JOURNAL OF FINANCIAL AND QUANTITATIVE ANALYSIS Vol. 51, No. 1, Feb. 2016, pp. 307–332

doi:10.1017/S0022109016000077

Financial Weakness and Product Market Performance: Internal Capital Market Evidence

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Abstract

Using a data set of Korean business groups in the period 1999–2006, just after the Asian Financial Crisis, this study shows how business groups' financial leverage can lead group-affiliated firms to lose market share to industry rivals. This analysis reveals that the negative effect of group leverage is greater when an affiliated firm is financially weak. Additionally, high group leverage is more detrimental to firms operating in fast-growing industries, discouraging affiliated firms from investing while encouraging their rivals. The results suggest that groups' financial positions encompass a substantial strategic dimension of group-affiliated firms.

I. Introduction

Since Coase (1937), many researchers have studied firm boundaries.[1] Subsequent empirical studies have provided insights into how firm boundaries affect resource allocation;[2] however, we are still far from understanding how organizational forms affect firm behavior. A business group (i.e., a group of independent companies owned or controlled by one person or family) can serve as a laboratory in which to examine the effects of firm boundaries, because the boundaries of affiliated firms lie somewhere between integrated and nonintegrated firms. The group's internal capital market provides a group-affiliated firm an additional source of internal financing that a standalone firm does not have. It is important to understand how such markets influence the product market behavior of

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[1]Notably, see Williamson (1975), (1985), Klein, Crawford, and Alchian (1978), and Grossman and Hart (1986) for theoretical studies, and Mullainathan and Scharfstein (2001) for an empirical study.

[2]See Maksimovic and Phillips (2007) for important summaries of the research in the area. More recently, Seru (2014) and Gopalan and Xie (2011) study the impact of the conglomerate form on resource allocation.

group-affiliated firms and their rivals. In this paper, I tackle this question by investigating how a group internal capital market's financial weakness affects the product market performance of a group-affiliated firm. This paper is complementary to the work of Boutin, Cestone, Fumagalli, Pica, and Serrano-Velarde (2013), who study the effect of group financial strength on entry into markets where group-affiliated firms operate.

Although this study is motivated by the question of how firm boundaries affect firm behavior, it focuses exclusively on group-affiliated firms due to potential concerns regarding the endogenous selection of firms into business groups (see Villalonga (2004b) and Almeida and Wolfenzon (2006) for further discussion). I explore how group financial leverage affects product market competition between group-affiliated firms and their rivals using a sample of Korean business group (*chaebol*) firms between 1999 and 2006, immediately following the Asian Financial Crisis of 1997–1998. It is important to examine whether group financial weakness plays a role in determining the product market strategies of affiliated firms when external capital markets are extremely difficult to access.

To identify the exogenous variations in group financial leverage not caused by anticipated changes in the product market performance of an affiliated firm, I calculate the financial leverage of other firms within the same *chaebol* that operate in different markets from those of an incumbent affiliated firm. This follows the strategy adopted by Boutin et al. (2013) for measuring group cash holdings. After controlling for the financial leverage of affiliated firms and other group variables, I find that the remaining group leverage has a significant and negative effect on the sales growth of affiliated firms.

To ensure that the product market performance of an affiliated firm does not drive the observed group leverage, I test the effect of the remaining group leverage on subsamples of noncore firms.[3] I also study the effect of core firms' leverage on noncore firms' performance. The subsample of noncore firms is obtained by dropping the core firms and their affiliates in the same industries. Lang, Ofek, and Stulz (1996) investigate the effect of conglomerate leverage on the investment of noncore divisions, as a noncore division's investment opportunities should not significantly influence a firm's financial leverage. Their empirical strategy is an application of that used by Lamont (1997), who investigates whether a liquidity shock in oil companies affects nonoil divisions in the same company. I still find that affiliated firms lose market shares to their competitors when their *chaebol* is financially weak.

Next, I explore how group leverage affects performance within a group and across industries. First, I examine whether the effect depends on an affiliated firm's financial position. Consistent with the idea that group resources shared through internal capital markets complement the funds of affiliated firms, I observe that the sensitivity of group leverage performance is magnified when an affiliated firm is financially weak. Second, I provide evidence that the negative effect of group leverage is more pronounced in fast-growing industries where external financing is not easily accessible and firms face large financing needs.

[3]I define core firms as those affiliated firms with the largest sales, assets, and financial leverage within a group (*chaebol*), and I classify other affiliated firms in the same *chaebol* as noncore firms.

Finally, I attempt to detect channels through which group financial weakness hurts the product market performance of affiliated firms. My analyses suggest that high group leverage discourages investment by affiliated firms and may encourage investments by rivals. I also conduct an additional robustness test to ensure that internal capital market operation explains the group leverage effect. I form pseudo-*chaebols* by matching non-*chaebol* firms to actual *chaebol* firms and test the group leverage effect on the sample of pseudo-*chaebol* firms. This placebo test shows no group leverage effect in pseudo-*chaebols* and confirms that the group leverage effect indeed stems from internal capital market operations.

This paper makes two main contributions to the literature. First, it provides evidence that group financial status comprises a substantial product market dimension of affiliated firms, deepening our understanding of the interplay between a financial position and product market outcomes. There is an extensive body of research examining the link between a firm's financial strength and its product market competition.[4] However, there is little empirical research exploring how access to internal capital markets affects a firm's product market outcomes.[5] To the best of my knowledge, the present paper is the first to examine the effect of group financial leverage on the product market outcomes of group-affiliated firms and their rivals. Although this study is closely related to the work of Boutin et al. (2013) in that both studies suggest that a group's financial characteristics influence the product market competition of affiliated firms, Boutin et al. show that a firm's access to its group's deep pockets can deter entry into the industry in which the firm operates. I show that high group leverage can lead the affiliated firms to lose market share to their rivals.

One advantage of using business group data to study the interaction between internal capital markets and product market competition is the ability to better control for industry effects that help mitigate the endogeneity problem. As Kovenock and Phillips (1997) and Campello (2006) indicate, the potential for simultaneity between financing decisions and product market performance stems largely from time-varying factors that affect all of the firms in an industry. An affiliated firm has accurate financial statements and a well-defined industry code that identify it as a separate legal entity. In contrast, the accounting data of conglomerates' segments may not reflect true values due to an arbitrary allocation of the values of accounting items across segments, and the reported Standard Industrial Classification (SIC) segments often do not represent actual business units.[6]

Second, this paper contributes to the literature on how internal capital markets operate, especially in times of market turmoil and distress. Other studies show evidence of internal capital markets' efficiency in difficult times by comparing group (or multisegment) firms and standalone firms. Almeida, Kim, and Kim (2015) show that after the Asian Financial Crisis, Korean business groups used

[4]See, among others, Zingales (1998), Campello (2003), (2006), Fresard (2010), and Hadlock and Sonti (2012).

[5]Khanna and Tice (2001) show that diversified firms are quicker to choose appropriate competitive strategies subsequent to Walmart's entry to their markets. Guedj and Scharfstein (2004) investigate biopharmaceutical firms to show multiple-product firms are more willing to abandon unpromising drug candidates compared with single-product firms.

[6]See Shin and Stulz (1998) and Villalonga (2004a) for additional discussion.

efficient internal capital markets to support the investments of affiliated firms. Gopalan and Xie (2011) find evidence that during periods of industry distress, U.S. conglomerates' internal capital markets help conglomerate segments invest more in research and development (R&D) and experience less decline in performance compared to single-segment firms. Kuppuswamy and Villalonga (2016) show that the efficiency of conglomerates' internal capital markets increased the value of corporate diversification during the 2008–2009 financial crisis. However, by focusing only on group-affiliated firms and investigating the effects of financial weakness of internal capital markets, my results provide evidence of the downside of internal capital markets for Korean business groups in the aftermath of the Asian Financial Crisis.

The remainder of this study is organized as follows: Section II develops the test hypotheses and presents my research strategy. Section III describes the data and the variables used in the analysis. Section IV presents the empirical findings, and Section V provides my conclusions.

II. Predictions and Research Strategy

A. How Financial Weakness of Internal Capital Markets Affects Group Firms

Research on the interaction between financial strength and product market competition has revolved around the hypothesis that financial policies either boost or weaken competitive positions.[7] Many empirical studies, such as Zingales (1998) and Campello (2003), focus on debt financing and indicate that a higher level of debt financing makes a firm a weaker competitor. Meanwhile, Fresard (2010) shows that large cash reserves confer market share gains at the expense of industry rivals.

These studies significantly improve our understanding of the effect of financial status on product market performance in standalone firms, but the picture is still far from complete, especially for firms affiliated with business groups. A group-affiliated firm can access its group's internal capital market to complement its own internally and externally generated funds. Firms with such additional internal funding sources should be able to take actions that are unavailable to their standalone competitors. Several studies have shown that internal capital markets help group-affiliated firms (or divisions of a conglomerate) overcome financial constraint.[8] However, little attention has been given to whether the group support through the internal capital markets affects product market outcomes of affiliated

[7]See Telser (1966), Brander and Lewis (1986), Maksimovic (1988), and Bolton and Scharfstein (1990).

[8]For example, Campello (2002) shows that small banks operating within multibank holding companies are less affected than independent banks by tightening monetary policy, indicating that internal capital markets relax credit constraints faced by the small bank affiliates. Maksimovic and Phillips (2008) also show that internal capital markets allow conglomerate segments to make more acquisitions, particularly in industries where firms are more likely to be financially constrained. Belenzon and Berkovitz (2010) show that group internal capital markets help group-affiliated firms engage in more successful innovation than standalone firms, especially in industries that rely greatly on external finance and have severe information asymmetry.

firms. Boutin et al. (2013) is an exception; this study examines the influence that group cash holdings have on new entries into a market where an affiliated firm operates to show that high group cash reserves indeed deter such market entry.

A few theories have been developed to explain the interaction between the internal capital markets and product market outcomes. Cestone and Fumagalli (2005) set forth a model suggesting that firms that can access group internal funds enjoy a competitive edge over their standalone rivals. Group internal capital markets can allocate relatively more resources to the subsidiaries facing tougher competition and, hence, make group-affiliated firms more likely to enter or stay and fight in a market. Moreover, the resource flexibility of internal capital markets may allow subsidiaries to make a credible commitment to invest more in R&D or advertising.

