Industrial Diversification, Partial Privatization and Firm Valuation: The Chinese Evidence

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Abstract

This paper investigates the relationship between industrial diversification and firm valuation in a sample of 816 publicly listed firms in China, and contributes to the literature in three ways: First, it provides one of the first few studies on diversification and performance in an emerging market dominated by partially privatized firms. Second, it explores the determinants of corporate diversification by considering some unique aspects of agency and political conflicts inherent in China's transition towards a market economy. Third, it employs an instrumental variable framework to examine the interrelation between diversification and firm valuation. The paper finds that when the decision to diversify is modeled as an endogenous choice based on firm characteristics, multi-segment firms have significantly higher Tobin's q than single-segment firms, even after controlling for factors such as ownership structure, ownership concentration and growth opportunities. An explanation is that non-government controlled firms that perform better and possess more cash are more likely to adopt diversification strategies and tend to diversify more. In contrast, government controlled multi-segment firms have lower Tobin's q than non-government controlled multi-segment firms, providing evidence in support of the political cost hypothesis of diversification. Overall, our results illustrate that the effect of diversification on firm valuation depends on firm's endogenous choice and the extent of government control.

Key words: Diversification, Firm valuation, Partial privatization, Political costs, China

JEL classification: G30, G15, C33

1. Introduction

Diversification is a means by which a firm expands from its core business into other product markets and should have no valuation consequence in a Modigliani-Miller world (Berry, 1975). Investors should be able to costlessly diversify their portfolios without the help of corporate CEOs. But in contrast to the Modigliani-Miller paradigm, large scale movements toward greater diversification at certain times and greater focus at other times have been witnessed around the globe during the past four decades.

Various arguments have been put forward to explain why corporations diversify and why diversification may affect firm value. One argument is that diversification creates value through lower production risks (Amihud and Lev, 1981), larger market power (Maksimovic and Philips, 2002), decreased consolidated tax liabilities (Errunza and Senbet, 1981) and higher efficiency in resource allocation through internal capital markets (Gertner et al., 1994; Hubbard and Palia, 1999; Khanna and Tice, 2001; Matsusaka and Nanda, 2002). Another argument is that diversification destroys value due to information asymmetries between CEO and division managers (Meyer et al., 1992; Scharfstein and Stein, 2000), conflicts of interest between management and outside shareholders (Servaes, 1996; Denis et al., 1997; Aggarwal and Samwick; 2003) and inefficient allocation of capital among divisions of diversified firms (Stulz, 1990; Lamont, 1997; Shin and Stulz, 1998; Rajan et al., 2000).

Stein (2003) and Martin and Sayrak (2003) provide comprehensive surveys of studies on corporate diversification. The general theme coming from the voluminous literature is that empirical research has failed to produce definitive results on diversification and firm value. For example, Lang and Stulz (1994) and Berger and Ofek (1995) show that the valuation discount for U.S. companies ranges between 13% and 54% depending on measurement methodologies. However, Campa and Kedia (2002), Graham et al. (2002), Schoar (2002) and Villalonga (2004) show that there exists a strong selection bias which causes a large fraction of the discount. They use establishment level data to value diversified companies and find that the discount can be reduced or turns into a premium. Lins and Servaes (1999, 2002) find significant discounts for diversified firms in Japan, the United Kingdom and a number of East Asian countries. Moreover, studies examining the valuation impact of mergers suggest that diversification is not a value-destroying event (Daley et al., 1997; Hubbard and Palia, 1999; Desai and Jain, 1999). Yet studies of corporate refocusing activity and studies imputing multi-segment firm value from single-segment proxies suggest that diversification is value-destroying (John and Ofek,

1995; Comment and Jarrell, 1995; Berger and Ofek, 1996). Similar seemingly contradictory results are often found within a given sample.

Because there is still no consensus in the literature regarding the valuation consequences of corporate diversification, we believe that it is important to continue to carefully evaluate the performance of diversifying firms using a variety of samples and empirical methodologies. More research is necessary to illustrate if firms located in different country environments and institutional contexts gain or lose from diversification. Accordingly, we examine whether and to what extent diversification affects performance for a sample of 816 partially privatized state-owned enterprises (SOEs) publicly listed in China during 2000 and 2002.

China offers a unique environment for analyzing diversification and firm performance for the following reasons: First, China's financial markets are less developed and largely segmented from the rest of the world. They are characterized with a lack of reliable information and a high degree of information asymmetry, which inevitably leads to a high degree of market imperfection. Gertner et al. (1994) and Stein (1997) argue that internal capital markets can overcome market imperfections involved in the selection of valuable new projects. Firms with only limited access to external capital can establish internal markets to allocate scarce resources within the firm. As a result, there may be a great room to increase firm value if a firm creates an internal capital market through diversification. If this conjecture is correct, it raises the possibility that the diversification discount for firms in the U.S. and other countries with developed capital markets does not automatically generalize to countries where external capital is more constrained. Second, China's SOE reform strategy hinges on the Modern Enterprise System characterized by the separation of ownership and control (Su, 2005). Ownership of an SOE's assets is distributed among the government, institutional investors, managers, employees, and private investors. Effective control rights are assigned to management, which generally has a very small, or even nonexistent ownership stake. This distinctive shareholding structure creates conflict of interest not only between management (insiders) and outside investors (Jensen and Meckling, 1976) but also between large shareholders and minority investors (Shleifer and Vishny, 1986). Moreover, because Chinese government desires to retain some control—in part through partial retained ownership of SOEs, further conflicts arise between politicians and firms (Shleifer and Vishny, 1994). Therefore, it is of interest to assess whether and to what extent this complex ownership structure affects corporate decisions to diversify. Third, most listed firms in China have a dominant shareholder that

helps to shape the strategies and policies of the company. The dominant shareholder can exercise substantial control over a firm by way of board representation as well as through voting rights. In many cases it is the central or local government that has the controlling stake. In other cases, the controlling shareholder is a SOE (from which the listed firm was carved out) or a private blockholder. The different types of controlling investor may have different objectives for the firm. We explore these differences and assess their implications for diversification and firm performance.

Our results provide evidence that the effect of diversification on firm valuation is related to ownership structure, government control and firm's endogenous choice. In particular, after controlling for firm-specific factors such as age, size and growth opportunities, we find that state and legal entity ownership of shares are negatively related to diversification probability and firm valuation. The relationship between ownership concentration and firm valuation is U-shaped, indicating the presence of tunneling and expropriation by the controlling shareholder. Moreover, firms ultimately owned by the government are less likely to diversify and perform worse than firms owned by other entities. After controlling for the endogeneity of the decision to diversify, multi-segment firms are valued significantly higher than single-segment firms. These results complement the U.S. and international findings by providing empirical evidence on a country where capital markets are less developed and legal protections for minority investors are relatively weak. For all publicly listed firms in China, the benefits of diversification appear to dominate its costs. However, for government controlled firms, where political costs of tunneling and expropriation may be high, the benefits of diversification are greatly reduced.

In addition to documenting the effect of diversification on firm valuation in a market dominated by partially privatized SOEs, our study contributes to the literature in two other important aspects. First, we test the agency cost hypothesis against the political cost hypothesis of diversification using a unique dataset on state and managerial share ownerships. In contrast to the agency cost predictions, we find more evidence in support of the political cost predictions as the performance of government controlled diversified firms is less than non-government controlled diversified firms. Second, we demonstrate that the link between diversification and firm value is sensitive to firm's endogenous choice. In particular, after controlling for ownership structure, large shareholder control and growth opportunities, we find that diversification has no effect on firm value. However, non-government controlled firms that perform better and have more cash are

more likely to adopt diversification strategies and tend to diversify more. To account for the potential endogeneity of the decision to diversify, we apply an instrumental variable estimation technique and subsequently find that multi-segment firms have significantly higher market valuation than single-segment firms.

The rest of the paper is organized as follows: Section 2 contains a brief survey of the corporate diversification literature. Section 3 describes data and the methodology used to measure diversification and firm performance. A number of hypotheses and variables are also discussed. Section 4 presents empirical results regarding the effect of diversification on firm performance with and without controls for firm-specific characteristics. Section 5 examines the determinants of diversification decision using Logit regression analyses. Section 6 provides further empirical evidence on the relation between diversification and firm performance under an instrumental variable estimation framework. Section 7 concludes with a summary of findings.

2. Literature Review

The relationship between diversification and firm performance is complex and the evidence is mixed. Early evidence seems to indicate that diversification is value-destroying while more recent evidence suggests that the valuation effect of diversification depends on a number of factors such as the type of diversification, corporate governance mechanisms, investment policies, industry structure, market environments and sample selection biases.

2.1 Diversification Discounts Documented in the U.S.

The majority of empirical evidence has indicated that diversified U.S. firms trade at discounts compared to single segment firms.[1] Lang and Stulz (1994) find that diversified firms have significantly lower average and median Tobin's *q* than portfolios of specialized firms during the period of 1978-1990, suggesting that diversified firms are priced at significant discounts. Berger and Ofek (1995) find that industrial diversification reduces

[1] Despite the observed costs arising from corporate diversification, there is theoretical work suggesting that there may also be benefits from diversification. For example, Gertner et al. (1994), Stein (1997) and Matsusaka and Nanda (2002) suggest that capital constrained firms may establish internal capital markets that are capable of effectively allocating scarce resources within the firm. Hubbard and Palia (1999) find evidence, using acquisitions in the 1960s, that gains from diversification are greatest when a financially unconstrained buyer acquires a constrained target. Billett and Mauer (2000) infer from their study of tracking stock announcements that there are benefits to diversification. Using anecdotal evidence from Wal-Mart's entry into the discount business, Khanna and Tice (2001) find that diversified firms appear to be quicker in making the market entry or exit decision and their capital expenditures are more sensitive to the productivity of the discount business, suggesting that internal capital markets function well. Hyland and Diltz (2002) document positive announcement impacts associated with announcements of diversifying events.

the market value of multi-segment firms by 13–15% relative to a theoretical value imputed from single-segment firms in the same industry between 1986 and 1991. They conclude that poorly performing units are subsidized, which contributes to the losses for diversified firms. Comment and Jarrell (1995) present evidence of a clear trend towards corporate focusing in the U.S. during the period of 1978 to 1989. They find that this restructuring has had a positive impact on the shareholder value of the refocusing firms. John and Ofek (1995), Daley et al. (1997) and Desai and Jain (1999) examine spinoffs and divestitures and find significantly positive long-term performance when firms increase their focus through the divestiture of non-core assets. Denis et al. (2002) find that global diversification is associated with a discount comparable in magnitude to the industrial diversification discount reported in Berger and Ofek (1995). In addition, firms which are both globally and industrially diversified experience an even more pronounced discount.

