

Corporate Governance and Operating Performance of Chinese Listed Firms

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This version: July 2009

Acknowledgement:

An earlier version of this paper was presented at the 2008 Annual Congress of the European Accounting Association and the 2008 Annual Meeting of the American Accounting Association. We would like to thank the participants for their comments and suggestions. Heibatollah Sami would like to thank the Martindale Center for its financial support in obtaining the TEJ Database for this project.

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Abstract

In this paper, we investigate the impact of corporate governance on firm performance and valuation in China. Our study is the first to use a composite measure of corporate governance to examine the impact of corporate governance on Chinese firms' performance and valuation. Because agency theory suggests that companies with better corporate governance standards perform better, we propose that better governed Chinese firms would have greater performance and higher valuation. Most importantly, we find that our composite measure of corporate governance is positively and significantly associated with firm performance and valuation. In addition, our results show that ownership concentration and board independence have a positive impact on firm performance and valuation. We also find that firm value increases with foreign ownership and firm performance decreases with state ownership. These findings have implications for policy makers, researchers, managers, and investors in general and those in emerging markets in particular.

Key Words: Corporate Governance; Operating Performance; Firm Valuation; Ownership; Tobin's Q; Emerging markets (China)

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I. Introduction

There has been a surge in empirical research in corporate governance following the accounting scandals of Enron and WorldCom in 2002. Some researchers empirically find that good corporate governance positively affects firm performance and market value (e.g., Gompers et al. 2003; Brown and Caylor 2006a; 2006b; Dittmar and Mahrt-Smith 2007). Most of these studies focus on corporate governance in developed markets, especially the US equity markets. For example, Gompers et al. (2003) find that better-governed US firms during the 1990s have higher operating performance and higher value in stock markets, suggesting investors in the United States factor in corporate governance when making their investment decisions. However, the importance of corporate governance in emerging markets, such as the equity markets in China, remains under-explored. In particular, Chinese firms have unique characteristics of ownership structure, one of the important facets of corporate governance, providing interesting settings to study corporate governance and its effects on firm performance and valuation. Therefore, the purpose of our study is to empirically examine the relationship between corporate governance and firm performance and valuation in the emerging markets of China.

Corporate governance is a set of mechanisms that affect how a corporation is operated. It deals with the welfares and goals of all the stakeholders, including shareholders, management, board of directors, lenders, regulators, and the economy as a whole. The purpose of corporate governance is to achieve the best overall welfare of all stakeholders and promote economic efficiency both internally and externally. Empirical

research on corporate governance is based on the theoretical framework of agency theory advanced by Jensen and Meckling (1976), Fama (1980) and Fama and Jensen (1983), with a focus on the principal-agent problem. In corporations, principal-agent problem occurs when the interest of managers (the agent) is not in line with the interest of owners (the principal). Agency theory provides a framework to explain how to create an effective monitoring and incentive scheme under uncertainty and incomplete information.

In addition, agency theory suggests that a better-governed firm is expected to have better performance and higher valuation due to lower agency costs. This prediction is supported by many empirical studies. For example, Gompers et al. (2003) find that better corporate governance is associated with higher firm valuation measured by Tobin's Q. Brown and Caylor (2006a; 2006b) find that better-governed U.S. firms have higher return on equity (ROE), higher return on assets (ROA), and higher Tobin's Q. Dittmar and Mahrt-Smith (2007) find that good corporate governance has a substantial positive impact on U.S. firms' value.

Agency theory also predicts that a better-governed company is associated with higher ownership concentration, which is further associated with firm performance. For instance, Gedajlovic and Shapiro (2002) find positive relationship between the ownership structure and firms' financial performance in Japan. Joh (2003) finds Korean firms with low ownership concentration have low firm profitability during the period of 1993 to 1997. These findings validate the claim that ownership concentration improves corporate governance and firm performance.

However, there has been no consensus on how to measure corporate governance and the results of corporate governance studies from U.S. and other countries are mixed.

For instance, Gompers et al. (2003) find better governed firms have better net-profit-margin and sales growth but not higher returns on equity (ROE). Hence, further investigation is demanded in order to shed light on the discrepancy of the findings in the literature.

In addition, it remains an empirical question whether the positive relationship between corporate governance, ownership concentration and firm performance suggested by agency theory, would exist in the emerging markets of China, as higher ownership concentration coexist with higher state ownership in such markets and the latter could cause lower firm performance. Our research is also motivated by the rapid growth and the emerging importance of the China equity markets from the perspectives of foreign investors (Sami and Zhou 2004). Since the Shanghai Stock Exchange opened in 1990 and the Shenzhen Stock Exchange opened in 1991, Chinese equity markets have attracted large foreign investment. From 1995 to 2005, listed companies in China increased from 323 to 1300, and market capitalization increased from \$28.92 billion to \$439 billion (Tower and Yan 2006). Thus it also provides a unique setting to investigate the role of foreign ownership in corporate governance and firm performance.

In recent years, there have been significant changes in regulations of ownership of public companies in China. For instance, starting from 2001, domestic shareholders with foreign currency accounts have been allowed to purchase B-shares which had been sold only to foreign investors. This has provided more investment opportunities for individual shareholders and increased the public float. In addition, on June 12, 2001, China's State Council first announced the sale of state-owned shares in Chinese companies.¹ Third, more private enterprises developed into larger corporations and/or went public in recent

¹ http://www.pbs.org/nbr/site/research/educators/060106_14c

years. As a result, privately controlled firms increased dramatically, from 120 firms (11% of listed firms) in 2001 to 531 firms (35% of listed firms) in 2007. We are interested in whether the results from prior studies using early data -- For instance, the positive impacts of high concentration of non-controlling shareholders and foreign ownership on firm valuation found by Bai et al. (2004) for a sample period of 1999 to 2001 -- still apply to the period of time subsequent to these regulations. In addition to using only single dimension, we extend prior studies by using recent data and employing both single dimension and composite measures of corporate governance to provide a systematic and comprehensive investigation of the impact of corporate governance on firm performance and valuation.

The results of our study suggest the following. First, and most importantly, we find that our composite measure of corporate governance is positively and significantly associated with firm performance and valuation. This result is not documented in prior studies. Second, we find that ownership concentration and board independence have positive impacts on firm performance and valuation. Third, we find that firms with foreign ownership have higher firm value and firms with state ownership have lower firm performance. Also, we find that among single dimension corporate governance measures, ownership concentration among top ten shareholders, identity of the largest shareholder, and the independence of the board are more effective measures than others. Overall, these results indicate that the quality of corporate governance has a positive impact on firm performance and value.

