RIETI Discussion Paper Series 17-E-004

Are Smaller (Larger) Corporate Headquarters Better?

MIYAJIMA Hideaki
RIETI

OGAWA Ryo
Waseda University

USHIJIMA Tatsuo
Keio University

The Research Institute of Economy, Trade and Industry
http://www.rieti.go.jp/en/

RIETI Discussion Paper Series 17-E-004

January 2017

Are Smaller (Larger) Corporate Headquarters Better?*

MIYAJIMA Hideaki

Waseda University and Research Institute of Economy, Trade and Industry

OGAWA Ryo

Waseda University

USHIJIMA Tatsuo **

Keio University

ABSTRACT

This paper investigates the size and performance effect of corporate headquarters for a large sample of Japanese firms. We find that the size of headquarters is systematically associated with firm attributes such as scale, industrial scope, and research and development (R&D) and advertising intensities. We also observe that better governed firms have larger headquarters in contrast to the view that corporate headquarters are apt to be overstaffed due to agency problems. Our analysis of firm value suggests that enlarging headquarters involves a cost that is particularly great for diversified firms. Specifically, as headquarters grow in size, the efficiency of inter-business fund flow declines. This novel finding suggests that downsizing headquarters can improve firm performance by increasing allocative efficiency.

***JEL classification*:** L22; L25; G31

***Keywords*:** Corporate headquarters, Diversification, Internal capital market, Japan

* This study is conducted as a part of the Project "Frontiers of Analysis on Corporate Governance: Risk-taking and Corporate Governance" undertaken at Research Institute of Economy, Trade and Industry(RIETI). This study utilizes the micro data of the questionnaire information based on "the Basic Survey of Japanese Business Structure and Activities" which is conducted by the Ministry of Economy, Trade and Industry (METI).
** Corresponding author.

1. Introduction

Corporate headquarters, which help executives to manage their firms and provide administrative services to other organizational units, are an important feature of modern corporations. However, it is widely believed that large headquarters harm corporate performance by increasing overhead costs and lowering the quality and speed of managerial decisions. Corporate restructuring abounds with episodes that are consistent with this view. For instance, to make General Electric a nimbler and more entrepreneurial organization, Jack Welch eliminated corporate planning staff, who in his words were "the questioners, and checkers, the nitpickers who bog down the process (of strategy making)."[1] Similarly, Kazuhiro Tsuga slashed the headquarters jobs at Panasonic in half in 2012 as his first job as the company's CEO. Thus, are smaller corporate headquarters better?

Understanding the roles and effect on firm performance of corporate headquarters is important to many strands of research. Since Chandler (1962), the roles of headquarters in diversified firms have been a central topic in management. Collis and Montgomery (1998) and Campbell, Whitehead, Alexander, and Goold (2014) discuss various types of corporate (parental) advantage through which headquarters make diversified firms worth more than the sum of their parts. Corporate headquarters also play a central role in capital budgeting. Accordingly, they can substantially affect the efficiency of internal capital markets, a hotly debated issue in finance (e.g., Shin and Stulz, 1998; Rajan, Servaes, and Zingales, 2000). Headquarters are also of interest to organizational economists because their size and structure reflect the allocation of decision-making authorities within a corporate hierarchy (Guadalupe, Li, and Wulf, 2014).

Nevertheless, answering the preceding question is difficult for academic researchers

[1] Christopher A. Bartlett and Meg Wozny (2002), "GE's two-decade transformation: Jack Welch's leadership," Harvard Business School Case 9-399-150. The words in parenthesis are added by the current authors.

because no theory unambiguously predicts the relationship between the size of a firm's central office and its performance. Moreover, empirical evidence on corporate headquarters is in short supply because of severe data constraints on firms' internal structure. Consequently, previous studies are predominantly case based except for a few notable contributions. In this article, we seek to contribute by making progress on the empirical front by studying the headquarters of publicly traded Japanese firms. Using data obtained from a unique governmental survey, we investigate factors underlying the size distribution of headquarters and the effect of headquarters' size on firm value.

In studying the determinants of headquarters' size, we are particularly interested in the effect of corporate governance because a possible reason behind the popular praise for "mean and lean" headquarters is that firms tend to have an oversized central office because of managerial agency problems. That is, as suggested by Williamson (1963), executives may overinvest in headquarters to increase their private benefits. We investigate this possibility by estimating the effect of variables that are known to affect the governance quality of Japanese firms. If an overinvestment problem exists, we should observe that better governed firms have smaller headquarters.

Our regressions identify several important determinants of the size of corporate headquarters. For instance, firm size and scope are negatively associated with headquarters' size, suggesting that there are scale and scope economies in headquarters' activities. An important result is that firms with higher R&D and advertising intensities tend to have larger headquarters. This pattern is consistent with the notion that a central role of corporate headquarters is the management of resources that are of firm-wide importance (Collis and Montgomery, 1998). Governance variables are also significantly associated with the size of headquarters. However, we find that better governed firms have larger, not smaller, headquarters. The association between governance quality and headquarters' size is therefore

opposite from the one implied by the overinvestment hypothesis. This result suggests that overstaffing is generally not a problem for the headquarters of sample firms.

Our analysis of firm value pays particular attention to diversified firms because beginning with Chandler (1962), researchers have advanced that corporate headquarters play particularly important roles in the management of multi-business firms. Using excess value proposed by Berger and Ofek (1995) for estimating diversification discounts (premiums), we find that headquarters' size is positively and significantly associated with firm value. This result is consistent with Collis et al. (2007) and Morikawa (2015) who also identify a positive relationship between headquarters' size and firm performance. In the present data, however, the positive association between headquarters' size and firm value is largely attributable to their unobserved common determinants. When such factors are accounted for by firm fixed effects, the association is substantially weakened for focused firms and disappears for diversified firms. This result suggests that enlarging headquarters generates a cost that is particularly large for multi-business firms.

For understanding the cost of large headquarters for diversified firms, we examine a hypothesis suggested by Williamson (1975), Chandler (1991), and Hill (1988 and 1994). These authors posit that a significant cost of large headquarters is a loss of efficiency in internal capital markets. The loss arises because large hands-on corporate headquarters lower the autonomy and accountability of business units and thereby mitigate competition for internal funds. We test this hypothesis using the relative value added index proposed by Rajan et al. (2000) for measuring the efficiency of a diversified firm's fund flows across segments. Consistent with the hypothesis, we find that the effect of headquarters' size on the efficiency of fund flows is robustly negative. This result suggests that downsizing headquarters, as often advocated in the business press, can be a remedy for poor performance if it is caused by inefficient internal capital markets.

This article contributes to various strands of research. Although management scholars have long noted that large headquarters or, more broadly, centralized corporate structure handicap firms in the generation of financial synergy, evidence supporting this view has been lacking. Our evidence for the adversarial effect of headquarters' size on intra-firm fund flows helps fill this void. In finance, a growing body of research documents that the efficiency of internal capital market is influenced by organizational factors, such as the background of CEO and the connection between executive and divisional managers (e.g., Xuan, 2009; Duchin and Sosyura, 2013; Glasper, Lopez-de-Silanes, and Saunter, 2013). Our evidence suggests that in addition to such informal (soft) factors, the formal (hard) structure of organization importantly underlies allocative efficiency.

