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THE CHINESE STOCK MARKET

- Differences in performance in consideration to level of state ownership

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Abstract

We examine the success of the privatization reform in China by evaluating the changes in performance of the State-Owned Enterprises (SOEs) after the Split-Share Structure reform in 2005, considering the changes in ownership structure. This study investigates how the ongoing privatization process in China is affecting the performance of SOEs. Existing studies made in other economies confirm that private ownership has a positive impact on the performance of the SOEs in contrast to state ownership. The Split-Share Structure reform is the large event by the Chinese government in order to reach the establishment of a modern corporate system. The methodology utilized consists of a Random Effects panel analysis. The data covers annual data for 1135 firms listed on the Shanghai Stock Exchange and the Shenzhen Stock Exchange over a six-year period, ranging from 2003 to 2008. The result from this study shows that the state ownership ratio of Chinese SOEs have been decreasing after the reform was introduced in 2005. Further, the result implies significant improvements in performance of the SOEs after the reform. The result from this study also shows that private ownership is superior to state ownership in consideration to improvements in performance, since an increase in the state ownership ratio would lead to a decrease in the market value of the firm.

Keywords: Split-Share Structure Reform, State-Owned Enterprises (SOEs), Ownership Structure, Corporate Governance, Privatization theory, China

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1. Introduction

One important reason behind the rapid economic growth seen in the emerging market of China during the last decades is the reform of the State-Owned Enterprises (SOEs) started in 1978 (Sun and Tong, 2003). This study investigates the success of the privatization process by evaluating the changes in performance of the SOEs after the Split-Share Structure reform in 2005, considering the changes in ownership structure. The Split-Share Structure reform in 2005 is the latest move from the government in order to reach the establishment of a modern corporate system (Liao et al. 2014). The empirical evidence in this study is based on balanced panel data of 1135 listed firms in both the Shanghai Stock Exchange and the Shenzhen Stock Exchange between the years 2003-01-01 and 2008-12-31, generating 6810 observations in total.

Previous studies about the effect of privatisation are many, but the results are divergent. Megginson and Neffer (2001) and Sun and Tong (2003) support the conclusion through their studies that private ownership are both more efficient and profitable than state ownership. In contrast, Chen et al. (2008) finds that state ownership can be superior under special conditions, such as a weak legal environment where the institutional situation is underdeveloped. In addition, Boubakri and Cosset (1998) suggest that state ownership can be superior when a country has a low economic growth rate and a low GDP per capita income.

Furthermore, it is important to note that the privatization reform in China differs in many parts from similar processes in other countries. The Chinese government has played an important role throughout the reform and therefore the SOE-reform in China is not a complete liberalization or democratization process (Sun and Tong 2003). The fact that the Chinese government still retains a substantial portion of the ownership and a dominant role in corporate decision-making, motivates the opportunity to examine this issue further. Also, the reform is said to be an important step for China to further develop their economy. Hou and Lee (2011) among others express the Split-Share Structure reform to be “one of the most significant institutional changes in the Chinese stock market”. Hence, it makes it interesting to see in what sense and in what extend the privatization process in China of the SOEs have been successful or not. The result of this study will contribute to the already existing privatization theory and also fill the gap of deficiency empirical studies that consider the privatization process in China.

1.1 Research questions

The following research questions are considered through this study:

1. Are there any significant improvements in performance of the SOEs in China after the Split-Share Structure reform in 2005?
2. Does state ownership has a less negative effect on performance of the SOEs after the Split-Share Structure reform in 2005 than before the reform?

1.2 Aim

The aim of this study is to increase the understanding of how the ongoing privatization process in China is affecting the performance of SOEs on the Shanghai Stock Exchange and the Shenzhen Stock Exchange. This study will analyse whether there are any significant improvements in performance of the SOEs in China after the Split-Share Structure reform in 2005. This study will further consider if the state ownership have a less negative effect on performance of the SOEs after the Split-Share Structure reform in 2005 than before the reform.