Our results have implications for various groups in understanding the impact of corporate governance on firm performance and valuation in the emerging markets such as

China. For the policy makers and regulators of emerging markets, it is important to build a competitive legal and regulatory infrastructure to efficiently attract foreign capital. Our comprehensive evidence on the impact of corporate governance on firm performance should help the policy makers and regulators make relevant policies and assess the effectiveness of these policies. For the managers of public companies, it is important to know the impact of corporate governance on firm performance because it may affect investors' confidence. For investors, it is important to learn how corporate governance affects company-specific risk so that they could have a better idea of the risk-return analysis. In addition, researchers are interested in corporate governance in China due to the unique characteristic of Chinese companies' ownership structure. The ownership structure of Chinese listed companies is quite different from companies in other countries because in China the government holds a majority of the shares in most companies (Tian and Estrin 2005; Choi et al. 2007). Therefore, our study contributes to the literature by providing further evidence on the impact of corporate governance on firm performance and valuation under the unique setting of the emerging markets of China.

The paper proceeds as follows. In the next section, we present the literature review. We develop the hypotheses in the third section. The fourth section contains the research design. The detail of data collection and empirical analyses are presented in section five, and section six summarizes our findings and discusses the implication.

II. Literature Review

Although the agency theory literature suggests that good governance could reduce agency costs and increase the return to shareholders, the empirical findings are mixed. One possible reason could be the different measures of corporate governance. In general,

two types of approaches are adopted in the empirical studies. The first approach uses a composite measure of corporate governance. For instance, Gompers et al. (2003) use data from Investor Responsibility Research Center (IRRC) to develop a Governance Index (G-Index). This G-Index summarizes 24 governance provisions, including tactics for delaying hostile takeover, voting rights, director/officer protection, other takeover defenses, and state laws. Thus, the constructed G-index is a proxy for the strength of shareholder rights. A higher G-Index indicates that there are more provisions that favor the director, so shareholder rights are limited and the governance quality is lower. Using the index, they examine the empirical relationship between G-index and corporate performance for a U.S. sample over the period of 1990 to 1999. They find that firms with lower G-Index have stronger shareholder rights, better operating performance, higher valuations and higher stock returns.

Although Gompers et al. (2003) find better governed firms have higher valuation and better operating performance (measured by the net-profit-margin and sales growth), they do not find corporate governance as a significant factor in explaining returns on equity (ROE), another widely used performance measure. Core et al. (2005) find Gompers' inconsistent results on ROE puzzling because net-profit-margin, sales growth, and ROE are all measures of operating performance and should be similarly affected by corporate governance. Consequently, Core et al. (2005) further investigate the issue by relating G-Index to another performance measure, ROA. They argue that ROA is a better measurement of operating performance because it is not affected by the use of financial leverage and the way they compute extraordinary items. They find that the G-Index is significantly related to this operating performance measure.

However, Brown and Caylor (2006a) argue that the inconsistent results of Gompers et al. (2003) and Core et al. (2005) are not due to the choice of operating performance measures but the biasness of the G-index. They claim that Gompers' G-index is not an effective proxy of corporate governance because most of the factors included in G-index are anti-takeover measures. Therefore, they develop a broader index, Gov-Score, to proxy for corporate governance more reliably. Using data provided by Institutional Shareholder Services (ISS), Brown and Caylor (2006a; 2006b) examine fifty-one provisions covering eight dimensions of corporate governance and create a summary index from those provisions. They show that poorly-governed firms have lower ROE, lower ROA and lower Tobin's Q.

More recently, Cheung et al. (2008) develop 86 questions to construct a corporate governance index (CGI) for 2004 Fortune 100 largest listed Chinese companies. Those questions are based on the Organization of Economic Cooperation and Development (OECD) principles of corporate governance, including rights of shareholders, equitable treatment of shareholders, role of stakeholders, disclosure and transparency, and board responsibilities. The authors do not find any impact of their constructed CGI on the market valuation of those top 100 Chinese listed companies in 2004. However, because of the limited sample (100 companies), period (one year only), and type of sampled firms (Fortune 100 largest Chinese listed firms), it is not clear whether the results can be generalized to a wider sample over a longer period of time which render results inconclusive and in need of further investigation. Given these discussions, the most important contribution of our study is the use of a composite measure and a more diverse sample over a longer period of time to thoroughly examine (for the first time) the impact

of overall corporate governance on firms' performance and valuation in China.

Rather than creating a comprehensive measure of corporate governance, some studies focus on examining the impact of a single corporate governance attribute, such as ownership structure and board characteristics. One stream of corporate governance research focuses on examining the impact of ownership structure on firm performance. Among these studies, Joh (2003) finds that firms with low ownership concentration have low firms' profitability in the Korean equity market. Gedajlovic and Shapiro (2002) find a positive relationship between ownership concentration and financial performance for 334 Japanese corporations over the period of 1986 to 1991. These findings are consistent with the predictions of the agency theory, which suggests that large shareholders can reduce agency costs because they can monitor managers more effectively than small shareholders.

Furthermore, Patibandla (2006) finds similar evidence that large outside investors are able to reduce agency costs by providing more effective monitoring in the India equity market. He further identifies that the identity of the larger shareholder matters. Patibandla (2006) also finds that private foreign investors have a greater positive effect on firms' profitability than do government-owned local financial institutions. Lehmann and Weigand (2000), on the other hand, do not find that the presence of large shareholders necessarily improves firm performance in Germany. But they do find that the presence of financial institutions as the largest shareholders of traded companies improves corporate performance. These findings suggest that it is important to consider the ownership concentration and the largest shareholder's identity when investigating corporate governance from the perspective of ownership structure.

Another stream of corporate governance research studies the impact of the characteristics of the board of directors on firm performance and valuation. However, the empirical results are usually mixed. For instance, some studies (e.g., Fosberg 1989; Bhagat and Black 2002) find the portion of outside directors has no significant impact on ROE or ROA, while other studies find that the ratio of outside directors is positively associated with ROE (e.g., Bonn 2004) and market-to-book value (Cho and Rui 2007), and that the appointment of the additional outside director increases firm value (e.g., Rosenstein and Wyatt 1990) and reduces cost of debt (e.g., Anderson et al. 2004).² The mixed findings suggest that the single dimension measure by itself may not be an effective proxy for corporate governance and thus need further investigation.

In addition, some studies examine the impact of the separation of CEO and chairman since the agency theory suggests that there are higher agency costs associated with the same person holding both positions (dual leadership). This idea has been supported by Yermack (1996) which finds that firms are more valuable when the CEO and the chairman of the board are separate. Therefore, it is important to consider the role of dual leadership in measuring corporate governance.