One explanation for the above findings is that diversified firms face higher agency costs as a consequence of their organizational structure. For example, Servaes (1996) finds that insider ownership was negatively related to diversification during the 1960s, a time when insider ownership was costly to shareholders. However, when the cost to shareholders became negligible, firms with high insider ownership were the first to diversify, possibly because insiders wanted to lower their exposure to firm-specific risk. Denis et al. (1997) find that the level of diversification is negatively related to managerial and blockholder equity ownership. They argue that agency problems are responsible for firms maintaining value-reducing diversification strategies, and that the trend toward increased corporate focus is attributable to market disciplinary forces. Aggarwal and Samwick (2003) find evidence that managers diversify their firms not to reduce their exposure to risk but to seek private benefits. In particular, diversification is positively related to managerial incentives, after controlling for firm-specific factors that influence diversification decisions.

Another explanation relies on the argument that diversified firms often invest inefficiently. For example, Shin and Stulz (1998) find that divisional resources depend on the performance of their sibling divisions and do not appear to be redirected to the ones with the most favorable investment opportunities. Rajan et al. (2000) find that firms with a greater dispersion of growth opportunities tend to transfer resources from large divisions with good investment opportunities to small divisions with poor investment opportunities. Lamont and Polk (2002) find that find that exogenous increases in diversity inferred from changes in industry investment levels are negatively related to firm value. Burch and

Nanda (2003) analyze changes in excess values resulting from corporate spinoffs and conclude that conglomerate discounts can be attributed to diversity in divisional investment opportunities in general.

2.2 Evidence on the Illusory Nature of the Diversification Discounts

A growing body of the literature suggests that the evidence on the so-called "diversification discount" does not necessarily imply that diversification per se destroys value. Diversification may be beneficial or, at the minimum, not value-destroying. For example, Chevalier (2000) analyzes the investment behavior of a sample of firms before and after diversifying mergers and finds no evidence of a change in investment behavior. She argues, therefore, that inefficient investment in diversified firms may be due to cross-section differences between the segments of diversified firms and single-segment firms. Mansi and Reeb (2002) claim that industrial diversification decreases risk and increases bondholder value. They find strong evidence that the market value of debt is positively related to diversification.

More recently, a number of studies suggest that the observed discounts may be the cause rather than the consequence of diversification or the discount may be a statistical artifact arising from measurement errors or sample selection biases. For example, Whited (2001) argue that miscalculation of Tobin's q can explain the evidence on the inefficient allocation of capital reported in Shin and Stulz (1998). Graham et al (2002) show that target firms in diversifying mergers have been discounted by the capital markets prior to the merger announcements and the acquisition of firms with poor investment opportunities explains the value loss. They further demonstrate that using industry-median market values from single-segment firms to impute the value of diversified firms may produce a spurious discount. Campa and Kedia (2002) show that diversification decision is endogenously determined by a firm along with other policies and characteristics, and that diversification discount drops or disappears when the endogeneity of the diversification decision is controlled for. Villalonga (2004) identifies a self-reporting bias in the industrial segment data from COMPUSTAT and uses he Business Information Tracking Series (BITS) as an alternative data source. She finds that diversified firms with business units defined according to the BITS data trade at a premium relative to specialized firms.

Most of the above studies highlight the difficulties involved in attempting to precisely measure the valuation effect of diversification. Other recent research focused at the plant level finds that conglomerates may not be less productive than single-segment firms of

similar size. For instance, Schoar (2002) examines the effects of industrial diversification on production efficiency using total factor productivity (TFP) and finds that diversified firms are more productive than single-segment firms but firms that acquire plants in unrelated industries experience a subsequent decrease in TFP. Using plant-level data from the U.S. manufacturing firms, Maksimovic and Phillips (2002) find that less productive firms are more likely to diversify, but diversification does not cause lower productivity. They argue that firms optimally choose to diversify and endogenous changes in diversification have a positive effect, reflecting firms moving closer to the optimum.

2.3 International Evidence

While diversification may have limited value in a developed economy such as the U.S., it may be more valuable for firms in other economies where it is costly or impossible to raise external capital, either because of imperfect information or incomplete capital markets. For example, Lins and Servaes (1999) document a diversification discount for Japan and the United Kingdom of about 10% and 15%, respectively. However, they are unable to determine a discount for German firms. They explain the non-existence of a discount in Germany with the concentrated ownership structure of insiders that leads to higher firm values. Claessens et al. (1999) find diversification discounts for firms in more developed East Asian economies and diversification premiums in less developed economies. Focusing on diversified business groups in India, Khanna and Palepu (2000) find that larger diversified groups that are in a better position to tap external capital outperform smaller unaffiliated firms, providing some indirect support for the hypothesis that the value of diversification depends critically on the level of capital market development and integration. However, Lins and Servaes (2002) argue that the less-developed financial and legal regimes in emerging markets increase the potential agency costs associated with diversification and that greater information asymmetry allows insiders to exploit minority shareholders more easily. Consistent with these arguments, they find that diversified firms in 7 East Asian countries (Hong Kong, India, Indonesia, Malaysia, Singapore, South Korea, and Thailand) trade at a discount of approximately 7% compared to single-segment firms.

Using a database of more than 8,000 companies from 35 countries, Fauver et al. (2003) find that the value of diversification is negatively related to the level of capital market development, international integration and legal systems, suggesting that diversification

may be more valuable in emerging markets than in more developed economies. Fauver et al. (2004) provide further evidence that a country's legal system and the ownership structure of the firm affect the value of diversified firms.

Therefore, the international evidence regarding the valuation effect of corporate diversification is still quite limited. The connection between diversification and firm performance continues to generate substantial interest among financial theorists and practitioners. In this paper, we intend to add on to the existing literature by examining whether and to what extent diversification affects performance of Chinese firms. More specifically, we assemble a unique data set that consists of 816 partially privatized firms listed in the two securities exchanges in China during 2000 and 2002, and test whether the gain or loss from diversification depends on firm's endogenous choice and the institutional context of ownership structure and shareholder control.

3. Data, Variables and Hypotheses

3.1 Sample Selection

Our sample spans the time period between 2000 and 2002 and initially includes all 926 firms going public before January 1, 2000. Firms are considered as diversified (multi-segment) if they operate in more than one CSRC (China Securities Regulatory Commission) two-digit code industries and none of their segments accounts for more than 90% of total sales. Single-segment firms are those with at least 90% of total sales derived from one single CSRC two-digit code industry. We exclude 6 financial firms because their liabilities are not strictly comparable to those in other industries. In addition, we eliminate 26 firms that have subsequently been persecuted for violation of Securities Law or undergone investigation for corporate fraud by the CSRC. Out of the remaining 894 firms, 78 firms have missing sales data for their segments during 2000 and 2002. As a result, our final sample consists of 816 firms from 74 two-digit industries with a total of 2448 firm-years. Data on segment sales are compiled from financial statements publicly available on the web (www.jrj.com and www.cnlist.com). Data on stock price and accounting information are extracted from China Stock Market and Accounting Research (CSMAR) database commercially available from University of Hong Kong and Shenzhen GTA Information Co. Ltd.

3.2 Measures of Diversification and Firm Performance

In measuring the diversification variable, two alternative proxies are constructed. The first measure of diversification is a dummy variable that takes 1 if a firm engages in

industrial diversification as defined in Section 3.1, and 0 otherwise (*DIV*). The second measure is a sales-based Herfindahl index (*HI*) defined as follows:

$$HI_i = \sum_{j=1}^{M} \left(\frac{SALES_{j,i}}{\sum_j SALES_{j,i}} \right)^2 \quad (1)$$

where $SALES_{j,t}$ is the sales revenue for segment j in firm i. *HI* equals 1 for single-segment firms and decreases as the degree of diversification increases.

In measuring firm performance, we employ an accounting-based and a stock market-based proxy.[2] The accounting-based performance measure is return on sales (*ROS*), defined as the ratio of operating income to sales revenue.[3] The stock market-based valuation measure is Tobin's *q*, estimated as the sum of market value of equity and the book value of total debt divided by the book value of total assets (Chung and Pruitt, 1994).[4]

Tables 1 and 2 present summary statistics and correlation matrix for diversification, firm performance and other control variables (described in subsequent sections). As shown in the table, the median sales-based Herfindahl index decreases from 0.958 in 2000 to 0.907 in 2002, indicating that the degree of diversification has increased over time. The average *ROS* and Tobin's *q* decreases from 26.7% and 2.738 in 2000 to 23.7% and 1.748 in 2002, respectively, providing strong evidence that firm performance has deteriorated over the sample period. In addition, *HI* is negatively correlated with Tobin *q* (statistically significant at the 5% level for all three years) and *ROS* (statistically significant in 2000 and 2001), presenting some evidence that diversification is associated with better firm performance.

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[2] We do not use the excess value method proposed by Berger and Ofek (1995) because there is practical limitation in securing the median ratios from representative firms in the same lines of business as there are often only a few stand-alone firms available in the same industry. Moreover, Campa and Kedia (2002), Graham et al. (2002) and Villalonga (2004) suggest that the Berger and Ofek's method causes a possible downward bias in computing firm value.

[3] Sun and Tong (2003) point out that China's regulatory rules allow listed companies to have rights issue up to 30% of outstanding stocks annually. Many firms take advantage of this rule to raise additional equity capital even if they have no investment opportunities. Total equity and total asset would increase dramatically in such cases, which poses major problems in using the common profitability measures such as return on assets (*ROA*) and return on equity (*ROE*). Consequently, *ROS* is a better profitability and performance measure.

