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Business Group Performance in China: Ownership and Temporal Considerations

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ABSTRACT   We address the institutional voids hypothesis, which suggests affiliation with a business group will improve a firm's performance in circumstances of poor-quality institutions and extensive market failures. We hypothesize that initial positive effects of group affiliation should decline as the quality of market institutions improves. Further, we hypothesize that differences in state and private ownership will influence the value and persistence of firm affiliation. Using data on 476 publicly listed firms in 1999 and 467 matched firms in 2004, we find support for a temporal hypothesis that affiliation with a business group improves performance, but the value of group affiliation declines over time. We also find support for a state 'helping hand' hypothesis that suggests firms with high levels of state ownership initially experienced an amplified value effect from their group affiliation, which disappeared by 2004. The results suggest that China's policy makers are beginning to establish an institutional and market infrastructure that is conducive to entry by unaffiliated, freestanding firms.

KEYWORDS   business groups, China, institutional voids, ownership, performance

INTRODUCTION

Business groups play a key role in the governance landscape of both emerging and mature markets (Khanna & Yafeh, 2005; Morck, Wolfenzon, & Yeung, 2005). As business groups' ubiquity becomes increasingly well documented, scholars have begun to study these groups' structural characteristics and performance (Khanna & Rivkin, 2001). A prevalent view suggests that affiliation with a business group enhances a firm's performance in circumstances of poor-quality legal or regulatory institutions and extensive market failures. Arguments based on exchange theory (Keister, 2001), embeddedness (Granovetter, 2005), transaction cost analysis (Khanna & Palepu, 1997), and the resource-based view of the firm (Guillen, 2000) each paint a positive picture of business groups, suggesting that affiliation will improve firm performance because it allows firms to internalize market trans-actions, provides better access to scarce resources, and introduces firms to networks

of value-creating relationships, including those with governments. However, evidence to support a positive group affiliation effect is mixed.

While some studies have found support for the hypothesis that business group affiliation improves firm performance (Chang & Choi, 1988; Keister, 1998; Khanna & Palepu, 2000), other studies offer only mixed support, and many find a negative effect (Bertrand, Mehta, & Mullainathan, 2002; Chang, 2003) For example, Khanna and Rivkin (2001) examine the effect of group affiliation on firm profitability for a sample of fourteen developing economies and find positive effects in only a minority of them, none of which were in emerging markets. The growing number of studies finding negative attributes has cohered into a dark-side perspective of business groups (Scharfstein & Stein, 2000). In such perspectives, business groups are viewed not as efficient responses to market failures, but rather as associations formed to expropriate minority shareholders and plunder the assets of their affiliates (Morck et al., 2005). Others characterize business groups as rent-seeking instruments of politically connected elites whose dominant owners entrench their management and exploit their control rights (Fisman, 2001).

Because business groups may contain both positive and negative performance tendencies, it is unclear whether they should be cast as paragons or parasites (Khanna & Yafeh, 2007). The balance of research suggests that there are both benefits and costs of affiliation, but whether affiliation has a positive or negative effect upon a firms' performance may depend crucially upon contingencies such as the nature of affiliation, timing, and the quality of the institutional environment. Under some circumstances, the positive attributes of business group affiliation may outweigh the negative. However, if circumstances change in a significant way, the darker side or negative attributes of affiliation may prevail. For instance, *chaebol* business groups served as a mechanism to catch up with technology during Korea's rapid growth in the 1960s through the 1980s (Amsden, 1989), but by the 1990s when many Korean firms reached the technological frontier, business groups increasingly lapsed into expropriation devices for their family owners (Chang, 2003).

In this study, we examine the performance effect of firms affiliated with Chinese business groups using data from 1999 and 2004 that includes both state-owned enterprises (SOEs) and private business groups, and we ask how the value of that affiliation changes over time. This period spans China's attempt to strengthen its market institutions in the aftermath of the 1997–1998 Asian financial crisis, a process that ultimately led to China's accession to the World Trade Organization in 2001. In this regard, China represents a new and particularly significant case of business groups in a dynamic emerging and transition economy. Beginning in 1987, China's reformers promoted the formation of business groups in the state-owned sector. Somewhat later, a number of private enterprises emerged and also adopted a business group structure, so a fundamental characteristic of Chinese business groups is that, while most are dominated by an SOE, some are not (Ma &

Lu, 2005). Much of the extant literature on the performance of China's business groups stems from this early period (Keister, 2000). Moreover, recent work has focused almost exclusively on state-owned groups (Lu & Yao, 2006; Ma, Yao, & Xi, 2006; White, Hoskisson, Yiu, & Bruton, 2008; Yiu, Bruton, & Lu, 2005).

A business group is 'a set of firms, which, though legally independent, are bound together by a constellation of formal and informal ties and are accustomed to taking coordinated action' (Khanna & Rivkin, 2001: 47). The structure of this constellation differs across countries, with differences defined both by formal ownership links, including the ownership roles of banks, families, the state, and other companies, and by differences in the nature and strength of informal social networks (Morck et al., 2005). For example, Korean *chaebol* are defined by private family ownership with limited bank involvement, whereas Japanese *keiretsu* are defined by multiple corporate owners, often centred on a lead bank (Gedajlovic & Shapiro, 2002). Thus, one explanation for the weak empirical results concerning the impact of business group membership is that cross-national studies cannot fully account for institutional differences across countries that engender business groups with country-specific characteristics. Moreover, cross-national studies include countries at different stages of institutional and economic development, and the value of business group affiliation may change with changes in these conditions. Therefore, studies of the group affiliation performance effect may be time dependent.

In this respect, the contribution of this study is its performance evaluation of business groups in a period of institutional change and improvement in the quality of market institutions. Accordingly, we examine the performance effects of 476 firms, of which 261 were group affiliates in 1999 at the onset of a major policy shift, and once again in 2004, five years later. We begin by situating the hypotheses in the context of China's unfolding institutional development.

THEORORETICAL BACKGROUND AND HYPOTHESIS DEVELOPMENT

China has been searching for suitable corporate forms since 1978 (Nee, 1992). Reformers studied Japanese and Korean business groups and were impressed by their evident capacity to absorb new technology, deliver stable financial performance, and achieve international competitiveness (Ma & Lu, 2005). Reformers believed that business groups might accomplish the same objectives for China. Beginning in 1987, the state signalled that it would favour the reorganization of SOEs into recognized business groups. What followed was a rampant business group fever (Hahn & Lee, 2006), resulting in a dramatic growth in the number of business groups. While the number of registered business groups reached some 7,000, most were small and lacked coherence (Wu, 1990).

To achieve reformers' policy goals, it was evident that significant consolidation was required. In 1991, China's central legislative body, the State Council, iden-

tified fifty-seven large groupings described as the National Trial Groups. These state-owned groups were entrusted with a complex socio-economic mission of leading a particular sector into international markets and, at the same time, absorbing a number of underperforming enterprises in return for favourable access to capital and protection from competition (Nolan, 2001). The experiment was judged a success and encouraged the State Council to select a second batch of sixty-three trial groups in 1997. Together these groups are colloquially known as the 'National Team' (Nolan, 2001). Yet, despite reformers' efforts at consolidation, business groups continued to proliferate. China is a decentralized federal state with significant responsibility for economic affairs delegated to provinces and large municipal governments. Each provincial government sought to mimic the national policy initiative by organizing local enterprises into a second tier of regional business groups. As reforms proceeded, SOE managers were frequently able to buy-out their enterprises, often at very low prices, and *de novo* groups founded by private entrepreneurs appeared. In this fashion, numerous private business groups began to emerge on the fringe of the economy. Private business groups (PBGs) are controlled and operated by founder-entrepreneurs, their families, and trusted business partners. As relative newcomers on the economic scene, they have not yet received much attention from researchers, and, due to differences in their ownership, PBGs merit separate consideration (Almeida & Wolfenzon, 2006).