Due to the rapid growth of the China capital market and the unique ownership characteristics of Chinese listed firms, there is growing interest in studying the impact of corporate governance on firm performance in China. For instance, using a sample period of 1999 to 2001, Bai et al. (2004) find foreign investor ownership and high ownership concentration (among the second to the tenth largest shareholders) are positively related to firms' Tobin's Q and market to book value. They also find the CEO being the chairman

² In addition, Brickley et al. (1994) find that there is a positive average market return to announcements of poison pill when the majority of the board is independent.

of the board and the largest shareholder being the government has a negative impact on market valuation. In contrast, using data for year 2000, Wu and Cui (2002) find that firms with higher concentration in ownership have better accounting profits but worse market performance reflected by lower market-to-book ratio and P/E ratio.

Additionally, Qi et al. (2000) find that firm performance is negatively related to the government's stake in a firm but positively related to the portion of legal-person shares for a sample of companies listed in the Shanghai Stock Exchange during the period of 1991 to 1996. However, they do not find correlation between company performance and the portion of either domestic or foreign investors' shares. Similar results are found in Xu and Wang (1999) and Chen et al. (2006). Hovey et al. (2003) find a positive relationship between institutional ownership and firm value for all publicly listed firms over the period of 1997 to 1999.

In summary, the empirical results of corporate governance studies are mixed. As mentioned above, Brown and Caylor (2006a; 2006b) find that better-governed U.S. firms have higher ROA, ROE, and Tobin's Q while Gompers et al. (2003) find that corporate governance is only positively associated with Tobin's Q. From the ownership structure prospective, the impact of ownership concentration on firm performance could differ in different countries (samples). For instance, prior studies document a positive impact of ownership concentration on firm performance in India (Patibandla 2006), in China (Bai et al. 2004), in Japan (Gedajlovic and Shapiro 2002), and in Korea (Joh 2003). However, Lehmann and Weigand (2000) do not find that the presence of large shareholders improves firm performance in Germany. Based on these discussions, we can conclude that prior studies have not fully explored the impact of corporate governance on firm

performance and valuation or completely addressed the limitation of single dimension for a comprehensive sample to systematically examine the effect of corporate governance in emerging markets. In the current paper, we extend the current literature by using more recent data and employing both single dimension and composite measures of corporate governance.

III. Hypotheses

Based on the aforementioned agency theory (Jensen and Meckling 1976, Fama 1980 and Fama and Jensen 1983), we are interested in examining how corporate governance affects firm performance and valuation in China. We use ROA, ROE and Tobin's Q as our dependent variables in our regression analyses because ROA and ROE are commonly used measures for operating performance and Tobin's Q is the widely used proxy for firm valuation in prior research. The independent variables include single-dimension measures of corporate governance, such as ownership structure and the characteristics of the board, and a multiple-dimension measurement of corporate governance as a separate approach.

Agency theory suggests that a company is better governed when it has concentrated ownership. Large shareholders have incentives and ability to monitor the management of the company more effectively. Some empirical findings support this theory. Gedajlovic and Shapiro (2002) find the ownership concentration is positively related to firms' financial performance in Japan. Joh (2003) finds low ownership concentration is related to low firm profitability for Korean firms. These findings indicate that there is a positive relationship between ownership concentration and firm performance and firm value. Hence, our first hypothesis is:

Hypothesis 1: Firms with higher ownership concentration have better firm performance and higher firm value.

Besides ownership concentration, prior literature suggests the identity of the largest owner also affects firms' profitability. In particular, the presence of larger institutional shareholders and foreign investors is associated with higher profitability, and large state ownership is associated with lower profitability. Xu and Wang (1999) find the presence of large institutional investors is positively associated with profitability. Bai et al. (2004) find the largest shareholder being the government has a negative impact on market valuation. Patibandla (2006) finds that foreign investors have a larger positive effect on firms' profitability than do government-owned local financial institutions. These results indicate that the largest shareholder's identity could affect the performance of a firm and its market value. Hence, our second, third, and fourth hypotheses are:

Hypothesis 2: Firms with an institutional investor being the largest shareholder have better firm performance and higher firm value.

Hypothesis 3: Firms with a foreign investor being the largest shareholder have better firm performance and higher firm value.

Hypothesis 4: Firms with the state being the largest shareholder have lower firm performance and firm value.

Agency theory suggests the role of the board of directors is to monitor the managers and assure the company is operated in the shareholders' best interest. Through effective monitoring, the presence of the board of directors is deemed to reduce agency costs. A typical board includes both inside and outside directors. It is generally believed that outside directors are elected because they provide more independent judgments on the firm's business decisions than inside directors. Bonn (2004) finds the portion of outside directors has a positive impact on ROE. Rosenstein and Wyatt (1990) find that the appointment of the additional outside director increases firm value. These results indicate

that the portion of independent directors could affect operating performance and firm value. Hence, our fifth hypothesis is:

Hypothesis 5: Firms with higher proportion of independent directors on the board have better firm performance and higher firm value.

In addition to the independent directors on the board, it is widely believed that the CEO being the chairman of the board of directors could compromise the independence and the effectiveness of its monitoring function. Some studies on dual leadership support this argument. Both Yermack (1996) and Bai et al. (2004) find that firms are more valuable when the CEO and the chairman of the board are separate. These results indicate that dual leadership might affect firm performance and firm value. Hence, our sixth hypothesis is:

Hypothesis 6: Firms with a segregation of CEO and Chairman of board of directors have better firm performance and higher firm value.

Overall, agency theory suggests that firms with better corporate governance standards perform better because of lower agency costs and more effective monitoring mechanisms. This prediction is supported by empirical studies. Brown and Caylor (2006a; 2006b) find that better-governed U.S. firms have higher ROE, ROA and Tobin's Q. Dittmar and Mahrt-Smith (2007) find that corporate governance has a substantial positive impact on U.S. firms' value. In addition, Gompers et al. (2003) find that better-governed US firms during the 1990s have higher ROE and Tobin's Q. These results indicate that good overall corporate governance is associated with better operating performance and higher firm value. Hence, our seventh and most important hypothesis is:

Hypothesis 7: Firms with better overall corporate governance have better firm performance and higher firm value.

IV. Research Design

In this paper, we examine companies listed on either the Shanghai Stock Exchange or Shenzhen Stock Exchange during the period of 2001 to 2004. The data on corporate governance measures are collected or calculated from China Listed Firm Corporate Governance Research Database (CLFCG). The data on firms' performance measures, including ROA, ROE and Tobin's Q, are obtained or derived by using the data from the Taiwan Economic Journal (TEJ) database.