The rest of this article is organized as follows. The next section reviews the literature. Section 3 introduces sample and data. Section 4 performs regressions to identify the determinants of headquarters' size. Section 5 is for the analysis of firm value and internal capital markets. The study's conclusions are presented in the final section.

2. Background

2.1. Concept

Menz, Kunisch, and Collis (2013) define corporate headquarters as "the firm's central organizational unit, (structurally) separated from the operating units (business and geographical units), hosting corporate executives and staff, as well as central staff functions that fulfil various roles for the overall firm." Although academic interest in corporate headquarters emerged from the study of divisional (M-form) structure of diversified firms (e.g., Chandler, 1962; Williamson, 1975), single-business firms organized along the functional (U-form) structure also have headquarters that play roles that are necessary regardless of firm scope. Such "obligatory" roles include the legal representation of the entire firm and the centralized

production and provision of administrative services in such areas as general management, legal, finance, treasury, and taxation (Collis and Montgomery, 1998; Collis, Young, and Goold, 2007; Campbell et al., 2014).

The two other roles of headquarters stressed in the literature are more specific to multi-business firms. The first is creating value through the management of synergistic links across business units (Chandler, 1991; Foss, 1997). Corporate headquarters perform this role by acting as the guardian of resources that are jointly used by multiple divisions, creating organizational mechanisms that foster inter-divisional cooperation, and centralizing activities that are critical for the performance of the entire firm (Hill, 1994; Collis and Montgomery, 1998; Campbell et al., 2014). The second is preventing loss by mitigating agency problems of divisional managers (Chandler, 1991; Foss, 1997). Headquarters perform this role, which is critical to the efficiency of internal capital markets, by fostering competition among divisions, developing financial control mechanisms that hold divisions accountable for their performance, and restructuring organization to mitigate influence activities (Hill, 1994; Chandler, 1991; Meyer, Milgrom, and Roberts, 1992).

Importantly, Chandler (1991) and Hill (1988 and 1994) hypothesize that there is a trade-off between the above-described value-creating and loss-preventing roles. While strong operating synergy requires large headquarters, which actively intervene in divisional activities as the central planner-cum-coordinator, such intervention makes divisions less accountable for their performance by decreasing their autonomy. Consequently, as stressed by Williamson (1975), large hands-on headquarters compromise the efficiency of internal capital markets, which critically depends on competition among autonomous divisions. Therefore, multi-business firms must choose between large headquarters (centralized structure) suited for operating synergy and small headquarters (decentralized structure) suited for financial synergy. Consistent with this view, Chandler (1991) observes that firms engaged in related

diversification tend to have larger headquarters than those engaged in unrelated diversification (conglomerates).

The trade-off hypothesis also implies that the relationship between headquarters' size and firm performance is a priori ambiguous because large and small headquarters have differential costs and benefits. This contrasts with a popular view in the business press that a large central office is a symptom of corporate obesity and bureaucracy and therefore harmful for firm performance. Because corporate headquarters are cost centers, there is little doubt that excessively large headquarters depress firm performance. However, why do they become oversized? Williamson (1963) suggests that executives overinvest in headquarters because a large central office makes their jobs easier, more joyful, and more prestigious. Executives may also feel reluctant to restructure headquarters because they care about employees, particularly those working close to them. Bertrand and Mullainathan (2003), Landier, Nair, and Wulf (2009), and Cronqvist, Heyman, Nilsson, Svaleryd, and Vlachos (2009) provide evidence that executives value social relationships with proximate employees such as headquarters' staff. Therefore, the overstaffing of headquarters may arise as a managerial agency problem.[2] We examine this possibility in Section 4 by estimating the effect of corporate governance on headquarters' size.

2.2. Evidence

Previous studies of corporate headquarters are predominantly case based because a firm's internal structure is difficult to observe. However, two notable exceptions exist. Collis et al. (2007) conduct a survey of headquarters of firms in seven countries including Japan. They

[2] Available evidence on this issue is limited and dated. Caves and Krepps (1993) provide weak evidence that the white-collar employment in U.S. manufacturing contains some "fat." Lichtenberg and Siegel (1990) find that U.S. employment at auxiliary establishments such as headquarters declines more than plant employment after a firm is taken over.

report a number of important results. For instance, they find that firms with a more centralized structure and those with deeper corporate involvement in operating activities have larger headquarters. An interesting result is that the size of headquarters is positively correlated with firm profitability in contrast to the view that large headquarters generate inefficiency. Collis et al. (2007) also find that Japanese firms have larger headquarters than firms in other countries.[3] According to their data, Japanese headquarters are large mainly because of their involvement in a wide range of operating activities. This pattern is consistent with Kano (1999), who argues that large headquarters with a wide functional scope characterize Japanese firms' organization.

Morikawa (2015) investigates Japanese headquarters based on data obtained from the Basic Survey of Japanese Business Structure and Activities (BSJBSA). This unique survey is conducted annually by the Ministry of Economy, Trade and Industry for collecting information on the operations, finance, and organization of firms with fifty or more employees and whose paid-up capital or investment fund is over 30 million yen. In particular, BSJBSA inquires as to the number of headquarters' staff by functional area. Morikawa (2015) uses this information to measure the size of headquarters for a large sample of firms. He observes that the average ratio of headquarters' staff in total employment is 13%, which is substantially larger than the comparable figure reported by Collis et al. (2007) for Japanese firms. As we will elaborate in the next section, this gap largely reflects the fact that while Collis et al. (2007) focus on large public firms, Morikawa's (2015) sample is dominated by small private firms. A key finding of Morikawa (2015) is that firms with larger headquarters are more productive. This result is robust to the controls for unobserved heterogeneity and the endogeneity of headquarters' size.

To summarize, a striking aspect of the existing evidence is that firms with larger headquarters perform better, not worse. Is the popular praise for small headquarters misplaced?

[3] Specifically, the median number of headquarter staff per 1,000 employees is 38.7 for Japanese firms, compared to 19.7 for the entire sample and 14.8 for U.S. firms. Even when various confounding factors are accounted for, Japanese headquarters are, on average, 40% larger than their U.S. counterparts.

We need to exercise caution in considering this issue. Collis et al.'s (2007) analysis is cross-sectional and therefore has limited power to claim causality. This is less of an issue for Morikawa's (2015) longitudinal analysis. However, his sample is dominated by small firms with simple organization. Whether the positive performance effect of headquarters holds even when the sample is limited to large firms with complex internal structure is uncertain. Moreover, many related issues remain underexplored. For instance, do executives overinvest in headquarters? How do headquarters affect synergy, a topic so central to the literature on diversification? In the sections that follow, we seek to help fill these gaps partially by supplying evidence from Japanese firms.

3. Data

3.1. Sample

In constructing the sample, we begin with all non-financial firms that were publicly traded from 2001 to 2010. We obtain financial data of sample firms from the Nikkei NEEDS database. We omit firm with negative equity and holding companies as well as multi-segment firms with a segment coded "9999" (unable to classify).[4] After screening, the initial sample includes 35,863 firm-years, of which 18,535 are multi-segment observations. Following Morikawa (215), we obtain headquarters data from BSJBSA. We find that approximately 62% of the firms in the initial sample are matchable with BSJBSA.[5] Matching is incomplete for two main reasons. First, BSJBSA is not a census to which firms are legally obliged to respond. The response rate varies from 76% to 85% during our sample period. Second, BSJBSA does not cover all industries. Its coverage is limited to mining, manufacturing, public utility,

[4] Holding companies are excluded because they are poorly represented in BSJBSA, from which we obtain headquarters data.

