CHAPTER 5
FIRM PERFORMANCE AND TYPES OF STATE-SHARE HOLDERS

This chapter provides the empirical tests and results on the relationship between the identity of state-share holders and firm performance (H1a to H1c).

5.1. Measurements of variables

*Dependent variable: firm performance*

Both accounting and market measures of firm performance are used to investigate the relationship between forms of shareholders and firm performance. The most common accounting profitability measure is return on assets.\(^{23}\) Considering discretionary accounting measures that are the common critique for accounting data, core operating income before tax and interest is introduced to calculate the accounting profitability. China’s standardized income statement separates the operating results into (1) “profit or loss from core operating activities” and (2) “profit or loss from non-core operating activities”. Chen and Yuan (2002) find that non-core profits could be a convenient means of earnings management for China’s listed companies. Thus, the core operating profitability measure (CROAI) is used to mitigate the possible effects of earnings management through non-core transactions. Industry effects are adjusted by subtracting their industry medians. The market measure of firm performance (MARET) is the annually market-adjusted stock returns estimated as the stock return minus the market index return. I use the Shanghai A-share Composite Index and Shenzhen A-share Composite Index to proxy for the market returns, e.g., if a company is listed in SHSE, its return is adjusted by

\(^{23}\) I also use return on equity measure with the results being qualitatively the same.
the return on Shanghai A-share Composite Index. The description of these variables is presented in Table 3.

Independent variable: type of state-share holders

Two types of state-share holders of China’s listed companies are distinguished in this study: GA shareholders and corporate state-share holders. The former includes central government ministries and commissions, national industrial companies, local government bureaus, local state assets management bureaus, and local state assets operating companies. For example, Shanghai Bureau of Finance holds 49.18% stakes in Shanghai Jinqiao Export Processing Zone Development Co., Ltd. in 1997 and then is classified as a GA shareholder. The latter includes SOEs and other types of market-oriented economic entities. For example, Shanghai International Airport Group, which is not a government agency, holds 65.16% stakes in Shanghai International Airport Co., Ltd. and then is classified as a corporate state-share holder. The details of the classification of GA and corporate state-share holders are discussed in section 3.4. Dummy variables are introduced to represent the identity of state-share holders. GAD is a dummy that proxies for GA shareholders and that is one if a firm has at least one GA shareholder and zero otherwise. The identity of corporate state-share holders is represented by CORPD that is one if a firm has a corporate state-share holder but not a GA shareholder and zero otherwise. The percentage of state-owned shares held by GAs (GA%) is then introduced to proxy for the degree of government intervention. For comparison, a traditional measure (STATMED), which is one if a listed firm has state-owned shares and zero otherwise, is also included. Description of these variables is presented in Table 3.
Control variables

Some other factors which will positively or negatively affect firm performance need to be controlled. Following the framework developed by Caves and Barton (1990)^24, a number of firm-level variables are introduced to help explain firm performance, given the special content of Chinese economy.

1. Organizational factors. Previous research has found a number of organizational factors which can influence firm performance. First, the size of a firm (SIZE) can affect a firm’s performance in many ways. Larger firms can exploit economies of scale. On the other hand, larger firms could be less efficient because of the loss of control by top managers over strategic and operational activities within the firm (Williamson (1967)). Thus size can have both positive and negative consequences on firm performance. Size may also be treated as a variable to control for competitive conditions because larger firms usually have higher market power in the product market and thus may attain performance that is superior to that of smaller firms. In addition, Watts and Zimmerman (1986) suggest that firm size also proxy for political cost because larger firms could get more attention from the government.

Firm’s listed age (LISTAGE), the number of years after its initial public offering (IPO), could have a significantly negative relation with firm performance in China’s listed companies. Aharony, Lee and Wong (2000) show that there is a significant earnings decline pattern post-IPO for a sample of 83 China’s listed companies which have issued to foreign investors B-shares in domestic stock exchanges or H-shares in the Hong Kong stock exchange. More recently, Chen and

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^24 Chhibber and Majumdar (1999) also implement this framework to find control variables for investigating the effect of foreign ownership on India’s firm performance.
Shih (2003) investigate firm performance of a sample of 884 listed companies which have issued A-shares or B-shares in SHSE or SZSE. They also find that the firms’ financial performance tends to fall rapidly year after year since their IPOs. Thus I predict a significantly negative coefficient of LISTAGE.