Measuring corporate governance is difficult because it cannot be directly observed and it usually involves multiple dimensions. While there is no consensus on how corporate governance can be measured, prior literature suggests several different ways to proxy for corporate governance. For instance, Bai et al. (2004) use both internal single dimensions, such as ownership structure, executive compensation, board of directors and financial disclosure, and external single dimensions, such as external takeover market, legal infrastructure, and product market competition. Gompers et al. (2003) create a 24-factor G-index to measure corporate governance and Brown and Caylor (2006a; 2006b) use 51 corporate governance provisions to create a broader measure. Other empirical studies examine the impact of a single dimension of corporate governance, such as ownership concentration and the separation of CEO and the chairman of the board. In this study, we use both approaches to measure corporate governance.

4.1 Single-Dimension Corporate Governance Measures

To test Hypotheses 1 through 6, we estimate the following equation based on the framework provided by Bai et al. (2003).

$$\begin{aligned} \text{ROA/ROE/Tobin's Q} = & \alpha_0 + \alpha_1 * \text{TOP1} + \alpha_2 * \text{TOP2_10} + \alpha_3 * \text{INSTITUTION} + \\ & \alpha_4 * \text{FOREIGN} + \alpha_5 * \text{STATE} + \alpha_6 * \text{INDEPENDENT} + \alpha_7 * \text{DUAL} + \alpha_8 * \text{LASSETS} + \alpha_9 * \\ & \text{CSRATIO} + \alpha_{10} * \text{ISRATIO} + \alpha_{11} * \text{LEVERAGE} + \varepsilon \quad (1) \end{aligned}$$

Where ROA = return on asset, net income divided by total assets;
 ROE = return on equity, net income divided by equity;
 Tobin's Q = measure of firm valuation³;
 TOP1 = percentage of the shares owned by the largest shareholder;
 TOP2_10 = log of the sum of squares of the percent ownership by the second to the tenth largest shareholders;
 INSTITUTION = 1 if the largest shareholder is an institutional investor and 0 otherwise;
 FOREIGN = 1 if the largest shareholder is a foreign investor and 0 otherwise;
 STATE = 1 if the largest shareholder is the State and 0 otherwise;
 INDEPENDENT = percentage of independent directors serving on the board;
 DUAL = 1 if the CEO and the chairman of the board of directors are separate and 0 otherwise;
 LASSETS = log of total assets;
 CSRATIO = capital (book value of total tangible assets) to sales ratio;
 ISRATIO = operating income to sales ratio;
 LEVERAGE = total debt to total assets ratio; and
 ε = the error term.

We expect a positive sign for the coefficient of TOP1, a measure of ownership concentration, since earlier studies (e.g., Gedajlovic and Shapiro 2002; Joh 2003) find that ownership concentration is positively associated with firm performance and valuation. The coefficient of TOP2_10 is expected to be positive since high concentration of non-controlling shareholders has a positive impact on performance and valuation as evidenced by Bai et al. (2003).

Ownership variables, INSTITUTION, FOREIGN, and STATE, are dummy variables that are coded as one if the largest shareholder is institutional investors, foreign

³ We follow Chung and Pruitt (1994) and Bai et al. (2004) where Tobin's Q is calculated using Tobin's Q = (MVCS+BVPS+BVLTD+BVINV+BVCL-BVCA)/BVTA, where MVCS = market value of the common stock; BVPS = book value of the preferred stock; BVLTD = book value of the long term debt; BVINV = book value of the inventory; BVCL = book value of the current liabilities; BVCA = book value of the current assets; and BVTA = book value of the total assets. All variables are measured using year-end values).

investors, or the local government, respectively, and zero otherwise. The coefficients of INSTITUTION and FOREIGN ownership variables are expected to be positive while the coefficient of STATE ownership is expected to be negative as predicted in Hypotheses 2 through 4. We expect the coefficient of INDEPENDENT to be positive to validate Hypothesis 5. To test Hypothesis 6, the dummy variable, DUAL, indicates whether the CEO and the chairman of the board of directors are separate. The coefficient of DUAL is expected to be positive if separate leadership is positively associated with performance as hypothesized. Based on prior literature (Bai et al. 2004; Joh 2003; Cho 1998), we include four control variables: LASSETS is a proxy for firm size; CSRATIO is a proxy for capital intensity, calculated by dividing the book value of total tangible assets by total sales; ISRATIO is a proxy for operating margin, measured as the ratio of operating income to sales; LEVERAGE is firm leverage, calculated as the book value of the total debt divided by the book value of total assets.

4.2 Composite Corporate Governance Measure

Brown and Caylor (2006a; 2006b) develop a Gov-Score for U.S. firms by using 51 corporate governance provisions in eight dimensions, including audit, board of directors, charter/bylaw, director education, executive and director composition, ownership, progressive practices, and state of incorporation. We use common factor analysis to construct a composite corporate governance measure (GOV-SCR) for our sample firms. We first identify the Brown and Caylor (2006a; 2006b) provisions that have exact or similar matches in the China Listed Firm Corporate Governance Research Database (CLFCG). Then we add all additional provisions that are unique to Chinese firms and listed in the CLFCG database. Finally, we use common factor analysis to construct our

composite corporate governance measure (GOV-SCR). We estimate the following equation for Chinese listed firms to test our last hypothesis.

$$\text{ROA/ROE/Tobin's Q} = \alpha_0 + \alpha_1 * \text{GOV-SCR} + \alpha_2 * \text{LASSETS} + \alpha_3 * \text{CSRATIO} + \alpha_4 * \text{ISRATIO} + \alpha_9 * \text{LEVERAGE} + \varepsilon \quad (2)$$

Where GOV-SCR = the composite measure of corporate governance based on common factor analysis;⁴

ROA = return on asset, net income divided by total assets;

ROE = return on equity, net income divided by equity;

Tobin's Q = measure of firm valuation;⁵

LASSETS = log of total assets;

CSRATIO = capital (book value of total tangible assets) to sales ratio;

ISRATIO = operating income to sales ratio;

LEVERAGE = debt to total assets ratio; and

ε = the error term.

We expect a positive sign for the coefficient of GOV-SCR since a higher GOV-SCR suggests better governance. In equation (2), we also include four control variables as in Equation (1).