[5] Matching is based on files provided by the Research Institute of Economy, Trade and Industry, which link the firm identification code of BSJBSA and the security code of public firms.

wholesale and retail trades, and selected service industries. After eliminating observations with unrealistically large headquarters, the matched sample contains 22,165 firm-years, of which 11,290 are multi-segment observations.[6] Firms in the matched sample are somewhat larger than firms in the initial sample, with the mean total asset being 206 (171) billion yen for the former (latter).

In collecting employment data, BSJBSA asks firms for the number of headquarters' staff in five functional areas: planning and research, information processing, R&D, international affairs, and others (general affairs, personnel, finance, etc.). The survey clearly separates headquarters and divisional employees performing similar jobs. For instance, engineers affiliated with a corporate lab are included in headquarters' staff but those affiliated with a divisional lab are not. For firms with a corporate group structure, we define the central office of the core (parent) firm as their corporate headquarters.[7]

3.2 Headquarters

Table 1 describes the size distribution of headquarters. Panel A tabulates the number of headquarters' staff and total (consolidated) employment of sample firms. The average number of headquarters' staff is 184. As the median (64) is considerably smaller than the mean, the distribution of headquarters' size is skewed. However, the distribution of total employment is even more skewed, with the mean (4,073) being more than four times larger than the median (733). The less-skewed distribution of headquarters' size suggests that larger firms have a relatively small central office. We shortly provide evidence on this point.

[6] Specifically, we omit firms if the number of headquarters' staff is 70% or more of the total (consolidated) employment.

[7] We have data of the headquarters of subsidiaries covered by BSJBSA. However, subsidiary headquarters are divisional headquarters from the standpoint of the corporate group and therefore functionally different from corporate headquarters, which are responsible for the management of the entire firm (group).

Of the five headquarters' functions classified by BSJBSA, "others", on average, has the largest number of staff, with the mean (median) being 97 (37). This is unsurprising because "others" includes obligatory functions, which essentially all firms have, such as general affairs, finance, and personnel. The four other functions are more discretionary in that not all firms have designated corporate-level staff. In particular, a majority of sample firms have no headquarters' staff engaged in R&D and international affairs. These functions also have relatively large standard deviations (SD). While the coefficient of variation (SD/mean) of the number of headquarters' staff is 3.5 for "others," it is 6.8 and 4.8 for R&D and international affairs, respectively.

Panel B tabulates the ratio of headquarters' staff in total employment. The mean (median) ratio of total headquarters' staff is .116 (.087), which is considerably larger than the .040 (.039) reported by Collis et al. (2007) for Japanese firms. This gap mostly emanates from the fact that Collis et al. (2007) focus on firms with 2,000 or more employees but we do not use any size cutoff in sampling firms. Consequently, the median employment of their sample firms is substantially larger than that of ours (6,100 vs. 733). When firms with less than 2,000 employees are excluded from our sample, the mean (median) ratio of total headquarters' staff declines to .057 (.040). Hence, the gap essentially disappears. To delve deeper into the influence of firm size, we divide sample firms into five equally sized bins based on total employment. As depicted in Figure 1, the ratio of headquarters' staff declines sharply with firm size. While the mean (median) ratio is .191 (.152) for firms in the bottom quintile, it is .052 (.037) for firms in the top quintile. Therefore, the data clearly indicate that large firms tend to have disproportionately small headquarters.

Table 2 reports the descriptive statistics of relative headquarters' size by year. The mean and median ratios of total headquarters' staff are essentially constant over the sample

period. Hence, we observe neither a downsizing nor upsizing trend for the headquarters of Japanese firms.

4. Analysis of Headquarters' Size

4.1. Model

This section performs regressions to examine how the size of corporate headquarters varies across firms. Our main goal is twofold. The first is to identify firm attributes that are systematically associated with headquarters' size. The second is to shed light on agency problems (or lack thereof) by estimating the effect of corporate governance. If ill-disciplined managers are apt to overinvest in the central office for their private benefits, we expect that poorly governed firms tend to have larger headquarters.

Our dependent variable is the ratio of headquarters' staff in total employment. The regression model is specified as follows:

$$Headquarters_{it} = \alpha + \beta \cdot x_{it} + \gamma \cdot z_{it} + \psi_t + \theta_j + \epsilon_{it},$$

where x is a vector of firm attributes, z is a vector of corporate governance variables, ψ is a year-fixed effect, and θ is an industry fixed effect (2-digit).[8] We estimate specifications with and without corporate governance variables, which we obtain from the Nikkei Cges (Corporate governance evaluation system). Because the initial year in this database is 2004, the estimation period with governance variables is shorter than the full period, 2001 to 2010. The firm attributes (x) we consider include firm size and scope, R&D and advertising intensities, corporate structure, the share of foreign sales, profitability, and leverage.

[8] The industry of multi-segment firms is based on the largest segment in terms of sales.

We measure firm size and scope by the logarithm of total employment and a dummy for firms that operate multiple 4-digit segments, respectively. Given the finding in the previous section, we anticipate that the effect of firm size is negative. The effect of firm scope is difficult to predict. On the one hand, headquarters' activities in such areas as general affairs, treasury, and taxation may exhibit economies of scope as they have low business specificity. Moreover, decentralization, which decreases the need for a large central office, is generally more important for diversified firms than for focused firms (e.g., Chandler, 1962, Williamson, 1975). On the other hand, diversification increases the complexity of strategy making, resource allocation, and organizational administration. Therefore, the executives of diversified firms may need more supports form headquarters' staff in performing their jobs than the executives of focused firms.

R&D and advertising intensities are included to shed light on the role of headquarters as the guardian of synergy-generating resources (Markides and Williamson, 1994; Collis and Montgomery, 1998; Campbell et al., 2014). We expect that this role is particularly important for firms with a large stock of intangible assets, such as proprietary technology and brand names, because these assets can be shared by multiple businesses at low cost and thus are rich in synergy opportunities (e.g., Teece, 1982, Itami, 1987). The expected effects of R&D and advertising intensities are therefore positive. R&D (advertising) intensity is defined as R&D (advertising) expenditure over sales.

The size of headquarters will also be affected by the corporate structure in which they are embedded. We employ the ratio of consolidated (parent plus subsidiaries) employment to unconsolidated (parent only) employment as a measure of decentralized structure. In creating an operating unit, firms can organize it as an internal division or a subsidiary. Firms that opt for the latter option decentralize their organization because subsidiaries are generally more autonomous than internal divisions. Unlike internal divisions, subsidiaries have legal identity,

which enables them to enter a contract in their own name. In addition, the organization of a subsidiary is physically separated from the rest of the firm. Because decentralization decreases the need for large headquarters by shifting decision rights to a lower level of hierarchy, the anticipated effect of decentralized structure on headquarters' size is negative.

The effect of foreign sales ratio is a priori ambiguous. It can be negative because firms that operate abroad must transfer some of their administrative functions to foreign subsidiaries to comply with local laws and regulations. At the same time, however, internationalization may demand a large central office to coordinate operations dispersed over distant locations. We define profitability as earnings before interest, taxes, depreciation, and amortization (EBITDA) over sales. Our measure of leverage is debt over the market value of equity.