On the other hand, Cestone and Fumagalli (2005) argue that resource reallocation within internal capital markets can hurt the competitiveness of group-affiliated firms. The positive effect of group affiliation on product market competition discussed earlier can be observed only when the group has enough resources to allocate to all subsidiaries. If group headquarters must engage in winner-picking because of scarce internal resources, an affiliated firm facing intense competition is likely to exit the market.[9] This is similar to the commitment cost of internal capital markets suggested by Matsusaka and Nanda (2002), who uncover that internal capital markets make firms less competitive because conglomerates may drain financial support from a division once the division faces more intense competition. Such winner-picking is more likely to take place in financially unhealthy groups and suggests that group financial weakness may be detrimental to the product market performance of group-affiliated firms.

These theories compare group-affiliated firms to standalone firms. Villalonga (2004b) shows that the diversification discount disappears when one considers that divisions are endogenously selected into a conglomerate. Almeida, Park, Subrahmanyam, and Wolfenzon (2011) also provide empirical evidence that group membership and the position of an affiliated firm in the group ownership structure are endogenously determined. Endogenous selection can introduce bias when comparing group and standalone firms to study the effect of a group's internal capital market. Additionally, the group firms might have been influenced by the Asian Financial Crisis in a differing magnitude than were nongroup firms. My sample period includes the years following the crisis. Therefore, except when measuring relative-to-rivals product market performance, I focus exclusively on group-affiliated firms.

These theories may suggest not only that a strong internal capital market confers a competitive edge to group-affiliated firms over standalone firms, but also that firms affiliated with financially healthy groups may be in relatively stronger competitive positions than similar firms in financially unhealthy groups. A high level of group financial leverage may indicate that the group does not have enough resources to allocate to affiliated firms after paying off its creditors. A firm affiliated with such a highly leveraged group would be unable to commit as many

[9]Mathews and Robinson (2008) develop the equilibrium organizational design based on the positive and negative effects of internal capital markets on competition between a conglomerate and a standalone firm.

resources to a competitive race as would an otherwise identical firm affiliated with a group with low group leverage. A lack of resources in the internal capital markets is more likely to harm group firms in the period following a financial crisis, when it is difficult to obtain additional external financing. This leads to my first prediction:

Prediction 1. High group leverage hurts the product market performance of group-affiliated firms.

To capture the variations in group leverage not associated with an affiliated firm's product market performance, I define group leverage as the leverage of all firms affiliated with the firm's group that operate in other markets than the affiliated firm. This strategy follows that of Boutin et al. (2013), who similarly identify group cash holdings. Individual affiliated firms are separate legal entities with limited liability and autonomous access to external capital markets (Cestone and Fumagalli (2005)).[10] Each affiliated firm in a group can ask for a bank loan or issue its own securities. Consequently, changes in a group's leverage caused by new financing undertaken by an affiliated firm are not necessarily caused by the product market performance of other affiliated firms operating in different markets within the same group.

I examine whether firms with high group leverage expand or lose market shares more than their industry rivals, after controlling for a list of factors that includes the affiliated firms' financial leverage. My baseline empirical model resembles that used by Campello (2006) and Fresard (2010), but it differs in that it includes both firm leverage and group leverage. I specify the following baseline model:

$$\begin{aligned}(1)\quad \text{SALES\_GROWTH}_{i,t} \;=\;& \alpha + \varphi_t + \gamma\,\text{FIRM\_LEVERAGE}_{i,t-1} + \phi\, X_{i,t-1} \\ &+ \beta\,\text{GROUP\_LEVERAGE}_{i,t-1} \\ &+ \theta\,\text{ULT\_OWN}_{i,t-1} + \mu\,\text{GX}_{i,t-1} + \varepsilon_{i,t}.\end{aligned}$$

$\text{SALES\_GROWTH}_{i,t}$ is the sales-growth rate of firm i at time t, $\text{FIRM\_LEVERAGE}_{i,t-1}$ measures the financial leverage of firm i at time $t-1$, and $\text{GROUP\_LEVERAGE}_{i,t-1}$ measures the financial leverage of group firms affiliated with firm i operating in other markets.

I attempt to avoid any bias from the changes in group leverage associated with a firm's own product market performance by including FIRM_LEVERAGE as an additional control variable. The matrix $X_{i,t-1}$ controls for the time-varying characteristics of firm i that may affect sales growth. It includes profitability, firm size, and investment at time $t-1$. Kovenock and Phillips (1997) argue that the potential for simultaneity between capital structure decisions and product market performance stems largely from time-varying factors such as capacity use and demand conditions that affect all of the firms in an industry. As Frank and Goyal (2009) reveal, industry average leverage is a key determinant of individual leverage, and the former varies substantially among industries. To eliminate any correlation between the group leverage and sales growth of affiliated

[10]In contrast, conglomerate divisions do not have autonomous access to financial markets. This is one advantage of studying business groups rather than U.S. conglomerates.

firms derived from these time-varying (industry) factors, the firm-level variables (SALES_GROWTH, PROFITABILITY, SIZE, INVESTMENT, and FIRM_LEVERAGE) are adjusted by their industry-year averages.[11]

To control for any effect derived from the group's ownership structure, I also include controlling family's cash-flow rights (ULT_OWN) in firm *i*. The controlling family's cash-flow rights in a firm may reflect a group-wide strategy regarding the firm and the controlling family's incentive to support it. This follows from Almeida et al. (2011), who argue that a group firm's position in the group ownership structure is endogenously determined and show that the controlling family's cash-flow rights are positively associated with profitability.[12]

$GX_{i,t}$ includes group controls such as group size, group investment, and group cash holdings. In all regressions, I include *year dummies* for each year. I adjust the estimates' standard errors for within-firm error clustering and heteroskedasticity (Petersen (2009)). Because the group leverage is the same for all affiliated firms, the *t*-statistics for GROUP_LEVERAGE may not be precisely estimated by within-firm error clustering. To address this concern, I also adjust the standard error for within-group clustering, but the main results do not change (not reported here).

I cannot entirely rule out the possibility that a firm's anticipated performance influences the financial leverage of other group firms; after all, all affiliated firms are controlled by an owner family. This is especially likely if the firm under investigation is one of the group's core firms. To address this issue, I examine the effect of group leverage on noncore firms. This strategy follows Lang et al. (1996), who study debt overhang in conglomerate firms. Their strategy is an extension of that developed by Lamont (1997), who investigates whether a liquidity shock in oil divisions affects nonoil divisions in the same company. A change in the liquidity of oil divisions is not associated with changes in the growth opportunities of nonoil divisions.

To obtain a sample of noncore firms, I drop the core firms. Furthermore, firms in the same industries as the core firms are excluded, because if a variation in group leverage is driven by industry shocks to core firms, the variation is no longer exogenous to the affiliated firms affected by same-industry shocks. Additionally, I estimate the effect of core firms' leverage on the performance of noncore firms in different industries. Core firms' leverage also encompasses other group firms that are in the same industries as the core firms.

B. The Influence of Group Leverage across Affiliated Firms with Different Financial Positions

If group financial leverage indeed measures a lack of group resources allocable to group-affiliated firms, it should influence affiliated firms differently,

[11]This is another advantage of focusing on business groups instead of U.S. conglomerates. Identifying conglomerate divisions by SIC-based proxies is problematic, because the reported SIC segments very often do not represent actual business units. Controlling the industry factors is important in studying the interaction between financial structure and product market outcomes.

[12]How ownership structure alters the interaction between internal capital markets and product market performance is explored in a later test.

depending on their own financial status. When the group internal capital market cannot offer enough support for affiliated firms, affiliated firms with insufficient funds are not able to compete aggressively in their product markets. In other words, group leverage may be less detrimental to the performance of affiliated firms that are financially strong on their own, compared with other affiliated firms whose financial standing is weak.

Maksimovic and Phillips (2002) find that more productive segments of a conglomerate receive more resource allocations from the internal capital market. As Cestone and Fumagalli (2005) argue, if a group does not have enough resources, winner-picking will take place. So if efficiency is the main factor in determining from which subsidiary the group drains financial resources, affiliated firms with weak financial positions are the most likely to suffer in product market competition. From this I derive the following prediction:

Prediction 2. High group leverage is more detrimental to group firms whose own financial position is weak.

The first measure of firm financial strength is profitability, which represents a firm's ability to generate cash flow. High profitability may indicate that the firm has enough internal funds to invest in market share expansion. This suggests that the negative group leverage effect may be greater in firms with lower profitability. Cash holdings can be another proxy of financial strength (Fresard (2010)). However, high cash reserves can also indicate that a firm is financially constrained. Almeida, Campello, and Weisbach (2004) show that financially constrained firms save more cash than their unconstrained counterparts, especially in recessions. Evidence provided by Song and Lee (2012) corroborates this: After the Asian Financial Crisis, financially constrained Asian firms began to hold more cash. Thus, it is not obvious a priori whether a firm hoarding large cash reserves is less reliant on group resources. I later present empirical evidence to show which outcome is observed in my sample.

I use firm size as a third measure of firm financial position, following Fresard (2010). Smaller firms are likely to have more difficulty raising external financing. Asset tangibility is another natural proxy for the ease of access to external capital (Boutin et al. (2013)). More tangible assets may allow more external financing by increasing the value that can be pledged to creditors in default and decreasing information asymmetry on the value of the pledged assets. If affiliated firms can easily raise external financing by holding a high proportion of tangible assets, group support may not be critical to those affiliated firms. I therefore expect high group leverage to be more detrimental to small or low-tangibility firms.

C. The Effect of Group Leverage across Industries with Different Growth Rates

External financing can be more difficult to obtain in some industries than others. Maksimovic and Phillips (2008) argue that the positive benefit of internal capital markets is the highest for conglomerate firms in the growth stages of the industry life cycle. Evidence provided by Boutin et al. (2013) also suggests that access to group deep pockets is more beneficial to affiliated firms in both growing

industries and innovative industries where firms face more serious financial constraints. Because much of a firm's value in a growing industry is derived from unexploited and intangible growth opportunities, information asymmetry between managers and outside investors tends to be larger than in more mature industries. Thus, firms in growing industries are more likely to experience credit rationing.

In fast-growing industries, firms should be able to commit to a high level of investment to stay competitive in the market. If a firm cannot raise enough external financing and its internal funds are insufficient, then support from group internal capital markets becomes more critical to winning market share. By the same token, insufficient group resources should be more detrimental to affiliated firms operating in industries with greater real sales growth in my sample period. This argument leads the following testable prediction:

Prediction 3. The negative effect of group leverage is greater in fast-growing industries.