[4] In calculating the market value of equity, we notice that almost two-thirds of total outstanding shares are in the form of non-tradable state and legal entity shares. As a result, we multiply the non-tradable shares by the net asset value per share and add the figure to the market capitalization of tradable shares.

[6] State shares are retained by the State Assets Management Bureau (SAMB) of the central or local government and are not allowed to be publicly traded, although reforms have been initiated to free up these shares since May 2005. Legal entity shares are held by domestic institutional investors including banks, securities companies, insurance companies, mutual funds, industrial enterprises, transportation and power companies, and research institutes. Similar to state shares, legal entity shares are not tradable and most of them are ultimately controlled by the state through its control over the legal entities. Public shares are held by the investment public and tradable on the two securities exchanges. Employee shares are offered to workers and managers of a listed firm, typically at substantial discounts, at the time of initial public offerings (IPOs).

3.3 Ownership Structure

During the sample period covered in this study, the ownership structure of China's listed firms can be classified into four main categories: state shares, legal entity shares, publicly tradable shares and employee shares.[6] A number of research has documented that because of complex agency problems and soft budget constraints, state ownership is negatively related to firm performance and firm value in China (see Xu and Wang, 1999; Sun and Tong, 2003; Aivazian et al., 2005; Wei et al., 2005; among others). Therefore, we include the percentage of shares held by the government (*STATE*) to and hypothesize that:

[H1] *State ownership is negatively related to firm valuation.*

In addition, Sun and Tong (2003) point out that unlike the government, many legal entities have close business connections with the listed firms in which they have ownership. Compared with either the government or individual shareholders, legal entities have more expert knowledge of the firm and are better equipped with the power to monitor management. Consequently, legal entity ownership is tied to better firm performance. However, it is also quite possible that legal entity shareholders may expropriate assets or cash flows from the listed firms. As a result, the impact of legal entity share ownership (*LEGAL*) on firm performance is an interesting empirical question to be addressed in this paper.

Moreover, Jensen (1986) argues that firms where managerial ownership is high tend to have shareholders' and managers' interests better aligned and, therefore, suffer less agency costs. Morck et al. (1988) and McConnell and Servaes (1990) provide evidence of a predominantly positive relation between corporate value and managerial ownership. With respect to the relation between diversification and agency costs, Denis et al. (1997) find that managerial ownership of shares is an important determinant of corporate diversification. Lins and Servaes (2002) argue that the severe market imperfections found in emerging markets increase the potential agency costs associated with diversification and that greater asymmetric information allows management and large shareholders to exploit minority shareholders more easily through value-reducing diversification. Nam et al. (2006) find that firms with high equity-based compensation have higher valuation than firms with low equity-based compensation, which is true in both single-segment and multi-segment firms. The effect of equity-based compensation for multi-segment firms, where agency costs are expected to be higher, is much greater than for single-segment firms. Therefore, we include the percentage of shares held by managers and directors (*MHOLD*) and hypothesize that:

[H2] *Managerial equity ownership is positively related to firm valuation.*

[H3] *The performance sensitivities of managerial equity ownership are larger for diversified firms than for single-segment firms (agency cost hypothesis of diversification).*

3.4 Ownership Concentration

Consistent with existing literature, we measure ownership concentration as the percentage of shares held by the largest shareholder (*LARGE*). In theory, a controlling shareholder can affect minority shareholders' rights and firm performance in two opposite ways. Shleifer and Vishny (1997) argue that large shareholders can benefit minority shareholders because they have the power and incentive to prevent expropriation or asset stripping by managers. On the other hand, large shareholders can collude with managers to expropriate minority shareholders' benefits, which is called "tunneling" (Johnson et al., 2000) and described as one of the central agency problems in countries with relatively poor shareholder protection (La Porta et al., 1999; 2000). Therefore, the relationship between ownership concentration and firm performance is an empirical question. When ownership of shares is widely dispersed, increasing ownership concentration is likely to mitigate the free-rider problem amongst shareholders and increase firm efficiency. However, when the fractional ownership of the largest shareholder exceeds a certain threshold, increasing ownership concentration raises the likelihood of tunneling and decreases firm efficiency. As ownership concentration approaches 100%, the tunneling effect diminishes and the relationship between ownership concentration and firm efficiency becomes positive again. In light of the institutional background in China, i.e., ownership of share is almost never widely dispersed and there is usually one overwhelmingly large shareholder with controlling power in the listed firms, we hypothesize that the last two effects dominate in the data, i.e.,

[H4] *The relationship between ownership concentration and firm valuation is U-shaped.*

Because government can extend its ownership and control through pyramidal shareholding scheme, it is a key player in the operational management of firms. Su (2005) argues that the Chinese government may pursue objectives that are at odds with the interests of other shareholders through tunneling activities (political costs). For example, the government can exert considerable influence on the selection of managers and board directors and thus, can persuade the management to engage in value-destroying spin-offs and divert assets from the listed firm to the state. Government bureaucrats can also run a

diversified firm like their own personal fiefdom, dispensing patronage in the form of jobs and favors. Therefore, we introduce a dummy variable *GOV* and interact it with *DIV* to examine the effect of the identity of ultimate owners on diversification and firm performance. *GOV* takes the value 1 if the government is the ultimate owner and 0 otherwise. We hypothesize that:

[H5] *Government control is negatively related to firm valuation.*

[H6] *The performance of government controlled diversified firms is worse than that of non-government controlled diversified firms* (*political costs hypothesis of diversification*).

3.5 Value of Internal Capital Markets

Billett and Mauer (2000) argue that the credit constraints of the internal capital markets affect conditions under which internal capital market transactions are value-enhancing. They use the sum across segments of the product of each segment's excess capital expenditures and its industry-adjusted return on investment to proxy for the value of the internal capital markets, and find that diversification discount is negatively correlated with cross-subsidies to segments of a diversified firm that would likely be credit constrained as stand-alone firms. Because data on excess capital expenditures at the segment level are not available in the Chinese case, we use two variables to access the credit constraints governing a firm's decision to engage in diversification activities. The first one is the sum of operating profits and cumulative depreciation divided by total assets (*CASH*), which is a proxy for the ease of credit condition for a firm to engage in cross-subsidization. The second one is a dummy variable that takes 1 if a firm declares cash dividend in a given year (*DD*)[7]. We hypothesize that:

[H7] *Firms that are less credit-constrained are more likely to diversify.*

3.6 Growth Opportunities

If diversified firms have fewer growth opportunities than average single-segment firms, they would have lower values relative to their industry average. In addition, certain specialized firms are characterized by the need for large amounts of firm-specific knowledge that is not easily transferable to other lines of business. Hyland and Diltz (2002) control for firm-specific knowledge and growth opportunities by including a measure of research and development (R&D) intensity. They find that diversifying firms invest less in

[7] Lang and Stulz (1994) argue that a firm which pays dividends could invest more by cutting dividends, and hence is unlikely to be credit-constrained in financial markets.

R&D and have significantly fewer growth opportunities than single-segment firms prior to diversification. However, Stowe and Xing (2006) measure growth opportunities with the ratio of capital expenditures to total assets and find that differing growth opportunities between diversified and single-segment firms cannot account for the diversification discount. Because data on R&D expenses are not available for China's listed firms, we use the percentage change in total assets (*GROWTH*) and the ratio of intangible assets to total assets (*INTANG*) to proxy for growth opportunities and control for the valuation effect of diversification that is attributable to firm-specific knowledge. We also follow Campa and Kedia (2002) in including the fraction of all firms in the industry that are conglomerates (*IND*) to proxy for the attractiveness of the industry to multi-segment firms. We hypothesize that:

[H8] *Firms with better growth opportunities performance better and are more likely to engage in value-enhancing diversification.*

[H9] *Industry attractiveness is positively related to diversification.*

3.7 Other Control Variables

Firm size is a positive predictor of firm diversification in that larger firms have greater propensity to be diversified. Thus, we employ the logarithm of total assets (*LNSIZE*) to control for the size effect. In addition, Stein (2003) posits that the rise and decline of corporate diversification may be due to the production life cycle of the firm. Because many firms in China carve out their most profitable assets and businesses into a joint stock company for the IPO in order to raise capital in the stock market, we use the the number of years after going public (*AGE*) to control for the age effect. Furthermore, Matsusaka and Nanda (2002) and Doukas and Pentzalis (2003) show that diversified firms can utilize internal capital markets to overcome the difficulty in access to external finance. Therefore, we include the ratio of book value of debt to the sum of the book value of debt and market value of equity (*LEVER*) as a control variable.[8] Moreover, we include a separate dummy variable for each of the 13 single-digit CSRC industries for all firms in the sample.

[8] Ahn et al. (2006) argues that leverage constrains investment in that firms with valuable growth opportunities would choose lower leverage to avoid the risk of being forced to bypass some of these opportunities. They find that within diversified firms, the negative impact of leverage on investment is significantly greater for high-growth than for low-growth segments. They also find that after controlling for excess leverage (actual leverage minus imputed leverage based on the methodology proposed by Berger and Ofek, 1995), the difference between the excess values of diversified and focused firms is large and statistically significant for high-growth firms while it is insignificant for low-growth firms. As mentioned in Section 3.2, we are constrained by the data to compute excess values. Nevertheless, we include leverage ratio as a control variable.

4. Preliminary Evidence on the Effect of Diversification on Firm Performance

Table 3 provides mean, standard deviation and Kolmogorov-Smirnov test statistic for our sample divided into single- and multi-segment firms. As shown in the table, the average Tobin's *q* for multi- and single-segment firms is 2.2245 and 2.0947, respectively. The Kolmogorov-Smirnov two sample *t*-statistic for the difference in sample means is 2.7198 and significant at the 1% level, indicating that diversified firms are valued more by the market. However, the difference in *ROS* between multi- and single-segment firms is not statistically significant. In terms of ownership structure, multi-segment firms have significantly lower state and managerial ownership but higher legal entity share ownership. In terms of ownership concentration, both the percentage of shares held by the largest shareholder and the likelihood of government as the ultimate owner are smaller for multi-segment firms. In terms of the value of internal capital markets and growth opportunities, multi-segment firms have higher cash flow, asset growth and intangible assets, and operate in more attractive industries, but distribute less cash dividends than single-segment firms. These results are largely consistent with the hypotheses that firms with less credit constraints or better growth opportunities are more likely to diversify. However, diversified firms are more levered, which is inconsistent with the notion that leverage is negatively related to diversification. Finally, multi-segment firms are older but their average firm size is not significantly different from single-segment firms.