2. Capital intensity. Strategic choices, such as capital intensity, may affect the performance of firms within an industry and lead to the creation of heterogeneity within industries. TANGIBLE, which is measured as a ratio of fixed assets over total assets, is introduced to control for variations in firms’ input structures.\footnote{Chhibber and Majumdar (1999) also use this variable.} Differences in input structure between firms can be associated with a number of factors such as capital market influences, managerial decisions as to what is thought to be an optimally feasible level of a particular input, or supply conditions in factor markets. Thus capital intensity is included as a regressor to control for the strategic choices of firms’ operations.

3. Dynamic disturbances. General environmental factors often have a strong impact on performance. Following Caves (1992), INTRY (ratio of net inventory to total assets) and SALESG (the growth rate of sales) are two variables capturing general business conditions. The variable INTRY, however, may also capture aspects of firm level competencies, since some firms within a given industry may turn out to be better managers of working capital than others and some industries can have higher inventory holding patterns relative to others. Similarly, in some industries growth in sales may be higher or lower compared to others.

4. Government and regulatory policies. To some extent, the independent variable (types of state-share holders) is a direct proxy for government intervention. Moreover, firm’s leverage (LEVERAGE), measured as the ratio of long-term
liability over total assets, may also indicate regulatory policies for China’s listed companies because the lenders are usually state-owned banks. On the one hand, lenders may monitor the operation of listed companies. On the other hand, state-owned lenders may have no incentive to monitor them. Thus the sign for this variable is also unpredictable.

5. Ownership concentration. To control for the effect of ownership concentration on firm performance, I follow Demsetz and Lehn (1985) to include a Herfindahl index (HERF) calculated as the average of the summary of squares of percentage of shares held by the top 10 shareholders. In support of the Shleifer and Vishny’s (1986) hypothesis that large shareholders may help reduce the free-rider problem of small investors and hence are value increasing, Xu and Wang (1999) find a significantly positive effect of ownership concentration (HERF) on China’s listed firms’ performance from 1993 to 1995.

6. Other control variables. The sample used in this thesis is taken from two stock exchanges (SHSE and SZSE) and thus an exchange dummy variable (EXCHANGE) is introduced to control for any possible geographic and historical noises on firm performance. Sun and Tong (2003), however, do not find any significant performance difference for firms listed in different exchanges. To control for macroeconomic environment, year dummies are also included. Finally, percentage of legal person shares (INST%) is also included in the regression analysis. This variable is included to control for any possible effects of an amalgam of shareholdings owned by persons with different interests on firm performance (Demsetz and Villalonga (2001)). The description of all control variables is also presented in Table 3.
5.2. Data and sample collection

The sample is all the firms listed in the Shanghai and Shenzhen stock exchanges before the year 2000, excluding bank and financial firms and those only issued foreign currency denominated shares (B shares). Table 4 summaries the sample selection procedure. The China Securities Regulatory Commission’s (CSRC) definition is used to classify firms into industries.\(^\text{26}\) The data sources include: ownership structure from TEJ, state-share holders, accounting information from Genius, stock returns from TEJ, industry classification from CSRC, top ten shareholders’ information from Genius, and the date of listing from TEJ. Table 4 shows a panel data with 918 listed firms and 3725 firm-years covering seven years from 1994 to 2000.\(^\text{27}\) Table 4 also reports the number of firms with GA shareholders (Group A1), firms with corporate state-share holders (Group A2), and firms without any state-owned shares (Group B). In the most recent year of 2000, there are 230 firms in Group A1, 518 firms in Group A2, and 165 firms in Group B.

