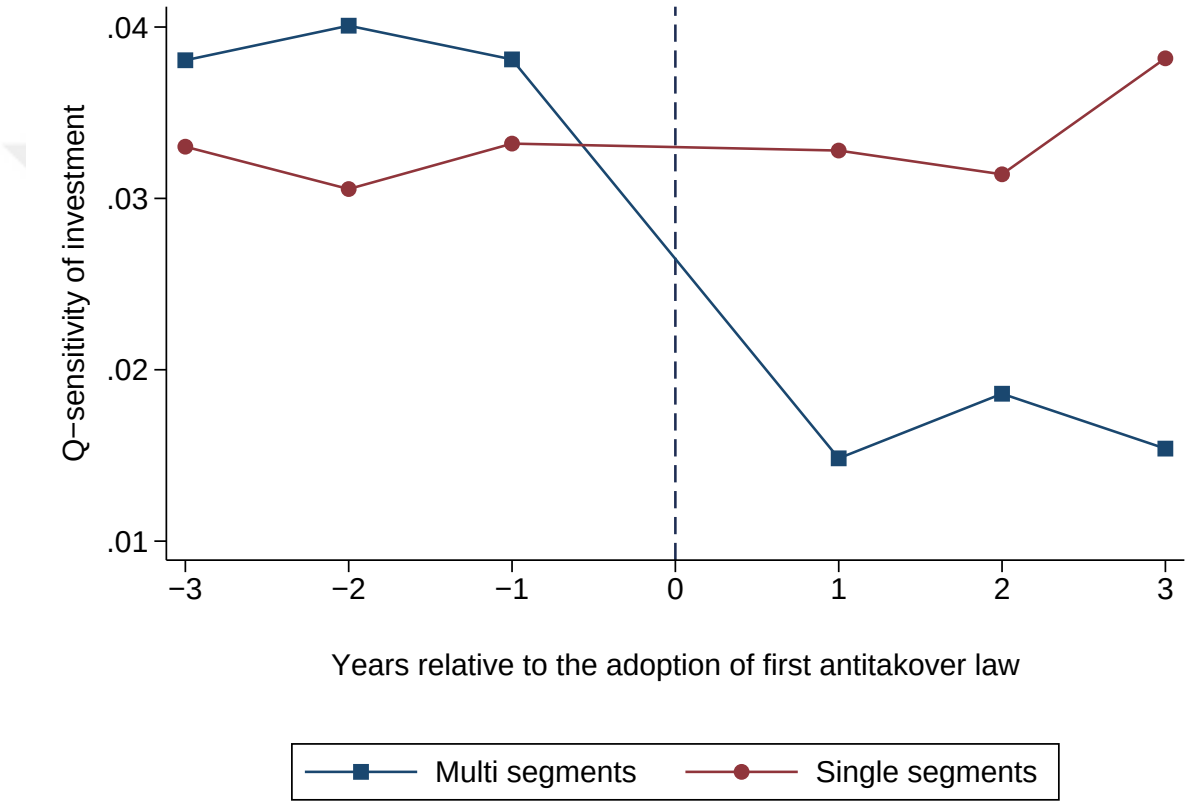

Figure 1: Q-sensitivity of investment around the adoption of first second-generation state antitakeover law

This figure presents how investment-Q sensitivity of standalone (single-segment) and conglomerate (multi-segment) firms react to the passage of first second-generation state antitakeover law.

Table 1.1. The Adoption Year of Second-Generation Antitakeover Laws by State

State	Business combination (BC)	Control share acquisition (CS)	Fair price (FP)	Directors' duty (DD)	Poison pill (PP)
Alaska	—	—	—	—	—
Alabama	—	—	—	—	—
Arkansas	—	—	—	—	—
Arizona	1987	1987	1987	1987	—
California	—	—	—	—	—
Colorado	—	—	—	—	1989
Connecticut	1988	—	1984	1988	2003
Delaware	1988	—	—	—	—
Florida	—	1987	1987	1989	1989
Georgia	1988	—	1985	1989	1988
Hawaii	—	1985	—	1989	1988
Iowa	1997		—	1989	1989
Idaho	1988	1988	1988	1988	1988
Illinois	1989	—	1985	1985	1989
Indiana	1986	1986	1986	1986	1986
Kansas	1989	1988	—	—	—
Kentucky	1986	—	1984	1988	1988
Louisiana	—	1987	1984	1988	—
Massachusetts	1989	1987	—	1989	1989
Maryland	1989	1989	1983	1999	1999
Maine	1988		—	1985	2002
Michigan	1989	1988	1984	—	2001
Minnesota	1987	1984	1991	1987	1995
Missouri	1986	1984	1986	1986	1999
Mississipi	—	1990	1985	1990	2005
Montana	—	—	—	—	—
North Carolina	—	1987	1987	1993	1989
North Dakota	—	—	—	1993	—
Nebraska	1988	1988	—	1988	—
New Hampshire	—	—	—	—	—
New Jersey	1986	—	1986	1989	1989

(Continued on the next page)

Table 1.1 – (Continued from the previous page)

State	Business combination (BC)	Control share acquisition (CS)	Fair price (FP)	Directors' duty (DD)	Poison pill (PP)
New Mexico	—	—	—	1987	—
Nevada	1991	1987	1991	1991	1989
New York	1985	—	1985	1987	1988
Ohio	1990	1982	1990	1984	1986
Oklahoma	1991	1987	—	—	—
Oregon	1991	1987	—	1989	1989
Pennsylvania	1988	1990	1988	1990	1988
Puerto Rico	—	—	—	—	—
Rhode Island	1990	—	1990	1990	1990
South Carolina	1988	1988	1988	—	1998
South Dakota	1990	1990	1990	1990	1990
Tennessee	1988	1988	1988	1988	1989
Texas	1997	—	—	2003	2003
Utah	—	1987	—	—	1989
Virginia	1988	1989	1985	1988	1990
Vermont	—	—	—	1998	—
Washington	1987	—	1985		1998
Wisconsin	1987	1984	1984	1987	1987
West Virginia	—	—	—	—	—
Wyoming	1989	1990	—	1990	—

Table 1.2. Descriptive Statistics

This table provides descriptive statistics for the characteristics of standalone firms and conglomerate segments in our sample. The sample period is from 1977 to 2006. Data on segment and firm financial characteristics come from Compustat segment files and annual industrial files, respectively. Industry Q is the median Q of standalone firms that operate within the industry. In computing standalone Q's, we follow the data definition of Kaplan and Zingales (1997). Industry is defined at the level of two-digit SIC codes. Firm age is the natural logarithm of one plus the number of years since the firm's first appearance in Compustat. *, **, and *** denote that the mean of standalone firms is significantly different from the mean of conglomerate segments at the 10%, 5% and 1% level, respectively (based on a two-tailed t-test, assuming unequal variances).

	Standalone firms		Conglomerate segments	
Variables	Mean	S.D.	Mean	S.D.
Segment Sales	767	3,172	845***	3,702
Segment Assets	696	3,231	697	3,036
Segment CapEx	55	320	52	278
Segment Cash Flow	102	543	118***	521
Segment CapEx/Sales	0.075	0.109	0.067***	0.103
Segment Cash Flow/Sales	0.109	0.155	0.131***	0.155
Industry Q	1.39	0.33	1.29***	0.33
Firm age	2.24	0.85	2.97***	0.73
N	48,810		66,286	

Table 1.3. Investment-Q Sensitivity Before and After Passage of Antitakeover Laws

This table reports the effect of second-generation state-level antitakeover laws on the Q-sensitivity of investment for standalone firms in column (1) and conglomerate segments in column (2). *Post* is an indicator variable that equals one after the firm's state of incorporation enacts a second-generation antitakeover law. The sample period is from 1977 through 2006. Standard errors that are heteroscedasticity-consistent and clustered at the firm level are reported in parentheses beneath coefficient estimates. *, **, and *** denote significance at the 10%, 5% and 1% level, respectively. The *p*-values of differences between coefficients in columns (1) and (2) are calculated using seemingly unrelated regressions.

	Investment_t		
Explanatory variables	(1) Standalone firms	(2) Conglomerate segments	*p*-value difference
Q_{t-1}	0.031***	0.039***	0.415
	(0.008)	(0.006)	
Post_t	0.012	0.047***	0.007
	(0.010)	(0.008)	
$Q_{t-1} \times \text{Post}_t$	0.001	-0.025***	0.006
	(0.007)	(0.006)	
CF_t	0.063***	0.195***	0.000
	(0.018)	(0.019)	
$CF_t \times \text{Post}_t$	-0.084***	-0.095***	0.688
	(0.019)	(0.019)	
Age_t	-0.021***	-0.007**	0.000
	(0.002)	(0.003)	
Size_t	-0.004**	-0.013***	0.000
	(0.002)	(0.001)	
Firm FEs	Yes	Yes	
Year FEs	Yes	Yes	
N	48,810	66,286	
R^2	0.058	0.080	

Table 1.4. Robustness Tests

This table reports robustness tests that address concerns with the endogeneity and measurement of treatment in the regression evidence in Table 3. In Panel A, firms that (i) lobbied for antitakeover laws, (ii) opted out of coverage, and (iii) were incorporated in Georgia and Tennessee whose antitakeover laws required firms to opt into coverage are excluded. In Panel B, firm-year observations in which first-generation antitakeover laws were effective are excluded. Standard errors that heteroscedasticity-consistent and clustered at the firm level are reported in parentheses beneath coefficient estimates. *, **, and *** denote significance at the 10%, 5% and 1% level, respectively. The p-values for the difference between the coefficient estimates for standalone firms and conglomerate segments are calculated using seemingly unrelated regressions.