V. Empirical Results

To select our sample, we identify the companies that are both covered by CLFCG and TEJ databases. The details of sample selection procedures are summarized in Table 1. The sample selection starts with the entire population of firms found in CLFCG database from 2001 to 2004. These firms in the population then are subjected to the following screening criteria: (1) firms are included in the TEJ database; (2) data on dependent

⁴ We match six provisions from Brown and Caylor (2006a; 2006b) to similar provisions in the CLFCG database and include four additional provisions that are unique to Chinese firms. The provisions include whether the CEO and chairman duties are separated, independent outside directors as the proportion of total number of board members, whether a board approved CEO succession plan is in place, whether there is relationship among the top 10 shareholders, percentage of State ownership, percentage of foreign investors ownership, percentage of institutional investors ownership, percentage of the shares owned by the largest shareholder, percentage of officers' and directors' stock ownership, whether all directors with more than one year of service own stock. We compute the GOV-SCR for each firm in each year for the period 2001-2004. We use common factor analysis to construct the composite measure of GOV-SCR.

⁵ See footnote 5 for more information.

variables and other control variables are available from TEJ database; (3) data on other test variables are available from CLFCG database. These screening criteria resulted in 3079 firm-year observations for our analyses on the single dimension measures, and 1236 firm-year observations for our analyses on the composite measure.

----- Insert Table 1 Here -----

Panel A of Table 2 presents the summary statistics of single dimension corporate governance measures. The largest shareholder on average owns 43% of the company. Institution is the largest shareholder for 75% of the sample, while foreign investors and state, respectively, are the largest shareholder for 1% and 23% of the sample. About 22% of the directors are independent. About 91% of the firms separate the CEO and the chairman of the board of directors. On average, the firms in our sample are about 49% leveraged. Panel B of table 2 presents the summary statistics for composite measure sample. The sample firms are about 49% leveraged, with an average ROA of 2.8% and ROE of 2.4%.

----- Insert Table 2 Here -----

Single-Dimension Corporate Governance Measures

Table 3 presents the correlation matrix for the variables used in the analyses of the impacts of single-dimension measures of corporate governance on firm performance and valuation. It shows that ownership concentration, measured by TOP1 and TOP2_10, are correlated with all three performance measures. TOP1 is positively correlated with ROA and ROE, and negatively correlated with Tobin's Q. TOP2_10 is negatively correlated with ROA and ROE and positively correlated with Tobin's Q. It also shows a high correlation between TOP1 and TOP2_10, which could cause multicollinearity problem in

our regression. The significant negative correlation between INSTITUTION variable and FOREIGN and STATE variables could also cause multicollinearity problem in our regression. In addition, the independence of board is also positively correlated with ROA, ROE and negatively correlated with Tobin's Q. LASSETS is positively correlated with ROA and ROE and negatively correlated with Tobin's Q. CSRATIO is negatively correlated with ROA and ROE and positively correlated with Tobin's Q. ISRATIO is positively correlated with ROA and ROE and negatively correlated with Tobin's Q. LEVERAGE is negatively correlated with all three dependent variables. Although not all variables have the predicted sign in the correlation matrix, we should concentrate on multivariate model because correlation matrix measures the effect of each variable in isolation.

----- Insert Table 3 Here -----

Table 4 reports the coefficient estimates for the single-dimension corporate governance measure (Equation 1). We do not include CSRATIO and ISRATIO in the same equation due to multicollinearity problem shown in Table 3. However, the regression results are qualitatively the same when including CSRATIO and ISRATIO at the same time although the model does not pass the variance inflation factor test. Panel A presents the regression results when CSRATIO is included and Panel B presents the regression results when ISRATIO is included. Both panels show similar results. We winzorize all variables in the regression analyses to within two standard deviations around the mean. The results are qualitatively the same if variables are not winzorized. After controlling for LASSETS, CSRATIO/ISRATIO and LEVERAGE, the coefficients of TOP1 and TOP2_10 are both positive and significant with respect to all three

dependent variables, ROA, ROE, and Tobin's Q. This suggests that ownership concentration for both controlling and non-controlling shareholders has a positive impact on performance and valuation. This provides support for Hypothesis 1, which predicts a positive relationship between ownership and firm performance and value.

To examine the impact of the identity of the largest shareholder, we only include FOREIGN and STATE dummy variables in the regression due to our concern on a multicollinearity problem when both INSTITUTION and STATE dummy variables are included. When we include the INSTITUTION dummy variable, the regression results are qualitatively the same although the model does not pass the variance inflation factor test. The variance inflation factors for INSTITUTION and STATE are around 20. When we include only INSTITUTION and FOREIGN dummy variables, the coefficients of INSTITUTION are significantly and positively (the coefficient for INSTITUTION is 0.53 with a p-value of 0.047, the results are not shown in Table 4) related to ROA but insignificantly related to ROE and Tobin's Q. Thus, the results partially support Hypothesis 2. Panel A of Table 4 shows that the coefficients of FOREIGN are positive in all three models but significant only for the Tobin's Q model. This suggests that firms with a foreign investor being the largest shareholder have higher firm value and partially supports Hypothesis 3. The coefficient of STATE is negative and significant only in ROA model (based on one-tail test, p-value is 0.070 in Panel A and 0.059 in Panel B) and in ROE model it is approaching significance (based on one-tail test, p-value is 0.117 in Panel A and 0.107 in Panel B). This suggests that firms with the state being the largest shareholder may hurt its performance. Thus, Hypothesis 4 is partially supported. The coefficients on INDEPENDENT are positive and significant in all models. This suggests

that firms with higher proportion of independent directors on the board have better firm performance and higher firm value. This provides support for Hypothesis 5, which predicts a positive relationship between board independence and firm performance and firm value. Finally, the coefficient on DUAL is not significant. Therefore, we do not find that segregation of CEO and Chairman of board of directors results in better firm performance and higher firm value. Hence, we do not find evidence to support Hypothesis 6.

In addition, the regression results show that firm size (LASSETS) has a positive impact on firm performance but a negative impact on firm value. Capital intensity (CSRATIO) has a negative impact on firm performance but a positive impact on firm value, while operating margin (ISRATIO) has a positive impact on firm performance but a negative impact on firm value. Firm leverage (LEVERAGE) has a negative impact on both firm performance and firm value. The F-tests show that our models are significant. The adjusted R-square ranges from 12% to 51% in Panel A and it ranges from 15% to 54% in Panel B.

----- Insert Table 4 Here -----

Composite Corporate Governance Measure

Recent research suggests that single dimension measures of corporate governance might be highly correlated. For example, Hermalin (2005) finds that a more diligent board tends to hire an outside candidate as CEO, have higher CEO turnover, and larger CEO compensation. In addition, board composition and its independence could be endogenously determined with other corporate governance measures. For instance, Hermalin and Weisbach (1998) show that the effectiveness of the board depends on the

board composition, while the board composition is partially controlled by the CEO because of his/her influence over the selection process. Also, board composition could be determined by firm performance, CEO's retirement, and the change of CEO (Hermalin and Weisbach 1988).