[Insert Table 4 Here]

5.3. Research design and empirical results

The sample is divided into three groups based on the type of shareholders. Group A1 is all the firms with GA shareholders. Group A2 is all the firms with corporate state-share holders. To avoid the overlapping of Groups A1 and A2, firms with both GA and corporate state-share holders are excluded from Group A2. Group A is the sum of Groups A1 and A2, which includes all the firms with state-owned

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\(^{26}\) The definition was promulgated in year 2001. Potential bias to use the industry classification is that some firms might have changed their industries before 2000.

\(^{27}\) Observations before 1994 are excluded because the new accounting system, which is comparable to international accounting standards, took effect in January 1994.
shares. Group B includes all the firms without state-owned shares. The number of observations for each group is presented in Table 4. To test the hypotheses, I trim the top and bottom 0.5% of the sample with respect to return on assets (CROAI), stock return (MARET), firm size (SIZE), capital intensity (TANGIBLE), inventory ratio (INTRY), sales growth (SALESG), and capital structure (LEVERAGE). These restrictions result in a total sample of 900 firms with 3468 firm-year observations.

Panel A of Table 5 presents the descriptive statistics (mean and median) of performance variables and control variables, partitioned on the type of shareholders. Panel B of Table 5 presents univariate tests of the first two hypotheses (H1a and H1b). The $t$-test and Wilcoxon Z-test are both performed. The test statistics comparing Groups A and B are not significant for both accounting and market performance measures (CROAI and MARET), e.g., the $t$-statistic and Z-statistic for MARET are 0.19 and 1.00 respectively, indicating a lack of significant performance difference between firms with state-owned shares and firms without state-owned shares. However, the comparisons among Groups A1, A2, and B reveal some significant differences. Firm performance of Group A1 is significantly lower than that of Group A2, e.g., the $t$-statistic and Z-statistic for CROAI are -6.03 and -6.59 respectively, although the significant level using MARET is weaker. Accounting performance (CROAI) of Group A1 is also significantly lower than that of Group B, but the same is not true in market performance (MARET). Firms with corporate state-share holders (Group A2) do not perform better than those without any state-owned shares (Group B). Collectively, Table 5 demonstrates that firms with GA shareholders (Group A1) have the lowest firm performance but the other two groups

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28 Alternatively, I exclude extreme observations that differ in absolute value from the mean of these variables by more than three times the standard deviation of the respective distribution. The analysis below is also performed without any outlier treatments. The results remain unchanged qualitatively.
have almost the same firm performance. However, because univariate tests do not control for other factors that could affect firm performance, I rely on the multivariate analysis to test and draw conclusions regarding my hypotheses.

Table 5 also shows that firms with state-owned shares (Group A) are generally larger (SIZE) than firms without state-owned shares (Group B). They also have higher capital intensity (TANGIBLE), higher leverage ratio (LEVERAGE), higher ownership concentration ratio (HERF), slower sales growth (SALESG), and less institutional shareholdings (INST%). Within firms with state-owned shares (Group A), firms with GA shareholders (Group A1) are generally smaller than firms with corporate state-share holders (Group A2). In addition, firms in Group A1 have less capital intensity, lower ownership concentration ratio, higher leverage ratio, and larger institutional shareholdings than firms in Group A2.

[Insert Table 5 Here]

Table 6 presents the Pearson and Spearman correlation coefficients for the variables used in the regression analysis. As expected, the two performance measures are correlated (Pearson correlation coefficient is 0.24 with a significant level of 1%). The identity of GA shareholders (GAD) is significantly negative correlated with accounting performance but not with market performance. Moreover, there is no significant correlation between STATED (whether state-owned or not) and firm performance. These correlations are consistent with the comparison results presented in Table 5.