1.3 Hypothesis development

To further study the effect of the Split-Share Structure reform in China in 2005, two hypotheses are developed. These are based on literature, theories and previous research on China, ownership structure and corporate governance. Both hypotheses are related to one unique coefficient each in the regression model.

H1: After the Split-Share Structure reform, there have been significant improvements in performance of the SOEs in China.

H2: After the Split-Share Structure reform, state ownership has a less negative effect on performance of the SOEs in China, than before the reform.

We expect that the Split-Share Structure reform have had a positive effect on the performance of the SOEs. We further expect that the state ownership has had a less negative effect on performance of the SOEs after the reform was introduced in 2005, than before the reform.

1.4 Delimitations

This study solely focuses on the Chinese stock market and the SOEs listed in either the Shanghai Stock Exchange or the Shenzhen Stock Exchange. Moreover, the SOEs included in this study are only companies existing during the whole time period between 2003-01-01 and 2008-12-31.

1.5 Disposition

The disposition of this study is organized as follow; the next section, section two, provides a review of prior literature over the privatization process in China. This section also includes a presentation of the ownership structure and the corporate governance in Chinese SOEs. Section two ends with a closer discussion of the research questions examined by this thesis and a closer hypothesis development. The third section presents data and the model for the statistical analysis, including variables and information about the regression models that will be used. The fourth section presents the empirical results, were the hypotheses are tested and analysed. In the fifth section, conclusions and suggestions for further research are presented. Finally, the last section presents the references used in this study followed by Appendix 1 and Appendix 2.

2. Literature and hypotheses

2.1 China's SOE-reform

One important reason behind the rapid economic growth seen in the emerging market of China during the last decades is the reform of the State-Owned Enterprises (SOEs) started in 1978 (Sun and Tong 2003). China's SOE-reform officially begun through a regulation detected by the Communist Party of China (CPC). The reform had four main stages (Sun and Tong 2003), which are explained in more detail in *Appendix 1*. However, this privatization reform in China differs from other countries. First of all, the majority of the shares in the SOEs were kept by the government and thereby still untradeable on the stock market. Second, the issued shares were non-tradable, meaning the shares were not possible to trade on a secondary market (Liao et al. 2014). In addition, the reform does not follow the general approaches of privatization used in general market economies. The Chinese government has played an important role throughout the reform, therefore, the SOE-reform in China is not a complete liberalization or democratization process. Further, the Chinese government still retains a substantial portion of the ownership and a dominant role in the decision making process of the SOEs (Sun and Tong 2003).

2.2 Ownership structure in Chinese companies

In the early 1990s, the Shanghai Stock Exchange and the Shenzhen Stock Exchange were founded in order to encourage economic development by the opportunity for SOEs to obtain external funding (Hou and Lee, 2011). This marked the start of the Share Issue Privatization (SIP) process, in which SOEs went public to issue minority tradable shares to institutional and individual investors (Liao et al. 2014). Although the Chinese stock market has achieved a rapid development since the establishment of the stock exchanges, the Chinese stock market has a different regulation environment compared to other stock markets around the world. The stock market in China is not a Market-oriented mechanism; it is established by the government and regulated by a complex regulatory system. Furthermore, while many economies have been transformed from state ownership to private ownership in one step, this transition occurs gradually in China (Wang and Zhu, 2012).

The SOEs in China can be listed on either the Shanghai Stock Exchange or the Shenzhen Stock Exchange. The SOEs can also have several types of shareholders, more specifically the state, legal person and other minority shares, which include employee shares, individual

domestic owners and foreign private owners (Delios et al. 2008). State shares imply holdings in the SOEs by the central government or the local governments. Legal person shares are instead owned by domestic institutions, which are either independent from or partially owned by the central or local government. Employee shares are only offered to employees of the listed company. These are normally limited in quantity and also issued at a substantial discount. The Chinese stock market consists of A-shares and B-shares. A-shares are mainly offered to the Chinese citizens and the domestic institutions, while B-shares are mainly offered to foreign individuals and institutional investors (Delios et al. 2008).