For estimating the effect of corporate governance system, we consider the following five variables: the ownership share of institutional investors (-), the ownership share of interlocking shareholders (+), executive ownership share (-), the share of independent directors on the board (-), and a dummy variable for firms with anti-takeover provisions (+). In parentheses are signs anticipated if strong corporate governance deters executives from overinvesting in the central office. The anti-takeover provisions dummy is available for only firms listed on the first section of Tokyo Stock Exchange because it is based on data manually collected by one of the authors. The sample of estimations involving this variable is therefore smaller than that for other estimations.

Table 3 reports the descriptive statistics of independent variables. All non-dummy variables are winsorized at the top and bottom 1%. We find that approximately one half of the sample firms are diversified. The median value of decentralized structure is 1.38. Because this variable is the ratio of consolidated employment to unconsolidated employment, the figure implies that subsidiary employees typically account for one third of the total employment of sample firms.

4.2 Baseline results

Table 4 reports regressions that omit governance variables. The dependent variable for Column (1) is the ratio of total headquarters' staff in total employment. The coefficients for firm size and scope are negative and highly significant, suggesting that there are scale and scope economies in headquarters' activities. As anticipated, the coefficient for decentralized corporate structure is negative and highly significant, implying that decentralization decreases the need for a large central office. Column (1) also reveals that firms investing more in intangible assets have a larger central office as the coefficients for R&D and advertising intensities are positive and highly significant. These patterns are consistent with the notion that an important role of corporate headquarters is managing resources that are of firm-wide importance (Markides and Williamson, 1994; Collis and Montgomery, 1998; Campbell et al., 2014).

The rest of Table 4 examines heterogeneity across the five headquarters' functions by using the number of personnel in each function over total firm employment as the dependent variable. Across the board, the sign patterns of regression coefficients are similar to those reported in Column (1). Unsurprisingly, the effect of R&D intensity is the largest for R&D staff as reported in Columns (3). More interesting is the result that the effect of R&D intensity is also significantly positive for other functions, with information processing being the only exception. Likewise, the effect of advertising intensity is significantly positive for all functions. These patterns are consistent with Collis and Montgomery (1998), who note that the role of headquarters as the guardian of resources involves a wide range of activities such as business portfolio planning, capital budgeting, human resource management, and organizational design.

4.3 Effect of corporate governance

The regressions reported in Table 5 incorporate governance variables to examine the influence of agency hazards. The dependent variable of all reported regressions is the ratio of total headquarters' staff in total employment. Column (1) examines the effect of the ownership share of institutional investors. The anticipated sign of this variable is negative if external monitoring curtails overinvestment. However, the estimated coefficient is positive and significant. Column (2) estimates the effect of the share of interlocking shareholders who shield managers from external controls. Although the anticipated effect of this variable is positive if agency problems exist, the estimated effect is significantly negative.

The regressions reported in the rest of Table 5 do not square with the overinvestment scenario either. Column (3) shows that the effect of managerial shareholding is not significantly different from zero, although it aligns the interests of managers and shareholders.[9] Column (4) examines the influence of independent directors who contribute importantly to the quality of board monitoring. The estimation result shows that firms with a higher share of independent directors tend to have larger headquarters. In Column (5), the effect of anti-takeover provisions is significantly negative, suggesting that firms better protected from hostile takeover threats have smaller headquarters. As reported in Columns (6) and (7), the sign and significance patterns of governance variables are mostly unchanged when they are jointly considered.

Overall, the regressions reported in Table 5 indicate that better governed firms, on average, have larger headquarters. This pattern is in stark contrast with the notion that ill-disciplined executives are apt to overinvest in headquarters to increase private benefits. The observed pattern suggests that if an agency problem exists in the determination of headquarters' size, it is an underinvestment problem. While this is an interesting possibility, delving deeper into this issue goes beyond the scope of the present article. For now, we stress that the effect of

[9] We also estimate a specification involving a squared term of managerial ownership share because managerial shareholding can entrench managers at a high level. However, we find no evidence for a nonlinear effect (results unreported).

corporate governance provides no evidence that the headquarters of sample firms are grossly oversized.

5. Corporate Headquarters and Performance

5.1 Model

Next, we examine the effect of headquarters' size on firm performance. In an efficient capital market, any known costs and benefits associated with a firm's organization are priced into its securities. Based on this idea, we investigate the value of corporate headquarters as reflected in firm value. Given the traditional interest of researchers in the headquarters of diversified firms, we are particularly interested in the value of headquarters to firms that operate in multiple industries. Accordingly, we employ excess value proposed by Berger and Ofek (1995) as our measure of firm performance. An obstacle in studying the value of diversified firms is that they differ considerably in the industry mix of business portfolios. Excess value copes with such heterogeneity by benchmarking firms to a portfolio of representative focused firms. Previous estimations of excess value suggest that diversified firms in Japan trade at a discount relative to focused firms in the same industries (Lins and Servaes, 1999; Ushijima, 2016).

Excess value is defined as the logged ratio of firm value to imputed value. That is,

$$Excess\ \ value_{it} = ln\left(\frac{Firm\ \ value_{it}}{Imputed\ \ value_{it}}\right),$$

where firm value is the market value of equity plus book value of debt. Imputed value is the sum of standalone value of a firm's segments, which is estimated as segmental sales times the

median ratio of firm value to sales of focused firms in the same industry.[10] We omit multi-segment firms for which the sum of segmental sales exceeds or falls short of the firm-level sales by 1% or more. When the deviation is within ±1%, we adjust the sales of all segments by an equal percentage such that the sum of adjusted segmental sales matches the firm's entire sales. We also exclude firms with financial segments because matching with focused firms (i.e., financial institutions) is problematic for such segments.

Our main independent variables are a dummy for diversified firms (*DIV*), which takes the value of one if a firm has multiple 4-digit segments and zero otherwise, and the ratio of total headquarters' staff in total employment (*HQ*). Our regression model in the complete form is specified as follows:

$$Excess\ \ value_{it} = \alpha + \beta DIV_{it} + \gamma HQ_{it} + \delta DIV_{it} \cdot HQ_{it} + \eta Z_{it} + \phi_t + \theta_i + \epsilon_{it},$$

where z is a vector of control variables, ϕ is a year fixed effect, and θ is a firm fixed effect. The model includes the interaction term of diversification and headquarters' size because researchers have noted that corporate headquarters play particularly important roles in the management of diversified firms (e.g., Chandler, 1962). A concern in estimating the above model is that firm scope and organization are potentially endogenous. Firm fixed effects mitigate this problem by absorbing any unobserved factors that stay constant over the estimation window. The control variables include EBITDA over sales, capital expenditure over sales, R&D and advertising intensities, and leverage.

5.2 Regression results

[10] Following Berger and Ofek (1995), segment-industry matching is made at the 4-digit level if 5 or more focused firms exist at that level. Otherwise, matching is made at the finest lower level at which no less than 5 focused firms exist.