To address the concern of high correlation between single dimension measures and determine the impact of overall corporate governance on firm performance and value, we conduct a common factor analysis to construct a composite measure of corporate governance. The list of our measures include ten items: whether the CEO and chairman duties are separated, independent outside directors as the proportion of total number of board members, whether a board approved CEO succession plan is in place, whether there is relationship among the top 10 shareholders, percentage of State ownership, percentage of foreign investors ownership, percentage of institutional investors ownership, percentage of the shares owned by the largest shareholder, percentage of officers' and directors' stock ownership, and whether all directors with more than one year of service own stock (see Table 5).

----- Insert Table 5 Here -----

Table 6 presents the results of the common factor analysis using the ten measures. The final communalities of the individual measures of corporate governance are shown in Panel A of Table 6. Communalities are equivalent to the squared multiple correlations obtained from regressing each of corporate governance measures on the other nine measures. In panel B, the eigenvalues of the reduced correlation matrix of the ten individual measures of corporate governance are presented. According to Harman (1976), the number of factors needed to approximate the original correlations among the

individual measures is equal to the number of summed eigenvalues needed to exceed the sum of the communalities. In our case, we do not have a single eigenvalue alone exceeding the sum of the ten communalities. Thus we construct a composite measure based on the sum of the four factors identified under the Harman (1976) rule. This rule was also used by Gaver and Gaver (1993).⁶

In panel C, the correlations between the composite measure and the original single dimension measures of corporate governance are presented. The composite measure is significantly and positively correlated with INDEPENDENT, TOP1, INST_PCT, OWN_1YRDIR, and DRI_PCT, and significantly and negatively correlated with SUCCESSOR, TOP10_NO_REL, STATE_PCT, and FOREIGN_PCT. This pattern of correlations strongly suggests that the composite measure captures the underlying construct that is common to at least nine of our ten single dimension measures of corporate governance. Panel D gives the descriptive statistics of the common factor.

----- Insert Table 6 Here -----

Table 7 presents the correlation matrix for the variables used in the analyses of the composite measure of corporate governance. It shows that the composite measure of corporate governance (GOV-SCR) is positively correlated to ROA, ROE and Tobin's Q, which is consistent with our expectation in Hypothesis 7.

----- Insert Table 7 Here -----

Table 8 reports the regression results for the composite measure sample (Equation 2). The coefficients on GOV-SCR, our main variable of interest, are positive and statistically significant with respect to all of the three dependent variables, ROA, ROE

⁶ We also construct a common factor based on the sum of factors suggested by the proportion criterion. The main results based on factor analysis using proportional method are qualitatively the same as the main results that we report based on Harman (1976) rule.

and Tobin's Q. Therefore, the regression results support Hypothesis 7, which predicts that firms with better overall corporate governance have better firm performance and higher firm value. In addition, similar to Table 4, the regression results show that firm size (LASSETS) has a positive impact on firm performance and a negative impact on firm value. Capital intensity (CSRATIO) has a negative impact on firm performance, while operating margin (ISRATIO) has a positive impact on firm performance. Firm leverage (LEVERAGE) has a negative impact on both firm performance and firm value. Our models are significant as indicated by the F-tests. The adjusted R-squares are 67%, 63% and 45%, respectively, for the ROA, ROE and Tobin's Q models.

----- Insert Table 8 Here -----

VI. Conclusion and Implication

In this paper, we investigate the impact of corporate governance on firm performance and valuation in the emerging markets of China. We extend the literature by employing both single dimension measures and a composite measure of corporate governance. We hypothesize that better governed Chinese firms would have greater performance and higher valuation. Our empirical results of single dimension measures support our hypotheses that ownership concentration and board independence have a positive impact on firm performance and valuation. In addition, we find that firms with foreign ownership have higher firm value and firms with higher state ownership have lower firm performance. Also, we find that among single dimension corporate governance measures, ownership concentration among top ten shareholders, identity of the largest shareholder, and the independence of the board are more effective measures than others. Most importantly, our results on the composite measure of corporate

governance show that overall quality of corporate governance has a significantly positive impact on firm performance and valuation.

In addition to shedding light on the discrepancy of the findings in the literature, our paper contributes to the current literature by systematically examining the relationship between corporate governance and firm performance and valuation in the emerging markets of China. Our findings on the positive relationship between ownership concentration and firm performance support the prediction by agency theory, while we also find that the state ownership, coexisting with ownership concentration, would impair firm performance such as ROA. In addition, we find that firms with foreign ownership have higher firm value, suggesting a positive role of foreign investors in corporate governance from the perspective of market participants. Finally, our results provide empirical evidence on the impact of corporate governance on firm performance and valuation during the period subsequent to new regulations of ownership structure in the emerging markets of China.

Our findings have implications for policy makers, regulators, managers, investors and researchers in the emerging markets. Our comprehensive evidence on the impact of corporate governance on firm performance should help the policy makers and regulators of the emerging markets make relevant policies and assess the effectiveness of these policies. Thus they could set a competitive legal and regulatory infrastructure to effectively and efficiently attract foreign capital. They should also continue to promote corporate governance among the listed firms. In addition, our findings have implications for the managers of public companies with regards to the importance of corporate governance as they strive to improve firm performance and valuation. Thus managers and

board of directors of listed firms should adopt high standard of corporate governance. As to the investors, it is important to learn how corporate governance indicates company-specific risk so that they could make better investment decisions. Since this study suggests better governed firms perform better, paying attention to some of the corporate governance metrics and avoiding investment in firms with poor governance could help investors to improve the performance of their portfolio. Our study would also have implications for researchers who are interested in the unique characteristics of ownership structure and corporate governance in emerging markets such as China. Possible areas of future research in China can focus on collecting more comprehensive and completed firm-level data, and researchers can also continue to develop a standardized method to measure overall corporate governance.