[Insert Table 6 Here]
To test the first two hypotheses, the effect of the types of state-share holders (GA and corporate) on firm performance, the following models are performed to estimate the coefficients using the ordinary least square (OLS) regression method:

\[ CROAl_{it}(MARET_{it}) = \alpha_1 + \alpha_2 \text{STATED}_{it} + \alpha_3 C_{it} + \varepsilon_{it}, \]  

\[ CROAl_{it}(MARET_{it}) = \beta_1 + \beta_2 \text{GAD}_{it} + \beta_3 C_{it} + \varepsilon_{it}, \]  

\[ CROAl_{it}(MARET_{it}) = \gamma_1 + \gamma_2 \text{STATED}_{it} + \gamma_3 \text{GAD}_{it} \cdot \text{STATED}_{it} + \gamma_4 C_{it} + \varepsilon_{it}, \]  

\[ CROAl_{it}(MARET_{it}) = \lambda_1 + \lambda_2 \text{STATED}_{it} + \lambda_3 \text{GALARGE}_{it} \cdot \text{STATED}_{it} + \lambda_4 C_{it} + \varepsilon_{it}, \]

where GALARGE is a dummy variable which is one if a GA shareholder is the largest controlling shareholder and zero otherwise, \( C_{it} \) contains SIZE, LISTAGE, TANGIBLE, INTRY, SALESG, LEVERAGE, HERF, EXCHANGE, and Year Dummies, and all other variables have been defined above. In Eq. (1), only the dummy variable STATED (whether state-owned or not) is included to show the effect of the nature of shares (whether state-owned or not and no matter who holds them) on firm performance and to compare findings with previous studies. In Eq. (2), GAD is included to test the effect of GA shareholders on firm performance. That is, the significance of \( \beta_2 \) will indicate if there is any firm performance difference between Group A1 (firms with GA shareholders) and the other two groups, which will provide evidence to test the first hypothesis. In Eq. (3), the interaction between GAD and STATED is included to test if there is any incremental effect of GA shareholders. Because STATED must be one if GAD is one, including their interaction (GAD*STATED) is equivalent to including GAD only. The coefficient of STATED in Eq. (3) (\( \gamma_2 \)) will show the difference between Groups A2 (firms with corporate state-share holders) and B (firms without state-owned shares) after controlling for some of the factors that could influence firm performance. The coefficient of GAD*STATED (\( \gamma_3 \)) will indicate the incremental effect of GA shareholders.
shareholders of state-owned shares. Since a higher degree of government intervention is expected if GA shareholders are controlling shareholders, GAD is then replaced by GALARGE, which is one if GA shareholder is the largest shareholder and zero otherwise, in Eq. (4) to test whether the incremental effect is more profound if the GA shareholder is the largest controlling shareholder.

The OLS pooled regression results are presented in Table 7. For both accounting (CROAI) and market (MARET) measures of firm performance, the coefficients on STATED in Eq. (1) are not significant, indicating the nature of shares defined by the Chinese government has no significant effect on firm performance. This insignificance effect of state-owned shares is also consistent with the findings in Tian (2001) and Sun and Tong (2003).

Table 7 also shows that the coefficients on GAD in Eq. (2) for both accounting and market performance measures are significantly negative (the \( t \)-statistics are \(-4.23 \) and \(-1.93 \) for accounting and market measures respectively). Thus the first null hypothesis corresponding to H1a is rejected, indicating that GA shareholders are generally detrimental to firm performance. The interpretation from the political perspective is that there will be a higher degree of government intervention with GA shareholders and thus lower firm performance. Corporate state-share holders are value increasing comparing with GA shareholders because of Chinese reform practice that cedes fourteen management autonomy rights to corporate state-share holders.\(^{29} \)

\[ \text{[Insert Table 7 Here]} \]

\(^{29}\) This result may be due to the fact that firms with GA shareholders lie in less-developed regions. However, the table in Appendix E shows that the distribution of GA shareholders in coastal (more-developed) regions is the same as that in inland (less-developed) regions.
In Table 7, Eq. (3) integrates the results from Eq. (1) and Eq. (2). The second null hypothesis corresponding to H1b, that there is no performance difference between firms with corporate state-share holders (Group A2) and firms without state-owned shares (Group B), cannot be rejected based on accounting performance because the estimated values of $\gamma_2$ in Eq. (3) and Eq. (4) are not significantly positive or negative (the $t$-statistics are 0.27 and 0.67 in Eq. (3) and Eq. (4) respectively). However, the second null hypothesis is rejected based on stock performance because the coefficients are significantly positive (the $t$-statistics are 2.02 and 2.20 in Eq. (3) and Eq. (4) respectively), indicating that firms with corporate state-share holders (Group A2) have better stock performance than firms without state-owned shares (Group B). But this result does not indicate that state-owned shares are more efficient because the benchmark (firms without state-owned shares) is not necessarily the most efficient one.