	Explanatory variables				
	Q_{t-1}	$Post_t$	$Q_{t-1} \times Post_t$	Other controls	N/ R^2
Panel A: Excluding Lobbyists, Opt-outs, and Firms Incorporated in GA and TN					
Standalone	0.031***	0.010	0.002	Yes	46,123
	(0.008)	(0.011)	(0.008)		0.058
Conglomerate	0.040***	0.047***	-0.026***	Yes	61,381
	(0.006)	(0.008)	(0.006)		0.078
p-diff	0.358	0.005	0.005		
Panel B: Excluding Firm-Years with Effective First-Generation Antitakeover Laws					
Standalone	0.031***	0.010	0.001	Yes	47,288
	(0.009)	(0.011)	(0.008)		0.058
Conglomerate	0.036***	0.044***	-0.022***	Yes	60,826
	(0.007)	(0.008)	(0.006)		0.079
p-diff	0.668	0.016	0.027		

Table 1.5. Most Effective Legal Changes and Q-sensitivity of Investment

This table reports the change in the Q-sensitivity of investment for standalone firms and conglomerate segments after the introduction of the three most effective legal changes according to Cain et al. (2017): fair price laws, assumption of labor contracts, and settlement of the Unocal case. Standard errors that are heteroscedasticity-consistent and clustered at the firm level are reported in parentheses beneath coefficient estimates. *, **, and *** denote significance at the 10%, 5% and 1% level, respectively. The p-values for the difference between the coefficient estimates for standalone firms and conglomerate segments are calculated using seemingly unrelated regressions.

	Explanatory variables				
	Q_{t-1}	$Post_t$	$Q_{t-1} \times Post_t$	Other controls	N/ R^2
Panel A: Passage of the First of the Three Most Effective Legal Changes					
(1) Standalone	0.033***	0.019**	-0.002	Yes	48,810
	(0.008)	(0.010)	(0.008)		0.061
(2) Conglomerate	0.047***	0.053***	-0.036***	Yes	66,286
	(0.006)	(0.008)	(0.006)		0.079
p-diff	0.145	0.008	0.001		
Panel B: Passage of Fair Price Laws					
(3) Standalone	0.035***	0.024***	-0.011**	Yes	48,810
	(0.004)	(0.007)	(0.005)		0.056
(4) Conglomerate	0.028***	0.037***	-0.024***	Yes	66,286
	(0.004)	(0.007)	(0.005)		0.075
p-diff	0.204	0.205	0.058		
Panel C: Assumption of Labor Contracts					
(5) Standalone	0.029***	0.000	0.005	Yes	48,810
	(0.005)	(0.008)	(0.005)		0.059
(6) Conglomerate	0.027***	0.021***	-0.010**	Yes	66,286
	(0.004)	(0.007)	(0.005)		0.075
p-diff	0.734	0.040	0.030		
Panel D: Settlement of Unocal Case					
(7) Standalone	0.030***	0.005	0.002	Yes	48,810
	(0.005)	(0.007)	(0.005)		0.058
(8) Conglomerate	0.033***	0.032***	-0.021***	Yes	66,286
	(0.004)	(0.007)	(0.005)		0.075
p-diff	0.659	0.006	0.002		

Table 1.6. Pre-Treatment Takeover Threat and Effect of Antitakeover Laws

This table reports how the intensity of a hostile takeover threat prior to the passage of second-generation antitakeover laws is related to the impact of those laws on the Q-sensitivity of investment of conglomerate segments. Panel A reports the estimates for large and medium-small conglomerate firms. Large (medium-small) conglomerate firms are those in the top (middle-bottom) tercile of total firm sales in the year prior to the passage of anti-takeover laws. Panel B reports the estimates for conglomerate firms with and without poison pills before the passage of antitakeover laws. Data on firm-level poison pills are from Bill Schwert's website. Standard errors that are heteroscedasticity-consistent and clustered at the firm level are reported in parentheses beneath coefficient estimates. *, **, and *** denote significance at the 10%, 5% and 1% level, respectively. The p-values for the difference between the coefficient estimates for high versus low takeover-risk groups are calculated using seemingly unrelated regressions.

	Explanatory variables				
	Q_{t-1}	$Post_t$	$Q_{t-1} \times Post_t$	Other controls	N/ R^2
Panel A: Ex-Ante Likelihood of a Hostile Takeover					
(1) Low	0.017**	0.021**	-0.007	Yes	26,877
	(0.007)	(0.010)	(0.007)		0.162
(2) High	0.069***	0.076***	-0.052***	Yes	16,745
	(0.012)	(0.017)	(0.013)		0.070
p-diff	0.000	0.005	0.003		
Panel B: Firm-level Poison Pills					
(3) Yes	0.029***	0.050***	-0.020	Yes	6,528
	(0.011)	(0.018)	(0.013)		0.196
(4) No	0.041***	0.048***	-0.027***	Yes	59,758
	(0.007)	(0.009)	(0.007)		0.073
p-diff	0.319	0.928	0.642		

Table 1.7. Financial Leverage, Ownership Concentration and Antitakeover Laws

This table reports how financial leverage and institutional ownership concentration measured prior to the passage of second-generation antitakeover laws is related to the impact of those laws on the Q-sensitivity of investment of conglomerate segments. In Panel A, conglomerate firms are split into quartiles based on financial leverage in the year before the passage of antitakeover laws. In Panel B, conglomerate firms are split into two subsamples based on the median level of institutional ownership concentration in the year before the passage of antitakeover laws. Standard errors that are heteroscedasticity-consistent and clustered at the firm level are reported in parentheses beneath coefficient estimates. *, **, and *** denote significance at the 10%, 5% and 1% level, respectively. The p-values for the difference between coefficients estimates are calculated using seemingly unrelated regressions.

	Explanatory variables				
	Q_{t-1}	$Post_t$	$Q_{t-1} \times Post_t$	Other controls	N/ R^2
Panel A: Leverage					
(1) Quartile 1	0.052***	0.078***	-0.056***	Yes	6,698
	(0.015)	(0.026)	(0.017)		0.050
(2) Quartile 2 & 3	0.035***	0.039***	-0.023***	Yes	26,310
	(0.008)	(0.010)	(0.008)		0.133
(3) Quartile 4	0.026*	0.012	-0.004	Yes	10,582
	(0.014)	(0.018)	(0.013)		0.126
p-diff (Q1-Q4)	0.204	0.031	0.016		
Panel B: Institutional Ownership Concentration					
(4) Low	0.052***	0.064***	-0.047***	Yes	8,148
	(0.017)	(0.022)	(0.016)		0.090
(5) High	0.032***	0.032***	-0.017*	Yes	17,587
	(0.008)	(0.012)	(0.009)		0.127
p-diff	0.284	0.192	0.097		

Table 1.8. Diversity of Investment Opportunities and Antitakeover Laws

This table reports how the diversity of investment opportunities among the segments of conglomerate firms is related to the impact of second-generation antitakeover laws on the Q-sensitivity of investment of conglomerate segments. Following Rajan et al. (2000), diversity of investment opportunities at a conglomerate firm is defined as the standard deviation of asset-weighted segment Q's divided by the equally-weighted average segment Q in the firm. Conglomerate firms are split into quartiles based on the diversity measure (lowest diversity in quartile 1 and highest in quartile 4). Standard errors that are heteroscedasticity-consistent and clustered at the firm level are reported beneath coefficient estimates. *, **, and *** denote significance at the 10%, 5% and 1% level, respectively. The p-values for the difference between coefficient estimates for the top and bottom diversity quartiles are calculated using seemingly unrelated regressions.

	Explanatory variables				
	Q_{t-1}	$Post_t$	$Q_{t-1} \times Post_t$	Other controls	N/ R^2
Diversity of investment opportunities					
(1) Quartile 1	0.005	0.015	-0.006	Yes	19,171
	(0.010)	(0.012)	(0.010)		0.133
(2) Quartile 2	0.031***	0.049***	-0.022*	Yes	18,556
	(0.011)	(0.014)	(0.012)		0.107
(3) Quartile 3	0.048***	0.051***	-0.031**	Yes	15,664
	(0.013)	(0.018)	(0.013)		0.080
(4) Quartile 4	0.076***	0.081***	-0.055***	Yes	11,365
	(0.015)	(0.020)	(0.016)		0.043
p-diff (Q1-Q4)	0.000	0.003	0.004		

Table 1.9. Excess Value and Performance

This table reports regressions explaining the excess value and performance of conglomerate firms relative to comparable industry portfolios of standalone (single-segment) firms around the passage of second-generation state-level antitakeover laws. Market-to-sales ratio is market value divided by sales. Market value is year-end share price multiplied by outstanding number of shares plus book value of short-term debt and long-term debt. EBITDA-to-sales ratio is earnings before interest, taxes, depreciation and amortization divided by sales (ebitda/sale). Excess measure is computed as actual minus imputed measure and winsorized at one percent in each tail. Imputed measures are segment sales-weighted averages of industry medians based on the narrowest SIC grouping that includes at least five standalone firms following Berger and Ofek (1995). Standard errors that are heteroscedasticity-consistent and clustered at the firm level are reported beneath coefficient estimates. *, **, and *** denote significance at the 10%, 5% and 1% level, respectively.