Group Affiliation and Ownership Hypotheses

Mature industrial economies typically benefit from high-quality legal and property rights institutions and a 's*oft infrastructure* of the market economy' (Niskanen, 1991: 233, italics added). The former institutions comprise an institutional matrix of formal laws and regulations and informal normative and cognitive rules and scripts about basic economic relationships in capitalist societies (North, 1990). A soft infrastructure is comprised of a diverse array of organizations and actors, such as technical standards committees, consumer watchdogs, market research firms, executive recruitment agencies, financial institutions, logistics providers, business schools, and training and accreditation agencies that facilitate economic specialization and market efficiency (Khanna & Palepu, 1997). Together, a robust property rights regime and strong soft infrastructure permit independent, freestanding firms to reliably and efficiently acquire key assets and resources through market transactions. In these circumstances, widely diversified and overly integrated vertical firms will underperform more narrowly focused rivals (Williamson, 1985).

Emerging markets are characterized by institutional voids in the form of undefined or unenforced property rights and poorly developed soft infrastructure. In these conditions, transactions costs in external markets will be high for freestanding firms. Diversified business groups have an advantage in the context of institutional

voids because they can provide an internal market or quasi-hierarchical governance mechanism that reduces transaction costs for member firms that trade with one another. For example, business groups can provide credible information about their members that reduces the risk of opportunism and lowers contract enforcement as well as search and screening costs. Larger groups can also attain sufficient scope and scale to internalize soft infrastructure and offer services such as management training, finance, technology, marketing, and logistics to their affiliates (Fisman & Khanna, 2004).

As China's enterprise managers gained autonomy, they faced decisions about with whom to trade for the first time (Naughton, 1995). In place of state resource allocation and production targets, managers had to acquire resources in markets characterized by incomplete information and shortages of capital, skilled personnel, and material inputs. Due to the weak soft infrastructure, finding reliable trading partners became a key concern. Financial markets were particularly slow to develop due to restrictions placed on state and foreign banks. Keister (2000) argues managers responded to the uncertainties of imperfect markets by forming stable relations with business partners who could credibly assure the provision of critical resources. To identify credible partners, managers relied upon their contacts and prior social relations with former bureaucrats and party cadres. In this way, hundreds of debt, equity, and trade ties spontaneously developed among newly autonomous enterprises (Keister, 2000). Linkages formed in this manner are at the heart of the spontaneous emergence of China's business groups because these links quickly solidified as firms became de facto group affiliates. Hence, we posit a 'baseline positive group affiliation' effect:

Hypothesis 1: Firms affiliated with a business group will be more profitable than independent firms.

However, there are both benefits and costs associated with group affiliation, and it is far from clear whether all affiliated firms participate equally in the distribution of group benefits and costs. Theoretical approaches to business groups typically focus on their complex governance and ownership structures comprised of multiple financial and operational linkages (Khanna & Rivkin, 2006). Indeed, a similar complexity is evident among China's business groups, described by Keister (1998: 408) as 'coalitions of firms from multiple industries . . . distinguished by elaborate interfirm networks of lending, trade, ownership, and social relations'. Despite the variation in the strength of the linkage with which firms are connected to a group, the vast majority of empirical studies distinguish simply between independent and group-affiliated firms. Researchers typically rely upon directories such *Dodwell's Industrial Groupings in Japan*, *Business Groups in Taiwan*, and the *Center for Monitoring the Indian Economy* that classify firms as either freestanding or group-affiliated firms. However, variation in the degree to which a firm is connected to the group suggests

that the group effect will be larger for some affiliate firms than for others (Kim, Hoskisson, & Wan, 2004). China's business groups are characterized by a core or parent firm known as the group company, which is linked to affiliates through equity, debt, personnel, and trading links. For example, the parent group company may hold a majority or minority equity stake in an affiliate, which may in turn hold equity in third companies. While one firm may be tightly coupled in a group's activities via numerous linkages, another firm may be more loosely coupled, playing only a marginal role within the group's affairs.

In this regard, group affiliation is likely to be more beneficial for tightly coupled than for loosely coupled affiliates. However, the categorical or dichotomous measure of group affiliation cannot adequately capture these differences in the extent to which a firm is central or peripheral in the group's affairs. In particular, dichotomous measures are unable to differentiate between firms that participate in the benefits of group affiliation and those that bear the costs. Power dependence perspectives predict that centrally located firms will more likely enjoy access to the benefits of group affiliation while peripherally located groups will be more likely to bear the burdens of group affiliation. Similarly, research that views business groups as a pyramid device (Morck et al., 2005) suggests that intergroup transfer mechanisms, such as related-party transactions, permit value to percolate from the bottom of the pyramid, where a dominant owner's cash flow rights are low, into peak firms, where a dominant owner has greater rights over cash flows. Both power dependence and pyramid perspectives suggest that there is a hierarchy of affiliation in business groups in which core or peak firms are better positioned to accrue benefits while lower order or peripheral affiliates bear the costs of group membership. The percentage of an affiliate's equity owned by the group may indicate this hierarchical aspect of business group structure. We propose a 'tight coupling' hypothesis stated in terms of equity ownership:

Hypothesis 2: The greater the group ownership of an affiliate's equity, the greater the performance impact of group affiliation will be.

Researchers are divided about the impact of continuing state ownership on firm performance. On one hand is a 'grabbing hand' perspective on the effects of state ownership, which suggests state officials and executives will divert firm resources to their own purposes at the expense of firm performance (Shleifer & Vishny, 1998). Much research on Chinese firms aligns with this view. Clarke (2003) believes China's SOEs are burdened by a syndrome of state ownership problems such as bureaucratic interference, multiple conflicting objectives, and weak incentives, a view supported by other researchers. For example, Nee, Opper, and Wong (2007) find that involvement and direct intervention in the governance of SOEs harms their economic performance. Yiu et al. (2005) argue that, due to factors such as politically motivated appointments and an outdated managerial mindset, continu-

ing state ownership inhibits a firm's ability to develop market-oriented capabilities and harms their performance.

In contrast, developmental state theorists (Amsden, 1989; Wade, 1990) propose that firms in transitional markets are latecomers to industrialization and that, unassisted, they will be unable to catch up with global leaders. Developmental state theorists believe that the state can provide a 'helping hand' to their domestic enterprises by curbing competition, guiding firms, allocating resources, and assisting in the acquisition of foreign technology to promote comparability with global leaders. In China, this 'helping hand' is likely the motivational force behind the establishment of the National Team (Nolan, 2001). However, the helping hand may reach much further down the industrial hierarchy. Because much responsibility for industrial development in China has been decentralized to more local levels of government, Guthrie (2005) argues that provincial and municipal governments have developed the administrative capacity to effectively monitor and to provide resources and guidance to a relatively small portfolio of SOEs. In this regard, local authorities have been able to promote organizational learning and productivity increases in local SOEs.