Table 6 reports the estimation results. The first three regressions exclude firm fixed effects. Column (1) also omits the interaction effect between diversification and headquarters' size. The estimated coefficient for headquarters' size is positive and highly significant. Therefore, consistent with Collis et al. (2007) and Morikawa (2015), our analysis of firm value suggests that firms with larger headquarters perform better.[11] The estimated coefficient implies that a one-SD increase in headquarters' size is associated with a 3.2 percentage point increase in excess value. Another important result is that the coefficient for the diversification dummy is negative and highly significant. The estimated coefficient implies that ceteris paribus diversified firms are valued 5.6 percentage points lower than median focused firms in the same industries.

Hoechle, Schmid, Walter, and Yermack (2012) document that the diversification discount widely reported in the literature is partly a discount for weak governance. Our results in the previous section suggest that corporate governance may also confound the effect of headquarters. We check this possibility by including four governance variables –the ownership shares of institutional investors, interlocking shareholders, and managers and the ratio of independent directors– as additional control variables.[12] Column (2) reports the estimation result. Except for the share of interlocking shareholders, the coefficients for governance variables are positive and significant, suggesting that better governed firms are valued higher by investors. This result notwithstanding, the effects of headquarters' size and diversification are highly significant and virtually identical to those estimated without a control for governance factors. Column (3) introduces the interaction effect between diversification and headquarters' size. The coefficient for the interaction term is positive and significant. Therefore, the size of

[11] Following Morikawa (2015), we also perform estimations in which headquarters' size is measured by the ratio of headquarters' staff in the "others" function to total employment. Unreported regression results are very similar to those reported herein.

[12] We do not include the dummy for firms with anti-takeover provisions because doing so substantially reduces the sample size. In practice, regressions yield very similar results, with and without this variable.

headquarters is a more important differentiator of the value of diversified firms than that of focused firms.

The positive association between headquarters' size and firm value identified by the above-reported estimations does not necessarily imply a causal effect because there can be unobserved factors that simultaneously affect firm value and headquarters' size. The regressions in Columns (4) and (5) address this issue by incorporating firm fixed effects. Column (4) estimates the effects of diversification and headquarters without considering their interaction. The coefficient for headquarters' size is positive. However, it declines substantially in size and is no longer significantly different from zero. This result implies that in the preceding estimations, unobserved common determinants mostly drive the positive association between firm value and headquarters' size. For instance, firms with superior resources valued highly by investors may need large headquarters for managing the acquisition and deployment of the resources. The fact that R&D and advertising intensities –our measures of observable resources– are positively and significantly correlated with both excess value and headquarters' size is consistent with this scenario.

The specification for Column (5) incorporates the interaction between headquarters' size and diversification. The main effect of headquarters is positive and significant, although it is considerably smaller than when estimated without firm fixed effects. In contrast, the interaction effect turns to significantly negative when unobserved heterogeneity is accounted for. The estimated coefficient on the interaction term is large in absolute value. The sum of the main effect of headquarters' size and the interaction effect is negative, although it is not significantly different from zero with a p-value of .175. Therefore, longitudinal estimations suggest that the growth of headquarters has differential implications for firm value depending on the industrial scope. While the growth is positively associated with the value of focused firms, it is, on average, neutral to the value of diversified firms.

To summarize, we find that the size of corporate headquarters is positively correlated with firm value. In the present data, however, this correlation is mostly attributable to unobserved common determinants of headquarters' size and firm value. When such factors are accounted for with firm fixed effects, the association is substantially weakened for focused firms and disappears for diversified firms. This result suggests that enlarging headquarters generates costs that are particularly large for diversified firms. Recall that Chandler (1991) and Hill (1988 and 1994) note that diversified firms face a trade-off in choosing the size of the central office. While large headquarters promote operating synergy by fostering coordination and cooperation among divisions, they mitigate inter-divisional competition for scarce funds and thereby financial synergy generated by internal fund reallocation. This view suggests that a major cost of enlarging headquarters is a loss of efficiency of internal capital markets. We perform a direct test of this possibility in the next subsection by examining segmental investment patterns of diversified firms.

5.3 Analysis of internal capital markets

For measuring the efficiency of internal capital markets, we use the relative value added (*RVA*) index proposed by Rajan et al. (2000). This index quantifies the efficiency of fund flows across a diversified firm's segments by comparing segmental investment to the investment of focused firms in the same industries as well as the investment of peer segments in the same firm. Specifically, *RVA* for firm *i* is defined as follows:

$$RVA_{it} = \frac{\sum_j A_j (q_j - \bar{q}) \left(\frac{I_j}{A_j} - \left(\frac{\widehat{I_J}}{A_J} \right) - \sum_j w_j \left(\frac{I_j}{A_j} - \left(\frac{\widehat{I_J}}{A_J} \right) \right) \right)}{A_i},$$

where *I*/*A* is the ratio of capital expenditure to assets of segment *j*, $\widehat{I/A}$ is the asset weighted average of the investment ratio of focused firms in the same industry, and *w* is the share of segmental asset in firm asset. *q* is the segmental Q ratio estimated as the weighted average of Q of focused firms in the same industry, and $\bar{q}$ is the asset-weighted *q* of all segments in the firm. This index takes a larger value for firms that transfer funds more efficiently across segments (i.e., from low Q to high Q segments) for financing investment.

We estimate the effect of corporate headquarters by regressing *RVA* on headquarters' size (the ratio of total headquarters' staff in total employment) and control variables, which includes firm size (logged total assets), firm scope (number of segments), capital expenditure normalized by sales, and market-to-book ratio (market value of equity over book value of equity). The last two variables are included to control for growth opportunities. All estimations include year dummies. We perform estimations with and without firm fixed effects.

Estimation results are tabulated in Table 7. The first three regressions omit firm fixed effects. Column (1) also excludes control variables, while Column (2) represents the baseline specification with control variables. In the both specifications, the effect of headquarters' size is negative and highly significant, suggesting that firms with larger headquarters, on average, have less efficient internal capital markets. As reported in Column (2), the coefficients for capital expenditure over sales and market-to-book ratio are significantly positive. Therefore, firms with more growth opportunities allocate funds more efficiently. Column (3) adds four governance variables to the baseline specification. The coefficient for headquarters' size remains negative and significant. The estimated effects of governance variables suggest that better governed firms tend to allocate funds more efficiently. Overall, the regressions reported in Columns (1) to (3) suggest that the efficiency of fund flows within a diversified firm declines with the size of corporate headquarters. To the best of our knowledge, this pattern is previously unreported in the literature.

Columns (4) to (6) introduce firm fixed effects to the above-described specifications. The negative effect of headquarters on the efficiency of internal capital market survives the control for unobserved heterogeneity. The coefficient for headquarters' size is negative and highly significant with and without a control for other determinants of allocative efficiency. Moreover, the estimated effect of headquarters' size is greater in absolute value when unobserved firm heterogeneity is accounted for. Therefore, data provide strong evidence that enlarging headquarters tends to result in less efficient fund flows within a diversified firm. This finding lends support to the notion that by mitigating competition among divisions, large headquarters decrease a firm's ability to generate financial synergy (Williamson, 1975; Hill, 1988 and 1994; Chandler, 1991). It also suggests that downsizing headquarters, as often advocated in the business press, can be a remedy for allocative inefficiency and thereby improve firm performance.