D. Group Leverage and Investment

If the negative effect of group leverage on the sales growth of group firms is derived from the fact that groups with weak financial positions cannot support the corporate investment that is crucial to market share expansion, I should also observe negative effects of group leverage on investments made by group firms. Standalone firms that are highly indebted may be unable to finance new investments due to debt overhang (Myers (1977)). Similarly, firms affiliated with heavily indebted groups may be unable to finance new investments. Lang et al. (1996) show that investments made by divisions are negatively associated with conglomerate financial leverage. High group leverage may force group firms to pass up profitable growth opportunities and, hence, lead them to lose market share to their rivals. This leads to a final prediction:

Prediction 4. Group leverage has a negative effect on the corporate investments of group firms.

III. Data and Variables

This section describes the data and the method I use to calculate the variables employed in the tests of the predictions discussed in Section II.

A. Data

My sample comprises Korean business groups during the period 1999–2006, immediately following the 1997–1998 Asian Financial Crisis. In economies like Korea's with underdeveloped external financial markets, internal capital markets are likely to be important sources of capital (Stein (2003)). Moreover, as Almeida et al. (2015) show, external financing in Korea became costly and in some cases virtually impossible to obtain in the aftermath of the crisis. As a consequence, Asian firms began to hold more cash after the crisis, suggesting that internal resources became more valuable when extreme market conditions did

not allow corporations to easily access external capital (Song and Lee (2012)). Because my sample period follows the crisis, the support of internal capital markets should be essential to group-affiliated firms to complement their own internal funds, especially during my sample period, which immediately follows the 1997–1998 Asian Financial Crisis.

The specific groups comprising my data set are large business groups in Korea called *chaebols*, as in Almeida et al. (2011). The legal expression for *chaebol* is "Large Business Group," which is defined in the Monopoly Regulation and Fair Trade Act (FTA). The Korean Fair Trade Commission (KFTC), which oversees the FTA, annually designates a business group as a *chaebol* based on the combined total assets of affiliated firms in the group. From 1987 to 2001, the KFTC designated the 30 largest business groups as *chaebols*; beginning in 2002, the KFTC designated more groups as *chaebols* by including any group with total combined assets greater than 2 trillion won.[13] Firms in KFTC-designated *chaebols* have been prohibited from cross-shareholding and limited to investing in the equity of domestic firms. Since 1998, these firms have also been prohibited from cross-debt guarantees among affiliated companies.

Ownership data for this study were obtained from the KFTC. Following the FTA and its enforcement ordinance, *chaebols* are required to report the financial status of affiliate shareholders, persons with special interests, and group companies on Apr. 30 of each year. Because I focus on *chaebols* entirely or partially controlled by a controlling family or person, my sample excludes some groups, such as those controlled by the government.

To obtain financial and accounting information for *chaebol* firms, I use databases developed by the Korea Listed Companies Association and Korea Investors Service, which contain information on listed companies and "statutory audited companies," or Korean companies with assets of over 6 billion won that are required by law to be audited by external certified public accountants. I use these databases to obtain information on non-*chaebol* firms. Even though I focus on *chaebol* firms, I need non-*chaebol* firms to account for all rivals of affiliated firms.

Firms that operate in the financial sector are excluded from my sample. The accounting treatment of revenues and profits for financial firms is significantly different than that in other sectors. The relation between financial structure and product market performance in financial sectors would have very different implications from the relation in manufacturing sectors. This exclusion is consistent with previous studies on the interaction between financial structure and product market performance.[14] I also exclude firms with sales growth in excess of 200% in any one year to avoid possible bias from outliers, firms with missing sales-growth rates,[15] and firms without assigned industry codes. The final sample includes 244 firms in 1999, 240 firms in 2000, 281 firms in 2001, 331 firms in 2002, 385 firms in 2003, 353 firms in 2004, 488 firms in 2005, and 512 firms in 2006.

[13]Based on the won/dollar exchange rate on Mar. 9, 2007, 1 dollar is equivalent to 946 won.

[14]Campello (2003), (2006) and Fresard (2010) focus on manufacturing firms. Chevalier (1995) and Zingales (1998) study supermarket and trucking industries, respectively. Lang et al. (1996) also choose only industrial firms (SIC codes between 2000 and 3999) to examine the effect of conglomerate leverage on segment investments.

[15]Firms that report sales for at least 2 consecutive years are included in the sample.

B. Definition of Variables

1. Firm Variables

To gauge a firm's performance in the product market, I use a firm's relative-to-industry sales growth, SALES_GROWTH, as the dependent variable. I first calculate the sales-growth rate by subtracting previous-year sales from current-year sales and dividing by previous-year sales. Then, I adjust the growth rate by its industry-year average. Following Fresard (2010), I use this as a proxy for market share growth. If a firm's sales grow more than its industry average, given the industry's overall market growth, I can roughly consider the firm's market share as increasing compared to industry-average firms.

FIRM_LEVERAGE, the first firm control variable, is the ratio of individual-firm long-term debt to individual-firm total assets, both in book value. PROFITABILITY is defined as operating income divided by total assets, and INVESTMENT is defined as capital expenditure normalized by total assets. SIZE is the natural log of total assets. CASH is the sum of cash holdings and marketable securities divided by total assets. All firm-characteristic variables including SALES_GROWTH are adjusted by their industry-year averages.

Additionally, I use asset tangibility as one measure of firm financial strength. As defined by Berger, Ofek, and Swary (1996), asset tangibility is a function of receivables, inventory, and fixed capital. However, due to limited data availability, I drop receivables and inventory from the original definition.[16] I also use another definition of tangibility, tangible assets divided by total assets, following Boutin et al. (2013). The results of using different definitions are essentially the same.

2. Group-Related Variables

For each group-affiliated firm *i*, I identify the group that the firm *i* is affiliated with. Two variables based on Almeida et al. (2011) are defined. ULT_OWN, or ultimate ownership, represents the cash-flow rights that the controlling family has in an affiliated firm. As a control for ownership structure, I also run main regressions using POSITION. POSITION is the distance between the family and a firm in the group. When POSITION increases, the firm is placed at the base of the pyramid, far from the controlling family at the pyramid's top. Whichever I use as an ownership control, the results are similar. Because many previous studies use the cash-flow rights of the controlling family in their business group studies, I report results using ULT_OWN.[17]

GROUP_LEVERAGE is defined as the sum of the long-term debt of all other affiliated firms within firm *i*'s group, excluding firm *i*, divided by the sum of assets of the other affiliated firms. Because market leverage is more likely to be influenced by anticipated product market performance and the depreciation of values following financial distress, book values are used to calculate group leverage. This helps further reduce the potential for reverse causality between group financial weakness and performance. GROUP_SIZE is the natural logarithm of the sum

[16] I define it as follows: TANGIBILITY = (0.6 TANGIBLE_ASSET + CASH + MARKETABLE_SECURITIES)/ASSETS.

[17] Results using POSITION are also available from the author.

of total assets of all affiliated firms in firm i's group. GROUP_INVESTMENT is defined as the ratio of the sum of capital expenditures to the sum of total assets. GROUP_CASH is defined in the same way, but capital expenditures are replaced by the sum of cash holdings and marketable securities.

GROUP_LEVERAGE and other group variables exclude affiliated firms in financial industries. Financial firms operate with unusually high leverage and issue liabilities with shorter maturity than their assets (Flannery (1994)). Many previous studies exclude from their analysis all financial firms because the high leverage of financial firms may not have the same meaning as for nonfinancial firms (Barber and Lyon (1997)). As argued by Samphantharak (2002), financial intermediaries within a group are likely to play a role of facilitating flow of funds in the internal capital markets. Thus, high group leverage caused by the high leverage of affiliated financial firms does not necessarily mean a financially unhealthy group. This is important, because high group leverage represents group financial weakness in this study. Table 1 reports the descriptive statistics of variables used in the study, including firm-specific and group-related variables. All financial data are deflated with the Consumer Price Index (CPI).

TABLE 1

Summary Statistics

Table 1 reports the summary statistics for the main variables used in the regression estimations (before industry-year adjustments). The sample includes Korean *chaebol* (business group) firms for the 1999–2006 period. Firms in financial sectors are excluded from the sample. Data are from the Korean Fair Trade Commission, Korea Listed Companies Association, and Korea Investors Service. Panel A presents firm variables of *chaebol*-affiliated firms. SALES_GROWTH is annual gross sales growth at time t, given by $(\text{SALES}_t - \text{SALES}_{t-1})/\text{SALES}_{t-1}$. FIRM_LEVERAGE is the ratio of long-term debt to total assets. SIZE is the natural log of total assets. PROFITABILITY is operating earnings over assets. INVESTMENT is capital expenditures over assets. CASH is cash holdings over assets. ULT_OWN represents the controlling family's cash-flow rights. Panel B presents group variables. GROUP_LEVERAGE is given by $\sum\text{LONG-TERM\_DEBT}_i/\sum\text{TOTAL\_ASSETS}_i$ of all other affiliated firms, excluding the firm of interest in the firm's group. GROUP_INVESTMENT is defined as $\sum\text{CAPITAL\_EXPENDITURES}_i/\sum\text{TOTAL\_ASSETS}_i$ for $i = 1, \ldots, N$, where there are N affiliated firms in a group. GROUP_SIZE is the natural logarithm of the sum of total assets of all N firms. GROUP_CASH is the sum of cash holdings and marketable securities over the sum of assets. CORE_LEVERAGE is $\sum\text{LONG-TERM\_DEBT}_i/\sum\text{TOTAL\_ASSETS}_i$ for core firms and affiliated firms that are in the same industries as the core firms. CORE_CASH is $\sum(\text{CASH}_i + \text{MARKETABLE\_SECURITIES}_i)/\sum\text{TOTAL\_ASSETS}_i$ for core firms and firms that are in the same industries as the core firms. Core firms are affiliated firms with i) the highest sales, ii) the largest assets, and iii) the highest leverage within a group in a given year.