Research on internal management processes in SOEs also lends support to the positive view of state ownership. One group of scholars concludes that contemporary Chinese SOEs have re-engineered their organizational cultures to become more market oriented 'dynamos' (Ralston, Terpstra-Tong, Terpstra, Wang, & Egri, 2006). Others see rapid learning and confident entrepreneurship among listed SOEs (Tan, 2005).

Between 1987 and 1998, the state actively promoted the formation of business groups, and the National Team enjoyed protection from domestic and foreign competition. Groups with proximity to powerful state actors enjoyed access to soft bank credit, some were allowed to create internal finance companies, and yet others were granted permission to make initial public offerings on the Hong Kong and New York stock exchanges. Moreover, in contrast, private business groups were dependent on self-generated resources or capital provided by families and friends. Private business groups also operated in unrestricted and more competitive markets. Given the division of opinion, the impact of state ownership on firm performance is ultimately an empirical question. We suggest that, on balance, state ownership will moderate the business group effect in a positive way, at least in the initial stages of reform. Hence our 'helping hand' hypothesis states:

Hypothesis 3: The performance impact of group affiliation will increase if the firm is affiliated with an SOE-owned business group.

Hahn and Lee (2006) argue that SOEs responded to the encumbrance of forced mergers by diverting assets and resources out of the parent firm to form spin-off enterprises in their group affiliates. We expect this asset diversion to favour affiliates

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in which the parent has a greater ownership linkage. Ma et al. (2006) argue that state ownership through business groups represents a superior monitoring and control device, relative to alternatives such as state asset ownership agencies, because groups fill ownership voids. Other things being equal, the greater the ownership, the greater the incentive to monitor and support the performance of the affiliate is, and we propose an 'amplified helping hand' effect:

> *Hypothesis 4. The performance benefits of SOE affiliation will increase with the ownership stake of the state.*

Group Ownership and Temporal Hypotheses

The temporal hypotheses are also based upon the idea of institutional voids (Khanna & Palepu, 1997). A corollary of the theory that business groups emerge (or are created) to solve market failures is that the logic for their existence will disappear when market institutions and soft infrastructure are established. Two mechanisms are activated by institutional development. First, the benefits associated with business group affiliation will gradually erode as market institutions emerge to fill institutional voids. For example, as alternative sources of finance materialize, the advantage of a group finance company lessens. Second, the development of market institutions facilitates the appearance of more focused freestanding firms that will compete away the excess returns of group-affiliated firms (Peng, 2003).

For example, Haier, a domestic manufacturer of refrigerators and air conditioners, grew rapidly through the 1990s due to its establishment of a diverse group of firms dedicated to warehousing, freight and logistics, retailing, and a service network to serve markets in China's interior. In the absence of a well-developed national distribution system, Haier's proprietary distribution network offered a competitive advantage over more focused freestanding firms such as Whirlpool and Electrolux because Haier's distribution network filled an important market infrastructure void. However, Haier executives recognize that the value of their proprietary distribution network is likely to erode as the quality of China's market distribution infrastructure improves and provides better access to the interior for freestanding firms (Palepu, Khanna, & Vargas, 2006).

We do not expect business groups to adapt smoothly and immediately to changes in their institutional environment. Rather we anticipate that business groups will display considerable inertia against a trend of institutional development. Keister (2001) believes the exchange ties that developed in the initial period may become enduring features of China's corporate landscape akin to those found in Japan and Korea. Importantly, Keister finds that, even when less expensive alternative sources of goods and capital became available, these early trading relationships persisted. If members continue to trade with one another within the group as less expensive and better quality sources are available from outside the group, then performance will

worsen. Hence, she conjectures that 'while business groups may be advantageous early in reform, increasing internalization of ties may create inefficiencies that have negative long-term consequences' (Keister, 2001: 356).

Proponents of the institutional voids explanation of business group change do not specify the time-frame in which costs and benefits of group affiliation might be expected to change, perhaps because the tempo of institutional development is likely to vary across countries. Campbell (2004) suggests that a scale of decades is necessary for the analysis of the formation of capitalist institutions because an interrelated set of legal, normative, and cognitive rules and scripts must co-evolve to produce a coherent and functioning system. Formal laws and rules about property rights can change swiftly, but normative and cognitive elements necessary for their efficacy may take considerably longer. In contrast, a scale of years may be adequate for the analysis of changes in soft infrastructure in the sense defined by Khanna and Palepu (1997).

A co-evolutionary pattern of institutional change has been observed in the context of China (Krug & Hendrishke, 2008). In the wake of the 1997 Asian financial crisis, which implicated poor governance in business groups as a causal factor, China's reformers became concerned that their business groups might share similar problems and set a course for correction in the direction of reform. Reformers were determined to accelerate the development of China's market institutions and rushed through a slate of legislation designed to establish international best-practices in corporate governance. Initiatives included bank reform, the establishment of a state asset supervisory administration commission, privatization of small- to medium-sized SOEs, establishment of internal controls through mandatory boards of directors and supervisory councils, a legal code for companies, a bankruptcy procedure, and principles of protection for minority stakeholders (Clarke, 2003). Most importantly, China's accession to the World Trade Organization strongly commits China to a prescribed timetable of market-based institutional development.

While China has made progress in institutionalizing market mechanisms and implementing its World Trade Organization commitments, we do not suggest that reforms have had an immediate and full effect in establishing a robust property rights regime, although the cumulative effect of change may eventually do so. Rather, we propose that the increasing depth and improved quality of China's soft infrastructure is driving changes in the business environment. The period between 1992 and 1998, when GDP growth in China was typically over 20 percent per annum and reached 35 percent one year, was a particularly turbulent era (Tan, 2005) that would promote group affiliation. However, the heavy investment in market infrastructure in this period would thereafter enable entry by freestanding firms that, by 2004, could exert increasing competitive pressure upon business group affiliates. Hence, our baseline temporal hypothesis states:

Hypothesis 5: The positive impact of business group affiliation effect will decline over time.

Here, we propose that, with the progress of institutional reform, the value of the state's helping hand will diminish and the 'grabbing hand' deficiencies of weak SOE governance will become increasingly salient. Several analysts suggest that inherent governance deficiencies have begun to surface in the ranks of SOE business groups. Initial reforms successfully cultivated a dynamic market orientation in the senior management of many enterprises. Charismatic chief executive officers who are closely identified with the rise of the particular enterprise have become a common phenomenon in China. Yet within a relatively short period of time, these powerful CEOs have become entrenched in their positions and are difficult to dislodge, even as the performance of their enterprise deteriorates (Clarke, 2003). Lin (2001) argues that officials who hold monitoring positions have few incentives to pursue their duties with any real vigour; heads of state ministries and senior bureaucrats are compensated according to standardized public sector payment systems that bear no relationship to the performance of the SOEs under their control. Lin (2001) concludes that the supervision of state firms is beset with serious moral hazard problems.

Hahn and Lee (2006) propose that, due to inadequate supervision, business groups are characterized by large-scale asset diversion as managers seek to shield more valuable assets. Within these non-transparent insider structures, it is likely that senior managers may engage in self-serving behaviour, such as taking perks or extracting rents for personal use. Hence, while business group governance of SOEs may have filled 'ownership voids' (Ma et al., 2006) during the early stages of reform, we suggest that inadequately monitored SOE managers subsequently exploited these voids in a manner that negatively impacts firm performance.