The results from Eq. (4) in Table 7 show that the negative effect on firm performance of GA shareholders is greatly increased if the GA shareholder is the largest controlling shareholder. This is consistent with the argument that the larger the voting rights of GA shareholders, the higher the degree of government intervention, and the worse the performance of the firm (H1c). To test hypothesis H1c, the following regression model is specified:

$$ CROA_{it} (MARET_{it}) = \alpha_1 + \alpha_2 GA^\%_{it} + \alpha_3 X_{it} + \alpha_4 C_{it} + \epsilon_{iti}, $$

(5)

where $X_{it}$ contains TANGIBLE, INTRY, SALESG, LEVERAGE, EXCHANGE, and Year Dummies, $C_{it}$ contains INST%, SIZE, and LISTAGE. Eq. (5) is performed using both ordinary least square (OLS) and two-stage least square (2SLS) regression methods.
The endogeneity of ownership structure has been a well-known issue in studying the relationship between firm performance and ownership (see, e.g., Demsetz and Lehn (1985), Demsetz and Villalonga (2001), and Megginson and Netter (2001)). For example, Kole (1996) provides evidence of a reversal of causality in the ownership-performance relation, suggesting that firm performance could be a determinant of ownership structure rather than being determined by ownership structure. These results raise doubts about the fundamental assumption that ownership structure is exogenously determined. For example, Xu and Wang (1999) treat the ownership structure of China’s listed companies as exogenously determined and thus their results should be interpreted with caution. Tian (2001) and Sun and Tong (2003) perform similar tests and claim that the endogeneity of ownership structure is not a problem for China’s listed companies. Their arguments are debatable. The reason is that there are some reasons to believe that corporate performance affects ownership structure of China’s listed companies. In China, the IPO process is under strict regulation by CSRC30 and initial ownership structure is decided in advance by Chinese government. In addition, Zhang (2000) shows that China’s listed companies’ ownership structures after IPO can change according to their performance and other market conditions. Lastly, rights offering in China’s listed companies might also lead the change of ownership structure. Only well-performed listed companies have rights to offer additional shares (Chen and Yuan (2002)) and many state-share holders give up the rights to acquire more shares from the rights offering (Wei and Wang (2001)), which causes the dilution of state-owned shares. In summary, ownership structure could affect firm performance and firm performance, again, could affect ownership structure in China’s listed companies.

Lack of consideration of the endogeneity of ownership structure will bias the estimated coefficient if we perform Eq. (5) using the OLS regression method only. Thus, I also use the 2SLS regression method to test H1c.

In the 2SLS regression method, lagged value of the endogenous variable (GA%) is the common instrument to control for endogeneity (Hermalin and Weisbach (1991)). In addition, three factors which could determine the level of state-owned shares held by GAs are also introduced as instruments. The first factor relates to why Chinese government has a higher or lower percentage of state-owned shares held by GAs in the IPO year. Using China’s survey data, Li and Lui (2001) find that Chinese government could maximise revenue by releasing state enterprises to private owners. For listed companies, firm performance before IPO could affect the percentage of state-owned shares that Chinese government chooses to hold. Firms who perform well may provide more revenue in the future and therefore the government wants to retain a higher portion of state-owned shares. Thus, a firm’s return on equity in the IPO year (IPOROE)\(^{31}\) is introduced to proxy for this governmental decision.

The second factor considers government behaviour after a firm’s IPO. State-owned shares cannot be traded publicly on stock exchanges but they could be sold or transferred to other parties with the consent of Chinese government (mainly the Ministry of Finance). Li and Lui (2001) also find that the prior year’s firm performance will affect the government’s decision. Thus lagged value of ROE (LAGROE) is used as another instrumental variable.