	Excess Value	Excess Performance
	(1)	(2)
Dependent variable:	Market to Sales	EBITDA to Sales
Panel A. Without firm and year fixed effects		
Post_t	-0.043	0.005
	(0.040)	(0.004)
Constant	-0.065***	-0.010***
	(0.025)	(0.003)
N	3,992	3,996
R^2	0.001	0.001
Panel B. With firm and year fixed effects		
Post_t	-0.032	-0.001
	(0.040)	(0.004)
N	3,992	3,996
R^2	0.591	0.623

Chapter 2

Product Market Competition and the Value of Diversification

Abstract

This paper examines how industry concentration affects the value of diversification and explores the strategic value of agency problems in product markets for concentrated conglomerates. I find that conglomerates that operate mainly in concentrated industries have higher diversification values. Consistent with agency theories, agency problems, on average, lead to greater diversification discount. In contrast, agency problems in concentrated conglomerates create strategic advantage and lead to greater diversification values consistent with the notion that these conglomerates can credibly commit to their industries in case of competitive threats. Using import tariff reductions as exogenous competitive shocks, I show that concentrated conglomerates experience significant decline in their valuations when they are hit by competitive shocks and they respond more aggressively to competitive shocks in order to defend their market positions in less-competitive industries.

2.1. Introduction

The effect of diversification on firm value has attracted significant research interest. Theoretical literature suggest that diversification has both value-enhancing and value-destroying effects. The potential benefits of diversification include the creation of an internal capital market and reducing the cost of information asymmetries that exists in the external markets (Stein, 1997), the coinsurance effect and reduced borrowing costs (Lewellen, 1971; Hann, Ogneva, and Ozbas, 2013). The main costs of diversification are mainly related to agency problems, inefficient internal capital markets or power struggles between divisions (Rajan et al., 2000; Scharfstein and Stein, 2000).

Although existing empirical literature finds that diversified firms trade, on average, at a discount relative to the value of a portfolio of comparable stand-alone firms (Lang and Stulz, 1994; Berger and Ofek, 1995), some diversified firms trade at a premium (Rajan et al., 2000). This dispersion in diversified firm values suggests that some diversified firms benefit from diversification while for many others, the costs of diversification outweigh the benefits.

This paper focuses on the cross-sectional variation in diversification value and examines the effect of product market concentration that a diversified firm operates on the value of diversification. I find evidence that diversified firms that operate mainly in concentrated industries have higher valuations. These results are robust to the use of econometric models to control for the endogeneity of firms' diversification decisions (Campa and Kedia, 2002; Villalonga, 2004). These results are also robust to alternative industry concentration measure. My main concentration measure is the Herfindahl-Hirschman Index (HHI) based

on Compustat data, I obtain similar results if I use fitted HHI measure as suggested by Hoberg and Phillips (2010).

Next, I study the strategic value of agency problems in product markets. Agency theories suggest that managers pursue their own private objectives at the expense of stockholders and may engage in value-destroying diversification. For instance, managers may prefer to diversify in order to (i) create private benefits such as power, prestige and higher compensation as in "empire-building" (Baumol, 1959; Marris et al., 1964; Williamson, 1964; Jensen, 1986); (ii) secure their positions by making manager-specific investments (Shleifer and Vishny, 1989); (iii) reduce the firm's risk (Amihud and Lev, 1981; Gormley and Matsa, 2016).

Although agency problems lead to value-destroying diversification, they may create strategic advantage in product markets for conglomerate firms. Matsusaka and Nanda (2002) introduce commitment cost of internal capital markets; investment flexibility of internal resource allocation or the ability to shift resources between divisions prevents diversified firms from committing credibly to a large investment levels in a particular industry. Their model suggests that agency problems could have strategic value as conglomerates with agency problems can credibly commit to aggressive investment strategies when there is a competitive threat. Moreover, existing theories also suggest that commitment to aggressive investment strategies has strategic value in concentrated industries in order to deter or manipulate entry (Brander and Lewis, 1986; Spencer and Brander, 1992).

Considering agency theories and the strategic value of commitment together, I demonstrate that agency problems, on av-

erage, lead to greater diversification discount consistent with agency theories. On the other hand, agency problems create strategic value for conglomerates that operate mainly in concentrated industries and lead to higher valuations in these conglomerates consistent with the idea that concentrated conglomerates with agency problems will be able to credibly commit to their industries in the presence of competitive threats.

In order to further investigate the effect of industry concentration on diversification value, I follow Fresard (2010) and use large import tariff reductions as exogenous shocks that unexpectedly changed the competitive environment in which firms operate. By reducing the cost of entry for foreign competitors into U.S. market, large reductions in import tariffs significantly intensifies the competitive pressure in product markets.

In particular, I study the change in the value of diversification following exogenous competitive shocks. I find evidence that concentrated conglomerates experience significant decline in their valuations when their segments are hit by competitive shocks. Taken together, these results suggest that concentrated conglomerates enjoy their market positions in less-competitive industries and have higher valuations. When these concentrated conglomerates are hit by competitive shocks, their market positions in less-competitive industries weaken and their value of diversification decrease significantly.

I examine the impact of competitive shocks on concentrated conglomerates further by assessing their response to increased competitive threats at the segment level. I find that concentrated conglomerates stay in the threatened industry and try to defend their market positions when their segments in less-competitive industries face exogenous competitive threats. Con-

centrated conglomerates allocate greater portion of their total capital expenditure to the threatened less-competitive industries and increase their sales growth and investment growth in these industries following competitive shocks. These findings are consistent with the notion that conglomerate firms respond aggressively to intensified competition in order to maintain market share (Faure-Grimaud and Inderst, 2005).

This study complements the literature on corporate diversification and firm value (Lang and Stulz, 1994; Berger and Ofek, 1995; Campa and Kedia, 2002; Villalonga, 2004) by exploring the impact of industry concentration that diversified firms operate on the value of diversification. While existing studies mostly overlook the effect of industry structures on diversification values, a related study by Santalo and Becerra (2008) considers the possibility that the impact of diversification on firm performance is not homogenous across industries and some industries may provide friendlier environments for diversified firms. They replicate Berger and Ofek (1995) and show that diversification creates value in industries with few single-segment competitors, while it destroys value in industries with a large number of single-segment competitors. My study deepens our understanding about the valuation of diversified firms and how industry characteristics affect the value of diversified firms by focusing on industry concentration and exploring the strategic dimension of agency problems in product markets.

This paper is also related to the literature on the interaction between internal capital markets and product market competition. Conglomerates may respond more aggressively to competitive threats by using their internal resources (Telser, 1966; Faure-Grimaud and Inderst, 2005). Alternatively, they may re-

spond less aggressively because they can easily shift resources to other segments and exit the threatened market (Matsusaka and Nanda, 2002). Cestone and Fumagalli (2005) further study the strategic impact of group membership in product markets and show that affiliation to a monopolistic subsidiary could make other segments of a diversified firm more vulnerable in product markets because if a segment faces a competitive threat, the diversified firm could channel the segment's resources to its monopolistic affiliate and exit the threatened industry. Khanna and Tice (2001) also examine how discount department stores reacted to Wal-Mart's entry into their market and show that diversified firms are quicker to exit, but those that stay invest more aggressively. My work adds to this literature by showing that concentrated conglomerates respond aggressively to competitive threats in order to maintain their market positions in less-competitive industries.

The rest of the paper proceeds as follows. Section 2 develops testable hypotheses. Section 3 discusses the data and empirical methodology. Section 4 analyzes the impact of industry concentration on diversification value and investigates the role of agency problems. Chapter 3 provides the results on the effect of competitive shocks, presents robustness tests and concludes.

2.2. Hypothesis Development

Previous research considers how industry characteristics affect firms' organizatinal forms and their decisions to diversify (Campa and Kedia, 2002; Villalonga, 2004; Maksimovic and Phillips, 2008). However, existing work does not examine the impact of product market characteristics on the value of diversi-

fication. Santalo and Becerra (2008) is an exception; they focus on competition from specialized firms and study the impact of the number of single-segment firms in a given industry on diversified firms' performance. In this paper, I build on their study by examining how product market characteristics (industry concentration) that diversified firms operate affect diversification values and study the strategic dimension of agency problems.

Transaction cost theory states that small number of alternative business partners (small numbers bargaining condition) makes contractual arrangements more difficult since this condition creates concern about contractual hold-up problems (Williamson, 1975, 1985). In such cases vertical integration reduces transaction costs. Hence, vertically integrated (diversified) firms may have competitive advantage in more concentrated industries with small numbers of potential trading partners as a result of lower transaction costs in these industries. This argument leads to my first hypothesis:

Hypothesis 1 (H1): Conglomerates that operate mainly in concentrated industries have higher diversification values.

Agency theories are based on the idea that self-interested managers will pursue their own private goals that are not in the best interests of shareholders. Managers may undertake value-destroying diversification as a result of different motivations. While agency problems lead to greater diversification discount, they have strategic impact for conglomerates in product markets. Conglomerates with agency problems will be able to credibly commit to their industries in case of competitive threats (Matsusaka and Nanda, 2002). The value of commitment is especially important in more concentrated industries given the importance of strategic interactions in these industries (Brander

and Lewis, 1986; Spencer and Brander, 1992). Agency theories and the strategic dimensions of agency problems for conglomerates in product markets (specifically in more concentrated industries) form the basis of my Hypothesis 2.

Hypothesis 2 (H2): Agency problems, on average, create greater diversification discount. In contrast, agency problems will have strategic value in product markets and lead to higher valuations for conglomerates that operate mainly in concentrated industries as these conglomerates can credibly commit to more aggressive investment strategies when competitive threats arise.