Table 4 partitions the sample along two dimensions, multi-segment versus single-segment and government controlled versus non-government controlled, for measures of firm performance and other characteristics. The mean and standard deviation of the four sub-samples are contained in cells with heavy border line. For each variable, the top two cells are for government controlled firms, partitioned by whether or not firms are diversified. The lower two cells are for non-government controlled firms, also partitioned by diversification. Surrounding these four cells are the Kolmogorov-Smirnov two sample *t*-statistics that test for the differences in sample means for the rows, columns and diagonals. Consistent with table 3, on average, multi-segment firms have higher Tobin's *q* than single-segment firms, but the difference in sample means is statistically significant for non-government controlled firms only.[9] In comparison, non-government controlled firms have significantly higher Tobin's *q* than government

[9] In subsequent sections, we demonstrate that non-government controlled firms, which are better performers, are more likely to take up diversification.

controlled firms, no matter whether they are diversified. These results suggest that government control may exert an important influence on whether or not diversification enhances firm value.

In addition, table 4 shows that the non-government controlled multi-segment firms have significantly higher *ROS* than state-owned single-segment firms. Furthermore, an examination of the table indicates that non-government controlled firms have significantly higher managerial equity ownership, growth opportunities and cash flow, and operate in more attractive industries than government controlled firms. After controlling for the identity of the ultimate owner, multi-segment firms always have higher leverage, asset growth, cash flow, intangible assets and industry attractiveness than single-segment firms. These results are consistent with those in table 3. However, government controlled multi-segment firms have significantly higher managerial equity ownership than government controlled single-segment firms while non-government controlled multi-segment firms have significantly lower managerial equity ownership than non-government controlled single-segment firms, suggesting that government control may be an important determinant of insider ownership.

To provide an initial investigation of the impact of diversification on firm valuation, we estimate the following multivariate panel data regressions:

$$\begin{aligned} q_{i,t} = {} & \alpha_0 + \alpha_1 DIV_{i,t} (\text{or } HI_{i,t}) + \alpha_2 STATE_{i,t} + \alpha_3 LEGAL_{i,t} + \alpha_4 LARGE_{i,t} + \alpha_5 LARGE2_{i,t} \\ & + \alpha_6 MHOLD_{i,t} + \alpha_7 DIV_{i,t} \times MHOLD_{i,t} + \alpha_8 GOV_{i,t} + \alpha_9 DIV_{i,t} \times GOV_{i,t} \\ & + \alpha_{10} GROWTH_{i,t} + \alpha_{11} INTANG_{i,t} + \alpha_{12} AGE_{i,t} + \alpha_{13} LNSIZE_{i,t} \\ & + \sum_k \varphi_k INDUSTRY\ DUMMIES + \sum_t \phi_t YEAR\ DUMMIES + \varepsilon_{i,t} \end{aligned} \tag{2}$$

where $q_{i,t}$ is Tobin's q for firm i in year t, $DIV_{i,t}$ and $HI_{i,t}$ are diversification dummy and sales-based Herfindahl index, respectively, $LARGE2_{i,t}$ is the squared term for $LARGE_{i,t}$ to allow for the nonlinear effect of ownership concentration on firm performance, $DIV_{i,t} \times MHOLD_{i,t}$ is the interaction term of diversification dummy and managerial ownership to test for the agency cost hypothesis of diversification [H3], and $DIV_{i,t} \times GOV_{i,t}$ is the interaction term of diversification and government control to test for the political cost hypothesis of diversification [H6].

Table 5 presents panel regression estimates and their associated *p*-values based on heteroskedasticity-consistent *t*-statistics. An inspection of the table reveals several

interesting features on the effect of diversification on firm value. First, multi-segment firms have higher Tobin's *q* than single-segment firms after controlling for firm age and size, as the coefficient estimate for *DIV* is significantly positive while the coefficient estimate for *HI* is significantly negative, both at the 5% level in columns (i) and (iv).[10] However, after controlling for the identity of ultimate owners, the coefficient estimate for *HI* is no longer significant, while the coefficient estimate for *DIV* remains significantly positive at the 10% level. The differences in Tobin's *q* between multi- and single-segment firms become much smaller and statistically insignificant after controlling for ownership structure, managerial incentives, large shareholder control, growth opportunities and other firm-specific characteristics.

Second, in contrast to the agency cost prediction in [H2], managerial equity ownership is negatively related to Tobin's *q* as the coefficient estimates for *MHOLD* are significantly negative in columns (iii) and (vii). An explanation is that executive shares, which are part of the employee share ownership program, are not tradable without explicit permission from the CSRC. Thus, ownership of equity shares creates no performance incentives for managers and board directors. Moreover, there is no evidence that the performance sensitivities of managerial equity ownership are larger for diversified firms, where agency costs are expected to be higher, as none of the coefficient estimates for the $DIV \times MHOLD$ interaction term is statistically significant. Therefore, the agency cost hypothesis of diversification [H3] can be firmly rejected in our data.

Third, consistent with hypothesis [H5], there is strong evidence that government control decreases Tobin's *q* as the coefficient estimates for *GOV* are all significantly negative. There is also some evidence that government controlled diversified firms have lower Tobin's *q* than non-government controlled diversified firms, as the coefficient estimates for the $DIV \times GOV$ are significantly negative at the 10% level in column (iii) and marginally significantly negative in column (vii). This result suggests that the effect of diversification on firm performance depends on the extent of government control and that the political cost prediction in hypothesis [H6] cannot be rejected, at least in model specifications (iii) and (vii). Therefore, an explanation for the insignificance of the coefficient estimates for *DIV* in regressions (iii)—(iv) and *HI* in regressions (vi)—(viii) is that government control, which is associated with inferior firm performance, reduces the positive impact of diversification on Tobin's *q*.

[10] Note that a higher Herfindahl index implies greater concentration (i.e., lower diversification). Thus the negative coefficient on *HI* is consistent with the positive coefficient on *DIV*.

In addition to providing important evidence on the effect of diversification on firm value, the results in Table 5 reaffirm a number of empirical findings documented in earlier studies on ownership structure, block-holder control and firm performance for China's listed firms. Consistent with Wei et al. (2005) and hypothesis [H1], we find that state and legal entity ownership are negatively related to Tobin's *q*. The magnitude of the negative impact of legal entity ownership slightly exceeds that of state ownership, indicating that the destruction of firm value by the legal entity shareholders is very serious. In line with Bai et al. (2004) and hypothesis [H4], the coefficient estimates for *LARGE* and *LARGE2* are significantly positive and negative, respectively, which suggests that the relationship between ownership concentration and Tobin's *q* is U-shaped. Therefore, tunneling and expropriation by the controlling shareholder appears to be an important issue to be further addressed in the ongoing corporate governance reform in China. Finally, smaller or older firms with higher annual asset growth rates have significantly larger Tobin's *q* while intangibles exert no impact on firm value.

5. The Determinants of Corporate Diversification Decisions

As discussed in Section 2, recent studies have shown that the valuation effect from diversification may be the product of sample selection bias or firm's endogenous choice and that diversification per se may not destroy or add value to the firm. Therefore, it is very important to examine whether certain characteristics inherent in firms are likely to affect diversification decisions.

In this section, the diversification decision is presented as a dependent variable. The probability to diversify is estimated with a set of explanatory and control variables which may influence a firm's decision to operate as a single- or multi-segment firm. Specifically, we estimate the following Logit regression using maximum likelihood estimation:

$$\begin{aligned}\ln\left(\frac{P_{i,t}^{DIV}}{1-P_{i,t}^{DIV}}\right) = {} & \alpha_0 + \alpha_1 q_{i,t-1} + \alpha_2 STATE_{i,t} + \alpha_3 LEGAL_{i,t} + \alpha_4 LARGE_{i,t} \\ & + \alpha_5 MHOLD_{i,t} + \alpha_6 GOV_{i,t} + \alpha_7 LEVER_{i,t-1} + \alpha_8 DD_{i,t-1} \\ & + \alpha_9 GROWTH_{i,t-1} + \alpha_{10} CASH_{i,t-1} + \alpha_{11} INTANG_{i,t-1} \\ & + \alpha_{12} IND_{i,t-1} + \alpha_{13} AGE_{i,t} + \alpha_{13} LNSIZE_{i,t} + \alpha_{14} EX_{i,t} \\ & + \sum_k \varphi_k INDUSTRY\ DUMMIES + \sum_t \phi_t YEAR\ DUMMIES + \varepsilon_{i,t}\end{aligned} \tag{3}$$

where $P_{i,t}^{DIV}$ is the probability that firm *i* will engage in diversification activities in year *t*.

The independent variables include lagged firm value, ownership structure, ownership concentration, the identity of the controlling shareholder, lagged leverage, lagged cash constraints, lagged growth potentials, stock exchange dummy (*EX* takes the value 1 when the firm is listed in the Shanghai Securities Exchange, and 0 if it is listed in the Shenzhen Securities Exchange), age, size and industry. For sensitivity tests, we re-estimate regression (3) by replacing lagged Tobins's q with $ROS_{i,t-1}$. As a result of our use of a number of lagged one-year variables, our sample size is reduced from 2448 to 1632 firm-year observations.

Table 6 reports transformed coefficient estimates representing the marginal effects evaluated at the sample means of the independent variables from the Logit regression. The marginal effect of a dummy variable is calculated as the discrete change in the expected value of the dependent variable as the dummy variable changes from 0 to 1. The equation statistics at the bottom of the table, i.e., Maddala's pseudo $\overline{R}^2$, McFadden's pseudo $\overline{R}^2$ and the likelihood ratio tests, measure the goodness-of-fit of the estimated model. The null hypothesis that the model does not have greater explanatory power than an "intercept only" model, is overwhelmingly rejected at the 1% significance level.