Further, the protected SOE business environment has liberalized. Specifically, whereas state-owned business groups had previously enjoyed favourable access to financial resources and protection from competition prior to the 1997–1998 Asian financial crisis, thereafter, the government began to tighten their soft budget constraints. Product market competition sharpened due to the gradual dismantling of competitive restrictions in sectors previously reserved for national champions. The confluence of these contextual effects suggests a 'negative amplification' effect:

Hypothesis 6a: In later stages of reform, the performance impact of group affiliation will decrease if the firm is affiliated with an SOE-owned business group.

Hypothesis 6b: In later stages of reform, the performance benefits of SOE affiliation will decrease with the ownership stake of the state.

METHODS

We test our hypotheses using estimating equations of the general form: Firm performance = f(business group affiliation, state ownership, business group

affiliation*state ownership, control variables). In order to capture the temporal aspects of our hypotheses, we estimated the equations for two years, 1999 and 2004.

Data

We collected data on Chinese companies listed on either the Shanghai or Shenzhen stock exchanges for the two sample years, 1999 and 2004. The data were compiled from company financial reports, published to comply with requirements of the China Securities Regulatory Commission (CSRC). We obtained the 1999 data from the annual *Stock Market Updated Data and Analysis: Annual Performance Reports of Listed Companies and Selection Guide* (Fu, 2000). The 2004 data were obtained from the *F10 Chinese Stock Market Information Database* (our translation), published online (Shanghai Vsat, 2005). Although the data were compiled from different sources, the requirement that both sources comply with CSRC regulations ensures they are comparable. Thus, all listed firms, including listed firms with significant state ownership, are obliged to follow the new 'Accounting Systems for Business Enterprise' standards, which are reasonably close to international accounting standards (Mako & Zhang, 2003).

In addition to financial data, we also determined group affiliation and state ownership from these sources. We verified group affiliation using the list of China's largest business groups in the National Bureau of Statistics of China's *Annual Statistics of Business Groups* (NBS, 2004). Nevertheless, there is concern about this method of measuring ownership because of the status of legal person shares, some of which are owned by the state while others are privately owned (Delios, Wu, & Zhou, 2006).

To minimize potential problems arising from heterogeneous accounting practices and sector characteristics (particularly in the financial and services sectors), we restricted the sample to firms in the manufacturing sector. The manufacturing sector is particularly important in China and central to Chinese economic reforms (Nolan, 2001). The final sample is an unbalanced panel comprising 476 firms in 1999 and 467 matching firms in 2004 (because nine firms subsequently delisted). Of these, 261 firms are identified in the data as group affiliated in both years. The firms are classified into 19 different industries, using the classification system of the CSRC. Dummy variables for each of these 19 industries are included in the estimated equations.

Measures

We measure the dependent variable as *return on assets* (*ROA*), calculated as net income divided by total assets. ROA has been the most widely used

performance measure in related studies of business group performance (Khanna & Palepu, 2000). ROA may be more reliable than stock-market based alternatives (such as Tobin's Q) when stock markets are in their early stages of development. For China, this was particularly true of the early period. Nevertheless, all equations were also estimated using *earnings per share* as the dependent variable, but this did not change the reported results in any meaningful way.

The independent variables measure business group affiliation and state ownership. We measured business group affiliation in two ways, corresponding to hypotheses 1 and 2. The first measure (*BG dummy*) is a dummy variable which equals one if the business group holds at least 5 percent of the shares. We chose this threshold because the majority of holdings by business groups were quite large (around 30 percent) and none held shares of less than 5 percent.[1] The second measure (*BG*) is the percentage of total holdings of the business group within the top ten largest shareholders. The two state ownership variables are measured in analogous ways and are related to hypothesis 4. Thus, *STATE dummy* is a dummy variable which equals one if the state owns at least 20 percent of the shares.[2] The second variable, *STATE*, is the percentage of the shares owned by the state. Finally, we include two interactive terms in order to test hypothesis 3. The first is the interaction of the business group and state ownership dummy variable (*BG dummy*STATE dummy*) while the second is the interaction of the two continuous measures (*BG*STATE*).

Control variables were chosen based on previous literature (Gedajlovic & Shapiro, 1998; Lu & Yao, 2006; Ma et al., 2006), data constraints, and the nature of this study.[3] Because there is evidence that performance is related to ownership structure (Gedajlovic & Shapiro, 1998; Lu & Yao, 2006), we include variables that indicate the percentage ownership (within the top ten) by owners of various types: individuals (*IND*), financial companies (*FIN*), and non-financial companies (*NONFIN*). We also include a variable controlling for the percentage of shares that are traded (*PUBLIC*). We expect that firms whose shares are not all traded will, other things being equal, not be subject to the same kind of public scrutiny as other firms, and this will negatively impact their performance. Firms with a high proportion of non-traded shares have been legally corporatized, but their shares are held by the state to facilitate direct control of their often non-market strategies (Nolan, 2001). Firm size (*SIZE*), measured as the log of total assets, is included to account for the potential economies of scale and scope accruing to large firms. If present, these would produce a positive relationship between firm size and profitability. Firm growth (*GROWTH*), measured as the percentage of annual growth of sales, is used as a control for demand conditions and product-cycle effects. Firms in relatively fast-growing markets are expected to experience above-average profitability. Finally, we included indicator variables to control for industry effects as discussed earlier.

Analysis

We test our hypotheses using the following estimating equation:

$$ROA_{jt} = \alpha_t + \beta'_t X_{jt} + \lambda_{1t} * BG \; dummy_{jt} + \lambda_{2t} * BG_{jt} + \gamma_{1t} * STATE \; dummy_{jt}$$
$$+ \gamma_{2t} * STATE_{jt} + \delta_t * BG_{ji} * STATE_{ji} + \varepsilon_{jt} \tag{1}$$

Subscripts j and t represent the firm and year, respectively. In our case, we obtained observations from two years, 1999 and 2004, so $t = 1999$ or $t = 2004$. β_t is a vector of estimated coefficients for our control variables, X_{jt}, and ε_{jt} is a disturbance term. Other terms are as defined above.

The critical estimated coefficients are λ_{1t} and λ_{2t}, which measure the effect of business group affiliation on firm performance; γ_{1t} and γ_{2t}, which measure the effect of state ownership on firm performance; and δ_t, which measures the moderating effect of state ownership on firm performance.

Hypotheses 1 and 2 are supported if the coefficients on *BG dummy* and *BG* in both periods ($\lambda_{1,1999}$, $\lambda_{1,2004}$, $\lambda_{2,1999}$, and $\lambda_{2,2004}$) are positive, indicating that business group affiliation improves performance and the effect is stronger when the ownership stake of the parent is stronger. Hypothesis 3 is supported if δ_{1999} and δ_{2004} are positive for the interaction of *STATE* with *BG dummy* and *BG* respectively, indicating that state ownership enhances business group performance and that stronger state ownership enhances the business group effect. Similarly, hypothesis 4 is supported if the coefficients on *STATE dummy* and *STATE* in both periods ($\gamma_{1,1999}$, $\gamma_{1,2004}$, $\gamma_{2,1999}$, and $\gamma_{2,2004}$) are positive. Although hypotheses 1–4 suggest that λ_t and δ_t are both positive, hypotheses 5 and 6 suggest the positive effects will diminish over time for any definition of *BG* and *STATE*. Thus, the test of hypothesis 5 is that the effect of group ownership or affiliation is greater in 1999 than in 2004 ($\lambda_{1,1999} > \lambda_{1,2004}$ and $\lambda_{2,1999} > \lambda_{2,2004}$). The test of hypothesis 6a and b, suggesting that state influence on *BG* performance declines over time, is that ($\delta_{1999} > \delta_{2004}$ and $\gamma_{2,1999} > \gamma_{2,2004}$).