The official classification scheme exhibit the general ownership structure in China and effectively divide the shareholders into three large groups, which are described above: state, legal person and other minority shares. Approximately these groups hold 30 % each of all shares in the listed SOEs even though this differ across firms and industries (Sun and Tong 2003). According to the literature, the legal person shares and the other minority shares are considering to be owned by private individual or institutional investors, while state shares are considering to be owned by the government. However, it is important to note that this categorization of shares does not point out who the definitive owner of the SOE is, since the owner categories have unclear definitions. In fact, the government can actually own a SOE in China through both state shares and state-owned legal person shares. According to the categorization, these two types of state owners fall into the state share and the legal person share categories. This simple example proves the assertion and the ownership classification scheme fails in clarifying the identity of one type of legal person shareholder, which can actually be owned by the government (Delios et al. 2008).

2.3 Corporate governance in Chinese companies

The ownership structure has a severe impact on a firm's corporate governance. Earlier literature treating this topic imply the possibility for larger shareholders to possess a positive role in corporate governance, as they with more power and knowledge can reduce the agency problem more effectively than minority shareholders (Noe, 2002). Incentives will arise when larger shareholders discover a larger cost from declines in the firm's value than they could gain by divert the firm's revenues to their own pockets. Also, Johnson et al. (2000) highlight a conflict of interest in the corporate governance theory called "tunneling", where actions from the larger shareholders transfer assets and profits out of the firm for their own benefits, but at the expenses of the minority shareholders.

As listed SOEs in China still have a large degree of state ownership, these SOEs are still controlled by the government (Ding et al. 2007). However, instead of taking advantage of the corporate governance benefits of large shareholders, the high degree of state ownership is more likely to worsen the agency problem from the perspective of the minority shareholders. When the government is more interested in acquiring political credits, the private owners have instead strong interest in maximizing the profit of the firm and thereby increase the market value of the firm (Hou and Lee, 2011).

Hou and Lee, (2011) emphasize the problematic in China when the SOEs have a high state-owned ratio and the government thereby manage the firm both directly, through the implementation of the government policies, and indirectly, by the government's influence over the management team. This creates incentives to collude with managers to divert resources from the SOE to gain their own objectives, at the expense of the private owners. Existing studies (Jiang et al. 2010) present evidence of this by the so-called inter-corporate loans, a large issue in China between 1996 and 2006, where funds were transferred from the listed company to benefit the larger shareholder. As expressed by Jiang et al. (2010), "Most of these loans did not accrue interest, and even when some interest was accrued, neither the interest nor the principal was typically ever paid back".

2.4 The Split-Share Structure reform in China

As a second step of the privatization process in China, the Split-Share Structure reform was formed in 2005. The main target of the Split-Share Structure reform was to further liberalize state-owned shares into full circulation (Liao et al. 2014). Before the reform these shares could not be traded in the stock exchange. The reform is often referred to as a socio-political ideology of China. On the one hand, the government wished to maintain its influence in listed SOEs, in order to achieve political and social objectives. On the other hand, the government also wanted their controlled SOEs to reduce their dependence on state subsidies and increase their ability to raise capital through the equity market (Hou and Lee, (2011).

An earlier attempt to accomplish this was made in 2001, but with unsuccessful result. In the first attempt, the shares of Chinese listed SOEs were classified into restricted and freely traded shares. There were two kinds of restricted shares: state shares and legal person shares. These could not be freely traded in the Chinese stock exchanges. The restricted shares could only be transferred with the authorities' approval or through auction. The fact that these

shares remained restricted even after the transfer or auction made them untradeable on the stock exchanges. Due to this model, the first attempt of the Split-Share Structure reform reduced the quality of the SOEs' corporate governance and the efficiency of their performance. This means exactly the opposite of what was the purpose of the reform (Hou and Lee, 2011).