As shown in the table, the marginal effect estimates for lagged Tobin's q are significantly positive at the 5% level while those for lagged *ROS* are positive but statistically insignificant, providing some evidence that firms with better past valuation are more likely to adopt diversification strategies. Consequently, any further attempt to shed more light on the effect of diversification on firm value has to take into consideration the endogeneity issue between diversification and valuation measures.

In addition, the marginal effect estimates for *STATE* and *LEGAL* are all significantly negative, indicating that firms with higher state or legal entity share ownerships are less likely to diversify. The transformed coefficient estimates for *GOV* are also significantly negative, mostly at the 5% level, indicating that government controlled firms are less likely to diversify. Thus, consistent with the political cost hypothesis, government ownership and control play an important role in understanding diversification behavior and firm performance, at least for partially privatized firms in China. In contrast, the agency cost hypothesis may not be able to explain diversification decisions, as the marginal effect estimates for *MHOLD*, the variable representing managerial incentive, are statistically insignificant.

Furthermore, the results in Table 6 indicate that hypotheses [H7], [H8] and [H9]

cannot be rejected. More specifically, the marginal effect estimates for *CASH* are significantly positive at the 1% level and the marginal effect estimates for *DD* are negative but statistically insignificant, indicating that firms with more operating profits plus cumulative depreciation are more likely to diversify while firms' policy on cash dividend distribution is unrelated to diversification decisions. Hence, consistent with hypothesis [H7], there is some evidence that firms with less cash constraints are more likely to diversify. The marginal effect estimates for *GROWTH* are significantly positive at the 1% level and the marginal effect estimates for *INTANG* are also positive but statistically insignificant, suggesting that diversification probability is positively related to asset growth while unrelated to the fraction of intangible assets. Thus, there is some evidence in favor of hypothesis [H8] that firms with better growth opportunities are more likely to diversify. The marginal effect estimates for *IND* are significantly positive at the 5% level, providing evidence that industry attractiveness is positively related to the diversification probability (hypothesis [H9]).

Finally, the results in Table 6 shows that firm age is positively related to the diversification decisions, which is consistent with the life-cycle proposition in Stein (2003). On the other hand, both leverage and firm size are unrelated to diversification as the transformed coefficient estimates for *LEVER* and *LNSIZE* are never statistically significant.

6. Diversification and Firm Performance: A Closer Look

In the previous section, we assume that the decision to operate as a multi-segment firm is a function of past performance, firm characteristics and industry. In this section, we allow diversification choice and firm performance to be endogenous outcomes based on firm characteristics. In the spirit of the methodology proposed by Campa and Kedia (2002), we apply an instrumental variable (IV) estimation technique to isolate the influence of diversification on firm performance from the influence of other firm-specific characteristics. Specifically, we first estimate the probability of being a multi-segment firm from the following Logit model, using the whole sample of 2448 firm-year observations:[11]

[11] Compared with Logit regression (3), the independent variables in (4) are all contemporaneous and do not include firm performance. Firm-specific instruments, such as *CASH*, *DD*, *IND* and *EX*, are assumed to affect firm performance only through making diversification more or less likely.

$$\ln\left(\frac{P_{i,t}^{DIV}}{1-P_{i,t}^{DIV}}\right) = \alpha_0 + \alpha_2 STATE_{i,t} + \alpha_3 LEGAL_{i,t} + \alpha_4 LARGE_{i,t} + \alpha_5 MHOLD_{i,t} + \alpha_6 GOV_{i,t} + \alpha_7 LEVER_{i,t} + \alpha_8 DD_{i,t} + \alpha_9 GROWTH_{i,t} + \alpha_{10} CASH_{i,t} + \alpha_{11} INTANG_{i,t} + \alpha_{12} IND_{i,t} + \alpha_{13} AGE_{i,t} + \alpha_{13} LNSIZE_{i,t} + \alpha_{14} EX_{i,t} + \sum_k \varphi_k INDUSTRY\ DUMMIES + \sum_t \phi_t YEAR\ DUMMIES + \varepsilon_{i,t} \quad (4)$$

We then use the estimated probability of diversification $\hat{P}_{i,t}^{DIV}$ as an instrument for the diversification status and include it along with a number of exogenous variables as explanatory variables in the following regression of the decision to diversify:

$$DIV_{i,t} = \alpha_0 + \alpha_1 \hat{P}_{i,t}^{DIV} + \alpha_2 STATE_{i,t} + \alpha_3 LEGAL_{i,t} + \alpha_4 LARGE_{i,t} + \alpha_5 MHOLD_{i,t} + \alpha_6 GOV_{i,t} + \alpha_7 GROWTH_{i,t} + \alpha_9 INTANG_{i,t} + \varepsilon_{i,t} \quad (5)$$

Lastly, we use the fitted value from regression (5) as an instrument for $DIV_{i,t}$ in the following regression of firm performance on diversification:

$$q_{i,t} = \alpha_0 + \alpha_1 D\hat{I}V_{i,t} + \alpha_2 STATE_{i,t} + \alpha_3 LEGAL_{i,t} + \alpha_4 LARGE_{i,t} + \alpha_5 LARGE2_{i,t} + \alpha_6 MHOLD_{i,t} + \alpha_7 DIV_{i,t} \times MHOLD_{i,t} + \alpha_8 GOV_{i,t} + \alpha_9 DIV_{i,t} \times GOV_{i,t} + \alpha_{10} GROWTH_{i,t} + \alpha_{11} INTANG_{i,t} + \varepsilon_{i,t} \quad (6)$$

To test for the existence of endogeneity between diversification and firm performance, we compute the Hausman's test statistics, which is based on the difference between the OLS estimator and the IV estimator. To test for the robustness of the results, we substitute *ROS* for Tobin's *q* as dependent variable and replicate regression (6). We also replace $DIV_{i,t}$ with $HI_{i,t}$ and $D\hat{I}V_{i,t}$ with $\hat{H}I_{i,t}$ and re-estimate regressions (5) and (6). Table 7 contains the IV estimates of the effect of diversification on firm valuation.

As shown in the table, the null hypothesis of no endogeneity can be rejected at the 1% level, indicating that endogeneity is present in the data. The coefficient estimates for $D\hat{I}V_{i,t}$ are significantly positive at the 5% level while the coefficient estimates for $\hat{H}I_{i,t}$ are significantly negative at the 1% level, suggesting that diversification is associated with higher firm value, even after controlling for ownership structure, ownership concentration, the identity of ultimate owners and growth opportunities. In contrast to the results in Table 5, the Tobin's *q* for multi-segment firms is on average 0.26 to 0.33 higher than that of single-segment firms, after correcting for the endogeneity problem. Moreover, a 0.1

decrease in sales-based Herfindahl index leads to a 0.22 to 0.27 increase in Tobin's *q*, suggesting that a higher degree of diversification is associated with higher firm value.

Furthermore, the coefficient estimates for *MHOLD* and $DIV \times MHOLD$ are positive but statistically insignificant, indicating that managerial share ownership does not affect firm value and there is no difference in performance sensitivities for managerial incentives among multi- and single-segment firms. Consequently, the agency cost hypothesis of diversification can be firmly rejected. However, the coefficient estimates for *GOV* are significantly negative at the 5% level in regressions (ii) and (iv) and at the 10% level in regressions (i) and (iii), indicating that government controlled firms have lower Tobin's *q* than non-government controlled firms. The coefficient estimates for $DIV \times GOV$ are significantly negative at the 10% level in regressions (i) and (iii), providing some evidence that government-controlled multi-segment firms have lower Tobin's *q* than government controlled single-segment firms. The implication is that government ownership of firms is associated with significant value loss for diversified firms. Therefore, the political cost hypothesis of diversification cannot be rejected.

Furthermore, consistent with the results in Table 5, firms with higher asset growth rates have larger Tobin's *q* as the coefficient estimates for *GROWTH* are significantly positive at the 1% level. However, most of the coefficient estimates for *STATE, LEGAL* and *LARGE* are no longer statistically significant, indicating that ownership structure and block shareholder control play very limited role in affecting firm value, after taking into account the endogeneity of the decision to diversify.

7. Conclusion

This paper analyzes corporate diversification and firm performance of partially privatized state-owned enterprises in China as they reflect conflicts among government's desire to retain political control, private investors' desire for return on their investments, and management's desire to appropriate resources for its own benefit. The paper thus sheds additional light on the benefits and costs of diversification in corporate China. The main findings of the paper can be summarized as follows:

First, managerial incentive does not appear to be significantly related to firm performance and there is no evidence that the performance sensitivities of managerial equity ownership are larger for diversified firms, where agency costs are expected to be higher. However, there is some evidence that government controlled diversified firms have lower Tobin's *q* than non-government controlled diversified firms, suggesting that

the effect of diversification on firm value varies according to whether a firm is controlled by the government. Therefore, the empirical results are against the agency cost predictions while in favor of the political cost hypothesis of diversification.

Second, a firm's diversification decision is not random and depends on past performance, ownership structure, government control, growth potential and the value of internal capital markets. Specifically, non-government controlled firms that have higher Tobin's *q* and possess more cash are more likely to adopt diversification strategies and tend to have a higher degree of diversification.

Third, when the diversification decision is modeled as an endogenous choice based on firm characteristics, multi-segment firms have significantly higher Tobin's *q* than single-segment firms, even after controlling for factors such as ownership structure, ownership concentration and growth opportunities. Overall, the results in this paper indicate that diversification has positive impact on firm valuation in a country where the external capital market is less developed and the diversification effect is largely influenced by political control and firm's endogenous choice.

Although the paper obtains some interesting results, two issues remain. One is that the intricate relation between diversification and the efficiency of the internal capital market is left unexplored due to a lack of detailed accounting data at the segment level. Another is that the empirical analysis does not consider the interactive effects of leverage and growth opportunities on diversification and firm value as the main objective is to differentiate agency cost predictions from political cost hypothesis of diversification. We hope to explore these unresolved issues more fully in future research.

References

Ahn, S., Denis, D.J., Denis, D.K., 2006. Leverage and investment in diversified firms. Journal of Financial Economics 79, 317-337.

Aggarwal, R., Samwick, A., 2003. Why do managers diversify their firms? Agency reconsidered. Journal of Finance 58, 71-118.