The last factor considered is the effects of rights issue. Rights issue is a very popular way to raise additional fund for listed companies after IPO (Chen and Yuan

\(^{31}\) The reason that ROE is used rather than ROA is that Chinese government often uses ROE in some regulations to evaluate firm performance. In tests not reported, the use of ROA leads to similar results.
However, state-share holders usually choose to give up the right and thus state shareholdings will be diluted after rights issue. This factor is very difficult to measure because the data for state-share holders’ choice on rights issue is difficult to obtain. Generally, state shareholdings will be diluted more seriously if more shares are issued through rights issue. Thus share capital expansion ratio (SHAREEXP), estimated as the total number of shares issued at the end of the year divided by the total number of shares issued in the IPO year, is introduced to measure the effects of rights issue on the dilution of state shareholdings.

There are some other factors which could affect both the level of state shareholdings and firm performance. They are included as control variables. The cross-sectional variation of state shareholdings may be explained by the variation of the legal person shares (INST%) because a larger percentage of legal person shares must be accompanied by a lower level of state shareholdings. Firm size (SIZE) has been considered as proxy for political cost (Watts and Zimmerman (1986)). Government pays attention to larger firms and thus wants to retain a higher portion of voting rights in larger firms. With the passage of time, there are many other factors which can cause a change in state shareholdings. The total number of years after IPO (LISTAGE) is then included to control for these factors.

Combining all the factors together, a second equation is performed to control for the endogeneity of state shareholdings held by GAs:

\[
GA_{it} = \beta_1 + \beta_2CROAI_{it}(MARERI_{it}) + \beta_3Z_{it} + \beta_4C_{it} + \varepsilon_{2it},
\]

where \(Z_{it}\) contains the instrumental variables for state shareholdings (GA\%): return on equity in IPO year (IPOROE), lagged value of return on equity (LAGROE), share

\footnote{The par value of stock should be assumed to be the same as time goes by. However, most of the listed companies listed before year 1993 have shares with par value other than one RMB (one RMB is the compulsory nominal share value after year 1993). When these listed companies split their shares is difficult to get. Thus, for firms listed before 1993, their total number of shares in the IPO year is set to be the total number of shares at the end of year 1993.}
capital expansion ratio (SHAREEXP) and lagged value of GA%, $C_\epsilon$ is the same as that in Eq. (5). Hence, a two-stage least square (2SLS) solution for Eq. (5) is analysed by estimating Eq. (6) with instrumental variables and getting fitted values of GA%. These fitted values are then used as instruments for GA% in Eq. (5). The estimated regression coefficient $\alpha_2$, for example, can then be interpreted as the marginal effect of a change in ownership structure (GA%) on firm performance (CROAI or MARET).

The regression results of Eq. (5) using both OLS and 2SLS regression methods are reported in Table 8. The estimated coefficients for GA% are significantly negative using both OLS and 2SLS regression methods for accounting performance measures, which indicates that a firm’s accounting performance is a significantly negative function of the GA shareholders’ ownership. However, the significance of negative coefficient on market measure (MARET) using OLS disappears after controlled for the endogeneity of state shareholdings. This insignificance might be due to the larger volatility of stock returns than accounting earnings.

[Insert Table 8 Here]

In summary, the hypothesis tests in Table 8 find partial support for the third hypothesis (H1c). Accounting performance of China’s listed companies is a significant negative function of the ownership ratio of GA shareholders, even after controlling for the endogeneity of state shareholdings. Market performance is also a significant negative function of the ownership ratio of GA shareholders if the ownership structure is assumed to be exogenously determined. However, there is no
significant relation between market performance and GA shareholders’ ownership ratio once the endogeneity of ownership structure is controlled.

5.4. Summary

Government intervention is the major concern for the inefficiency of state shareholdings from political perspective. Most of the previous theoretical and empirical studies advocate the detrimental role of state shareholdings on firm performance. However, existing empirical studies on China’s listed companies fail to show significantly negative effect of state shareholdings on firm performance (see, e.g., Xu and Wang (1999), Tian (2001), and Sun and Tong (2003)). This study shows that failure is due to the possible bias in the measure of the percentage of state-owned shares; because there are different types of state-share holders (GA and corporate) who have different incentives.