Several studies point out that relationships among ownership concentration, group-affiliation, and profitability are endogenous (Chang, 2003; Demsetz, 1983). While it is possible that group ownership improves firm returns by overcoming market imperfections, it is equally possible that groups choose to acquire stakes in firms with excess returns. In order to address the problem of endogeneity, we use instrumental variables to conduct a two-stage least squares (2SLS) estimation (Chang, 2003). This approach requires the determination of instruments that are (i) uncorrelated with the error term but (ii) correlated with group ownership. The determination of instruments is often difficult due to data limitations. In this study, we use characteristics of home provinces of the listed companies in 1978. We selected 1978 because that year predated the beginning of economic reform in China. The set of variables are population, GDP, GDP of industrial sectors, GDP

of communication and transportation sectors, GDP of retail sector, the number of industrial firms, the number of state-owned firms, and the number of collectively-owned firms. These are rough measures indicating the size of local markets, ease of access to distant markets and the pool of potential business partners within the province. The profit from a larger market is more likely to justify the fixed cost involved in group formation. Difficulties accessing distant markets may provide more incentive to join a business group. Lastly, a larger pool of local firms provides a greater chance of forming business groups.

RESULTS

Descriptive statistics are provided in Table 1. On average, the business group core firm owns about 30 percent of the shares of sample firms, while 64 percent of sample firms have at least 5 percent business group ownership and 58 percent have a dominant (>20 percent) business group owner. State ownership is pervasive, 43 percent on average, and state ownership exceeds 20 percent in 79 percent of sample firms. The business group variables are highly correlated as are the state variables, suggesting that, when either group takes an ownership stake, it tends to be large. The correlation between state ownership and business group ownership is not as high. Nevertheless, it is the case that firms with above-average business group ownership are also characterized by above-average state ownership. Thus, it is difficult to disentangle business group and state ownership effects.

   The major source of potential multicollinearity arises from the ownership by the non-financial firm variable (*NONFIN*), which is negatively correlated with both the state and business group terms (the correlation coefficient ranges from −0.33 to −0.47). However, we find no evidence that multicollinearity is an issue in this study because the deletion of the *NONFIN* variable (results not reported) does not impact the results reported below.

Testing the Hypotheses

Table 2 presents the results obtained from estimating the 1999 and 2004 samples separately by ordinary least squares (OLS). The benchmark estimation is column 1 for 1999 and column 5 for 2004. These estimated equations include a dummy variable indicating 5 percent group ownership and the continuous percentage measure for group ownership (testing hypotheses 1 and 2) while measuring state as a continuous variable (testing hypothesis 4). The remaining equations provide alternative specifications. Columns 2 and 6 present estimates that include both a dummy measure and a continuous measure for state ownership, while columns 3, 4, 7, and 8 report estimates that include, respectively, an interaction term between

Table 1. Descriptive statistics, averaged 1999–2004

Variable	Unit	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12
1 Return on assets (ROA)	Percent	3.90	7.99	1											
2 Business Group (BG) dummy (5%+)	Dummy variable	0.64	0.48	-0.02	1										
3 BG dummy (20%+)	Dummy variable	0.58	0.49	-0.01	0.89**	1									
4 BG ownership	Percent	30.04	26.91	0.03	0.84**	0.89**	1								
5 STATE dummy (20%+)	Dummy variable	0.79	0.41	0.07*	0.13**	0.19**	0.23**	1							
6 STATE ownership	Percent	43.00	24.93	0.09**	0.11**	0.17**	0.34**	0.82**	1						
7 Individual ownership (IND)	Percent	0.62	0.87	-0.03	0.01	0.02	0.03	-0.01	0.01	1					
8 Financial ownership (FIN)	Percent	6.86	11.07	-0.08**	-0.09**	-0.15**	-0.20**	-0.12**	-0.19**	-0.16**	1				
9 Other ownership (NONFIN)	Percent	13.10	19.33	0.02	-0.40**	-0.44**	-0.47**	-0.35**	-0.33**	-0.11**	-0.02	1			
10 Public traded shares (PUBLIC)	Percent	34.74	13.25	-0.08**	-0.06	-0.09**	-0.18**	-0.17**	-0.30**	0.10**	-0.11**	-0.07*	1		
11 Sales growth (GROWTH)	Percent	0.77	8.90	0.06	-0.04	-0.04	-0.04	-0.03	-0.05	-0.04	0.01	0.03	0.06	1	
12 Firm size (SIZE)	Log of assets	14.08	0.97	-0.02	0.17**	0.18**	0.22**	0.12**	0.17**	-0.23**	0.09**	-0.08**	-0.1**	-0.07*	1

Notes: * $p < 0.05$, ** $p < 0.01$. All p-values smaller than 0.01 are reported as 0.01. Firms with a Business Group (BG) dummy (20%+) value equal to 1 also have a BG dummy (5%+) value equal to 1.

SD, standard deviation.

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Table 2. Ordinary least squares (OLS) results of business group and state ownership on firm return on assets (ROA) for the 1999 and 2004 samples

	1999 (OLS)				2004 (OLS)			
	1	2	3	4	5	6	7	8
Business Group (BG) dummy (5%+)	3.63** (1.85)	3.89** (1.92)	4.18** (1.87)	2.99 (1.91)	−1.76 (1.55)	−1.88 (1.57)	−0.88 (2.36)	−2.00 (1.49)
BG ownership (%)	−0.04 (0.03)	−0.05 (0.03)	−0.03 (0.48)	0.02 (0.06)	0.05* (0.03)	0.05* (0.03)	0.06* (0.03)	0.07 (0.05)
STATE dummy (20%+)		−0.90 (1.61)				0.72 (1.45)		
STATE ownership (%)	0.06*** (0.02)	0.08** (0.03)	0.08** (0.03)	0.09*** (0.03)	0.02 (0.02)	0.01 (0.03)	0.04 (0.05)	0.03 (0.04)
BG dummy* STATE%			−0.03 (0.05)				−0.03 (0.05)	
BG (%)*STATE%				−0.00 (0.00)				−0.00 (0.00)
Individual ownership (IND)	−0.40 (0.26)	−0.40 (0.26)	−0.39 (0.27)	−0.37 (0.27)	0.41 (0.55)	0.42 (0.55)	0.39 (0.55)	0.40 (0.56)
Financial ownership (FIN)	−0.15*** (0.06)	−0.14** (0.06)	−0.14** (0.05)	−0.13** (0.05)	0.02 (0.03)	0.02 (0.03)	0.02 (0.04)	0.02 (0.03)
Non-financial ownership (NONFIN)	0.05** (0.03)	0.05* (0.03)	0.07* (0.03)	0.08** (0.03)	0.03 (0.03)	0.03 (0.03)	0.03 (0.03)	0.03 (0.03)
Public traded shares (PUBLIC)	0.02 (0.03)	0.03 (0.03)	0.03 (0.03)	0.04 (0.03)	−0.02 (0.04)	−0.02 (0.04)	−0.01 (0.05)	−0.01 (0.05)
Sales growth (GROWTH)	0.08*** (0.01)	0.08*** (0.01)	0.09*** (0.01)	0.09*** (0.01)	0.02 (0.02)	0.02 (0.02)	0.03 (0.02)	0.02 (0.02)
Firm size (SIZE)	0.01 (0.37)	0.01 (0.37)	0.03 (0.38)	0.04 (0.37)	0.87* (0.52)	0.87* (0.53)	0.83* (0.50)	0.86* (0.51)
Constant	1.93 (5.69)	2.01 (5.70)	0.47 (6.77)	−0.51 (6.18)	−9.96 (9.00)	−10.05 (9.09)	−10.43 (9.49)	−10.22 (9.43)
F-stat	4.72	4.97	4.68	4.80	4.63	2.81	2.72	2.81
R-squared	0.19	0.18	0.19	0.19	0.19	0.11	0.11	0.11
N	473	473	473	473	473	457	457	457