The use of large tariff reductions as exogenous competitive shocks helps to demonstrate that industry concentration has a causal impact on the value of diversification. I expect exogenous competitive shocks to cause significant decline in the value of concentrated conglomerates. I specifically focus on the valuations of concentrated conglomerates since these conglomerates will be more motivated to protect their market positions in less-competitive industries instead of shifting their resources to another segment and exiting the threatened industry and as a result will be adversely affected by competitive shocks. This leads to following hypothesis:

Hypothesis 3 (H3): The value of diversification declines significantly when concentrated conglomerates are hit by competitive shocks.

Existing theories suggest competing hypotheses on whether conglomerates act as more or less aggressive competitors in response to competitive threats. Conglomerates may respond more aggressively to competitive threats compared to standalone firms as a result of financial flexibility (Telser, 1966; Faure-

Grimaud and Inderst, 2005). On the other hand, investment flexibility limit conglomerates' ability to respond to competitive threats. In other words, conglomerates may respond less aggressively as they can easily shift their resources to other segments and exit the threatened industry (Matsusaka and Nanda, 2002). Since conglomerates' response to entry threats may depend on which of their segments experience intensified competitive pressure; I focus on the reaction of concentrated conglomerates to competitive shocks in their less-competitive industries. I expect that concentrated conglomerates will try to defend their positions in less-competitive product markets since these concentrated industries provide more rents to enjoy. From this argument I derive the following hypothesis:

Hypothesis 4 (H4): Concentrated conglomerates tend to protect their market positions in less-competitive industries in response to competitive threats.

2.3. Data and Empirical Methods

2.3.1. Sample Selection and Definition of Variables

The sample includes all firms that have available segment-level data in Compustat for the period of 1990-2006. Following Berger and Ofek (1995), I eliminate firms with at least one division in the financial sector (SIC codes between 6000 and 6999). I further exclude all firm-year observations for which I do not have each segment's industry (SIC code). Following the literature, I require total sales from the Compustat annual files to be greater than $20 million and within 1% of the sum of segment sales. Since my analysis is based on sales and asset-based multiples, I exclude firms whose sales or assets at the segment level

are unavailable on Compustat.

Following Berger and Ofek (1995), I compute excess values as the natural logarithm of a firm's market to sales/ market to book ratio divided by the imputed market to sales/ market to book ratio of the firm. For each firm, imputed market to sales/ market to book ratios are computed as weighted average of the industry median market to sales/ market to book ratios in which the firm operates, using segment sales/total sales or segment asset/total assets as relative weights. The industry median values are computed by using single segment firms in each industry, and industries are defined based on the narrowest SIC grouping that includes at least five single segment firms. Excess values based on asset multipliers (excess market to book) are calculated by excluding those firms for which the sum of segment assets deviates from the firm's total assets by more than 25%. Finally, extreme excess values which are greater than 1.386 in absolute value are eliminated from the sample. Table 2.1 provides descriptive statistics for the sample.

My main measure of industry concentration is the standard Herfindahl-Hirschman index (HHI). A higher HHI implies weaker competition. The HHI is defined as the the sum of squared market shares;

$$HHI_{\mathrm{jt}} = \sum_{i=1}^{N_{\mathrm{j}}} \mathrm{s}_{ijt}^2$$

where $\mathrm{s_{ijt}}$ is the market share based on sales of segment i that operates in industry j in year t. Consistent with excess value calculations, HHI is also based on the narrowest SIC grouping that includes at least five single segment firms. This HHI is based on information from public firms in Compustat, in robustness

tests I also use fitted HHI based on three-digit SIC-codes suggested by Hoberg and Phillips (2010).[1] Fitted HHI combines Compustat data with Herfindahl data from the U.S. Commerce Department and captures the effect of both public and private firms.

In order to compute the industry concentration at the firm-level, following Santalo and Becerra (2008), I use concentration variable, *CONC*, which is defined as the weighted average of different HHIs of different industries in which a firm operates. Weights are calculated as the ratio of segment sales to total firm sales. Hence;

$$CONC_{\mathrm{kt}} = \sum_{j=1}^{N} w_{\mathrm{i(k)jt}} HHI_{\mathrm{jt}}$$

where $\mathrm{w_{i(k)jt}}$ is the sales weight of segment i that belongs to firm k and operates in industry j in year t. In order to identify firms that operate mainly in concentrated industries, I define the dummy variable *Concentrated*, which equals one if a firm's concentration variable, *CONC*, is above the annual median, and equals zero otherwise. This dummy variable instead of the continuous concentration measure allows for an intuitive economic interpretation of coefficient estimates.

As pointed out by Santalo and Becerra (2008) a larger market size may increase the returns to firm specialization (Stigler, 1951) and provide competitive advantage to single segment firms over diversified firms in larger industries. In my regressions, I also control natural logarithm of industry size based on total industry sales. Following Santalo and Becerra (2008), I calculate industry size variable, *ISIZE*, at the firm-level as the weighted average of different industry sizes in which the firm

[1]Fitted HHI data is available at Hoberg and Phillips' website.

operates by using the ratio of segment sales to total firm sales as relative weights. Hence, *ISIZE* is defined as $ISIZE_{\mathrm{kt}} = \sum_{j=1}^{N} w_{\mathrm{i(k)jt}} log(industry\ size)_{\mathrm{jt}}$ where $\mathrm{w_{i(k)jt}}$ is the sales weight of segment i that belongs to firm k and operates in industry j in year t and industry size is total industry sales.

2.3.2. Empirical Methodology

To examine the effect of industry concentration that diversified firms operate on the value of diversification, I estimate the following difference-in-difference specification:

$$y_{\mathrm{kt}} = \beta_1 \times Multi_{\mathrm{kt}} + \beta_2 \times Concentrated_{\mathrm{kt}} + \beta_3 \times (Multi_{\mathrm{kt}} \times Concentrated_{\mathrm{kt}}) + \gamma X_{\mathrm{kt}} \tag{2.1}$$

where k indexes firms, t indexes years, the dependent variable $\mathrm{y_{kt}}$ is firms' sales-based and asset-based excess values. *Multi* is a dummy variable that equals one if a firm has more than one segment, *Concentrated* is a dummy variable that equals one if the firm-level concentration index (*CONC*) is above the annual median, and the vector X includes the same control variables used by Berger and Ofek (1995): natural logarithm of total assets, EBIT divided by sales, and the ratio of capital expenditures to sales in order to control for firm size, profitability and growth opportunities. The coefficient of interest is β_3, which measures the difference in firm valuations between diversified firms and single segment firms that operate mainly in concentrated industries.

Campa and Kedia (2002) and Villalonga (2004) argue that the organizational form of a firm is not exogenous; the firm chooses the extent of its operations and decides whether to diversify or not. In order to address this self-selection biases and

control for the endogeneity of the diversification decision, in robustness tests I follow Santalo and Becerra (2008) and use firm fixed effect regressions for firms that change their number of segments during the sample period.

2.4. Competition and the Value of Diversification

In this section, I examine the effect of industry concentration that diversified firms operate on their valuations. Then, I investigate the strategic value of agency problems for these conglomerates; in particular, I test whether agency problems in concentrated conglomerates create higher valuations consistent with the strategic advantage of being able to credibly commit to an industry and fight aggressively in case of potential threats.

2.4.1. Main Results

I study the effect of industry concentration on the value of diversification by estimating Equation (2.1). The results of the OLS regressions are presented in Table 2.2 both with excess market to sales and excess market to book as dependent variables. In column 1, the coefficient on *(Multi* $\times$ *Concentrated)* is 0.033 and significant at the 5% confidence level, indicating that conglomerates that operate mainly in concentrated industries have 3.3% higher valuations. Note that, the coefficient on *Multi* is negative and significant at the 1% level suggesting that diversified firms trade at a discount compared to single-segment firms consistent with the diversification discount literature (Berger and Ofek, 1995).

In column 2, I include industry size control and its interaction with the *Multi* dummy to capture industry size characteristics that could influence the value of diversification. The coefficient on *(Multi* $\times$ *Concentrated)* increases slightly to 0.041 and it is significant at the 5% level. Columns 3 and 4 report the coefficient estimates when using excess market to book as a dependent variable. Column 3 reports the coefficient of 0.022 on *(Multi* $\times$ *Concentrated)* and it is statistically significant. In Column 4, the coefficient of interest decreases slightly to 0.018 as I include industry size and its interaction with the *Multi* dummy; although it is not statistically significant at conventional levels, it will become significant in cross-sectional tests. Overall, these results support the hypothesis that conglomerates that operate mainly in concentrated industries have higher valuations.

2.4.2. Strategic Value of Agency Problems

Agency problem is one of the main costs of diversification. On the other hand, agency problems may be advantageous for conglomerates that operate mainly in concentrated industries since they will be able to credibly commit to their industries in case of product market threat. In this subsection, I investigate the strategic value of agency problems. I use two different proxies for agency problems: financial resources and governance.

2.4.2.1. Financial Resources

My first proxy for agency problems is financial resources. Theory predicts that high level of financial resources lead to empire building motives and as a result exacerbate agency problems and managerial slack (Jensen, 1986). On the other hand, finan-

cial flexibility provides competitive strength in product markets (Bolton and Scharfstein, 1990). In order to examine whether high level of financial resources create greater valuations for conglomerates that operate mainly in concentrated industries, I use three different measures for financial flexibility: (i) cash flow/ assets, (ii) net debt, and (iii) KZ index (Kaplan and Zingales, 1997).