Amihud, Y., Lev, B., 1981. Risk reduction as managerial motive for conglomerate mergers. Bell Journal of Economics 12, 605– 617.

Aivazian, V., Ge, Y., Qiu J., 2005. Can corporatization improve the performance of state-owned enterprises even without privatization? Journal of Corporate Finance 11, 791-808.

Bai, C.E., Liu, Q., Lu, J., Song, M., 2004. Corporate governance and market valuation in China. Journal of Comparative Economics 32, 599-616.

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

Berger, P., Ofek, E., 1996. Bustup takeovers of value-destroying diversified firms. Journal of Finance 51, 1175-1200.

Berry, C., 1975. Corporate Growth and Diversification, Princeton, NJ: Princeton University Press.

Billett, M.T., Mauer, D.C., 2000. Diversification and the value of internal capital markets: The case of tracking stock. Journal of Banking and Finance 24, 1457-1490.

Burch, T., Nanda, V., 2003. Divisional diversity and the conglomerate discount: The evidence from spin-offs. Journal of Financial Economics 70, 69-98.

Campa, J., Kedia, S., 2002. Explaining the diversification discount. Journal of Finance 57, 1731-1762.

Chevalier, J.A., 2000. What do we know about cross-subsidization? Evidence form the investment policies of merging firms. Working paper, University of Chicago and NBER.

Chung, K., Pruitt, S., 1994. A simple approximation of Tobin's q. Financial Management 23, 70-74.

Claessens, S., Djankov, S., Fan, J.P.H., Lang, L.H.P., 1999. Corporate diversification in east Asia: The role of ultimate ownership and group affiliation. World Bank working paper series #2089, Washington, DC.

Comment, R., Jarrell, G., 1995. Corporate focus and stock returns. Journal of Financial Economics 37, 67-87.

Daley, L., Mehrotra, V., Sivakumar, R., 1997. Corporate focus and value creation: Evidence from spinoffs. Journal of Financial Economics 45, 257–281.

Desai, H., Jain, P., 1999. Firm performance and focus: Long-run stock market performance following spinoffs. Journal of Financial Economics 54, 75–101.

Dennis, D. J., Denis, D.K., Sarin, A., 1997. Agency problems, equity ownership and corporate diversification. Journal of Finance 52, 135-160.

Denis, D.J., Denis, D.K., Yost, K., 2002. Global diversification, industrial diversification, and firm value. Journal of Finance 57, 1951–1979.

Doukas, J.A., Pantzalis, C., 2003. Geographic diversification and agency costs of debt of multinational firms. Journal of Corporate Finance 9, 59-92.

Errunza, V.R., Senbet, L.W., 1981. The effects of international operations on the market value of the firm: theory and evidence. Journal of Finance 36, 401–417.

Fauver, L., Houston, J.F., Naranjo, A., 2003. Capital market development, integration, legal systems, and the value of corporate diversification: a cross-country analysis. Journal of Financial and Quantitative Analysis 38, 135-157.

Fauver, L, Houston, J.F., Naranjo, A., 2004. Cross-country evidence on the value of corporate industrial and international diversification. Journal of Corporate Finance 10, 729-752.

Gertner, R., Scharfstein, D., Stein, J., 1994. Internal versus external capital markets. Quarterly Journal of Economics 109, 1211-1230.

Graham, J., Lemmon, M., Wolf, J., 2002. Does corporate diversification destroy value? Journal of Finance 57, 695-720.

Hubbard, R., Palia, D., 1999. A reexamination of the conglomerate merger wave in the 1960s: An internal capital markets view. Journal of Finance 54, 1131-1152.

Hyland, D., Diltz, D., 2002. Why firms diversify: An empirical examination, Financial Management, Spring, 5 – 35.

Jensen, M., 1986. Agency costs of free cash flow, corporate finance, and takeovers. American Economic Review 76, 323-329.

Jensen, M.C., Meckling, W.H., 1976. Theory of firm: Managerial behavior, agency cost and capital structure. Journal of Financial Economics 3, 305-360.

John, K., Ofek, E., 1995. Asset sales and increase in focus. Journal of Financial Economics 37, 105–126.

Johnson, S., La Porta, R., Loped-de-Silanes, F., Shleifer, A., 2000. Tunneling. American Economic Review 90, 22-27.

Khanna, T., Palepu, K. 2000. Is group affiliation profitable in emerging markets? An analysis of diversified Indian business groups. Journal of Finance, 55: 867-891.

Khanna, N., Tice, S., 2001. The bright side of internal capital markets. Journal of Finance 56, 1489-1528.

La Porta, R., Loped-de-Silanes., F., Shleifer, A., Vishny, R., 1999. Corporate ownership around the world. Journal of Finance 44, 471-517.

La Porta, R., Loped-de-Silanes., F., Shleifer, A., Vishny, R., 2000. Investor protection and corporate governance. Journal of Financial Economics 58, 3-27.

Lamont, O., 1997. Cash flow and investment: Evidence from internal capital markets. Journal of Finance 52, 83-109.

Lamont, O., Polk, C., 2002. Does diversification destroy value? Evidence from industry shocks. Journal of Financial Economics 63, 51–77.

Lang, L., Stulz, R., 1994. Tobin's q, corporate diversification, and firm performance. Joural of Political Economy 102, 1248-1291.

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

Lins, K., Servaes, H., 2002. Is corporate diversification beneficial in emerging markets? Financial Management 31, 5-31.

Maksimovic, V., Phillips, G., 2002. Do conglomerate firms allocate resources inefficiently across industries? Theory and evidence. Journal of Finance 57, 721-767.

Mansi, S., Reeb, D.M., 2002. Corporate diversification: What gets discounted? Journal of Finance 57, 2167–2184.

Martin, J.D., Sayrak, A., 2003. Corporate diversification and shareholder value: A survey of recent literature. Journal of Corporate Finance 9, 37-57.

Matsusaka, J.G., Nanda, V., 2002. Internal capital markets and corporate refocusing, Journal of Financial Intermediation 11, 176-211.

McConnell, J., Servaes, H., 1990. Additional Evidence on Equity Ownership and Corporate Value. Journal of Financial Economics 27, 595-612.

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

Morck, R.; Shleifer, A.; Vishny, R. W., 1998. Management Ownership and Market Valuation: An Empirical Analysis. Journal of Financial Economics 20, 293-315.

Nam, J., Tang, C., Thornton Jr., J.H., Wynne, K., 2006. The effect of agency costs on the value of single-segment and multi-segment firms. Journal of Corporate Finance 12,

761-782.

Rajan, R., Servaes, H., Zingales, L., 2000. The cost of diversity: The diversification discount and inefficient investment. Journal of Finance 55, 35-79.

Scharfstein, D., Stein, J., 2000. The dark side of internal capital markets: Divisional rent-seeking and inefficient investments. Journal of Finance 55, 2537-2564.

Schoar, A., 2002. Effects of corporate diversification on productivity. Journal of Finance, 2379– 2403.

Servaes, H., 1996. The value of diversification during the conglomerate merger wave. Journal of Finance, 51, 1201-1225.

Shleifer, A., Vishny, R., 1986. Large shareholders and corporate control. Journal of Political Economy 94, 461-488.

Shleifer, A., Vishny, R., 1994. Politicians and firms. Quarterly Journal of Economics 109, 995-1025.

Shleifer, A., Vishny, R., 1997. A survey of corporate governance. Journal of Finance 52, 737-777.

Shin, H., Stulz, R., 1998. Are internal capital markets efficient? Quarterly Journal of Economics 113, 531-553.

Stein, J., 1997. Internal capital markets and the competition for corporate resources. Journal of Finance 52, 111-133.

Stein, J., 2003. Agency, information and corporate investment", Chapter 2 in Handbook of the Economics of Finance: Corporate Finance Vol. 1A, edited by G.M. Constantinides, M. Harris, and R. M. Stulz, Amsterdam: Elsevier-NorthHolland.

Stowe, J.D., Xing, X., 2006. Can growth opportunities explain the diversification discount? Journal of Corporate Finance 12, 783-796.

Stulz, R., 1990. Managerial discretion and optimal financing policies. Journal of Financial Economics 26, 3-27.

Su, D., 2005. Corporate finance and state enterprise reform in China. China Economic Review 16, 118-148.

Sun, Q., Tong, W., 2003. China share issue privatization: the extent of its success. Journal of Financial Economics 70, 183-222.

Villalonga, B., 2004. Diversification discount or premium? New evidence from the business information tracking series. Journal of Finance 59, 479-506.

Wei, Z., Xie, F., Zhang, S., 2005. Ownership structure and firm value in China's privatized firms: 1991-2001. Journal of Financial and Quantitative Analysis 40, 87-108.

Whited, T., 2001. Is it efficient investment that causes the diversification discount? Journal of Finance 56, 1667–1692.

Xu, X., Wang, Y., 1999. Ownership structure and corporate governance in Chinese stock companies. China Economic Review 10, 75-98.

Table 1: Descriptive Statistics for Diversification, Firm Performance and Other Variables

	Definition	Mean	Std. Dev.	Min	Max
DIV	A dummy variable that takes one if a firm engages in diversification and 0 otherwise	0.5993	0.4901	0	1
HI	Sales-based Herfindahl index	0.7983	0.2353	0.167	1
Tobin's *q*	Market value of equity plus book value of total debt divided by the book value of total assets	2.1725	1.0471	0.933	22.339
ROS	The ratio of operating income to sales revenue	0.2519	0.1487	-0.872	0.909
STATE	The percentage of shares held by the State Asset Management Bureau	0.3459	0.2641	0	0.85
LEGAL	The percentage of shares held by legal entities	0.2471	0.2522	0	0.864
MHOLD	The percentage of shares held by top executives (managers and directors)	0.0007	0.0053	0	0.149
LARGE	The percentage of shares held by the largest shareholder	0.4544	0.1747	0.032	0.886
GOV	A dummy variable that takes 1 if government is the ultimate owner of the firm	0.5846	0.4929	0	1
LEVER	The ratio of book value of debt to the sum of book value of debt and market value of equity	0.4262	0.1615	0.012	0.878
DD	A dummy variable that takes 1 if a firm distribute cash dividend in a given year	0.6311	0.4826	0	1
GROWTH	The percentage change in total assets	0.3010	1.0170	-0.826	22.283
CASH	The sum of operating profits and cumulative depreciation divided by total assets	0.1800	0.1425	-0.256	1.369
IND	The number of diversified firms divided by the total number of firms in an industry	0.5948	0.2088	0	1
INTANG	The ratio of intangible assets to total assets	0.0429	0.0605	0	0.811
AGE	The number of years after going public	5.4203	2.4681	1	13
LNSIZE	The logarithm of the total assets	21.0485	0.7909	18.748	23.689

The sample consists of 816 firms from 74 two-digit CSRC industries during the period of 2000 to 2002 with a total of 2448 firm-years.