Notes: * p < 0.05; ** p < 0.01; *** p < 0.001. Values in parentheses are heteroskedastic-consistent standard errors.

group dummy and state (hypothesis 3) and an interaction between group owner-ship percentage and state (alternative test of hypothesis 3). It is the comparison of the relevant coefficients (*BG, BG dummy*, and *STATE*) over time that constitutes the test of hypotheses 5 and 6.

The first four equations in Table 2 indicate that the *BG dummy* is always posi-tive and statistically significant in three of the four specifications. These results provide support for hypothesis 1 (the group affiliation effect), at least for 1999. However, the effect of group ownership (*BG*) on *ROA* is negative, although the coefficient is not statistically significant, providing no support for hypothesis 2 (the tight coupling effect) in 1999. However, these results are reversed in 2004. Thus, in comparison with the 1999 sample, equations 5 through 8 of Table 2 indicate that firms with substantial group affiliation (*BG dummy*) no longer enjoy significant excess *ROA*. On the other hand, the *BG* coefficient becomes positive and statis-tically significant in 2004, consistent with hypothesis 2. We note as well that very similar results are obtained when the *BG dummy* and *BG* terms are included separately.

The results on the *STATE dummy* variable reported in Table 2 provide no support for hypothesis 3 (a positive state ownership effect) or for hypothesis 6a (declining state ownership effect over time). The interactive terms between state ownership (in terms of percent) and business group ownership (both dummy and percent variables) are not statistically significant in either year (columns 3, 4, 7, and 8 of Table 2).

We do find some support for hypothesis 4 (an amplified 'helping hand' effect), but only for 1999. The state ownership term (*STATE*) is positive and statistically significant in all specifications for 1999, but the positive effect of state ownership is absent from all specifications by 2004 where the relevant coefficients are no longer significant. The former is consistent with hypothesis 4 and the latter with 6b. In constructing the *STATE dummy* variable, we tried different thresholds (such as 5 percent) but found the dummy variable is not statistically significant at any ownership threshold. However, the continuous variable (*STATE*) always has a significant and positive effect on *ROA* in 1999 (for example, $\beta = 0.06$; p < 0.001 in column 1), and in 2004, the effect is also positive, but the coefficients are not statistically significant (column 5).

With regard to the temporal hypothesis 5 (a declining positive group-affiliation effect), the comparison between the 1999 equations (1 to 4) and the 2004 equations (5 to 8) in Table 2 indicates that the coefficient on the group (*BG*) dummy is positive and significant in 1999, and the coefficient becomes negative and insignificant in 2004. This is consistent with hypothesis 5. At the same time, all equations estimated by OLS suggest that the marginal effect of percentage group ownership (*BG* ownership) on *ROA* changes from negative in 1999 (in column 1, $\beta = -0.04$, n.s.) to positive and significant in 2004 (in column 5, $\beta = 0.05$, p < 0.01). This is not consistent with hypothesis 5.

In order to examine the robustness of our results, we undertook further analysis using pooled data (pooling 1999 and 2004 data), estimated by both OLS and 2SLS (using the instrumental variable method described above). Table 3 presents the results of these estimations. The first two equations estimate the first two specifications of Table 2 using OLS, and the last two equations estimate the same specifications using 2SLS. In all cases, we augment the equations with terms that interact group and state variables with a time dummy (for 2004) to explore further the effects of group and state ownership over time. We also estimated specifications with state–group interactions using pooled OLS or pooled 2SLS. These results are not reported as the state–group interactions are always insignificant.

The first two equations in Table 3, which are estimated using OLS, are broadly consistent with the results in Table 2 with respect to business group affiliation and state ownership. There is a statistically significant and positive business group affiliation effect (*BG dummy*), but no business group ownership effects are found (*BG*). Moreover, the year interactive terms are negative and statistically significant for the *BG* term (for example, in column 1, $\beta = -5.14$, p < 0.01), suggesting that the positive business group effect declined over time and may even have become negative by 2004. However, the opposite is true of the *BG* ownership effect ($\beta = -0.04$, n.s., column 1), which increased over time ($\beta = 0.09$, p < 0.01, column 1) and may have become positive in 2004. The OLS pooled sample results also suggest positive state ownership effects ($\beta = 0.05$, p < 0.001, column 1); however, the year interactive term, though negative, is not statistically significant ($\beta = -0.03$, n.s., column 1), indicating that the effects of state ownership did not decline significantly over the period.

The last two equations of Table 3 are estimated using 2SLS. We note that both the coefficients on the business group dummy and the continuous measure of business group ownership are magnified by a factor of 10. Note as well that the average *ROA* is 5.4 in 1999; thus, even an excess return of 3 to 4 percent is economically very significant. Such magnifications also characterize other coefficients in the regression but to a much lesser extent. There are a few possible explanations. One possibility is that the OLS estimates are seriously biased and so differ dramatically from 2SLS estimates, which would be the case if there were a serious endogeneity problem. A more general reason is that the 2SLS estimator relies heavily on the impact of the instruments of pre-determined factors on the business group members, and the substantial difference in coefficient estimates is simply a manifestation of this heavy reliance. Thus, if one believes in the validity of our instruments,[4] then the natural interpretation is that the OLS estimates are seriously biased.

For the 2SLS results, we continue to find a positive and statistically significant business group effect, and, while the time interaction term is negative, it is not statistically significant, so we cannot conclude that the business group effect declines with time by a statistically significant amount.[5] It is still true, however, that the business group effect is less important in 2004. Although the standard error for

Table 3. Ordinary least squares (OLS) and two-stage least squares (2SLS) results for the pooled sample