To test my prediction, I split the sample firms as financially constrained and unconstrained firms based on three measures of financial resources. To classify firms as financially constrained, I sort for each year all firms into two groups based on whether a firm's measure of financial resources lies above or below the median in that year. Next, I estimate Equation (2.1) for these subsamples separately, and compare the coefficients of estimates across financially constrained and unconstrained subgroups via a seemingly unrelated regression system (SUR).

Panel A of Table 2.3 reports the results with excess market to sales as dependent variable. For brevity, I only report the coefficients on the *Multi* dummy, *Concentrated* dummy and the interaction term between the *Multi* and the *Concentrated* dummies. Columns 1 and 2 of Panel A shows that consistent with the agency theories, higher level of financial resources lead to greater diversification discount on average. The coefficient on the *Multi* dummy is -0.180 for firms with high level of cash flow/asset while it is -0.078 for firms with low level of cash flow/asset ratio; and the difference between the subgroups is statistically significant at the 1% level. The results are consistent across other measures of financial flexibility: the negative coefficient of *Multi* dummy is always more pronounced for financially unconstrained firms.

The effect of agency problems is reversed when we focus on

the conglomerates that operate mainly in concentrated industries. For instance, the coefficient of the interaction term *(Multi × Concentrated)* in Column 1 of Panel A is 0.061 for firms with high level of cash flow/asset ratio and it is statistically significant at the 1% level. On the other hand, the coefficient of the interaction term for firms with low level of cash flow/asset ratio is negative in column 2 of Panel A. The difference between the financially constrained and unconstrained subsamples, based on cash flow/asset ratio, is statistically significant at the 5% level. Across other measures financial flexibility, the coefficients of the interaction term are always positive and statistically significant for firms with high level of financial resources and the differences between the subgroups are strongly significant.

In Panel B, I obtain similar patterns when I use excess market to book as dependent variable. Overall, these results support the argument that while agency problems create greater diversification discount on average, the negative effect of agency problems is reversed for conglomerates that operate mainly in concentrated industries. Agency problems in concentrated conglomerates create strategic value and lead to greater valuations as these conglomerates will credibly commit to their industries and tend to protect their market positions in concentrated industries in case of potential entries.

2.4.2.2. Governance and Efficiency

My second proxy for agency problems is corporate governance. Existing studies show that well-governed firms have better performance on average and weak corporate governance is associated with more severe agency problems (Gompers, Ishii, and Metrick, 2003; Giroud and Mueller, 2011). My first mea-

sure of corporate governance is G-index introduced by Gompers et al. (2003). The index is constructed by adding one point for each of the 24 anti-governance provisions that reduces shareholder rights. Higher index values imply weaker governance. Gompers et al. (2003) categorize firms with higher index values as Dictatorships suggesting the highest management power and firms with lower index values as Democracies implying the lowest management power. The G-index is available for the years 1990, 1993, 1995, 1998, 2000, 2002, 2004, and 2006 during the sample period. For intermediate years, the value of the latest available year is used.

In order to test my hypothesis, I divide the sample firms into two subsamples as Democracy and non-Democracy firms[2] and estimate Equation (2.1) for these subsamples separately, and compare the coefficients of estimates across the subgroups via a seemingly unrelated regression system (SUR). Table 2.4 only reports the coefficients on the *Multi* dummy, *Concentrated* dummy and the interaction term (*Multi* $\times$ *Concentrated*), which are the main variables of interest.

Column 1 of Panel A shows that well-governed Democracy conglomerates have higher valuations consistent with the notion that good governance reduces agency problems. The coefficient on the *Multi* dummy is positive and statistically significant at the 10% level. On the other hand, Column 2 of Panel A displays that Non-Democracy conglomerates with higher agency problems have greater diversification discount, the coefficient of the *Multi* dummy is -0.171. The difference between the Democracy and Non-Democracy subgroups is statistically significant

[2] Gompers et al. (2003) refer to companies with a G-index of 5 or less as Democracies. I use a cutoff of G-index 8 or less as Democracies in order to have more balanced subsamples.

at the 5% level.

Columns 1 and 2 of Panel A also display that agency problems, that normally create greater diversification discount, lead to higher valuations when we consider concentrated conglomerates. The coefficient of *(Multi* $\times$ *Concentrated)* for Democracy firms is -0.088 and significant at the 5% level while the coefficient on the interaction term is positive for Non-Democracy firms. The difference between the Democracy and Non-Democracy subsamples is statistically significant at the 5% level.

My second measure of corporate governance is Takeover Index introduced by Cain et al. (2017). The index is constructed by using legal determinants and other control variables such as macroeconomic factors (aggregate capital liquidity) and firm-specific factors (age) that affect the probability of hostile takeover. The index measures takeover susceptibility and higher values of Takeover Index indicate greater susceptibility to takeovers. Since takeover market is an effective external disciplinary mechanism on management, higher insulation from external market discipline suggests poor governance and higher agency problems.

In order to test my prediction, for each year I rank the sample firms on a quartile basis according to their Takeover Index, and categorize firms with high takeover index as those ranked in the highest quartile of the distribution and firms with low takeover index as those ranked in lower quartiles of the same distribution. Columns 4 and 5 of Table 2.4 display the results both with excess market to sales and excess market to book as dependent variables.

Column 4 of Panel A shows that diversification discount is greater for conglomerates with lower Takeover Index values con-

sistent with the view that higher insulation from takeovers lead to agency problems and entrenchment. The coefficient on the *Multi* dummy is -0.388 and significant at the 1% level for firms with low level of Takeover Index. On the other hand, the coefficient on the *Multi* dummy is positive for firms with high level of index values suggesting that external market discipline on management prevent inefficiency. The difference between the subsamples is statistically significant at the 1% level.

Columns 4 and 5 of Panel A also show that concentrated conglomerates benefit from having agency problems. The coefficient of the *(Multi* $\times$ *Concentrated)* is 0.074 and significant at the 1% level for firms with low level of Takeover Index while the coefficient is -0.048 and significant at the 10% level for firms with high level of Takeover Index. The difference between the subgroups is statistically significant at the 1% level. Panel B of Table 2.4 repeats the test by using excess market to book as dependent variable. Even though the results are not statistically significant at the conventional significance levels, they still suggest consistent findings with the prediction. The results are consistent with the results in Table 2.3 where financial resources are employed as as proxies for agency problems.

Taken together, these results present evidence that agency problems and entrenchment lead to greater diversification discount on average. On the other hand, agency problems create strategic advantage for conglomerates that operate mainly in concentrated industries as powerful managers in these conglomerates will be able to credibly commit to more aggressive strategies in case of potential threat to their industries where they have market power.

Table 2.1. Descriptive Statistics

This table presents summary statistics for the sample. Total capital is the sum of book value of debt and market value of equity. Following Santalo and Becerra (2008), industry concentration index, *Conc*, is defined as the weighted average of the Herfindahl-Hirschman index (HHI) of different industries in which the firm operates, using segment sales over total firm sales as relative weights. HHI is computed as the sum of squared market shares in a given industry. Industry definitions are based on the narrowest SIC grouping that includes at least five single segment firms. The sample period is from 1990 to 2006.

	Mean	Median	S.D.
Assets ($ millions)	1,238	165	5136
Sales ($ millions)	1,092	172	4306
Total capital ($ millions)	1,748	222	7318
Capital expenditures/Sales	0.10	0.04	0.25
EBIT/Sales	0.04	0.07	0.26
Multi	0.16	0	0.36
Industry concentration index *(Conc)*	0.14	0.11	0.12
Observations	45,262		

Table 2.2. Industry Concentration and the Value of Diversification

This table presents the results of OLS regressions of excess value measures on the interaction of multi segment *(Multi)* and concentrated *(Concentrated)* indicators. *Multi* is a dummy variable equal to one if the firm has more than one segment. *Concentrated* is a dummy variable equal to one if the firm level concentration index (*Conc*) is above the annual median. Industry concentration index, *Conc*, is the weighted average of the HHIs of different industries in which the firm operates, using segment sales over total firm sales as relative weights. HHI is computed as the sum of squared market shares in a given industry. Industry definitions are based on the narrowest SIC grouping that includes at least five single segment firms. The sample period is from 1990 to 2006. Standard errors are in parentheses. Significance at the 1%, 5%, and 10% levels is represented by ***, **, and *, respectively.

Dependent variable:	Excess market to sale		Excess market to book	
	(1)	(2)	(3)	(4)
Multi_{d}	-0.158***	-0.163**	-0.055***	-0.025
	(0.011)	(0.067)	(0.009)	(0.060)
$\text{Multi}_{\text{d}} \times \text{Concentrated}_{\text{d}}$	0.033**	0.041**	0.022*	0.018
	(0.015)	(0.016)	(0.013)	(0.014)
$\text{Concentrated}_{\text{d}}$	0.031***	0	-0.004	0
	(0.006)	(0.006)	(0.005)	(0.005)
$\text{Multi}_{\text{d}} \times$ Isize		0		-0.003
		(0.006)		(0.006)
Isize		-0.026***		0.003
		(0.002)		(0.002)
Log of assets	0.066***	0.072***	0.007***	0.007***
	(0.002)	(0.002)	(0.001)	(0.001)
Capex/sales	0.283***	0.288***	0.022**	0.021**
	(0.011)	(0.011)	(0.009)	(0.009)
EBIT/sales	0.106***	0.096***	0.310***	0.311***
	(0.010)	(0.010)	(0.009)	(0.009)
Constant	-0.397***	-0.155***	-0.032***	-0.058***
	(0.009)	(0.024)	(0.008)	(0.020)
N	45,262	45,262	43,639	43,639
R^2	0.064	0.067	0.031	0.031

Table 2.3. Strategic Value of Agency Problems and the Value of Diversification: Financially Constrained vs. Unconstrained Firms

This table presents the results of OLS regressions of excess value measures on the interaction of multi segment *(Multi)* and concentrated *(Concentrated)* indicators for different subsamples in terms of financial resources. Sample firms are split into two subgroups with respect to annual median values of related variables. *Multi* is a dummy variable equal to one if the firm has more than one segment. *Concentrated* is a dummy variable equal to one if the firm level concentration index (*Conc*) is above the annual median.Industry concentration index, *Conc*, is the weighted average of the HHIs of different industries in which the firm operates, using segment sales over total firm sales as relative weights. HHI is computed as the sum of squared market shares in a given industry. Industry definitions are based on the narrowest SIC grouping that includes at least five single segment firms. The *p*-values of the differences between the coefficients for subsamples are calculated using seemingly unrelated regressions. The sample period is from 1990 to 2006. Standard errors are in parentheses. Significance at the 1%, 5%, and 10% levels is represented by ***, **, and *, respectively.