6. Conclusions

This article investigates the size and performance effect of corporate headquarters for a large sample of Japanese firms in 2001 to 2010. We observe that the size of headquarters is systematically related to firm attributes such as scale, industrial scope, organizational structure, and intangible investment. We also find that better governed firms have relatively large headquarters in contrast to the view that corporate headquarters are apt to be overstaffed due to managerial agency problems. Our analysis of firm value reveals that enlarging headquarters involves a cost that is particularly large for diversified firms. Specifically, as the size of headquarters increases, the efficiency of internal capital markets declines. This novel finding implies that downsizing headquarters can lead to better corporate performance by improving allocative efficiency.

Our results suggest many interesting opportunities for future research. Although our analysis of internal capital markets highlights a dark side of corporate headquarters, the association between headquarters' size and firm performance suggests that there is also a bright side. Identifying the mechanism though which corporate headquarters add/destroy value is important for many strands of academic research. A puzzling result obtained in our study is the positive association between governance quality and headquarters' size. Studying why managers underinvest in headquarters may shed new light on managerial motives behind corporate resource allocation and organizational design.

References

Berger, P. G., Ofek, E., 1995. Diversification's effect on firm value, Journal of Financial Economics 37, 39-65.

Campbell, A., Whitehead, J., Alexander, M., Goold, M., 2014. Strategy for the Corporate Level: Where to Invest, What to Cut Back, and How to Grow Organizations with Multiple Divisions. John Wiley & Sons.

Caves, R.E., Krepps, M.B., 1993. Fat: The displacement of nonproduction workers from U.S. manufacturing industries, Brookings Papers on Economic Activities: Microeconomics 2, 227-288.

Chandler, A.D., Jr., 1962. Strategy and Structure. Cambridge, MA: MIT Press.

Chandler, A.D., 1991. The functions of the HQ unit in the multi-business firm, Strategic Management Journal 12, 31-50.

Collis D.J., Montgomery, C.A., 1998. Corporate Strategy: A Resource-Based Approach. Boston, MA: Irwin/McGraw-Hill.

Collis, D., Young, D., Goold, M., 2007. The size, structure, and performance of corporate headquarters, Strategic Management Journal 28, 383-405.

Cronqvist, H., Heyman, F., Nilsson, M., Svaleryd, H., Vlachos, J., 2009. Do entrenched managers pay their workers more? Journal of Finance 64, 309–339.

Driscoll, J., A. Kraay, 1998. Consistent covariance matrix estimation with spatially dependent panel data, Review of Economics and Statistics, 80, 549–560.

Duchin, R., Sosyura, D., 2013. Divisional managers and internal capital markets, Journal of Finance 68, 387-429.

Foss, N.J., 1997. On the rationales of Corporate Headquarters, Industrial and Corporate Change 6, 313-338.

Glasper, M., Lopez-de-Silanes, F., Saunter, Z., 2013. Opening the black box: Internal capital markets and managerial power, Journal of Finance 68, 1577-1631.

Guadalupe, M., Li, H. Wulf, J., 2014. Who lives in the C-suite? Organizational structure and the division of labor in top management, Management Science 60, 824-844.

Hill, C.W., 1988. Internal capital market controls and financial performance in multidivisional firms, Journal of Industrial Economics 34, 67-83.

Hill, C.W.L., 1994. Diversification and economic performance: Bringing structure and corporate management back to the picture. In: R.P. Rumelt, D.E. Schendel, D.L. Teece (eds.) Fundamental Issues in Strategy: A Research Agenda. Boston, MA: Harvard Business School Press.

Hoechle, D., Schmid, M., Walter, I., Yermack, D., 2012. How much of the diversification discount can be explained by poor corporate governance? Journal of Financial Economics 103, 41-60.

Itami, H., 1987. Mobilizing Intangible Assets. Cambridge, MA: Harvard University Press.

Kono,T., 1999. A strong head office makes a strong company, Long Range Planning 32, 225-236.

Landier, A., Nair, V.B., Wulf, J., 2009. Trade-offs in staying close: Corporate decision making and geographic dispersion, Review of Financial Studies 22, 1119-1148.

Lang, L., Stulz, R., 1994. Tobin's q, corporate diversification, and firm performance, Journal of Political Economy 102, 1248-1280.

Lichtenberg, F.R., Siegel, D., 1990. The Effect of ownership changes on the employment and wages of central office and other personnel, Journal of Law and Economics 33, 383-408.

Lins, K., Servaes, H., 1999. International evidence on the value of corporate diversification, Journal of Finance 54, 2215-2239.

Markides, C.C., Williamson, P.J., 1994. Related diversification, core competences, and corporate performance, Strategic Management Journal 15, 149-165.

Menz, M., Kunisch, S., Collis, D.J., 2013. What do we know about corporate headquarters? A

review, integration, and research agenda, Harvard Business School Working Paper No. 14-016.

Morikawa, M., 2015. Are large headquarters unproductive? Journal of Economic Behavior and Organization 119, 422-436.

Meyer, M., Milgrom, P., Roberts, J., 1992. Organizational prospects, influence costs, and ownership changes, Journal of Economics and Management Strategy 1, 9–35.

Rajan, R., Servaes, H., Zingales, L., 2000. The cost of diversity: The diversification discount and inefficient investment, Journal of Finance 55, 35-80.

Shin, H. H., Stulz, R. M., 1998. Are internal capital markets efficient? Quarterly Journal of Economics 113, 531-52.

Teece, D.J., 1982. Towards an economic theory of the multiproduct firm, Journal of Economic Behavior and Organization 3, 39-63.

Ushijima, T., 2016. Diversification, organization, and value of the firm, Financial Management 45, 467-499.

Williamson, O.E., 1963. Managerial discretion and business behavior, American Economic Review 53, 1032-1057.

Williamson, O.E., 1975. Markets and Hierarchies: Analysis and Antitrust Implications. New York: Free Press.

Xuan, Y., 2009. Empire-building or bridge-building? Evidence from new CEOs' internal capital allocation decisions, Review of Financial Studies 22,4919-4948.

Table 1: Distribution of headquarters' size

	N	Mean	Standard deviation	Percentile				
				1%	25%	50%	75%	99%
Panel A: Number of employees								
Total employment	21,938	4,073	16,778	68	333	733	2,144	56,848
Total headquarters staff	21,938	184	632	7	32	64	158	1,827
Planning and research	21,938	23	77	0	0	4	14	378
Research and development	21,938	47	321	0	0	0	20	655
International affairs	21,938	6	29	0	0	0	4	91
Information processing	21,938	10	28	0	0	4	10	109
Others	21,938	97	345	4	20	37	82	837
Panel B: Ratio to total employment								
Total headquarters staff	21,938	0.116	0.105	0.006	0.048	0.087	0.149	0.517
Planning and research	21,938	0.014	0.031	0.000	0.000	0.004	0.014	0.136
Research and development	21,938	0.023	0.057	0.000	0.000	0.000	0.021	0.279
International affairs	21,938	0.003	0.011	0.000	0.000	0.000	0.002	0.042
Information processing	21,938	0.008	0.018	0.000	0.000	0.005	0.011	0.059
Others	21,938	0.067	0.063	0.002	0.027	0.051	0.086	0.306

Note: This table tabulates the number of headquarters' staff (Panel A) and the ratio of headquarters' staff to total (consolidated) firm employment (Panel B). Data on Headquarters' staff are obtained from the Basic Survey of Japanese Business Structure and Activities. Total employment is from the Nikkei NEEDS database.