	Pooled 1 (OLS)	Pooled 2 (OLS)	Pooled 3 (2SLS)	Pooled 4 (2SLS)
Business Group (BG) dummy (5%+)	3.15* (1.75)	3.46* (1.84)	26.94* (14.74)	24.11* (13.72)
BG ownership (%)	-0.04 (0.03)	-0.05 (0.03)	-0.64** (0.29)	-0.55** (0.26)
STATE dummy (20%+)		-0.93 (1.60)		-8.42* (5.09)
STATE ownership (%)	0.05*** (0.02)	0.07** (0.03)	0.30** (0.13)	0.36** (0.16)
BG dummy (5%+)* year dummy	-5.14** (2.36)	-5.47** (2.47)	-9.75 (28.28)	-4.78 (25.24)
BG (%)* year dummy	0.09** (0.04)	0.10** (0.04)	0.60 (0.50)	0.42 (0.44)
STATE dummy (20%+)* year dummy		0.89 (2.29)		5.56 (7.23)
STATE ownership (%)* year dummy	-0.03 (0.03)	-0.04 (0.04)	-0.27 (0.17)	-0.27 (0.23)
Individual ownership (IND)	-0.19 (0.24)	-0.19 (0.24)	0.58 (0.50)	0.35 (0.43)
Financial ownership (FIN)	-0.02 (0.03)	-0.02 (0.03)	0.04 (0.12)	0.02 (0.12)
Non-financial ownership (NONFIN)	0.04** (0.02)	0.04** (0.02)	0.17 (0.12)	0.13 (0.11)
Public traded shares (PUBLIC)	0.01 (0.03)	0.01 (0.03)	0.03 (0.08)	0.03 (0.08)
Sales growth (GROWTH)	0.06** (0.03)	0.06** (0.03)	0.10*** (0.03)	0.10*** (0.03)
Firm size (SIZE)	0.41 (0.34)	0.41 (0.35)	0.86 (0.67)	0.83 (0.65)
Constant	-2.54 (5.24)	-2.42 (5.25)	-18.76** (9.32)	-14.61* (8.26)
p-value associated with over-identification test	NA	NA	0.91	0.95
p-value associated with Anderson–Rubin statistics	NA	NA	0.02	0.02
F-stat	5.81	5.59	5.5	5.52
R-squared	0.12	0.12	0.12	0.12
N	930	930	930	930

Notes: * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$. Values in parentheses are heteroskedastic-consistent standard errors. For the over-identification test p-value, we carried out the Hausman over-identification test to examine the validity of instruments for each specification. For p-values greater than 0.1, we could not reject the null at 10-percent significance levels. Thus, there is no statistical evidence that the instruments are invalid. For the p-values associated with Anderson–Rubin (AR) statistics, we constructed AR statistics for testing the null that coefficients on all group variables are jointly zero. If the p-value associated with an AR statistic is less than 0.05, we could reject at 5 percent significance levels the null that the group variables are jointly insignificant in the regression.

NA, not applicable.

the coefficient on the business group dummy in 2004 is not reported directly by statistical programs, simple calculations show they are never significant. The business group ownership term in this case is negative and statistically significant (contrary to hypothesis 2), but again, the year interaction term does not suggest that the effect changes over time. Finally, the state ownership results based on 2SLS estimates are similar to the OLS estimates: increases in state ownership increase profitability, but the effect does not diminish over time.

Overall, based on both the OLS and 2SLS results in Table 3, we find that, in 1999, firms with at least 5 percent group ownership (*BG dummy*) enjoy a statistically and economically significant excess return, but there is no marginal effect of group ownership (*BG*) since the coefficient is not significant. In 2004, there is no evidence of excess return to firms with at least 5 percent group ownership, while the marginal effect of increasing ownership can be positive or near zero, depending on whether one relies on the OLS or 2SLS estimates. In short, hypothesis 1 is again supported by the 1999 sample but not the 2004 sample, and hypothesis 2 is rejected by the 1999 sample and receives support only from OLS estimates in 2004.

Because we include two measures of group ownership in each equation, it is somewhat difficult to determine the overall effect of group ownership on firm performance. Figure 1 illustrates the impact of both group variables (*BG dummy* and *BG*) by plotting the effect of each variable on *ROA* for both 1999 and 2004. Thus, the horizontal axis is the percentage of group ownership of a firm, and the vertical axis is the associated predicted excess *ROA*, based on the pooled OLS estimates reported in column 1 of Table 3, holding other variables constant. Note that the group ownership effect is non-linear with a break at 5 percent ownership levels, which is caused by the presence of the *BG dummy* variable. Importantly, the estimated overall effect of group ownership is statistically significant in 1999 but not in 2004. In 1999, positive group ownership effects exist for ownership levels higher than 5 percent. However, the effect declines with an increasing percentage of group ownership. The same is not true for 2004 where the total *BG* effects result mostly in negative returns, which are reduced as ownership increases. These are not statistically significant. These results provide additional support for hypothesis 5 that the effect of business group ownership will decline over time. Similar results are obtained using the 2SLS estimates reported in column 3 of Table 3.

DISCUSSION

The thunderous institutional and economic forces that have buffeted China's economy in recent decades have engendered radical changes in its industrial structure, about which little is currently known. To the small but growing literature that is beginning to map the contours of China's new industrial organization, this study cautiously offers three contributions. First, the longitudinal research design tested the impact of affiliation in China's business groups over time. In so doing,

Figure 1. The impact of group affiliation on firm performance
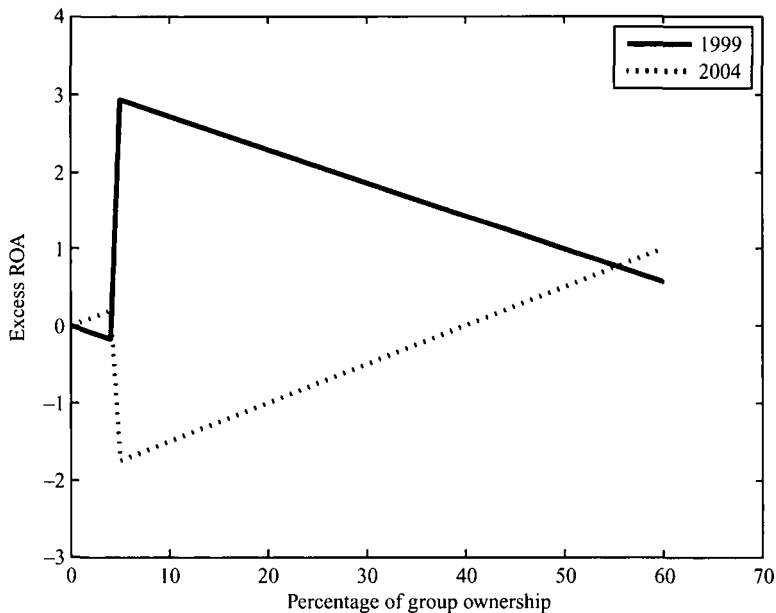
Note: The horizontal axis is the percentage of group ownership of a firm, and the vertical axis is the associated predicted excess *ROA* (*return on assets*) based on the pooled ordinary least squares estimates reported in column 1 of Table 3, holding other variables constant. Note that the group ownership effect is non-linear with a break at 5 percent ownership levels, which is caused by the presence of the *BG dummy* variable.

the paper sheds light on the temporal dynamics of business groups and offers some (albeit not unanimous) support for the institutional voids hypothesis that the advantages of business group affiliation decline as market institutions and soft infrastructure are constructed.

We do concede that this support is dependent upon the manner in which group affiliation is measured. Support for the hypothesis is found with the *BG dummy* (at least 5 percent ownership) and the combined effect of the *BG dummy* and the *BG* ownership (in percentages) term. However, the *BG* ownership term alone points to a different conclusion, at least at levels of group ownership that are above the population mean. This latter finding may be interpreted as an increase in the incidence of 'tunneling' (Bertrand et al., 2002), in which executives transfer income from firms with low cash-flow rights to group affiliates with high cash-flow rights. Further research is warranted. Nevertheless, we do suggest that, overall, the balance of the evidence points to a profit premium for business group affiliation in 1999, which largely disappears by 2004. The finding is consistent with Keister's (2001) conjecture that durable business group linkages may have negative long-term consequences as markets improve.