Key Variables	Mean	P25	Median	P75	SD	*N*
Panel A. Firm Variables						
SALES_GROWTH	0.128	0.0002	0.096	0.218	0.269	1,805
FIRM_LEVERAGE	0.170	0.043	0.114	0.239	0.175	1,805
SIZE	19.301	17.917	19.261	20.597	1.876	1,805
PROFITABILITY	0.070	0.030	0.064	0.105	0.104	1,805
INVESTMENT	0.047	0.009	0.029	0.066	0.081	1,805
Panel B. Group-Related Variables						
ULT_OWN	8.980	0.080	0.261	7.242	18.890	1,805
GROUP_LEVERAGE	0.213	0.125	0.208	0.265	0.111	1,805
GROUP_INVESTMENT	0.038	0.020	0.033	0.048	0.033	1,799
GROUP_CASH	0.048	0.028	0.440	0.065	0.029	1,805
GROUP_SIZE	23.345	22.215	23.198	24.640	1.345	1,799
CORE_LEVERAGE						
by SALES	0.199	0.125	0.191	0.246	0.119	1,432
by SIZE	0.199	0.125	0.191	0.247	0.118	1,429
by LEVERAGE	0.198	0.127	0.191	0.242	0.114	1,516
CORE_CASH						
by SALES	0.043	0.011	0.025	0.065	0.044	1,432
by SIZE	0.044	0.012	0.025	0.065	0.045	1,429
by LEVERAGE	0.045	0.012	0.027	0.066	0.045	1,516

IV. Empirical Results: Effect of Group Leverage on Sales Growth of Affiliated Firms

This section examines how group financial weakness affects the relative-to-rivals sales growth of affiliated firms.

A. Full Sample

Table 2 presents the results of estimating equation (1). Using the full sample of all affiliated firms, I relate group financial leverage to the sales growth of affiliated firms. In all of the specifications in Table 2, firm-specific variables, including the dependent variable, are adjusted for their industry-year averages to control for industry effects. The reported t-statistics are calculated based on standard errors adjusted for heteroskedasticity and within-firm clustering.

TABLE 2

The Effect of Group Leverage on Market Share Growth (baseline estimation)

Table 2 presents results of the main tests described in Section II, which relate group financial leverage to the market share expansion of affiliated firms. The sample includes Korean *chaebol* firms for the 1999–2006 period. The dependent variable is the relative-to-rivals sales growth of affiliated firms. SALES_GROWTH is annual sales growth at time t, given by $(\text{SALES}_t - \text{SALES}_{t-1})/\text{SALES}_{t-1}$. FIRM_LEVERAGE is the ratio of long-term debt to total assets. PROFITABILITY is operating earnings over assets. SIZE is the natural log of total assets. INVESTMENT is capital expenditures over assets. All firm-level variables are adjusted by their industry-year averages to control for unobserved industry effects. ULT_OWN represents the controlling family's cash-flow rights. GROUP_LEVERAGE is given by $\sum\text{LONG-TERM\_DEBT}_i/\sum\text{TOTAL\_ASSETS}_i$ of all other affiliated firms, excluding the firm of interest in the firm's group. GROUP_INVESTMENT is defined as $\sum\text{CAPITAL\_EXPENDITURES}_i/\sum\text{TOTAL\_ASSETS}_i$ for $i = 1, \ldots, N$, where there are N affiliated firms in a group. GROUP_SIZE is the natural logarithm of the sum of total assets of all N firms. GROUP_CASH is the sum of cash holdings and marketable securities over the sum of assets. All regressions include year dummies. The intercepts are not reported to save space. The estimations correct the error structure for heteroskedasticity using the Huber–White estimator and within-firm error clustering. t-statistics are in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Independent Variables	Dependent Variable: SALES_GROWTH$_t$				
	1	2	3	4	5
PROFITABILITY$_{t-1}$	−0.043	−0.045	−0.051	−0.053	−0.052
	(−0.55)	(−0.57)	(−0.64)	(−0.67)	(−0.66)
SIZE$_t$	−0.007**	−0.007*	−0.009**	−0.009**	−0.009**
	(−1.99)	(−1.96)	(−2.34)	(−2.32)	(−2.41)
INVESTMENT$_{t-1}$	0.525***	0.523***	0.510***	0.510***	0.515***
	(2.93)	(2.92)	(2.84)	(2.84)	(2.86)
FIRM_LEVERAGE$_{t-1}$		−0.016	−0.017	−0.015	−0.016
		(−0.66)	(−0.70)	(−0.60)	(−0.67)
ULT_OWN$_{t-1}$	0.001	0.001	0.001	0.001	−0.0002
	(1.02)	(0.99)	(1.50)	(1.53)	(−0.24)
GROUP_LEVERAGE$_{t-1}$	−0.187***	−0.182***	−0.162**	−0.163**	−0.203***
	(−2.89)	(−2.76)	(−2.37)	(−2.38)	(−2.64)
GROUP_SIZE$_t$			0.011**	0.011*	0.010*
			(1.99)	(1.86)	(1.81)
GROUP_INVESTMENT$_{t-1}$			0.101	0.114	0.126
			(0.51)	(0.54)	(0.60)
GROUP_CASH$_{t-1}$				0.227	0.248
				(1.00)	(1.09)
ULT_OWN × GROUP_LEVERAGE					0.005*
					(1.65)
N	1,797	1,797	1,797	1,797	1,797
R^2	0.046	0.046	0.049	0.050	0.051

Columns 1 and 2 of Table 2 display the results of estimating my base regression, not yet controlling for other group characteristics. In column 1, I exclude FIRM_LEVERAGE from the regression equation out of concern that the significance of GROUP_LEVERAGE could be driven by a potentially high correlation between FIRM_LEVERAGE and GROUP_LEVERAGE. The coefficient of GROUP_LEVERAGE is negative and statistically significant with and without FIRM_LEVERAGE in the same equation, confirming the conjecture that internal capital markets should matter in the product market performance of affiliated firms.

The performance of affiliated firms is plausibly affected by group characteristics. To eliminate the possible alternative explanation that other group factors may be driving the group leverage effect, I first include group controls of group size and group investment, as shown in column 3 of Table 2. Because Boutin et al. (2013) suggest that group cash holdings affect group firms' competitiveness, I additionally include group cash holdings in column 4. The estimates of the group leverage effect suggest that for the net of the effects of group size, group investment, and group cash holdings, a 1-standard-deviation increase in group leverage in year $t - 1$ entails a reduction in sales growth of about 1.8% relative to the industry average growth between year t and year $t + 1$, with 95% confidence. This result is consistent with Prediction 1 that firms affiliated with financially unhealthy groups can lose market share to industry rivals.

Column 5 of Table 2 adds the interaction between GROUP_LEVERAGE and ULT_OWN (the controlling family's cash-flow rights in firm i). The interaction is positive and significant at the 10% level, suggesting that group firms in which the controlling family has high cash-flow rights derive smaller costs from high group leverage, probably because they are likely to receive a higher priority of group support through internal capital markets. This also confirms previous evidence that the controlling family is more willing to boost the performance of firms in which they have high cash-flow rights. This is consistent in that ULT_OWN seems to have a positive effect on the product market performance of affiliated firms for most of the specifications in Table 2, even though the effect does not seem to be statistically and economically significant. The interaction is marginally significant in this full sample regression, and it is no longer significant in the noncore sample regressions. I do not draw a strong conclusion on whether the controlling family's cash-flow rights matter greatly in internal resource reallocation.

Note that the coefficient of firm-specific leverage (FIRM_LEVERAGE) is not significant, even though it is also negative. The market share expansion of group-affiliated firms is largely affected by the group financial position, but not significantly by the individual-firm financial position. In contrast, the effect of firm investment (INVESTMENT) is significantly positive even after controlling for group investment (GROUP_INVESTMENT). The coefficient of GROUP_INVESTMENT is positive but not statistically significant. To improve the performance of an affiliated firm, it is more important to increase firm-specific investments than to increase group-wide investments. On the other hand, GROUP_SIZE seems to significantly explain the market share expansion of affiliated firms. The larger the group is, the better its affiliated firms perform in their product

markets relative to their rivals. Group cash reserves do not seem to have a significant effect on the sales growth of affiliated firms after controlling for other group characteristics, but the positive coefficient is consistent with previous findings.

B. Noncore Firms

To better identify exogenous variations in the remaining group leverage, I estimate my main regression equation using subsamples of noncore firms. The subsamples exclude core firms, firms in the same industries (by 2-digit industry codes), and groups as core firms. First, I define as core firms the affiliated firms with the highest sales in a given year among all group firms within a given group. This definition of core firms is close to that used by Lang et al. (1996).[18] I identify noncore firms more conservatively, using 2-digit industry codes, whereas Lang et al. use 4-digit codes. This prevents those firms that are closely related to core firms from being classified as noncore. Second, core firms are defined as firms with the largest assets. Almeida et al. (2011) suggest that larger, older, and public firms are likely to be core/key firms in a group. Third, core firms are defined as firms with the highest leverage. If an affiliated firm is in financial distress due to high leverage and hence needs group support through the internal capital market, top management (or the controlling family) is likely to change group policy, including group leverage, to rescue the firm (Gopalan, Nanda, and Seru (2007)).

Table 3 reports the results from subsample regressions in which I relate the remaining group leverage to the sales growth of noncore affiliated firms. Panels A, B, and C, respectively, display estimates from the first subsample of noncore firms, where core firms are defined as the firms with the largest sales; from the second subsample, where core firms are the firms with the largest assets; and from the third subsample, where core firms are the firms with the highest leverage. In all subsamples of noncore firms, after controlling for all relevant firm and group characteristics, I observe a negative association between group leverage and the sales growth of noncore firms (-0.151 with a t-statistic of -2.01, -0.185 with a t-statistic of -2.50, and -0.143 with a t-statistic of -1.97 in the first, second, and third subsample regressions, respectively). The average magnitude of the effect obtained from the three subsamples (-0.159) is very close to that from the full sample (-0.163). This again confirms that firms affiliated with financially unhealthy groups underperform their rivals compared to those affiliated with healthy groups. Excluding core firms has no bearing on the conclusions, because there is a continued negative and significant effect of group leverage on the market share expansion of affiliated firms.

[18]Lang et al. (1996) designate a segment of a conglomerate as a "core segment" if its 4-digit SIC code is the primary SIC code of the firm. But, a business group is unlike a conglomerate; it is not a single firm, and there is no main SIC code for a group. Because a firm's primary SIC code is determined by the business that is most relevant to the firm, the main SIC code of a conglomerate is likely to correspond to the industry of the division that produces largest sales.