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Table 1: Sample Selection Procedures

	Number of Observations
Model 1: Single dimension corporate governance measure	
Firm-year in China Listed Firm Corporate Governance Database from year 2001 to 2004 (CLFCG)	5623
Less: missing from the Taiwan Economic Journal Database (TEJ)	594
Less: missing ROA and ROE (TEJ)	254
Less: missing Tobin's Q data (TEJ)	35
Less: missing control variables data (TEJ)	512
Less: missing top 10 shareholder ownership (CLFCG)	1037
Less: missing the identity of the largest shareholder (CLFCG)	99
Less: missing the percentage of independent directors (CLFCG)	13
Total number of firm-year observations	3079
Model 2: Composite corporate governance measure	
Firm-year in China Listed Firm Corporate Governance Database from year 2001 to 2004 (CLFCG)	5623
Less: missing from the Taiwan Economic Journal Database (TEJ)	594
Less: missing corporate governance provisions (CLFCG)	3719
Less: missing ROA and ROE (TEJ)	71
Less: missing Tobin's Q data (TEJ)	3
Less: missing control variables data (TEJ)	30
Total number of firm-year observations	1236

Table 2: Descriptive statistics of variables

Panel A: Single Dimension Corporate Governance Measure

Variable	Obs.	Mean	Std. Dev.	Min	Max
TOP1	3079	43.149	17.059	3.240	85.000
TOP2_10	3079	3.542	2.648	-4.276	7.982
INSTITUTION	3079	0.747	0.435	0.000	1.000
FOREIGN	3079	0.010	0.098	0.000	1.000
STATE	3079	0.234	0.424	0.000	1.000
INDEPENDENT	3079	0.217	0.136	0.000	0.667
DUAL	3079	0.906	0.292	0.000	1.000
LASSETS	3079	14.172	0.886	10.799	19.782
CSRATIO	3079	5.833	150.502	0.159	8343.528
ISRATIO	3079	-0.900	28.857	-1097.830	2.712
LEVERAGE	3079	49.438	18.435	1.080	99.210
ROA	3079	2.672	7.140	-122.730	26.950
ROE	3079	2.676	19.684	-380.660	204.330
Tobin's Q	3079	1.909	1.626	0.193	43.006

Panel B: Composite Corporate Governance Measure

Variable	Obs.	Mean	Std. Dev.	Min	Max
GOV-SCR	1236	0.0010	1.3340	-3.1000	3.0300
LASSETS	1236	14.2002	0.8535	12.0510	19.7246
CSRATIO	1236	3.1269	4.6474	0.2427	124.5615
ISRATIO	1236	-0.0131	0.6650	-16.4324	2.7118
LEVERAGE	1236	48.5763	17.6544	1.1800	99.2100
ROA	1236	2.8057	6.4381	-41.8900	23.7600
ROE	1236	2.3652	20.4982	-380.6600	61.6400
Tobin's Q	1236	1.8740	1.2263	0.1931	10.5821

Definition of Variables: ROA = return on asset; ROE = return on equity; Tobin's Q = measure of firm valuation; TOP1 = percentage of the shares owned by the largest shareholder; TOP2_10 = log of the sum of squares of the percent ownership by the second to the tenth largest shareholders; INSTITUTION = 1 if the largest shareholder is an institutional investor and 0 otherwise; FOREIGN= 1 if the largest shareholder is a foreign investor and 0 otherwise; STATE = 1 if the largest shareholder is the State and 0 otherwise; INDEPENDENT = percentage of independent directors serving on the board; DUAL = 1 if the CEO and the chairman of the board of directors are separate and 0 otherwise; LASSETS = log of assets; CSRATIO = capital (book value of total tangible assets) to sales ratio; ISRATIO = operating income to sales ratio; LEVERAGE = total debt to total assets ratio; GOV-SCR = a composite measure of corporate governance.

Table 3: Correlation Matrix for Single Dimension Corporate Governance Measure

	ROA	ROE	Tobin's Q	TOP1	TOP2_10	INSTITUTION	FOREIGN	STATE	INDEPENDENT	DUAL	LASSETS	CSRATIO	ISRATIO	LEVERAGE
ROA	1.000													
ROE	0.808 (0.000)	1.000												
Tobin's Q	-0.305 (0.000)	-0.120 (0.000)	0.995 (0.000)											
TOP1	0.144 (0.000)	0.109 (0.000)	-0.045 (0.013)	1.000										
TOP2_10	-0.056 (0.002)	-0.035 (0.054)	0.113 (0.000)	-0.667 (0.000)	1.000									
INSTITUTION	0.016 (0.381)	0.019 (0.284)	0.015 (0.400)	-0.026 (0.153)	0.047 (0.009)	1.000								
FOREIGN	0.022 (0.215)	0.015 (0.406)	-0.014 (0.456)	-0.093 (0.000)	0.072 (0.000)	-0.170 (0.000)	1.000							
STATE	-0.014 (0.453)	-0.020 (0.265)	-0.014 (0.432)	0.068 (0.000)	-0.075 (0.000)	-0.949 (0.000)	-0.055 (0.002)	1.000						
INDEPENDENT	0.071 (0.000)	0.062 (0.001)	-0.239 (0.000)	-0.021 (0.247)	0.030 (0.091)	0.065 (0.000)	0.037 (0.038)	-0.082 (0.000)	1.000					
DUAL	0.011 (0.557)	0.002 (0.933)	-0.009 (0.602)	0.047 (0.009)	-0.040 (0.025)	0.001 (0.940)	-0.013 (0.461)	0.000 (0.989)	-0.009 (0.636)	1.000				
LASSETS	0.214 (0.000)	0.156 (0.000)	-0.504 (0.000)	0.208 (0.000)	-0.162 (0.000)	-0.066 (0.000)	0.045 (0.013)	0.051 (0.005)	0.106 (0.000)	0.014 (0.451)	1.000			
CSRATIO	-0.047 (0.009)	-0.046 (0.010)	0.028 (0.122)	-0.002 (0.935)	-0.007 (0.704)	0.012 (0.498)	-0.002 (0.907)	-0.012 (0.523)	0.006 (0.738)	0.006 (0.748)	-0.023 (0.202)	1.000		
ISRATIO	0.352 (0.000)	0.158 (0.000)	-0.469 (0.000)	0.015 (0.400)	-0.013 (0.474)	-0.019 (0.305)	0.003 (0.849)	0.018 (0.331)	0.024 (0.178)	-0.010 (0.585)	0.085 (0.000)	-0.717 (0.000)	1.000	
LEVERAGE	-0.218 (0.000)	-0.194 (0.000)	-0.150 (0.000)	-0.172 (0.000)	0.130 (0.000)	-0.024 (0.176)	-0.005 (0.776)	0.027 (0.141)	0.049 (0.006)	-0.027 (0.132)	0.117 (0.000)	0.028 (0.127)	0.028 (0.127)	1.000

Definition of Variables: ROA = return on asset; ROE = return on equity; Tobin's Q = measure of firm valuation; TOP1 = percentage of the shares owned by the largest shareholder; TOP2_10 = log of the sum of squares of the percent ownership by the second to the tenth largest shareholders; INSTITUTION = 1 if the largest shareholder is an institutional investor and 0 otherwise; FOREIGN= 1 if the largest shareholder is a foreign investor and 0 otherwise; STATE = 1 if the largest shareholder is the State and 0 otherwise; INDEPENDENT = percentage of independent directors serving on the board; DUAL = 1 if the CEO and the chairman of the board of directors are separate and 0 otherwise; LASSETS = log of assets; CSRATIO = capital (book value of total tangible assets) to sales ratio; ISRATIO = operating income to sales ratio; LEVERAGE = total debt to total assets ratio; GOV-SCR = a composite measure of corporate governance.