Table 2: Correlation Matrix for Diversification, Firm Performance and Other Variables

	HI	Tobin's *q*	*ROS*	*GOV*	*STATE*	*LEGAL*	*LARGE*	*MHOLD*
DIV	-0.7003 [0.0000]	0.0607 [0.0026]	0.0175 [0.3877]	-0.1058 [0.0000]	-0.1474 [0.0000]	0.087 [0.0000]	-0.1958 [0.0000]	-0.018 [0.3738]
HI		-0.0884 [0.0000]	-0.086 [0.0000]	0.1712 [0.0000]	0.1592 [0.0000]	-0.0953 [0.0000]	0.2104 [0.0000]	0.0028 [0.8883]
Tobin's *q*			0.1329 [0.0000]	-0.1541 [0.0000]	-0.0779 [0.0001]	0.0412 [0.0415]	-0.1352 [0.3865]	0.0489 [0.0155]
ROS				-0.0095 [0.6371]	-0.0174 [0.3882]	-0.1199 [0.0000]	-0.0746 [0.0002]	0.0255 [0.2076]
GOV					0.3795 [0.0000]	-0.3499 [0.0000]	-0.1947 [0.0000]	-0.0615 [0.0023]
STATE						-0.8677 [0.0000]	0.4529 [0.0000]	-0.0656 [0.0012]
LEGAL							-0.1742 [0.0000]	0.0421 [0.0373]
LARGE								-0.0336 [0.0969]

	LEVER	*GROWTH*	*CASH*	*IND*	*INTANG*	*AGE*	*LNSIZE*
DIV	0.1043 [0.0000]	0.0253 [0.2104]	0.2765 [0.0000]	0.4191 [0.0000]	0.1169 [0.0000]	0.1711 [0.0000]	-0.0427 [0.0348]
HI	-0.083 [0.0000]	-0.023 [0.2557]	-0.2501 [0.0000]	-0.3607 [0.0000]	-0.1114 [0.0000]	-0.1072 [0.0000]	0.0641 [0.0015]
Tobin's *q*	-0.0981 [0.0000]	0.1565 [0.0000]	0.0005 [0.9793]	0.06 [0.0030]	0.0152 [0.4535]	-0.1613 [0.0000]	-0.3642 [0.0000]
ROS	0.0546 [0.0069]	0.0217 [0.2827]	0.2286 [0.0000]	0.0631 [0.0018]	0.1783 [0.0000]	-0.0908 [0.0000]	-0.0497 [0.0140]
GOV	0.0022 [0.9134]	-0.109 [0.0000]	-0.0893 [0.0000]	-0.098 [0.0000]	-0.0315 [0.1187]	0.0126 [0.5334]	0.0555 [0.0060]
STATE	0.0053 [0.7923]	0.0133 [0.5093]	-0.1421 [0.0000]	-0.1425 [0.0000]	-0.161 [0.0000]	-0.1657 [0.0000]	0.1222 [0.0000]
LEGAL	-0.0383 [0.0583]	-0.0175 [0.3860]	0.0178 [0.3782]	0.1206 [0.0000]	0.1282 [0.0000]	0.0137 [0.4987]	-0.1502 [0.0000]
LARGE	-0.13 [0.0000]	-0.0635 [0.0017]	-0.3271 [0.0000]	-0.2147 [0.0000]	-0.1601 [0.0000]	-0.2522 [0.0000]	0.1841 [0.0000]
MHOLD	-0.0495 [0.0143]	0.0146 [0.4690]	-0.032 [0.1139]	0.0211 [0.2966]	-0.0191 [0.3461]	-0.0585 [0.0038]	-0.028 [0.1666]
LEVER		0.0666 [0.0010]	-0.2737 [0.0000]	0.1107 [0.0000]	0.0168 [0.4072]	0.2326 [0.0000]	0.1707 [0.0000]
GROWTH			-0.0308 [0.1272]	0.0576 [0.0044]	-0.0114 [0.5728]	-0.1974 [0.0000]	0.0384 [0.0578]
CASH				0.3291 [0.0000]	0.1397 [0.0000]	0.1863 [0.0000]	0.1667 [0.0000]
IND					0.1575 [0.0000]	0.1541 [0.0000]	-0.0232 [0.2515]
INTANG						0.1202 [0.0000]	-0.1204 [0.0000]
AGE							0.0847 [0.0000]

Table 3: Comparison of Single- and Multi-segment Firms

Variable	Multi-segment Firms		Single-segment Firms		Mean Difference (*t*-statistic)
	Mean	Standard Deviation	Mean	Standard Deviation	
Tobin's *q*	2.2245	1.4117	2.0947	1.1587	0.1298*** (2.7198)
ROS	0.2540	0.1665	0.2487	0.1573	0.0053 (0.9112)
STATE	0.3140	0.2527	0.3935	0.2555	-0.0794*** (-8.4001)
LEGAL	0.2650	0.2308	0.2203	0.1960	0.0447*** (4.7560)
MHOLD	0.0006	0.0016	0.0008	0.0050	-0.0002* (-1.8013)
LARGE	0.4259	0.2482	0.4958	0.2658	-0.0699*** (-7.1381)
GOV	0.5419	0.4684	0.6483	0.4386	-0.1064*** (-6.9092)
LEVER	0.4400	0.2485	0.4056	0.2238	0.0344*** (3.8253)
DD	0.6033	0.4805	0.6728	0.4438	-0.0695*** (-4.3578)
GROWTH	0.2325	0.3742	0.2008	0.3085	0.0317*** (3.0918)
CASH	0.2282	0.1561	0.1478	0.1102	0.0804*** (17.3291)
IND	0.6663	0.3622	0.4878	0.2619	0.1785*** (14.8078)
INTANG	0.0487	0.0561	0.0343	0.0363	0.0144*** (9.8358)
AGE	5.7655	3.4410	4.9042	2.7995	0.8613*** (7.3897)
LNSIZE	21.0209	10.3198	21.0897	10.3509	-0.0688 (-0.1649)
Number of Observations	1467		981		

***, ** and * denote a significance level of 1%, 5% and 10% for a two-tailed Kolmogorov-Smirnov two sample *t*-test, respectively.

Table 4: Comparison of Government controlled versus Non-government controlled and Single-segment versus Multi-segment Firms

		Multi-segment Firms	Single-segment Firm	
Tobin's *q*	Government-owned	2.0569 (1.0499)	2.0110 (0.9456)	Row Test: 0.0459 [1.38]
	Non-government	2.4228 (1.3340)	2.2490 (0.8830)	Row Test: 0.1737*** [4.98]
	Diagonal Test: -0.4118*** [-11.10]	Column Test: -0.3659*** [-9.32]	Column Test: -0.2380*** [-8.31]	Diagonal Test: -0.1921*** [-6.26]
ROS	Government-owned	0.2532 (0.1422)	0.2475 (0.1379)	Row Test: 0.0056 [1.25]
	Non-government	0.2549 (0.1378)	0.2508 (0.1013)	Row Test: 0.0042 [1.11]
	Diagonal Test: -0.0074* [-1.69]	Column Test: -0.0019 [-0.39]	Column Test: -0.0033 [-0.88]	Diagonal Test: 0.0024 [0.61]
MHOLD	Government-owned	0.0004 (0.0008)	0.0003 (0.0005)	Row Test: 0.0001*** [3.61]
	Non-government	0.0008 (0.0014)	0.0016 (0.0050)	Row Test: -0.0008***[-7.45]
	Diagonal Test: -0.0004*** [-14.41]	Column Test: -0.0004*** [-10.94]	Column Test: -0.0012*** [-11.91]	Diagonal Test: -0.0011*** [-11.12]
LEVER	Government-owned	0.4430 (0.2243)	0.4059 (0.1961)	Row Test: 0.0371*** [5.32]
	Non-government	0.4364 (0.2143)	0.4051 (0.1538)	Row Test: 0.0313*** [5.37]
	Diagonal Test: -0.0305*** [-4.56]	Column Test: 0.0066 [0.90]	Column Test: 0.0008 [0.1469]	Diagonal Test: 0.0379*** [6.24]
GROWTH	Government-owned	0.1921 (0.2313)	0.1590 (0.1585)	Row Test: 0.0331*** [5.65]
	Non-government	0.2803 (0.3100)	0.2778 (0.2707)	Row Test: 0.0025 [0.30]
	Diagonal Test: -0.1213*** [-16.80]	Column Test: -0.0882*** [-10.94]	Column Test: -0.1188*** [-18.43]	Diagonal Test: -0.0857*** [-11.69]
CASH	Government-owned	0.2218 (0.1039)	0.1357 (0.0787)	Row Test: 0.086***[30.68]
	Non-government	0.2317 (0.1317)	0.1580 (0.0989)	Row Test: 0.074***[19.97]
	Diagonal Test: -0.0960*** [-28.37]	Column Test: -0.0098*** [-2.72]	Column Test: -0.0223*** [-7.85]	Diagonal Test: 0.0638*** [20.48]
IND	Government-owned	0.6531 (0.3252)	0.4831 (0.2267)	Row Test: 0.1700*** [18.34]
	Non-government	0.6820 (0.3239)	0.4965 (0.1865)	Row Test: 0.1855*** [22.54]
	Diagonal Test: -0.1989*** [-21.83]	Column Test: -0.0289*** [-2.66]	Column Test: -0.0134** [2.06]	Diagonal Test: 0.1566*** [18.78]
INTANG	Government-owned	0.0472 (0.0454)	0.0340 (0.0304)	Row Test: 0.0131*** [11.39]
	Non-government	0.0506 (0.0388)	0.0348 (0.0219)	Row Test: 0.0158*** [16.93]
	Diagonal Test: -0.0165*** [-15.79]	Column Test: -0.0034*** [-2.64]	Column Test: -0.0008 [-0.9741]	Diagonal Test: 0.0124*** [11.81]

Figures in cells with heavy border lines are sample means and figures in parentheses are standard deviations. The null hypothesis that the difference in sample means is zero is tested using a two-tailed Kolmogorov-Smirnov two sample *t*-test. The differences in sample means are reported in row tests, column tests and diagonal tests and figures in brackets are *t*-statistics. ***, ** and * denote a significance level of 1%, 5% and 10%, respectively.