TABLE 3

The Effect of Group Leverage on Market Share Growth (noncore firms)

Table 3 contains results of the main tests described in Section II, which relate group financial leverage to the market share expansion of affiliated firms. The sample includes noncore firms in Korean *chaebols* for the 1999–2006 period. Core firms are those firms affiliated with i) the highest sales, ii) the largest asset base, and iii) the highest leverage within a group in a given year. To obtain a noncore sample, core firms as well as the affiliated firms operating in the same industry as the core firms are dropped. The dependent variable is the relative-to-rivals sales growth of affiliated firms. SALES_GROWTH is annual sales growth at time t, given by $(\text{SALES}_t - \text{SALES}_{t-1})/\text{SALES}_{t-1}$. FIRM_LEVERAGE is the ratio of long-term debt to total assets. PROFITABILITY is operating earnings over assets. SIZE is the natural log of total assets. INVESTMENT is capital expenditures over assets. All firm-level variables are adjusted by their industry-year averages to control for unobserved industry effects. ULT_OWN represents the controlling family's cash-flow rights. GROUP_LEVERAGE is given by $\sum\text{LONG-TERM\_DEBT}_i/\sum\text{TOTAL\_ASSETS}_i$ of all other affiliated firms, excluding the firm of interest in the firm's group. GROUP_INVESTMENT is defined as $\sum\text{CAPITAL\_EXPENDITURES}_i/\sum\text{TOTAL\_ASSETS}_i$ for $i = 1, \ldots, N$, where there are N affiliated firms in a group. GROUP_SIZE is the natural logarithm of the sum of total assets of all N firms. GROUP_CASH is the sum of cash holdings and marketable securities over the sum of assets. All regressions include year dummies. The intercepts are not reported to save space. The estimations correct the error structure for heteroskedasticity and within-firm error clustering. t-statistics are in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	Dependent Variable: SALES_GROWTH_t					
	Core Firm as a Firm with Largest Sales		Core Firm as a Firm with Largest Size		Core Firm as a Firm with Largest Leverage	
Independent Variables	1	2	1	2	1	2
$\text{PROFITABILITY}_{t-1}$	−0.041	−0.051	−0.026	−0.034	−0.056	−0.060
	(−0.43)	(−0.53)	(−0.28)	(−0.37)	(−0.64)	(−0.68)
SIZE_t	−0.009**	−0.010**	−0.009**	−0.010**	−0.007*	−0.009**
	(−2.01)	(−2.17)	(−2.01)	(−2.03)	(−1.88)	(−2.15)
INVESTMENT_{t-1}	0.395*	0.385*	0.403*	0.398*	0.520**	0.512**
	(1.84)	(1.78)	(1.86)	(1.82)	(2.46)	(2.42)
$\text{FIRM\_LEVERAGE}_{t-1}$	−0.027	−0.027	−0.034	−0.034	0.018	0.015
	(−0.64)	(−0.62)	(−0.85)	(−0.84)	(0.72)	(0.57)
ULT_OWN_{t-1}	0.001	0.001*	0.0005	0.001	0.001	0.001*
	(1.39)	(1.68)	(0.91)	(1.11)	(1.32)	(1.68)
$\text{GROUP\_LEVERAGE}_{t-1}$	−0.180**	−0.156**	−0.202***	−0.190**	−0.164**	−0.148**
	(−2.51)	(−2.06)	(−2.82)	(−2.55)	(−2.41)	(−2.04)
GROUP_SIZE_t		0.008		0.005		0.011*
		(1.19)		(0.69)		(1.69)
$\text{GROUP\_INVESTMENT}_{t-1}$		0.198		0.118		−0.006
		(0.78)		(0.49)		(−0.02)
GROUP_CASH_{t-1}		0.251		0.236		0.011
		(0.88)		(0.81)		(0.04)
N	1,422	1,416	1,419	1,414	1,507	1,502
R^2	0.036	0.039	0.035	0.036	0.046	0.047

Table 4 presents the results of regressions that address how core firms' leverage influences the relative-to-rivals sales growth of noncore firms. I calculate the core firms' leverage using the core firms and their same-industry firms for the three definitions of core firms. The core firms' leverage (CORE_LEVERAGE) is the ratio of the sum of long-term debt to the sum of total assets of the core firms and their same-industry firms. The coefficient of CORE_LEVERAGE is statistically significant and negative. For example, when the core firms are the firms with the largest sales, a 1-standard-deviation increase in CORE_LEVERAGE leads to about 1.65% (significant at the 5% level) of the sales growth of noncore firms below the industry-average sales growth. This confirms that firms affiliated with highly leveraged core firms lose market share to their rivals and reaffirms that group financial weakness hurts the product market performance of affiliated firms.

TABLE 4

The Effect of Core Leverage on Market Share Growth (noncore firms)

The regressions in Table 4 examine the effect of core leverage on the sales growth of noncore affiliated firms. The sample includes noncore firms in Korean *chaebols* for the 1999–2006 period. Core firms are those firms affiliated with i) the highest sales, ii) the largest asset base, and iii) the highest leverage within a group in a given year. To obtain a noncore sample, core firms as well as the affiliated firms operating in the same industry as the core firms are dropped. The dependent variable is the relative-to-rivals sales growth of affiliated firms. SALES_GROWTH is annual sales growth at time t, given by $(\text{SALES}_t - \text{SALES}_{t-1})/\text{SALES}_{t-1}$. FIRM_LEVERAGE is the ratio of long-term debt to total assets. PROFITABILITY is operating earnings over assets. SIZE is the natural log of total assets. INVESTMENT is capital expenditures over assets. All firm-level variables are adjusted by their industry-year averages to control for unobserved industry effects. ULT_OWN represents the controlling family's cash-flow rights. CORE_LEVERAGE is $\sum$LONG-TERM_DEBT$_i$/$\sum$TOTAL_ASSETS$_i$ for core firms and firms that are in the same industries as core firms. CORE_CASH is $\sum$(CASH$_i$+ MARKETABLE_SECURITIES$_i$)/$\sum$TOTAL_ASSETS$_i$ for core firms and firms that are in the same industries as the core firms. All regressions include year dummies. The intercepts are not reported to save space. The estimations correct the error structure for heteroskedasticity and within-firm error clustering. t-statistics are in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	Dependent Variable: SALES_GROWTH$_t$					
	Core Firm as a Firm with Largest Sales		Core Firm as a Firm with Largest Size		Core Firm as a Firm with Largest Leverage	
Independent Variables	1	2	1	2	1	2
PROFITABILITY$_{t-1}$	−0.045	−0.043	−0.030	−0.028	−0.058	−0.056
	(−0.47)	(−0.45)	(−0.33)	(−0.31)	(−0.67)	(−0.64)
SIZE$_t$	−0.009**	−0.009**	−0.009**	−0.009**	−0.007	−0.007*
	(−1.98)	(−2.02)	(−1.99)	(−2.02)	(−1.87)	(−1.84)
INVESTMENT$_{t-1}$	0.403*	0.404*	0.413*	0.414*	0.527**	0.527**
	(1.87)	(1.88)	(1.90)	(1.91)	(2.49)	(2.50)
FIRM_LEVERAGE$_{t-1}$	−0.032	−0.029	−0.039	−0.036	0.016	0.016
	(−0.75)	(−0.67)	(−0.99)	(−0.90)	(0.62)	(0.61)
ULT_OWN$_{t-1}$	0.001	0.001	0.0005	0.0005	0.001	0.001
	(1.39)	(1.37)	(0.90)	(0.90)	(1.30)	(1.26)
CORE_LEVERAGE$_{t-1}$	−0.135**	−0.139**	−0.138**	−0.142**	−0.119*	−0.120**
	(−2.20)	(−2.29)	(−2.22)	(−2.32)	(−1.94)	(−1.98)
CORE_CASH$_{t-1}$		−0.284		−0.266		−0.184
		(−1.45)		(−1.35)		(−0.98)
N	1,422	1,422	1,419	1,419	1,507	1,507
R^2	0.034	0.035	0.033	0.034	0.044	0.044

C. Does the Effect of Group Leverage Depend on Firm Financial Status?

To better understand the nature of the group leverage effect, I first test whether the effect of group leverage differs across affiliated firms in a way that is consistent with Prediction 2. I expect the negative effect of group leverage to be more pronounced in firms whose own financial position is weak. To test this prediction, I split noncore samples into two subgroups based on a firm's financial position: those whose financial position is above the industry-year average and those whose financial position is below the average. Given that the standard of financial strength may differ significantly across different industries, I compare a firm's financial position to its industry-year average. I then estimate equation (1) on each subsample. I measure a firm's financial strength using PROFITABILITY, SIZE, CASH, and TANGIBILITY.

Table 5 shows the estimates of split regressions based on four measures of firm financial strength using the three subsamples of noncore firms defined in the previous section. For brevity, the table displays only group leverage–sales growth estimates. Across all measures of financial strength, the effect of group leverage is larger when affiliated firms' financial position is weaker. Panel A presents