	CF/Asset			Net Debt			KZ Index		
	High	Low	*p-diff*	Low	High	*p-diff*	Non-FC	FC	*p-diff*
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Panel A: Excess Market to Sales									
Multi_d	-0.180***	-0.078***	0.000	-0.215***	-0.080***	0.000	-0.211***	-0.098***	0.000
	(0.014)	(0.014)		(0.018)	(0.012)		(0.016)	(0.014)	
$\text{Multi}_d \times \text{Concentrated}_d$	0.061***	-0.011	0.013	0.060**	-0.011	0.021	0.051**	0.002	0.094
	(0.020)	(0.020)		(0.025)	(0.018)		(0.022)	(0.019)	
Concentrated_d	0.058***	0.048***	0.407	0.012	0.071***	0.000	0.029***	0.058***	0.014
	(0.008)	(0.008)		(0.009)	(0.008)		(0.009)	(0.008)	
N	22,628	22,634		22,470	22,460		22,331	22,322	
R^2	0.108	0.093		0.065	0.101		0.058	0.091	
Panel B: Excess Market to Book									
Multi_d	-0.075***	0.017	0.000	-0.072***	-0.005	0.001	-0.077***	-0.029**	0.007
	(0.013)	(0.012)		(0.018)	(0.010)		(0.015)	(0.012)	
$\text{Multi}_d \times \text{Concentrated}_d$	0.067***	-0.038**	0.000	0.043*	-0.015	0.043	0.058***	-0.012	0.007
	(0.018)	(0.017)		(0.024)	(0.014)		(0.021)	(0.016)	
Concentrated_d	0.016**	0.002	0.134	-0.004	0.012**	0.081	0.005	0.006	0.921
	(0.007)	(0.006)		(0.008)	(0.006)		(0.007)	(0.006)	
N	21,766	21,873		21,358	21,957		21,294	21,767	
R^2	0.048	0.004		0.055	0.017		0.068	0.007	

Table 2.4. Strategic Value of Agency Problems and the Value of Diversification: Governance

This table presents the results of OLS regressions of excess value measures on the interaction of multi segment *(Multi)* and concentrated *(Concentrated)* indicators for different subsamples in terms of governance measures. *Multi* is a dummy variable equal to one if the firm has more than one segment. *Concentrated* is a dummy variable equal to one if the firm level concentration index (*Conc*) is above the annual median. Industry concentration index, *Conc*, is the weighted average of the HHIs of different industries in which the firm operates, using segment sales over total firm sales as relative weights. Industry definitions are based on the narrowest SIC grouping that includes at least five single segment firms. The *p*-values of the differences between the coefficients for subsamples are calculated using seemingly unrelated regressions. The sample period is from 1990 to 2006. Standard errors are in parentheses. Significance at the 1%, 5%, and 10% levels is represented by ***, **, and *, respectively.

	G-index			Takeover Index		
	Democracy	Non-Democracy	*p-diff*	Low	High	*p-diff*
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Excess Market to Sales						
Multi_{d}	0.372*	-0.171	0.028	-0.388***	0.182	0.000
	(0.201)	(0.149)		(0.097)	(0.118)	
$\text{Multi}_{\text{d}} \times \text{Concentrated}_{\text{d}}$	-0.088**	0.051	0.013	0.074***	-0.048*	0.001
	(0.044)	(0.035)		(0.023)	(0.027)	
$\text{Concentrated}_{\text{d}}$	0.062***	-0.043**	0.000	-0.014*	0.039***	0.001
	(0.019)	(0.019)		(0.008)	(0.014)	
N	4,615	4,957		28,728	9,447	
R^2	0.068	0.054		0.063	0.128	
Panel B: Excess Market to Book						
Multi_{d}	0.172	0.088	0.703	-0.238***	0.322***	0.000
	(0.186)	(0.135)		(0.088)	(0.108)	
$\text{Multi}_{\text{d}} \times \text{Concentrated}_{\text{d}}$	-0.05	0.01	0.245	0.028	-0.025	0.102
	(0.042)	(0.032)		(0.021)	(0.025)	
$\text{Concentrated}_{\text{d}}$	0.040**	0.026	0.558	-0.009	0.038***	0.001
	(0.017)	(0.016)		(0.007)	(0.012)	
N	4,424	4,737		27,830	8,983	
R^2	0.063	0.049		0.034	0.063	

Chapter 3

The Effect of Competitive Shocks on Diversified Firms

The results so far show that diversified firms that operate mainly in concentrated industries have higher valuations. Agency problems, which normally lead to greater diversification discount, become advantageous for these conglomerates since they can credibly commit to their industries in case of potential entry threats. In this chapter, I specifically test how the diversification value of a concentrated conglomerate changes following an exogenous competitive shock to an industry it operates and study the response of concentrated conglomerates to competitive shocks.

3.1. Reductions of Import Tariffs

In order to show the impact of intensified competition on the value of diversification, I follow Fresard (2010) and use large import tariff reductions as an exogenous shock to the competitive environment of product markets.[1] Reductions of import tariff rates reduce the cost of entering the U.S. market and, as a result, increase the competitive pressure from foreign competitors.

To measure significant reductions in import tariffs at the four-digit SIC level, I use U.S. import data compiled by Feenstra (1996), Feenstra, Romalis, and Schott (2002), and Schott (2010). These tariff data only covers manufacturing industries (SIC codes between 2000-3999). For each industry-year, tariff rates are computed as the total duties collected divided by the total customs.[2] Competitive shocks are identified as large tariff cuts in terms of the deviation of the yearly change in tariff rates from the same industry's median change. Following Fre-

[1] Other papers that exploit the reductions of import tariffs in quasi-natural experiment setting include Frésard and Valta (2016),Valta (2012), Xu (2012).

[2] Tariff rates are also available on Laurent Fresard's web page.

sard (2010), I classify a large tariff cut in a specific industry-year if a negative change in the tariff rate is three times larger than the median absolute change in that industry. To ensure that the identified cut is not a transitory change, I exclude tariff cuts that are followed by equivalently large increases in tariff rates over the following two years period.

Next, in order to examine the impact of competitive shock on the value of concentrated conglomerates, I define CUT dummy variable at the firm-level. Tariff reductions (CUT) at the firm-level are defined using three different alternatives: CUT equals one if a firm owns a segment; or a segment with maximum sales share within the firm; or a segment with more than 50% of sales share within the firm that experiences a competitive shock in that year.

3.1.1. The Value of Diversification Following Competitive Shocks

To investigate the effect of intensified competition on the value of concentrated conglomerates, I estimate a variant of Equation (2.1) in which I include CUT dummy and its interactions with *Multi* and *Concentrated* dummies. Specifically, I estimate the following model:

$$\begin{aligned} y_{\mathrm{kt}} &= \beta_1 \times Multi_{\mathrm{kt}} + \beta_2 \times Cut_{\mathrm{kt}} + \beta_3 \times Concentrated_{\mathrm{kt}} \\ &+\beta_4 \times (Multi_{\mathrm{kt}} \times Cut_{\mathrm{kt}}) + \beta_5 \times (Multi_{\mathrm{kt}} \times Cut_{\mathrm{kt}} \times Concentrated_{\mathrm{kt}}) \\ &+\beta_6 \times (Multi_{\mathrm{kt}} \times Concentrated_{\mathrm{kt}}) + \beta_7 \times (Cut_{\mathrm{kt}} \times Concentrated_{\mathrm{kt}}) + \gamma X_{\mathrm{kt}} \end{aligned} \tag{3.1}$$

As in model (2.1), subscripts k and t represent firms and years, respectively. The dependent variable y_{kt} is excess market

to sales measure. *Multi* is a dummy variable that equals one if a firm has more than one segment, *Concentrated* is a dummy variable that equals one if a firm-level concentration index ($CONC$) is above the annual median. CUT_{kt} is a dummy variable that equals one if a firm k owns a segment; or a segment with maximum sales share within the firm; or a segment with more than 50% of sales share within the firm that experiences a competitive shock in year t. The vector X includes the control variables which are natural logarithm of total assets, EBIT divided by sales, and the ratio of capital expenditures to sales.

The coefficient on ($Multi_{\text{kt}} \times CUT_{\text{kt}} \times Concentrated_{\text{kt}}$) captures the effect of competitive shock experienced by segments of concentrated conglomerates on the value of diversification and it is (β_5) the main parameter of interest in Equation (3.1). Table 3.1 displays the results. Regardless of which definition of CUT dummy I use, the coefficient on ($Multi_{\text{kt}} \times CUT_{\text{kt}} \times Concentrated_{\text{kt}}$) is always negative and significant. Column 1 of Table 3.1 shows that the excess value of concentrated conglomerates declines significantly when one of their segments is hit by a competitive shock. The coefficient of interest (β_5) is -0.069 indicating 6.9% decline in excess value of concentrated conglomerates following an exogenous competitive shock.