Table 5: Measures used to construct GOV-SCR

Variable	Definition
DUAL	Whether the CEO and chairman duties are separated
INDEPENDENT	Independent outside directors as the proportion of total number of board members
SUCCESSOR	Whether a board approved CEO succession plan is in place
TOP10_NO_REL	Whether there is relationship among the top 10 shareholders
STATE_PCT	Percentage of State ownership
FOREIGN_PCT	Percentage of foreign investors ownership
INST_PCT	Percentage of institutional investors ownership
TOP1	Percentage of the shares owned by the largest shareholder
DIR_PCT	Percentage of officers' and directors' stock ownership
OWN_1YRDIR	Whether all directors with more than one year of service own stock

Table 6: Selected statistics related to a common factor analysis of eleven measures of corporate governance

Panel A. Estimated communalities of ten measures					
DUAL	INDEPENDENT	SUCCESSOR	TOP10_NO_REL	STATE_PCT	FOREIGN_PCT
0.032	0.077	0.059	0.093	0.882	0.247
INST_PCT	TOP1	DIR_PCT	OWN_1YRDIR		
0.862	0.403	0.013	0.043		
Panel B. Eigenvalues of the reduced correlation matrix of ten measures					
1	2	3	4	5	6
1.935	0.950	0.325	0.283	0.108	0.056
7	8	9	10		
0.020	-0.105	-0.177	-0.243		
Panel C. Correlation between the composite measure (the sum of factors identified) and ten measures					
DUAL	INDEPENDENT	SUCCESSOR	TOP10_NO_REL	STATE_PCT	FOREIGN_PCT
-0.005	0.270***	-0.064***	-0.296***	-0.385***	-0.399***
INST_PCT	TOP1	DIR_PCT	OWN_1YRDIR		
0.740***	0.220***	0.102***	0.116***		
Panel D. Descriptive statistics of the composite measure (the sum of factors extracted from ten measures, GOV-SCR)					
Maximum	4.096				
Third quartile	0.871				
Median	-0.106				
First quartile	-0.893				
Minimum	-4.058				
Mean	0.000				

Definition of variables: DUAL = 1 if the CEO and chairman duties are separated and 0 otherwise; INDEPENDENT = percentage of independent directors serving on the board; SUCCESSOR = 1 if a board approved CEO succession plan is in place and 0 otherwise; TOP10_NO_REL = 1 if there is no relationship among the top 10 shareholders and 0 otherwise; STATE_PCT = percentage of State ownership; FOREIGN_PCT = percentage of foreign investors ownership; INST_PCT = percentage institutional investors ownership; TOP1 = percentage of the shares owned by the largest shareholder; DIR_PCT = percentage of officers' and directors' stock ownership; OWN_1YRDIR = 1 if all directors with more than one year of service own stock and 0 otherwise.

Table 7: Correlation Matrix for Composite Corporate Governance Sample

	ROA	ROE	Tobin's Q	GOV-SCR	LASSETS	CSRATIO	ISRATIO	LEVERAGE
ROA	1.000							
ROE	0.920 (0.000)	1.000						
Tobin's Q	0.032 (0.263)	-0.014 (0.633)	1.000					
GOV-SCR	0.091 (0.001)	0.085 (0.003)	0.088 (0.002)	1.000				
LASSETS	0.193 (0.000)	0.186 (0.000)	-0.606 (0.000)	-0.108 (0.000)	1.000			
CSRATIO	-0.265 (0.000)	-0.270 (0.000)	0.130 (0.000)	0.005 (0.858)	-0.181 (0.000)	1.000		
ISRATIO	0.803 (0.000)	0.782 (0.000)	-0.004 (0.898)	0.073 (0.010)	0.163 (0.000)	-0.219 (0.000)	1.000	
LEVERAGE	-0.270 (0.000)	-0.247 (0.000)	-0.208 (0.000)	-0.011 (0.711)	0.187 (0.000)	-0.014 (0.621)	-0.237 (0.000)	1.000

Definition of Variables: ROA = return on asset; ROE = return on equity; Tobin's Q = measure of firm valuation; GOV-SCR = a composite measure of corporate governance; LASSETS = log of assets; CSRATIO = capital (book value of total tangible assets) to sales ratio. ISRATIO = operating income to sales ratio; LEVERAGE = total debt to total assets ratio.

Table 8: Regression Results for Composite Corporate Governance Measure and Firm Performance and Firm Value

Variables	Expected Sign	ROA (n=1236)			ROE (n=1236)			Tobin's Q (n=1236)		
		Coef.	Std. Dev.	P> t	Coef.	Std. Dev.	P> t	Coef.	Std. Dev.	P> t
Intercept		-4.521	2.105	0.032	12.453	5.922	0.036	13.410	0.553	0.000
GOV-SCR	+	0.233	0.085	0.006	0.477	0.238	0.045	0.074	0.019	0.000
LASSETS	+	0.654	0.149	0.000	1.418	0.438	0.001	-0.830	0.040	0.000
CSRATIO		-0.227	0.069	0.001	-0.664	0.198	0.001	0.014	0.012	0.233
ISRATIO		15.609	0.823	0.000	40.922	2.564	0.000	0.295	0.128	0.021
LEVERAGE	-	-0.038	0.007	0.000	-0.080	0.026	0.002	-0.004	0.002	0.004
F-value		88.410			50.730			108.220		
Pr > F		0.000			0.000			0.000		
R-squared		0.666			0.632			0.450		

Definition of Variables: ROA = return on asset; ROE = return on equity; Tobin's Q = measure of firm valuation; GOV-SCR = a composite measure of corporate governance based on common factor analyses; LASSETS = log of assets; CSRATIO = capital (book value of total tangible assets) to sales ratio. ISRATIO = operating income to sales ratio; LEVERAGE = total debt to total assets ratio.

For variables with predicted sign, one-tail t-test is used. Otherwise, two-tail t-test is used.