TABLE 5

The Effect of Group Leverage on Affiliated Firms Dependent on Financial Status

The regressions reported in Table 5 examine whether the group leverage effect varies depending on the financial position of affiliated firms. The sample includes noncore firms in Korean *chaebols* for the 1999–2006 period. Core firms are those firms affiliated with i) the highest sales, ii) the largest asset base, and iii) the highest leverage within a group in a given year. To obtain a noncore sample, core firms as well as the affiliated firms operating in the same industry as the core firms are dropped. *Chaebol* firms in each noncore sample are classified on the basis of their financial position. Firms in the group of "weak financial position" are those whose financial position is below its industry-year average, and firms in the group of "strong financial position" are those whose financial position is above the average. Firm financial position is measured by PROFITABILITY, SIZE, CASH, and TANGIBILITY. Profitability is operating earnings over assets. SIZE is the natural log of total assets. CASH is cash holdings plus marketable securities divided by total assets. TANGIBILITY is (0.6 × TANGIBLE_ASSETS + CASH + MARKETABLE_SECURITIES)/TOTAL_ASSETS. The dependent variable is the relative-to-rivals sales growth of affiliated firms. SALES_GROWTH is annual sales growth at time t, given by $(\text{SALES}_t - \text{SALES}_{t-1})/\text{SALES}_{t-1}$. GROUP_LEVERAGE is given by $\sum\text{LONG-TERM\_DEBT}_i/\sum\text{TOTAL\_ASSETS}_i$ of all other affiliated firms, excluding the firm of interest in the firm's group. All regressions include year dummies. The intercepts are not reported to save space. The estimations correct the error structure for heteroskedasticity and within-firm error clustering. t-statistics are in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	Dependent Variable: SALES_GROWTH$_t$					
	Core Firm as a Firm with Largest Sales		Core Firm as a Firm with Largest Size		Core Firm as a Firm with Largest Leverage	
Independent Variables	Weak Financial Position	Strong Financial Position	Weak Financial Position	Strong Financial Position	Weak Financial Position	Strong Financial Position
Panel A. PROFITABILITY as a Measure of Firm Financial Status						
GROUP_LEVERAGE$_{t-1}$	−0.353***	−0.055	−0.352***	−0.103	−0.196*	−0.135
	(−2.62)	(−0.62)	(−2.81)	(−1.15)	(−1.71)	(−1.48)
N	535	881	542	872	561	941
R^2	0.047	0.055	0.039	0.054	0.043	0.070
Panel B. SIZE as a Measure of Firm Financial Status						
GROUP_LEVERAGE$_{t-1}$	−0.319**	−0.092	−0.373***	−0.103	−0.332**	−0.076
	(−2.54)	(−1.04)	(−3.06)	(−1.15)	(−2.66)	(−0.97)
N	556	860	558	856	528	974
R^2	0.052	0.074	0.049	0.072	0.056	0.080
Panel C. CASH as a Measure of Firm Financial Status						
GROUP_LEVERAGE$_{t-1}$	−0.182**	−0.063	−0.226***	−0.088	−0.153*	−0.097
	(−2.05)	(−0.54)	(−2.61)	(−0.76)	(−1.75)	(−0.93)
N	982	434	983	431	1,042	460
R^2	0.052	0.050	0.053	0.033	0.069	0.064
Panel D. TANGIBILITY as a Measure of Firm Financial Status						
GROUP_LEVERAGE$_{t-1}$	−0.213**	−0.070	−0.250**	−0.084	−0.120	−0.135
	(−1.97)	(−0.70)	(−2.42)	(−0.80)	(−1.25)	(−1.32)
N	685	731	690	724	726	776
R^2	0.045	0.060	0.045	0.061	0.038	0.098

the regression results for subgroups formed according to firm profitability. A comparison of coefficients across the subgroups reveals that the group leverage–sales growth estimate is significant only when the affiliated firms have poor cash-generating ability relative to industry rivals. This suggests that when a firm is profitable, it may not need to raise external financing or tap the internal capital market of its group. Consistent with this conjecture, high group leverage is more detrimental to affiliated firms that are less profitable than industry-average firms than to affiliated firms that are more profitable than their rivals.

Panel B of Table 5 reports the results for the subgroups divided by cash holdings. A comparison of the coefficients obtained from two subgroups based on cash holdings indicates that high group leverage does not significantly hurt the group-affiliated firms whose cash holdings are high, indicating that firms with

high cash reserves do not need much group support. The group leverage effect is negative and statistically significant only in firms hoarding less cash than their industry-average firms.

Panel C of Table 5 shows the effects of group leverage on subgroups partitioned by relative-to-industry size. A small firm is likely to have difficulty raising external financing. The group leverage coefficient is statistically significant only when firms are smaller than industry-average firms, suggesting that high group leverage has more harmful effects for smaller-than-industry-average firms. Panel D splits noncore samples on the basis of tangibility and again confirms that group leverage is more detrimental to firms whose financial position is weak: As firms hold relatively less tangible assets than the industry average, their group leverage coefficients are statistically significant. Despite an apparent difference in the coefficients of group leverage in Panels A–D, the Wald tests do not reject the equality of the group leverage coefficients across subgroup estimations.

Overall, the results in Table 5 support the views that high group leverage can lead the group's affiliated firms to lose product market share and that the magnitude of these losses depends on the affiliated firms' own financial status. The competitive effect of an internal capital market is determined jointly by a firm's and its group's financial strength.

D. Is the Effect of Group Leverage More Pronounced in High-Growth Industries?

Table 6 explores whether the effect of group leverage is stronger in high-growth industries, given that group firms operating in high-growth industries face larger financing needs to win in their competitive races and are more likely to face credit rationing. To test this prediction, I divide the industries into two subgroups: those whose sales growth exceeds the median growth of all industries and those whose sales growth is below the median.

The results confirm that the lack of group support matters more in fast-growing industries, which is consistent with Prediction 3. GROUP_LEVERAGE is statistically significant only in subsamples of firms in fast-growing industries. The differences between the coefficients from the two subsamples based on sales-growth rates are statistically significant (p-values: 0.0052 for the first noncore sample, 0.0122 for the second, and 0.0080 for the third). They are also consistent with evidence provided by Boutin et al. (2013) that group cash holdings have a stronger influence in deterring new entry into fast-growing industries.

The finding in this section is in line with that in the previous section that an affiliated firm's own financial strength determines the actual magnitude of the group leverage effect. When an affiliated firm has a weak financial position, because of their own and/or industry factors, high group leverage is detrimental to the affiliated firm.

E. Does the Group's Financial Weakness Reduce Affiliated Firms' Investments?

The results reported in the previous section suggest that group financial weakness hurts the product market performance of a group's affiliated firms.

TABLE 6

The Effect of Group Leverage on Fast-Growing Industries

The regressions reported in Table 6 examine whether the group leverage effect is greater in growing industries. The sample includes noncore firms in Korean *chaebols* for the 1999–2006 period. Core firms are those firms affiliated with i) the highest sales, ii) the largest asset base, and iii) the highest leverage within a group in a given year. To obtain a noncore sample, core firms as well as the affiliated firms operating in the same industry as the core firms are dropped. *Chaebol* firms in each noncore sample are divided into two subgroups: those whose industry sales growth exceeds the median growth of all industries (fast-growing industries) and those whose industry sales growth is below the median (slow-growing industries). The dependent variable is the relative-to-rivals sales growth of affiliated firms. SALES_GROWTH is annual sales growth at time t, given by $(\text{SALES}_t - \text{SALES}_{t-1})/\text{SALES}_{t-1}$. FIRM_LEVERAGE is the ratio of long-term debt to total assets. PROFITABILITY is operating earnings over assets. SIZE is the natural log of total assets. INVESTMENT is capital expenditures over assets. All firm-level variables are adjusted by their industry-year averages to control for industry effects. ULT_OWN represents the controlling family's cash-flow rights. GROUP_LEVERAGE is given by $\sum\text{LONG-TERM\_DEBT}_i/\sum\text{TOTAL\_ASSETS}_i$ of all other affiliated firms, excluding the firm of interest in the firm's group. GROUP_INVESTMENT is defined as $\sum\text{CAPITAL\_EXPENDITURES}_i/\sum\text{TOTAL\_ASSETS}_i$ for $i = 1, \ldots, N$, where there are N affiliated firms in a group. GROUP_SIZE is the natural logarithm of the sum of total assets of all N firms. GROUP_CASH is the sum of cash holdings and marketable securities over the sum of assets. All regressions include year dummies. The intercepts are not reported to save space. The estimations correct the error structure for heteroskedasticity and within-firm error clustering. t-statistics are in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	Dependent Variable: SALES_GROWTH$_t$					
	Core Firm as a Firm with Largest Sales		Core Firm as a Firm with Largest Size		Core Firm as a Firm with Largest Leverage	
Independent Variables	Slow-Growing Industries	Fast-Growing Industries	Slow-Growing Industries	Fast-Growing Industries	Slow-Growing Industries	Fast-Growing Industries
PROFITABILITY$_{t-1}$	−0.111	−0.046	−0.060	−0.036	−0.141	−0.018
	(−0.65)	(−0.41)	(−0.36)	(−0.32)	(−1.19)	(−0.18)
SIZE$_t$	−0.002	−0.019***	0.002	−0.020***	−0.003	−0.017***
	(−0.21)	(−3.09)	(0.25)	(−3.20)	(−0.59)	(−3.06)
INVESTMENT$_{t-1}$	0.702***	0.233	0.678***	0.261	0.839***	0.250
	(2.74)	(0.91)	(2.70)	(1.00)	(6.55)	(0.80)
FIRM_LEVERAGE$_{t-1}$	−0.044	0.034	−0.045	0.028	0.007	0.098
	(−0.88)	(0.54)	(−1.05)	(0.41)	(0.25)	(1.17)
ULT_OWN$_{t-1}$	0.001	0.001	0.0004	0.001	0.001	0.001
	(1.29)	(1.40)	(0.63)	(1.14)	(1.22)	(1.44)
GROUP_LEVERAGE$_{t-1}$	−0.030	−0.196**	−0.045	−0.248***	0.007	−0.291***
	(−0.26)	(−2.09)	(−0.39)	(−2.72)	(0.10)	(−2.95)
GROUP_SIZE$_t$	−0.013	0.024***	−0.013	0.017*	0.001	0.019**
	(−1.46)	(2.58)	(−1.45)	(1.88)	(0.18)	(2.18)
GROUP_INVESTMENT$_{t-1}$	0.708*	−0.040	0.543	−0.119	0.465	−0.336
	(1.65)	(−0.13)	(1.35)	(−0.39)	(1.18)	(−1.11)
GROUP_CASH$_{t-1}$	0.692	−0.005	0.711	−0.006	0.313	−0.099
	(1.57)	(−0.01)	(1.60)	(−0.02)	(0.94)	(−0.27)
N	542	874	537	877	613	889
R^2	0.090	0.052	0.081	0.054	0.108	0.058

To better understand the mechanism underlying the results, I explore how group leverage affects the corporate investments of group-affiliated firms. In line with the argument that investments may be essential to win in a competitive race, firm investment is shown to be the most significant explanatory variable among the several firm variables determining relative-to-rivals sales growth discussed in the previous sections. One cause of performance deterioration can be a reduction in investment.