While we agree with Campbell (2004) that the creation of capitalist institutions is a lengthy process best measured in decades, we believe that the tempo of institutional reform accelerated in China after the 1997 financial crisis and that the accumulation of these reforms has served to reduce the value of business group affiliation. However, we suggest that a more direct cause of the decline in the value of group affiliation is the rapid improvement in the quality of the soft infrastructure of the type identified by Khanna and Palepu (1997). In particular, we speculate that after 1999, the beneficial effects of large investments in China's soft infrastructure made during the booming 1990s were increasingly evident. We suspect that the materialization of soft infrastructure enabled the entry of freestanding firms that provided stiffer competition for incumbent business-group affiliates. It is also possible that the observed decline in the value of group affiliation could be explained by other negative business group attributes, such as executive entrenchment (Morck et al., 2005) or expropriation (Chang, 2003), which may have become more salient after 1999.

A second contribution is our attempt to correct for the potential endogenous nature of the relationship between affiliation and performance, something not done in previous studies of Chinese groups. Given the weaknesses in China's corporate governance (Clarke, 2003; Lin, 2001), the possibility of asset diversion by enterprise managers (Hahn & Lee, 2006), and the continuing state pressure on groups to merge with or acquire weak enterprises, there is a distinct potential for endogeneity bias and reverse causality in the affiliation–performance relationship. Although the 2SLS estimates provide some confidence in the parameter estimates, it is difficult to address the causality issue in the absence of a well-specified structural model. In the 2SLS estimations, we chose as instrumental variables several 1978 characteristics of the province where a company was registered in 1999. We find that these historical provincial features are correlated with the formation of business groups in that province. Since these factors were determined twenty years before our sample period, they are evidently uncorrelated with current factors that determine ROA in 1999 and 2004. Thus, they are reasonable candidates for instrumental variables. Nevertheless, there remain potential problems with our procedures. For example, if the historical factors used in this study are correlated with both group affiliation and some unobserved variable, such as business culture in the province, and if business culture affects current ROA, then the 2SLS estimates will erroneously attribute the performance effect of business culture to business groups. Accordingly, this will bias our estimate of the group ownership effect. However, when choosing instrumental variables, researchers always make the untested assumption that the instrumental variables are not correlated with any unmeasured variables in the error term. In this regard, our study is no exception. Given the difficulties in finding and establishing valid instrumental variables, we view the 2SLS results as suggestive but not definitive. They should, therefore, be interpreted with due caution. Further research which explores alternative instrumental variables is warranted.

Third, while business group theories emphasize the multidimensionality of a firm's affiliation with a group, the prevailing tendency among researchers is to use a dummy variable to denote group affiliation. Our paper addressed the disjunction between theory and empirical research by utilizing an ownership identity variable (*STATE* percent) to capture the strength of a firm's affiliation with a group, which we described as a 'tight coupling' effect, but we did not find much support for our state ownership hypotheses. The absence of support for these hypotheses may be due to the ambiguity about some categories of state ownership identity (Delios et al., 2006) or because equity ownership taps into only one dimension of what is likely to be a more complex relationship. However, future researchers should pay greater attention to the specification and operationalization of group affiliation since these linkages specify the group's boundaries and the extent to which an affiliated firm can expect to benefit from group membership (Khanna & Rivkin, 2006).

More research needs to be done about which firms benefit from group affiliation as well as how and why they benefit. In this regard, Keister (2001) suspects that firms in major population centres and in coastal cities were the first movers in the formation of China's groups, and they have prospered at the expense of later joining member firms and those located in China's interior. Another possibility is that firms possessing superior technical and market capabilities are more able to profit from group affiliation than firms with weaker resource profiles (Yiu et al., 2005). Certainly, there is no suggestion in the literature that China's business groups perform a profit redistribution function comparable to Japan's business groups (Gedajlovic & Shapiro, 2002). China's large business groups were initially charged with 'catching up' to global technology standards and leading affiliated firms toward international competitiveness (Nolan, 2001). As firms approach the technology frontier and venture out into international competition, scholars agree that significant organizational restructuring and refocusing is called for (Hoskisson, Johnson, Tihanyi, & White, 2005). Our results support Keister's (2001) speculation that firms that retain their group affiliation are exhibiting inertia in the face of changing market conditions. Whether and how domestic business groups respond to China's growing integration into the world economy is of considerable interest.

CONCLUSION

Over the past 20 years, business groups have emerged as powerful players in China's rapidly changing economy. Their materialization is a direct result of an economic experiment that state policy-makers are now rethinking and may wish to reverse. Prior to the Asian financial crisis, the consensus of opinion about business groups as a developmental tool was generally positive; after the crisis, in which inadequacies in the governance of business groups were implicated as a causal factor, that opinion became more divided. Consequently, we should not be

surprised if policy-makers temper their commitment to the business group struc-
ture as a prominent instrument of economic development. Theorization about
business group functioning and performance is running far ahead of empirical
research, and many questions remain to be tested in both contemporary and
historical contexts. In this paper, we have focused upon two under-researched
issues, ownership and temporal effects, but much more work is needed. China
continues to be an exciting empirical venue to research business group issues. In
this regard, we believe China's reform will offer ample research opportunities to
address issues of state policy, institutional change, business group structure, and
performance.

NOTES

We thank Yusong Han, Tingting Shi and Wenhui Fan for their assistance in data collection. We
would also like to thank Senior Editor Doug Guthrie and two anonymous reviewers for their helpful
comments.

[1] We also explored alternative thresholds of 0 percent and 20 percent in constructing dummies
    indicating significant group affiliation but found no significant change to the results. We did find
    that the regression with the 0 percent dummy threshold generated results similar to the bench-
    mark equation 1 of Table 3. When we used the 20 percent dummy threshold, the variable was
    not significant.
[2] Again, we experimented with various thresholds, and the results reported are mostly insensitive
    to the choice of threshold.
[3] In addition to the included variables discussed, other variables were employed but are not
    reported because they were never statistically significant and did not change the results. For
    example, financial leverage, measured as the ratio of debt to equity, fell into this category. Similar
    results are reported by Ma et al. (2006).
[4] Since the number of instruments is greater than the number of endogenous variables, we also
    performed the Hausman test of over-identification, a test for necessary conditions for the validity
    of instruments. The null is that, under the condition that a subset of instruments are valid,
    additional instruments are also valid. The p-values for each specification are reported in the notes
    following Table 3. In all cases, the nulls are not rejected.
[5] The F-statistics for the first-stage regressions are usually below 5, raising the potential for a weak
    instrument problem. Staiger and Stock (1997) show that in the presence of weak instruments,
    conventional inference methods can be problematic. In practice, it is difficult to detect and
    correct for potential asymptotic bias of Generalized Method of Moments (GMM) estimators in
    the presence of weak instruments. However, one can use the Anderson–Rubin statistics for
    confidence regions to achieve correct size in inference, regardless of the strength of the instru-
    ments. The power property, though, may be poor. Accordingly, we construct Anderson–Rubin
    statistics to test both over-identification (i.e. validity of instruments) and significance of coefficients
    on group variables. For over-identification tests, we again fail to reject that the instrumental
    variables are valid. In the tests of significance of group variables, we found that the group
    variables are jointly significant at the 5-percent level for both specifications reported. These test
    results are consistent with the test results using conventional t-statistics and Wald-statistics.

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