Table 5: Panel Regression Estimates of the Effect of Diversification on Firm Value

	(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	(viii)
CONST	11.057***	11.060***	12.584***	12.746***	11.208***	11.170***	12.636***	12.791***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
DIV	0.082**	0.062*	0.029	0.021				
	(0.024)	(0.084)	(0.588)	(0.697)				
HI					-0.174**	-0.109	-0.069	-0.066
					(0.032)	(0.166)	(0.343)	(0.377)
STATE			-0.322**				-0.318**	
			(0.016)				(0.017)	
LEGAL			-0.389**				-0.385**	
			(0.015)				(0.015)	
LARGE				-1.806***				-1.793***
				(0.003)				(0.003)
LARGE2				1.948***				1.940***
				(0.002)				(0.002)
MHOLD			-2.709**	-2.084			-2.726**	-2.069
			(0.048)	(0.131)			(0.044)	(0.126)
DIV			42.635	46.286			42.741	46.182
$\times$ *MHOLD*			(0.240)	(0.199)			(0.236)	(0.197)
GOV		-0.245***	-0.092**	-0.089**		-0.244***	-0.095***	-0.088***
		(0.000)	(0.029)	(0.027)		(0.000)	(0.005)	(0.007)
DIV			-0.072*	-0.052			-0.064	-0.051
$\times$ *GOV*			(0.087)	(0.158)			(0.106)	(0.187)
GROWTH			1.167***	1.177***			1.167***	1.178***
			(0.000)	(0.000)			(0.000)	(0.000)
INTANG			-0.190	-0.135			-0.192	-0.138
			(0.504)	(0.622)			(0.498)	(0.615)
AGE	-0.015	-0.013	0.017*	0.024*	-0.014	-0.013	0.017*	0.024*
	(0.219)	(0.277)	(0.083)	(0.059)	(0.245)	(0.304)	(0.078)	(0.057)
LNSIZE	-0.424***	-0.420***	-0.503***	-0.506***	-0.423***	-0.420***	-0.502***	-0.506***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
$\overline{R}^2$	0.286	0.298	0.544	0.546	0.286	0.305	0.551	0.552

This table contains fixed effect estimates of panel regressions of Tobin's *q* on diversification. Tobin's *q* is the market value of equity plus the book value of total debt divided by the book value of total assets, *DIV* is the diversification dummy, *HI* is the sales-based Herfindahl index, *STATE* is the percentage of shares held by the government, *LEGAL* is the percentage of shares held by legal entities, *MHOLD* is the percentage of shares held by top executives (managers and directors), *LARGE* is the percentage of shares held by the largest shareholder, *LARGE2* is the squared term for *LARGE*, *GOV* is a dummy variable that takes 1 if government is the ultimate owner of the firm, *GROWTH* is the percentage change in total assets, *INTANG* is the ratio of intangible assets to total assets, *AGE* is the number of years after going public, and *LNSIZE* is the logarithm of the total assets. Figures in parentheses are *p*-values for heteroskedasticity-consistent *t*-statistics. ***, ** and * denote a significance level of 1%, 5% and 10%, respectively.

Table 6: Logit Regression Estimates of the Determinants of Diversification Decision

	(i)	(ii)	(vii)	(viii)
Tobin's *q* (-1)	0.188**	0.189**		
	(0.023)	(0.022)		
ROS (-1)			0.212	0.211
			(0.709)	(0.712)
STATE	-1.193**		-1.214**	
	(0.033)		(0.028)	
LEGAL	-1.204**		-1.245**	
	(0.041)		(0.033)	
LARGE		-0.526		-0.564*
		(0.114)		(0.091)
MHOLD	-0.164	-0.146	-0.162	-0.145
	(0.534)	(0.566)	(0.533)	(0.565)
GOV	-0.261**	-0.250**	-0.274**	-0.272**
	(0.023)	(0.026)	(0.017)	(0.011)
LEVER (-1)	-0.199	-0.304	-0.211	-0.321
	(0.673)	(0.519)	(0.658)	(0.502)
DD (-1)	-0.109	-0.106	-0.081	-0.079
	(0.480)	(0.491)	(0.595)	(0.605)
GROWTH(-1)	0.561***	0.567***	0.640***	0.644***
	(0.000)	(0.000)	(0.000)	(0.000)
CASH (-1)	0.376***	0.391***	0.382***	0.397***
	(0.000)	(0.000)	(0.000)	(0.000)
INTANG (-1)	0.365	0.402	0.331	0.350
	(0.759)	(0.733)	(0.780)	(0.765)
IND (-1)	0.419	0.413	0.377	0.371
	(0.035)	(0.035)	(0.036)	(0.036)
AGE	0.140***	0.151***	0.132***	0.143***
	(0.000)	(0.000)	(0.000)	(0.000)
LNSIZE	-0.016	0.015	-0.108	-0.075
	(0.878)	(0.882)	(0.256)	(0.429)
Maddala's pseudo $\overline{R}^2$	0.222	0.220	0.222	0.220
McFadden's pseudo $\overline{R}^2$	0.187	0.185	0.186	0.184
LR	615.894	608.982	614.110	607.269
	(0.000)	(0.000)	(0.000)	(0.000)

This table contains transformed coefficient estimates representing the marginal effects evaluated at the sample means of the independent variables from the Logit regression. The marginal effect of a dummy variable is calculated as the discrete change in the expected value of the dependent variable as the dummy variable changes from 0 to 1. The dependent variable is the diversification dummy (*DIV*). Tobin's *q* is the market value of equity plus the book value of total debt divided by the book value of total assets, *ROS* is the ratio of operating income to sales revenue, *STATE* is the percentage of shares held by the government, *LEGAL* is the percentage of shares held by legal entities, *MHOLD* is the percentage of shares held by top executives (managers and directors), *LARGE* is the percentage of shares held by the largest shareholder, *GOV* is a dummy variable that takes 1 if government is the ultimate owner of the firm, *LEVER* is the ratio of book value of debt to the sum of book value of debt and market value of equity, *DD* is a dummy variable that takes 1 if a firm distribute cash dividend in a given year *GROWTH* is the percentage change in total assets, *CASH* is the sum of operating profits and cumulative depreciation divided by total assets, *INTANG* is the ratio of intangible assets to total assets, *IND* is the number of diversified firms divided by the total number of firms in an industry, *AGE* is the number of years after going public, and *LNSIZE* is the logarithm of the total assets. (-1) denotes lagged variable of one year. *LR* is the likelihood test statistic for the goodness-of-fit of the model. Figures in parentheses are *p*-values. ***, ** and * denote a significance level of 1%, 5% and 10%, respectively.

Table 7: Instrumental Variable Regression Estimates of the Effect of Diversification on Firm Performance

	(i)	(ii)	(iii)	(iv)
CONST	1.6966***	1.9420***	3.2052***	3.2487***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
$D\hat{I}V$	0.3272**	0.2625**		
	(0.0266)	(0.0406)		
$\hat{HI}$			-2.6808***	-2.1514***
			(0.0000)	(0.0148)
STATE	-0.1837		-0.1622	
	(0.5387)		(0.5466)	
LEGAL	-0.3256*		-0.3347*	
	(0.0920)		(0.0869)	
LARGE		-0.8347*		-0.8090
		(0.0918)		(0.1060)
LARGE2		0.4845		0.7460
		(0.2627)		(0.1108)
MHOLD	0.0078	0.0093	0.0084	0.0084
	(0.9558)	(0.5547)	(0.7414)	(0.7881)
DIV × *MHOLD*	0.3988	0.3840	0.3964	0.3762
	(0.2874)	(0.3007)	(0.2873)	(0.3083)
GOV	-0.0659*	-0.0849**	-0.0689*	-0.0827**
	(0.0956)	(0.0252)	(0.0913)	(0.0292)
DIV × *GOV*	-0.0647*	-0.0426	-0.0769*	-0.0499
	(0.0983)	(0.2589)	(0.0791)	(0.1988)
GROWTH	1.0781***	1.0707***	1.0826***	1.0764***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
INTANG	0.3452	0.3461	0.0804	0.1789
	(0.3163)	(0.3059)	(0.8195)	(0.6232)
$\overline{R}^2$	0.440	0.421	0.442	0.426
Hausman Test	34.852	31.108	26.446	22.693
(*p*-value)	(0.000)	(0.000)	(0.000)	(0.000)

This table contains coefficient estimates of regression of Tobin's *q* on instruments of diversification. Tobin's *q* is the market value of equity plus the book value of total debt divided by the book value of total assets, $D\hat{I}V$ is the fitted value of the diversification dummy from a regression of *DIV* on the estimated probability to diversify and a set of exogenous variables, $\hat{HI}$ is the fitted value of the sales-based Herfindahl index from a regression of *HI* on a set of exogenous variables, *STATE* is the percentage of shares held by the government, *LEGAL* is the percentage of shares held by legal entities, *MHOLD* is the percentage of shares held by top executives (managers and directors), *LARGE* is the percentage of shares held by the largest shareholder, *LARGE2* is the squared term for *LARGE*, *GOV* is a dummy variable that takes 1 if government is the ultimate owner of the firm, *GROWTH* is the percentage change in total assets and *INTANG* is the ratio of intangible assets to total assets. Figures in parentheses are *p*-values for heteroskedasticity-consistent *t*-statistics. ***, ** and * denote a significance level of 1%, 5% and 10%, respectively.