Table 2: Mean and median headquarters' size by year

	# observations	Mean	Median	Standard deviation
2001	2,116	0.112	0.086	0.096
2002	2,168	0.113	0.088	0.098
2003	2,135	0.113	0.087	0.101
2004	2,197	0.114	0.086	0.100
2005	2,246	0.116	0.085	0.107
2006	2,209	0.116	0.084	0.110
2007	2,361	0.117	0.086	0.108
2008	2,265	0.119	0.087	0.112
2009	2,232	0.118	0.088	0.110
2010	2,009	0.119	0.091	0.105

Note: This table tabulates the mean and median ratios of total headquarters' staff in total firm employment over the sample period.

Table 3: Descriptive statistics for headquarters' size regressions

	# Observations	Mean	Standard deviation	Median
Logged # employees	21,968	6.828	1.466	6.596
Diversification dummy	21,896	0.510	0.500	1.000
Decentralized structure	21,968	2.100	1.929	1.384
R&D intensity	21,966	0.018	0.028	0.007
Advertising intensity	21,969	0.009	0.019	0.001
Foreign sales ratio	21,969	0.127	0.198	0.000
EBITDA/sales	21,971	0.090	0.078	0.076
Leverage	21,968	0.906	1.468	0.384
Share of institutional investors	15,225	0.141	0.151	0.089
Share of interlocking shareholders	15,333	0.079	0.083	0.056
Share of managerial ownership	15,342	0.084	0.127	0.020
Share of independent directors	15,411	0.060	0.113	0.000
Anti-takeover provisions dummy	6,235	0.143	0.350	0.000

Note: This table reports the descriptive statistics of regressions variables. Logged # employees is the logged consolidated employment. Diversification dummy takes one for firms that operate multiple 4-digit industrial segments. Decentralized structure is the ratio of consolidated employment to unconsolidated employment. R&D (advertising) intensity is R&D (advertising) expenditure over sales. Foreign sales ratio is the ratio of foreign sales to total sales. Leverage is the book value of debt over market equity. The shares of institutional investors, interlocking shareholders, and managers measure the share of stocks held by corresponding investors. The share of independent directors is the ratio of independent directors on the board. Anti-takeover provisions dummy takes one for firms with an anti-takeover provision. The corporate governance variables are taken from the Nikkei Cges (Corporate governance evaluation system) except for anti-takeover provisions dummy, which is based on manually collected data. Non-governance variables are from the Nikkei NEEDS database.

Table 4: Regressions of headquarters' size determinants

Dependent variable	Total Headquarters staff	Planning & research	Research & development	International affairs	Information processing	Others
	(1)	(2)	(3)	(4)	(5)	(6)
Logged # employees	-0.030 ***	-0.001 ***	-0.007 ***	-0.001 ***	-0.001 ***	-0.018 ***
	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)
Diversification dummy	-0.011 ***	-0.002 ***	-0.004 ***	-0.000 ***	-0.000 **	-0.004 ***
	(0.001)	(0.000)	(0.001)	(0.000)	(0.000)	(0.001)
Decentralized structure	-0.006 ***	-0.001 ***	-0.002 ***	-0.000 ***	-0.000 ***	-0.002 ***
	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
R&D intensity	0.781 ***	0.080 ***	0.513 ***	0.020 ***	-0.000	0.146 ***
	(0.046)	(0.008)	(0.018)	(0.001)	(0.002)	(0.020)
Advertising intensity	0.719 ***	0.200 ***	0.130 ***	0.022 ***	0.053 ***	0.196 ***
	(0.035)	(0.010)	(0.035)	(0.003)	(0.003)	(0.015)
Foreign sales ratio	0.007 ***	-0.010 ***	0.007 ***	0.008 ***	-0.001 ***	0.000
	(0.002)	(0.000)	(0.001)	(0.000)	(0.000)	(0.003)
EBITDA/sales	0.008 *	0.005 ***	-0.013 ***	0.001 **	-0.001	0.008 ***
	(0.004)	(0.002)	(0.002)	(0.001)	(0.001)	(0.003)
Leverage	-0.001	-0.000 ***	-0.000	-0.000	-0.000 ***	0.000
	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R-squared	0.337	0.347	0.136	0.235	0.133	0.148
# Observations	21,846	21,846	21,846	21,846	21,846	21,846

Note: This table reports the regressions results of the determinants of headquarters' size. The dependent variable for Column (1) is the ratio of total headquarters' staff to total employment. The dependent variable for Columns (2) to (6) is the ratio of headquarters' staff in the denoted function to total employment. Industry dummies are defined at the 2-digit level. In parentheses are heteroskedastic-consistent Driscoll and Kraay (1988) standard errors that are robust to general forms of cross-sectional and temporal dependence. *** Significant at the 0.01 level. ** Significant at the 0.05 level. * Significant at the 0.10 level.

Table 5: Regressions of headquarters' size with corporate governance variables

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Logged # employees	-0.033 ***	-0.031 ***	-0.031 ***	-0.031 ***	-0.025 ***	-0.033 ***	-0.025 ***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)
Diversification dummy	-0.011 ***	-0.010 ***	-0.011 ***	-0.011***	-0.007 ***	-0.011 ***	-0.007 ***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)	(0.002)
Decentralized structure	-0.005 ***	-0.005 ***	-0.005 ***	-0.005 ***	-0.004 ***	-0.005 ***	-0.004 ***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
R&D intensity	0.776 ***	0.769 ***	0.782 ***	0.766 ***	0.627 ***	0.763 ***	0.614 ***
	(0.066)	(0.065)	(0.066)	(0.063)	(0.042)	(0.068)	(0.043)
Advertising intensity	0.703 ***	0.691 ***	0.707 ***	0.690 ***	0.639 ***	0.691 ***	0.620 ***
	(0.039)	(0.034)	(0.037)	(0.031)	(0.055)	(0.038)	(0.066)
Foreign sales ratio	0.004 ***	0.007 ***	0.008 ***	0.008 ***	-0.021 ***	0.003 ***	-0.024 ***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
EBITDA/sales	-0.013 **	0.002	0.005	0.003	0.063 ***	-0.013 **	0.056 **
	(0.006)	(0.005)	(0.005)	(0.005)	(0.014)	(0.006)	(0.021)
Leverage	-0.001 **	-0.002 ***	-0.002 ***	-0.002 ***	0.002 ***	-0.002 **	0.003 **
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Share of institutional investors	0.037 ***					0.034 ***	0.004 ***
	(0.002)					(0.001)	(0.009)
Share of interlocking shareholders		-0.049 ***				-0.045 ***	-0.053 ***
		(0.004)				(0.004)	(0.003)
Share of managerial ownership			-0.000			-0.003	-0.032
			(0.002)			(0.002)	(0.009)
Share of independent directors				0.021 ***		0.016 ***	0.018 ***
				(0.003)		(0.003)	(0.004)
Anti-takeover provisions					-0.002 ***		-0.001
					(0.001)		(0.001)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R-squared	0.350	0.348	0.347	0.347	0.359	0.352	0.364
# Observations	15,128	15,233	15,243	15,311	6,186	15,104	6,109

Note: This table reports the regressions of headquarters' size with corporate governance variables. The dependent variable is the ratio of total headquarters' staff in total employment. In parentheses are heteroskedastic-consistent Driscoll and Kraay (1988) standard errors that are robust to general forms of cross-sectional and temporal dependence. *** Significant at the 0.01 level. ** Significant at the 0.05 level. * Significant at the 0.10 level.