In columns 2 and 3 of Table 3.1, I use alternative definitions of CUT dummy. Column 2 shows the effect of intensified competition when a segment with maximum sales share within the firm is hit by a competitive shock while Column 3 presents the impact when a segment with more than 50% of sales share within the firm is affected by a tariff cut. For these alternative definitions of CUT dummies, the parameters of interest are -0.081 and -0.082 in columns 2 and 3, respectively, suggesting larger

drop in excess values when segments with larger sales shares are exposed to competitive shocks. Consistent with the hypothesis, these results indicate that concentareted conglomerates experience significant decline in their valuations when a competitive shock hits the industry they operate.

3.1.2. Segment-Level Evidence

The evidence presented thus far shows that concentrated conglomerates have higher valuations and agency problems in these conglomerates create strategic advantage in product market competition. These conglomerates can credibly commit to large investment levels in the threatened market in order to deter entry. In this subsection, I present segment-level evidence on how concentrated conglomerates respond to competitive threats. In particular, I study whether concentrated conglomerates defend their market positions in less-competitive industries in case of entry threats.

In order to examine the reaction of concentrated conglomerates to competitive threats, I estimate the following specification:

$$\begin{aligned} y_{\mathrm{ikjt}} = \beta_1 \times Multi_{\mathrm{kt}} + \beta_2 \times Cut_{\mathrm{jt}} + \beta_3 \times Concseg_{\mathrm{it}} + \beta_4 \times (Multi_{\mathrm{kt}} \times Cut_{\mathrm{jt}}) \\ + \beta_5 \times (Multi_{\mathrm{kt}} \times Cut_{\mathrm{jt}} \times Concseg_{\mathrm{it}}) + \beta_6 \times (Multi_{\mathrm{kt}} \times Concseg_{\mathrm{it}}) \\ + \beta_7 \times (Cut_{\mathrm{jt}} \times Concseg_{\mathrm{it}}) + \alpha_{\mathrm{i}} + \alpha_{\mathrm{t}} + \gamma X_{\mathrm{it}} \quad (3.2) \end{aligned}$$

where i indexes segments, k indexes firms, j indexes industries, t indexes years, y is the dependent variable, α_{i} and α_{t} are segment and year fixed effects, X is the control of vector variables and includes segment size and segment profitability. Segment size is measured by natural logarithm of segment total identifiable

assets and segment profitability is defined as the ratio of segment operating profit to segment assets. *Multi* is a dummy variable equals one if a segment belongs to a firm that has more than one segment, *Cut* is a dummy variable equals one if the segment's industry experiences a tariff cut at year t.

In order to better understand whether concentrated conglomerates defend their market positions in less-competitive industries instead of shifting their resources to different segments in case of competitive threats, I define *Concseg* dummy variable which identifies segments both operate in concentrated industries as well as owned by concentrated firms. Specifically, *Concseg* is a dummy variable equals one if the segment operates in a concentrated industry and belongs to a concentrated firm. To classify industries as concentrated, I sort for each year all industries into two groups based on whether a industry's HHI lies above or below the median in that year. Similarly, if a firm's concentration index ($CONC$) lies above the median in that year, the firm is categorized as a concentrated firm.

Dependent variables are the change in the segment share of total firm investment, segment sales growth and segment investment growth. Change in the segment share of total firm investment reflects whether a firm allocates a greater portion of its total capital expenditure to the threatened industry. For each year, I calculate each segment's share of the firm's total capital expenditures and use the change in the ratio as a dependent variable. Sales growth is the growth in segment sales and investment growth is the growth in segment capital expenditures. In order to mitigate the effect of outliers, all dependent variables are winsorized at 1% tails.

The estimates of segment-level regressions are presented in

Table 3.2. The coefficient on ($Multi_{\mathrm{kt}} \times CUT_{\mathrm{jt}} \times Concseg_{\mathrm{it}}$) measures the effect of competitive shocks on concentrated conglomerate segments that are also active in less-competitive industries. As is shown in column 1, when one of their segments that operates in a less-competitive industry is hit by a competitive shock, concentrated conglomerates allocate more resources to the threatened industry. The coefficient on the triple-interaction term is positive and statistically significant at the 1% level, indicating 3.3% increase in the investment share of the threatened segment.

Columns 2 and 3 display a similar pattern with respect to sales growth and investment growth. As column 2 shows, the parameter on the triple-interaction term is positive and statistically significant at the 10% level. The sales growth of concentrated conglomerate segments in threatened industries increase by 5%. Similarly, Column 3 presents that investment growth of threatened concentrated conglomerate segments increase by 11%, although it is not statistically significant at the conventional levels.

Note that this analysis only captures the reaction of concentrated conglomerates to increased competitive threats in their less-competitive industries rather than whether conglomerate firms are more aggressive competitors on average. Hence, these results are not inconsistent with the contradictory theories that conglomerate firms might be weaker competitors because of resource flexibility within firms. Diversified firms' response to competitive threats may depend on which of their segments experience increase in competitive pressure.

Overall, these results suggest that concentrated conglomerates try to defend their market positions in less-competitive

industries when their segments are hit by competitive shocks. Instead of exiting the industry and shifting resources to other segments, concentrated conglomerates allocate larger portion of their total investment to the threatened industry and respond more aggressively by using their internal resources in case of competitive threats to their concentrated industries.

3.2. Robustness Tests

3.2.1. Controlling for Self-selection

As Campa and Kedia (2002) and Villalonga (2004) point out, observed organizational structures are not exogenous because firms choose to diversify. There might be unobserved firm characteristics that affect both diversification decision and performance. In order to control for the self-selection bias, Campa and Kedia (2002) and Villalonga (2004) use alternative econometric techniques. Campa and Kedia (2002) identify industry instruments that affect firms' decision to diversify and estimate instrumental variable model. In order to capture the attractiveness of a given industry to conglomerates, they use industry characteristics such as the fraction of diversified firms in the industry.

Santalo and Becerra (2008), on the other hand, show that diversified firms have higher values in industries with a small number of single segment competitors. Their results indicate that industry characteristics also affect the value of diversified firms. In order to satisfy the exclusion restriction, an ideal instrument should affect the decision to diversify but not have a direct effect on relative valuation. As a result, Santalo and Becerra (2008) argue that some of the industry instruments could

be questionable considering the effect of industry heterogeneity on valuations and point out that other self-selection correction techniques such as the inclusion of firm fixed effects are not affected by such potential concerns.

In order to show the robustness of the results to self-selection biases, I follow Santalo and Becerra (2008) and use firm-fixed effect regressions for firms that change their number of segments during the sample period. Table 3.3 presents the results of fixed effect regressions for a subsample of 951 firms that report a change in their number of segments during the sample period (7,702 firm-year observations) using excess market to sales as dependent variable.

In Panel A, I estimate the baseline model (Equation 2.1) by including firm fixed effects. Column 1 shows that concentrated conglomerates have 5.6% higher excess values, which is consistent with previous results. The coefficient on (*Multi*× *Concentrated*) is statistically significant at the 5% level. In column 2, I further control for industry size *ISIZE* and its interaction with the *Multi* dummy. The coefficient of (*Multi*× *Concentrated*) has a value of 0.067 and is statistically significant.

Similarly, Panel B of Table 3.3 shows the robustness of results regarding import tariff shocks. I estimate Equation 3.1 by including firm and year fixed effects for the same subsample of firms that report a change in their number of segments during the sample period. Consistent with previous findings, concentrated conglomerates experience significant decline in their valuations when one of their segments is hit by a competitive shock. The parameter on (*Multi* × *CUT* × *Concentrated*) is -0.130 and is statistically significant at the 5% level.

3.2.2. Alternative Measure of Industry Concentration

My main industry concentration measure is Compustat HHI based on segment-level data. Compustat HHI covers only public companies. In order to capture the effect of both public and private firms, I use the fitted HHI industry concentration measure at the 3-digit SIC codes level suggested by Hoberg and Phillips (2010).

Hoberg and Phillips (2010) calculate the fitted HHI using Herfindahl data from the Commerce Department which only covers manufacturing industries, employee data from the Bureau of Labor Statistics (BLS) (covers both public and private firms) and Compustat data on the number of employees for each public firm. First, they regress industry HHI from the Commerce department on Compustat HHI, the average number of employees per firm using the BLS data and number of employees per firm using Compustat data. Next, they use the coefficient estimates from this regression to calculate fitted HHI for all industries. Hence, this fitted HHI measure covers both public and private firms and available for all industries.

In order to test the robustness of my findings to alternative industry concentration definition, I calculate firm-level concentration index ($CONC$) by using fitted HHIs and create *Concentrated* dummy variable, as previously defined, that equals one if the firm-level concentration index ($CONC$) based on fitted HHIs is above the annual median. Table 3.4 presents the results of baseline model (Equation 2.1) both with excess market to sales and excess market to sales as dependent variables.

As is shown, the results become stronger when I use fitted HHI measure and include the impact of private firms in product market competition. In column 1, the coefficient on ($Multi\times$

Concentrated) becomes 0.058 and it is statistically significant at the 1% level, suggesting that concentrated conglomerates have 5.8% higher values. In column 2, where the dependent variable is excess market to book, the coefficient on the interaction term becomes 0.040 and it is again statistically significant at the 1% level. These results are consistent with the previous findings showing that conglomerate firms that operate mainly in concentrated industries have higher diversification values.