The test design is similar to the main regression presented earlier, where relative-to-rivals sales growth is replaced by relative-to-rivals investment. I run investment regressions on the same three subsamples of noncore firms as reported in previous sections. The results of these tests are shown in Table 7. In all of the specifications, I observe that high group leverage significantly reduces the investments

TABLE 7

The Effect of Group Leverage on Investment

Table 7 presents estimates of regressions examining the effect of group leverage on the investments of affiliated firms. The sample includes noncore firms in Korean *chaebols* for the 1999–2006 period. Core firms are those firms affiliated with i) the highest sales, ii) the largest asset base, and ii) the highest leverage within a group in a given year. To obtain a noncore sample, core firms as well as the affiliated firms operating in the same industry as the core firms are dropped. The dependent variable is the relative-to-rivals investment, where investment is given by capital expenditures over assets. PROFITABILITY is operating earnings over assets. SIZE is the natural log of total assets. CASH is cash holdings plus marketable securities over assets. FIRM_LEVERAGE is the ratio of long-term debt to total assets. All firm-level variables are adjusted by their industry-year averages to control for unobserved industry effects. ULT_OWN represents the controlling family's cash-flow rights. GROUP_LEVERAGE is given by $\sum$LONG-TERM_DEBT$_i$/$\sum$TOTAL_ASSETS$_i$ of all other affiliated firms, excluding the firm of interest in the firm's group. GROUP_INVESTMENT is defined as $\sum$CAPITAL_EXPENDITURES$_i$/$\sum$TOTAL_ASSETS$_i$ for $i = 1, \ldots, N$, where there are N affiliated firms in a group. GROUP_SIZE is the natural logarithm of the sum of total assets of all N firms. GROUP_CASH is the sum of cash holdings and marketable securities over the sum of assets. All regressions include year dummies. The intercepts are not reported to save space. The estimations correct the error structure for heteroskedasticity and within-firm error clustering. t-statistics are in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	Dependent Variable: INVESTMENT$_t$					
	Core Firm as a Firm with Largest Sales		Core Firm as a Firm with Largest Size		Core Firm as a Firm with Highest Leverage	
Independent Variables	1	2	1	2	1	2
PROFITABILITY$_{t-1}$	0.048**	0.046**	0.048**	0.047*	0.063**	0.058**
	(2.13)	(2.01)	(2.12)	(2.05)	(2.53)	(2.42)
SIZE$_t$	−0.003*	−0.003**	−0.003*	−0.004**	−0.002*	−0.003**
	(−2.12)	(−2.38)	(−2.14)	(−2.16)	(−1.75)	(−2.06)
CASH$_{t-1}$	0.002	−0.006	0.0003	−0.006	0.016	0.010
	(0.07)	(−0.22)	(0.01)	(−0.21)	(0.65)	(0.42)
FIRM_LEVERAGE$_{t-1}$	−0.007	−0.005	−0.006	−0.005	−0.010	−0.011
	(−0.66)	(−0.47)	(−0.63)	(−0.53)	(−1.43)	(−1.55)
ULT_OWN$_{t-1}$	0.0002	0.0003	0.0001	0.0002	0.000	0.000
	(1.01)	(1.52)	(0.80)	(1.16)	(0.01)	(0.58)
GROUP_LEVERAGE$_{t-1}$	−0.074***	−0.052**	−0.077***	−0.058**	−0.054***	−0.033*
	(−3.40)	(−2.29)	(−3.50)	(−2.54)	(−2.89)	(−1.67)
GROUP_SIZE$_t$		0.003		0.002		0.003*
		(1.29)		(0.97)		(1.69)
GROUP_INVESTMENT$_{t-1}$		0.195***		0.174**		0.178***
		(2.66)		(2.36)		(2.66)
GROUP_CASH$_{t-1}$		−0.032		−0.041		−0.083
		(−0.39)		(−0.49)		(−1.21)
N	1,441	1,435	1,439	1,434	1,523	1,518
R^2	0.028	0.037	0.028	0.035	0.033	0.043

of affiliated firms. After controlling for the likely determinants of investments, the coefficient of group leverage is statistically significant and negative (e.g., −0.052, with a t-statistic of −2.29, in column 2). This implies that a 1-standard-deviation increase in group leverage results in a decrease in the affiliated firms' capital expenditure by about 0.6% of their assets, relative to industry-average firms. GROUP_SIZE and GROUP_INVESTMENT have a positive effect on the investments of affiliated firms, as expected, but only GROUP_INVESTMENT is statistically significant.

Overall, these findings are consistent with the prediction that group financial weakness discourages investments and thereby hurts the product market performance of group-affiliated firms. Group leverage reduces internal resources that can be reallocated to affiliated firms. Relative-to-rivals sales growth can be driven by a less aggressive strategy undertaken by affiliated firms with weak internal capital markets, but it can also arise from competitors' more aggressive actions. The relative-to-rivals investments of affiliated firms capture the effects of both sides.

One group's high group leverage may lead other groups with low leverage to take more aggressive actions in their product market competition.

F. Robustness Check (pseudo-*chaebols*)

The negative effect of group leverage on performance obtained in the previous section is derived from a lack of resources within highly indebted groups. However, it is still possible that an endogenous relation between a financial position and performance, unassociated with the operation of group internal capital markets, may drive the group leverage effect. In this scenario, the negative association between group leverage and performance would likely be observed if poorly performing firms happened to belong to one group, and because of their poor performance, the group firms had to keep high levels of debt. To cement the validity of my internal capital market explanation, the same negative effect should not appear in a pseudogroup (i.e., a collection of nongroup firms mimicking actual group firms). If I find a similar negative association in pseudogroups despite the fact that the firms within the pseudogroups are not actually related through internal capital markets, I cannot argue that internal capital markets drive the group leverage effect.

Therefore, I construct a pseudo-*chaebol* to mimic an actual *chaebol* using non-*chaebol* firms with similar firm characteristics. To form pseudo-*chaebols* that are as close as possible to actual *chaebols*, I use Abadie and Imbens's (2002) matching estimator (full covariate). The Abadie–Imbens estimator allows me to match a *chaebol* (treated) firm to a non-*chaebol* (control) firm, with respect to both categorical and continuous variables. I can produce exact matches on categorical variables and close matches on continuous variables. In this process, I use the 2-digit industry code and year as categorical variables, and I use the following firm characteristics as continuous variables: PROFITABILITY, SIZE, INVESTMENT, and FIRM_LEVERAGE. For each *chaebol* firm, the matching estimator selects two individual matches.[19] I allow one non-*chaebol* firm to be matched to more than one *chaebol* firm as long as the non-*chaebol* firm is the closest match to those *chaebol* firms. By placing these matched non-*chaebol* firms in the same pseudo-*chaebol*, I can construct the *chaebol*-level variables of the pseudo-*chaebol*.

Table 8 presents results from running the same baseline regressions as in Table 2 (but without ULT_OWN) on the sample of pseudo-*chaebol* firms. None of the group variables is statistically significant in all specifications. Specifically, GROUP_LEVERAGE is not significant, and the sign of the coefficient is even positive. Note that the coefficient of FIRM_LEVERAGE is statistically significant in Table 8 (pseudo-*chaebols*), whereas it is not significant in Table 2 (actual *chaebols*). Moreover, its magnitude in Table 8 is almost 10 times that of its counterpart in Table 2. In short, I do not observe the same group leverage effect in pseudo-*chaebols*.

The placebo test involving pseudo-*chaebols* helps rule out explanations that are unrelated to the operation of internal capital market within *chaebols*. A final

[19]If two non-*chaebol* firms are equally close to that being matched (a *chaebol* firm), both will be used. I also match one control firm per treated firm, but the results do not change.

TABLE 8

Pseudo-*Chaebols*

Table 8 presents results of regressions that relate group leverage to the sales growth of affiliated firms. The sample includes Korean pseudo-*chaebol* firms for the 1999–2006 period. The pseudo-*chaebol* is a collection of non-*chaebol* firms that are selected to mimic actual *chaebol* firms using the matching estimator (full covariate) of Abadie and Imbens (2002). PROFITABILITY, SIZE, INVESTMENT, FIRM_LEVERAGE, industry code, and year are matching characteristics. The dependent variable is the relative-to-rivals sales growth of pseudo-*chaebol* firms. SALES_GROWTH is annual sales growth at time t, given by $(\text{SALES}_t - \text{SALES}_{t-1})/\text{SALES}_{t-1}$. FIRM_LEVERAGE is the ratio of long-term debt to total assets. PROFITABILITY is operating earnings over assets. SIZE is the natural log of total assets. INVESTMENT is capital expenditures over assets. All firm-level variables are adjusted by their industry-year averages to control for industry effects. GROUP_LEVERAGE is given by $\sum\text{LONG-TERM\_DEBT}_i/\sum\text{TOTAL\_ASSETS}_i$ of all other affiliated firms, excluding the firm of interest in the firm's group. GROUP_INVESTMENT is defined as $\sum\text{CAPITAL\_EXPENDITURES}_i/\sum\text{TOTAL\_ASSETS}_i$ for $i = 1, \ldots, N$, where there are N affiliated firms in a group. GROUP_SIZE is the natural logarithm of the sum of total assets of all N firms. GROUP_CASH is the sum of cash holdings and marketable securities over the sum of assets. All regressions include year dummies. The intercepts are not reported to save space. The estimations correct the error structure for heteroskedasticity and within-firm error clustering using the Huber–White estimator. t-statistics are in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Independent Variables	Dependent Variable: SALES_GROWTH$_t$			
	1	2	3	4
PROFITABILITY$_{t-1}$	0.109	0.002	−0.002	−0.001
	(0.77)	(0.01)	(−0.02)	(−0.01)
SIZE$_t$	0.005	0.009	0.008	0.008
	(0.57)	(0.90)	(0.82)	(0.82)
INVESTMENT$_{t-1}$	0.524**	0.467*	0.458*	0.456*
	(2.16)	(1.93)	(1.90)	(1.89)
FIRM_LEVERAGE$_{t-1}$		−0.114**	−0.114**	−0.114**
		(−2.49)	(−2.50)	(−2.50)
GROUP_LEVERAGE$_{t-1}$	0.070	0.079	0.078	0.076
	(1.22)	(1.38)	(1.38)	(1.35)
GROUP_SIZE$_t$			0.003	0.003
			(0.50)	(0.51)
GROUP_INVESTMENT$_{t-1}$			0.278	0.266
			(1.34)	(1.23)
GROUP_CASH$_{t-1}$				−0.057
				(−0.24)
N	2,838	2,835	2,835	2,835
R^2	0.018	0.027	0.027	0.027

takeaway from these results is that, whether it is due to their own leverage or group leverage, highly indebted firms lose market share to their rivals in the period following the financial crisis when external financing is extremely difficult to access.

V. Conclusion

I find that a business group's financial weakness influences the product market outcomes of its affiliated firms and their rivals. In particular, I provide evidence that high group leverage leads to market share losses of group-affiliated firms to their industry rivals. This group leverage effect is magnified when affiliated firms themselves are financially weak. Additionally, group leverage exerts larger negative influence when the affiliated firms operate in fast-growing industries. The negative effect of group leverage is explained by the lack of internal market resources, which discourages group firms from making corporate investments essential to competition. Finally, by forming and testing pseudo-*chaebols*, I confirm that the group leverage effect is indeed derived from internal capital market operations.