Table 6: Effects of headquarters' size and diversification on excess value

	(1)	(2)	(3)	(4)	(5)
Diversification dummy	-0.056 ***	-0.064 ***	-0.068 ***	-0.067 ***	-0.046 ***
	(0.007)	(0.008)	(0.010)	(0.017)	(0.015)
Headquarters size	0.301 ***	0.359 ***	0.264 ***	0.033	0.099 **
	(0.034)	(0.029)	(0.030)	(0.047)	(0.050)
Diversification × Headquarters size			0.105 ***		-0.172 ***
			(0.040)		(0.028)
Logged total assets	0.036 ***	0.021 **	0.036 ***	0.006	0.006
	(0.004)	(0.009)	(0.004)	(0.018)	(0.018)
EBITDA/sales	2.212 ***	2.089 ***	2.212 ***	0.605 ***	0.603 ***
	(0.181)	(0.228)	(0.181)	(0.178)	(0.178)
Capital expenditure/sales	1.676 ***	1.772 ***	1.675 ***	0.665 ***	0.663 ***
	(0.148)	(0.170)	(0.148)	(0.113)	(0.114)
R&D intensity	0.899 ***	0.611 ***	0.893 ***	1.564 ***	1.558 ***
	(0.148)	(0.226)	(0.149)	(0.223)	(0.228)
Advertising intensity	1.895 ***	1.549 ***	1.892 ***	1.038 ***	1.021 ***
	(0.146)	(0.199)	(0.144)	(0.168)	(0.169)
Leverage	0.030 ***	0.039 ***	0.030 ***	0.009 ***	0.009 ***
	(0.002)	(0.003)	(0.002)	(0.003)	(0.003)
Share of institutional investors		0.257 ***			
		(0.047)			
Share of interlocking shareholders		-0.013			
		(0.029)			
Share of managerial ownership		0.057 ***			
		(0.015)			
Share of independent directors		0.128 **			
		(0.057)			
Year fixed effects	Yes	Yes	Yes	Yes	Yes
Firm fixed effects	No	No	No	Yes	Yes
Adjusted R-squared	0.227	0.232	0.227	0.179	0.180
# Observations	16,528	11,481	16,528	16,528	16,528

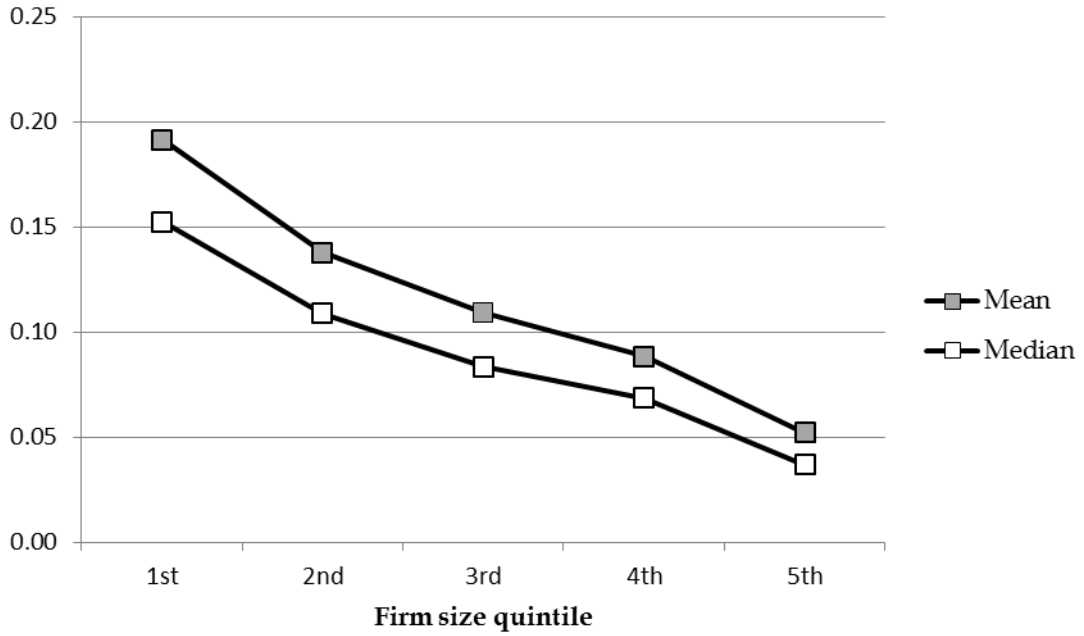
Note: This table reports the regressions of excess value. Headquarters' size is measured by the ratio of total headquarters' staff in total employment. In parentheses are heteroskedastic-consistent Driscoll and Kraay (1988) standard errors that are robust to general forms cross-sectional and temporal dependence. *** Significant at the 0.01 level. ** Significant at the 0.05 level. * Significant at the 0.10 level.

Table 7: Effect of headquarters' size on internal capital market

	(1)	(2)	(3)	(4)	(5)	(6)
Headquarters size	-0.120 **	-0.191 ***	-0.247 **	-0.373 ***	-0.363 ***	-0.489 ***
	(0.048)	(0.064)	(0.097)	(0.104)	(0.106)	(0.079)
Logged total assets		-0.006	0.002		0.019	-0.014
		(0.005)	(0.007)		(0.025)	(0.031)
# Industrial segments		-0.011 **	-0.012		-0.009	-0.032 *
		(0.006)	(0.008)		(0.008)	(0.017)
Capital expenditure/sales		0.417 **	0.588 ***		0.839 ***	1.342 ***
		(0.177)	(0.224)		(0.257)	(0.162)
Mraket-to-Book ratio		0.045 ***	0.044 ***		0.046 ***	0.060 ***
		(0.009)	(0.005)		(0.009)	(0.004)
Share of institutional investors			0.035 **			-0.048
			(0.015)			(0.056)
Share of interlocking shareholders			-0.230 ***			-0.023
			(0.051)			(0.073)
Share of managerial ownership			0.244 ***			0.109
			(0.037)			(0.141)
Share of independent directors			-0.038			-0.103 **
			(0.039)			(0.044)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Firm fixed effects	No	No	No	Yes	Yes	Yes
Adjusted R-squared	0.009	0.014	0.023	0.013	0.018	0.027
# Observations	10,277	10,277	7,116	10,277	10,277	7,116

Note: This table reports the regressions to estimate the effect of headquarters' size on the internal capital market of diversified firms. The dependent variable is the relative value added index of Rajan et al. (2000). Headquarters' size is the ratio of total headquarters' staff to total employment. In parentheses are heteroskedastic-consistent Driscoll and Kraay (1988) standard errors that are robust to general forms cross-sectional and temporal dependence. *** Significant at the 0.01 level. ** Significant at the 0.05 level. * Significant at the 0.10 level.

Figure 1: Headquarters' size by firm size quintile



Note: This figure illustrates how the mean and median headquarters' sizes vary with firm size by dividing sample firms into quintiles according to total (consolidated) employment. Headquarters' size is the ratio of total headquarters' staff to total employment.