3.3. Conclusion

In this paper, instead of focusing on the mean value of diversification, I study the cross-sectional variation in the diversification discount and explore its relation with the degree of industry concentration. In particular, I provide evidence that conglomerates that operate mainly in concentrated industries have higher diversification values. This result is robust to the use of different econometric model that controls for self-selection of the diversification decision. The results are also robust to the use of alternative industry concentration definition which captures the effect of both public and private firms in product markets (Hoberg and Phillips, 2010).

This paper also examines the strategic value of agency problems. Agency theories predict that agency problems lead to inefficiencies and destroy firm value. On the other hand, agency problems create competitive advantage in product markets. The flexibility of shifting resources from one segment to another segment could create competitive disadvantage because it prevents diversified firms from committing their resources to a specific industry. In this case, having agency problems could be advan-

tageous for a diversified firm, as agency problems will enable the firm to credibly commit to more aggressive investment strategies when there is a threat of entry (Matsusaka and Nanda, 2002). First, consistent with agency theories, I show that agency problems create greater diversification discount on average. Second, consistent with the idea of strategic value of agency problems, I show that agency problems in concentrated conglomerates create higher diversification values.

Using tariff rate reductions as an exogenous competitive shocks, the paper shows that concentrated conglomerates experience significant decline in their valuations when their segments are hit by competitive shocks. Furthermore, concentrated conglomerates try to defend their market positions by allocating larger portion of their total investment to the threatened less-competitive industries and they increase their sales growth and investment growth in these industries in response to competitive shocks. These findings suggest that concentrated conglomerates enjoy higher valuations in less-competitive industries, and they commit to tougher investment strategies in case of competitive threats to their less-competitive industries.

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Table 3.1. The Value of Diversification Following Competitive Shocks

This table presents the effect of competitive shocks on the value of diversification. Tariff reductions (Cut) at the firm level are defined using three different alternatives. Specifically, Cut equals one if a firm owns a segment (column 1); or a segment with maximum sales share within the firm (column 2); or a segment with more than 50% of sales share within the firm (column 3) that experiences a competitive shock in that year, and zero otherwise. A competitive shock occurs in a specific industry-year when a negative change in the tariff rate is three times larger than the median absolute change in that specific industry. The sample period is from 1990 to 2006. Standard errors are in parentheses. Significance at the 1%, 5%, and 10% levels is represented by ***, **, and *, respectively.

Dependent variable:	Excess market to sale		
	Cut	Cut(max)	Cut(50%)
	(1)	(2)	(3)
Multi_d	-0.193***	-0.187***	-0.188***
	(0.019)	(0.017)	(0.017)
Cut_d	-0.003	-0.003	-0.003
	(0.015)	(0.015)	(0.015)
Concentrated_d	0.032***	0.032***	0.032***
	(0.011)	(0.011)	(0.011)
$\text{Multi}_d \times \text{Cut}_d$	0.04	0.043	0.056
	(0.030)	(0.034)	(0.035)
$\text{Multi}_d \times \text{Cut}_d \times \text{Concentrated}_d$	-0.069*	-0.081*	-0.082*
	(0.041)	(0.046)	(0.049)
$\text{Multi}_d \times \text{Concentrated}_d$	0.067***	0.055**	0.051**
	(0.025)	(0.023)	(0.022)
$\text{Cut}_d \times \text{Concentrated}_d$	-0.011	-0.011	-0.011
	(0.020)	(0.020)	(0.020)
Log of assets	0.070***	0.070***	0.070***
	(0.003)	(0.003)	(0.003)
Capex/sales	0.927***	0.927***	0.927***
	(0.043)	(0.043)	(0.043)
EBIT/sales	0.150***	0.150***	0.149***
	(0.018)	(0.018)	(0.018)
Constant	-0.425***	-0.425***	-0.425***
	(0.016)	(0.016)	(0.016)
N	19,195	19,195	19,195
R^2	0.079	0.079	0.079

Table 3.2. Segment-Level Evidence

This table presents the results of segment-level regressions. *Cut* equals one if a segment experiences a competitive shock in that year, and zero otherwise. A competitive shock occurs in a specific industry-year when a negative change in the tariff rate is three times larger than the median absolute change in that specific industry. *Congseg* is a dummy variable equals one if a segment operates in concentrated industry and is owned by a concentrated firm. Concentrated industries are categorized by using annual median values of industry HHIs. All variables are winsorized at 1% in each tail. The sample period is from 1990 to 2006. Robust standard errors are in parentheses. Significance at the 1%, 5%, and 10% levels is represented by ***, **, and *, respectively.

Dependent variable:	Δ in segment share of total firm investment	Sales growth	Investment growth
	(1)	(2)	(3)
Multi_d	-0.055***	0.014	-0.283***
	(0.013)	(0.024)	(0.107)
Cut_d	0	0.029***	0.016
	(0.001)	(0.008)	(0.037)
Concseg_d	0.002	0.001	-0.034
	(0.001)	(0.010)	(0.045)
$\text{Multi}_d \times \text{Cut}_d$	-0.013*	-0.031**	-0.017
	(0.007)	(0.015)	(0.069)
$\text{Multi}_d \times \text{Cut}_d \times \text{Concseg}_d$	0.033**	0.050*	0.112
	(0.016)	(0.028)	(0.141)
$\text{Multi}_d \times \text{Concseg}_d$	-0.017	-0.040**	-0.114
	(0.010)	(0.019)	(0.094)
$\text{Cut}_d \times \text{Concseg}_d$	-0.001	-0.031**	-0.005
	(0.002)	(0.013)	(0.062)
Segment profitability	0.006	0.796***	1.453***
	(0.011)	(0.033)	(0.133)
Segment size	0.008***	0.104***	0.044
	(0.002)	(0.009)	(0.037)
Segment F.E.	Yes	Yes	Yes
Year F.E.	Yes	Yes	Yes
N	18,502	18,919	18,471
R^2	0.244	0.481	0.267

Table 3.3. Controlling for Self-selection

This table presents the results of firm-fixed effect regressions. This alternative specification includes only observations from 951 firms that report a change in the number of segments during the sample period of 1990-2006. Panel A replicates the main test (Table 2.2) and Panel B replicates the competitive shock test (Table 3.1) for excess market to sales values. Significance at the 1%, 5%, and 10% levels is represented by ***, **, and *, respectively.

Panel A: Main results		
Dependent variable:	Excess market to sale	
	(1)	(2)
$Multi_d$	-0.100***	-0.172*
	(0.014)	(0.094)
$Multi_d \times Concentrated_d$	0.056**	0.067**
	(0.026)	(0.027)
$Concentrated_d$	-0.014	-0.035*
	(0.019)	(0.019)
$Multi_d \times Isize$		0.007
		(0.009)
Isize		-0.068***
		(0.008)
Log of assets	-0.002	0.028***
	(0.009)	(0.009)
Capex/sales	0.354***	0.335***
	(0.039)	(0.039)
EBIT/sales	0.280***	0.282***
	(0.038)	(0.038)
Constant	-0.071	0.446***
	(0.049)	(0.081)
Firm F.E.	Yes	Yes
N	7,702	7,702
R^2	0.568	0.573

Panel B: Import tariff shock	
Dependent variable:	Excess market to sale
	(1)
$Multi_d$	-0.139***
	(0.028)
Cut_d	-0.032
	(0.033)
$Concentrated_d$	0.011
	(0.028)
$Multi_d \times Cut_d$	0.087**
	(0.044)
$Multi_d \times Cut_d \times Concentrated_d$	-0.130**
	(0.059)
$Multi_d \times Concentrated_d$	0.072**
	(0.037)
$Cut_d \times Concentrated_d$	0
	(0.045)
Log of assets	0.059***
	(0.017)
Capex/sales	1.169***
	(0.164)
EBIT/sales	0.459***
	(0.066)
Constant	-0.319***
	(0.088)
Firm F.E.	Yes
Year F.E.	Yes
N	3,848
R^2	0.599

Table 3.4. Alternative Measure of Industry Concentration

This table presents the results of the regressions in Table 2.2 where Compustat HHIs are replaced by fitted HHIs based on both public and private firms (Hoberg and Phillips, 2010). *Multi* is a dummy variable equal to one if the firm has more than one segment. *Concentrated* is a dummy variable equal to one if the firm level concentration index (*Conc*) based on fitted HHIs is above the annual median. Industry concentration index, *Conc*, is the weighted average of the fitted HHIs of different industries in which the firm operates, using segment sales over total firm sales as relative weights. The sample period is from 1990 to 2006. Standard errors are in parentheses. Significance at the 1%, 5%, and 10% levels is represented by ***, **, and *, respectively.

Dependent variable:	Excess market to sale	Excess market to book
	(1)	(2)
Multi_{d}	-0.199***	-0.081***
	(0.014)	(0.012)
$\text{Multi}_{\text{d}} \times \text{Concentrated}_{\text{d}}$	0.058***	0.040***
	(0.019)	(0.015)
$\text{Concentrated}_{\text{d}}$	-0.027***	-0.007
	(0.007)	(0.005)
Log of assets	0.086***	0.018***
	(0.002)	(0.002)
Capex/sales	0.326***	0.052***
	(0.013)	(0.010)
EBIT/sales	0.081***	0.269***
	(0.011)	(0.009)
Constant	-0.470***	-0.089***
	(0.011)	(0.009)
N	40,993	39,197
R^2	0.073	0.032