Overall, these results reveal the dark sides of group internal capital markets. In particular, I provide evidence that group-affiliated firms may indeed lose market share if their groups are financially weak. To the best of my knowledge, this paper is the first to confirm that group leverage can actually hurt the competitiveness of group-affiliated firms in their product markets relative to their incumbent rivals. Overall, the evidence from Korean *chaebols* during the period immediately following the Asian Financial Crisis suggests that highly indebted firms, whether their indebtedness is due to their own debt financing or group debt financing, lose market share to their industry rivals when they cannot readily access external capital markets due to a financial crisis. This evidence is consistent with previous studies arguing for the negative effect of firm financial weakness on product market competition (Chevalier (1995), Zingales (1998), and Campello (2003)).

This study's focus is on the effect of internal capital markets on the market share expansion of affiliated firms. My results shed light on the claim that access to group resources, by complementing the individual-firm financing of group-affiliated firms, may affect those firms and their industry rivals along product market dimensions, and with respect to investment policy. These findings point to several interesting avenues for future research. First, just as Boutin et al. (2013) show that group cash holdings can strengthen the product market competitiveness of affiliated firms, it would be fruitful to study how other group characteristics affect the strategic dimensions of affiliated firms and firm rivals. Second, this paper may have implications for understanding the context of the global financial crisis of 2008 and its associated recession. The results presented here suggest that some firms with access to internal resources may suffer more when they face harsh external financing markets. It would be interesting to examine how diversified conglomerates managed their divisions in 2008 and following years based on their relative financial positions.

References

Abadie, A., and G. Imbens. "Simple and Bias-Corrected Matching Estimators for Average Treatment Effects." National Bureau of Economic Research Technical Working Paper 0283 (2002).

Almeida, H.; M. Campello; and M. Weisbach. "The Cash Flow Sensitivity of Cash." *Journal of Finance*, 59 (2004), 1777–1804.

Almeida, H.; C.-S. Kim; and H. B. Kim. "Internal Capital Markets in Business Groups: Evidence from the Asian Financial Crisis." *Journal of Finance*, 70 (2015), 2539–2586.

Almeida, H.; S. Y. Park; M. Subrahmanyam; and D. Wolfenzon. "The Structure and Formation of Business Groups: Evidence from Korean *Chaebols*." *Journal of Financial Economics*, 99 (2011), 447–475.

Almeida, H., and D. Wolfenzon. "A Theory of Pyramidal Ownership and Family Business Groups." *Journal of Finance*, 61 (2006), 2637–2681.

Barber, B. M., and J. D. Lyon. "Firm Size, Book-to-Market Ratio, and Security Returns: A Holdout Sample of Financial Firms." *Journal of Finance*, 52 (1997), 875–883.

Belenzon, S., and T. Berkovitz. "Innovation in Business Groups." *Management Science*, 56 (2010), 519–535.

Berger, P.; E. Ofek; and I. Swary. "Investor Valuation and Abandonment Option." *Journal of Financial Economics*, 42 (1996), 257–287.

Bolton, P., and D. Scharfstein. "A Theory of Predation Based on Agency Problems in Financial Contracting." *American Economic Review*, 80 (1990), 93–106.

Boutin, X.; G. Cestone; C. Fumagalli; G. Pica; and N. Serrano-Velarde. "The Deep-Pocket Effect of Internal Capital Markets." *Journal of Financial Economics*, 109 (2013), 122–145.

Brander, J., and T. Lewis. "Oligopoly and Financial Structure." *American Economic Review*, 76 (1986), 956–970.

Campello, M. "Internal Capital Markets in Financial Conglomerates: Evidence from Small Bank Responses to Monetary Policy." *Journal of Finance*, 57 (2002), 2773–2805.
Campello, M. "Capital Structure and Product Markets Interactions: Evidence from Business Cycles." *Journal of Financial Economics*, 68 (2003), 353–378.
Campello, M. "Debt Financing: Does It Boost or Hurt Firm Performance in Product Market?" *Journal of Financial Economics*, 82 (2006), 135–172.
Cestone, G., and C. Fumagalli. "The Strategic Impact of Resource Flexibility in Business Groups." *RAND Journal of Economics*, 36 (2005), 193–214.
Chevalier, J. "Do LBO Supermarkets Charge More? An Empirical Analysis of the Effects of LBOs on Supermarket Pricing." *Journal of Finance*, 50 (1995), 1095–1112.
Coase, R. "The Nature of the Firm." *Economica*, 4 (1937), 386–405.
Flannery, M. J. "Debt Maturity and the Deadweight Cost of Leverage: Optimally Financing Banking Firms." *American Economic Review*, 84 (1994), 320–331.
Frank, M. Z., and V. K. Goyal. "Capital Structure Decisions: Which Factors Are Reliably Important?" *Financial Management*, 38 (2009), 1–37.
Fresard, L. "Financial Strength and Product Market Behavior: The Real Effects of Corporate Cash Holdings." *Journal of Finance*, 65 (2010), 1097–1122.
Gopalan, R.; V. Nanda; and A. Seru. "Affiliated Firms and Financial Support: Evidence from Indian Business Groups." *Journal of Financial Economics*, 86 (2007), 759–795.
Gopalan, R., and K. Xie. "Conglomerates and Industry Distress." *Review of Financial Studies*, 24 (2011), 3642–3687.
Grossman, S., and O. Hart. "The Costs and Benefits of Ownership: A Theory of Vertical and Lateral Integration." *Journal of Political Economy*, 94 (1986), 691–719.
Guedj, I., and D. Scharfstein. "Organizational Scope and Investment: Evidence from the Drug Development Strategies and Performance of Biopharmaceutical Firms." National Bureau of Economic Research Working Paper 10933 (2004).
Hadlock, C. J., and R. Sonti. "Financial Strength and Product Market Competition: Evidence from Asbestos Litigation." *Journal of Financial and Quantitative Analysis*, 47 (2012), 179–211.
Khanna, N., and S. Tice. "The Bright Side of Internal Capital Markets." *Journal of Finance*, 56 (2001), 1489–1531.
Klein, B.; R. Crawford; and A. Alchian. "Vertical Integration, Appropriable Rents, and the Competitive Contracting Process." *Journal of Law and Economics*, 21 (1978), 297–326.
Kovenock, D., and G. Phillips. "Capital Structure and Product Market Behavior: An Examination of Plant Exit and Investment Decisions." *Review of Financial Studies*, 10 (1997), 767–803.
Kuppuswamy, V., and B. Villalonga. "Does Diversification Create Value in the Presence of External Financing Constraints? Evidence from the 2007–2009 Financial Crisis." *Management Science*, forthcoming (2016).
Lamont, O. "Cash Flow and Investment: Evidence from Internal Capital Markets." *Journal of Finance*, 52 (1997), 83–109.
Lang, L.; E. Ofek; and R. M. Stulz. "Leverage, Investment and Firm Growth." *Journal of Financial Economics*, 40 (1996), 3–29.
Maksimovic, V. "Capital Structure in Repeated Oligopolies." *RAND Journal of Economics*, 19 (1988), 389–407.
Maksimovic, V., and G. Phillips. "Do Conglomerate Firms Allocate Resources Inefficiently across Industries? Theory and Evidence." *Journal of Finance*, 57 (2002), 721–767.
Maksimovic, V., and G. Phillips. "Conglomerate Firms and Internal Capital Markets." In *Handbook of Corporate Finance: Empirical Corporate Finance*, vol. 1, B. E. Eckbo, ed. Amsterdam: North-Holland, Elsevier (2007).
Maksimovic, V., and G. Phillips. "The Industry Life Cycle, Acquisitions and Investments: Does Firm Organization Matter?" *Journal of Finance*, 63 (2008), 673–708.
Mathews, R. D., and D. T. Robinson. "Market Structure, Internal Capital Markets, and the Boundaries of the Firm." *Journal of Finance*, 63 (2008), 2703–2736.
Matsusaka, J., and V. Nanda. "Internal Capital Markets and Corporate Refocusing." *Journal of Financial Intermediation*, 11 (2002), 176–211.
Mullainathan, S., and D. Scharfstein. "Do Firm Boundaries Matter?" *American Economic Review*, 91 (2001), 195–199.
Myers, S. C. "The Determinants of Corporate Borrowing." *Journal of Financial Economics*, 5 (1977), 146–175.
Petersen, M. A. "Estimating Standard Errors in Finance Panel Data Sets: Comparing Approaches." *Review of Financial Studies*, 22 (2009), 435–480.
Samphantharak, K. "Internal Capital Markets in Business Groups." Working Paper, University of California at San Diego (2002).

Seru, A. "Firm Boundaries Matter: Evidence from Conglomerates and R&D Activity." *Journal of Financial Economics*, 111 (2014), 381–405.

Shin, H., and R. M. Stulz. "Are Internal Capital Markets Efficient?" *Quarterly Journal of Economics*, 113 (1998), 531–552.

Song, K., and Y. Lee. "Long-Term Effects of a Financial Crisis: Evidence from Cash Holdings of East Asian Firms." *Journal of Financial and Quantitative Analysis*, 47 (2012), 617–641.

Stein, J. C. "Agency, Information and Corporate Investment." In *Handbook of the Economics of Finance*, vol. 1A, G. M. Constantinides, M. Harris, and R. M. Stulz, eds. Amsterdam: North-Holland, Elsevier (2003).

Telser, L. G. "Cutthroat Competition and the Long Purse." *Journal of Law and Economics*, 9 (1966), 259–277.

Villalonga, B. "Diversification Discount or Premium? New Evidence from the Business Information Tracking Series." *Journal of Finance*, 59 (2004a), 479–506.

Villalonga, B. "Does Diversification Cause the 'Diversification Discount'?" *Financial Management*, 33 (2004b), 5–27.

Williamson, O. *Markets and Hierarchies: Analysis and Antitrust Implications*. New York, NY: Free Press (1975).

Williamson, O. *The Economic Institutions of Capitalism: Firms, Markets, and Relational Contracting*. New York, NY: Free Press (1985).

Zingales, L. "Survival of the Fittest or the Fattest? Exit and Financing in the Trucking Industry." *Journal of Finance*, 53 (1998), 905–938.