To accommodate further economic development, the China Securities Regulatory Commission (CRSC) announced on 29 April 2005 its decision to mandate the elimination of the trading constraints imposed on all restricted shares in order to reach a more modernize capital market (Hou and Lee 2011). Now, all shares of Chinese listed SOEs were transformed into tradable shares by gradually removing the legal and technical obstacle of transferring shares to public investors. This was a negotiation process and the changes occurred gradually with the start in the end of 2005 (Hou and Lee 2011). The goal was that all restricted shares would become fully tradable in the stock market in 2008, three years after the announcement by the CRSC. By removing the restrictions on the earlier non-tradable shares, a secondary market was opened up (Liao et al. 2014).

2.5 Privatization theory

The world has during the last decades observed a global shift away from state socialism towards entrepreneurial capitalism in the most developed economies. This by selling out their SOEs to private investors in hope that the earlier unsatisfied result would improve by private ownership (Megginson et al. 1994). Studies about the effect of privatization are many and the result tends to be divergent.

Megginson and Neffer (2001) highlight that "privatization is one of the most important elements of the continuing global phenomenon of the increasing use of markets to allocate resources". In their empirical study they have investigated the fast growing literature on privatization to find proof on its effects. As a result, Megginson and Neffer (2001) research support the conclusion that privately owned companies are both more efficient and profitable than state owned SOEs. Further, Sun and Tong (2003) evaluate in their empirical study whether performance has changed after the Share Issue Privatization (SIP) in China during the period 1994-1998. Their findings are that "SIP is effective in improving SOEs' earnings ability, real sales, and workers' productivity but is not effective in improving profit returns and leverage after privatization." Furthermore, they conclude that state ownership had a

negative effect on the firm's performance while legal person shares had a positive effect on the firm's performance after the SIP. This implies that private ownership acts different from state ownership (Sun and Tong 2003).

In contrast, Chen et al. (2008) argues, "In a transitional economy with a weak legal environment, the governance mechanisms of state and private ownership are different from those in either a planned economy or a developed market economy." In their article they find that state ownership has advantages under these conditions and could be superior to private ownership, especially when the institutional situation is undeveloped and when the enforcement by the law is quite weak (Chen et al. 2008). Also, Boubakri and Cosset (1998) findings are consistent with the above statement. Further, they suggest that state ownership can be superior when a country has a low economic growth rate and a low GDP per capita income. Competent managers, entrepreneurs and capital, are said to be the main ingredients for a successful privatization. According to Boubakri and Cosset (1998), a country that lack of these ingredients will not benefit from a privatization program.

2.6 Hypothesis development and expected results

In this section the hypotheses is developed to examine the effect of the privatization of the SOEs in China after the Split-Share Structure reform in 2005. Earlier privatization theories (Megginson et al., 1994) and (Megginson and Neffer, 2001) support the conclusion through their studies that privately owned companies are both more efficient and profitable than state-owned SOEs. In addition, Sun and Tong (2003) analysis over the SIP process in 1994 conclude that state ownership had a negative impact on the performance of the SOEs. As a result from the Split-Share Structure reform, all shares of the Chinese listed SOEs were transformed into tradable shares by gradually removing the legal and technical obstacle of transferring shares to public investors (Hou and Lee 2011). A secondary market was then opened up and the restricted shares became fully tradable in the stock market a couple of years after the reform in 2005 (Liao et al. 2014). Furthermore, the reform is said to be an important step for China to further develop their economy. Hou and Lee (2011) among others express the Split-Share Structure reform to be "one of the most significant institutional changes in the Chines stock market". Hence, it makes it interesting to see in what sense and in what extend the privatization process of the SOEs in China have been successful or not.

To study the effect of the Split-Share Structure reform in China in 2005, the following hypotheses are developed:

H1: After the Split-Share Structure reform, there have been significant improvements in performance of the SOEs in China.

Also, the effect of the ownership structure on the performance of the SOEs will be considered. To examine the existence of a privatization effect of the Split-Share Structure reform, the second hypothesis is developed:

H2: After the Split-Share Structure reform, state ownership has a less negative effect on performance of the SOEs in China, than before the reform.

To test the hypothesis stated above, the regression model presented below will be used:

$$\text{Tobin's } q = \alpha + \beta_1 PM_{it} + \beta_2 DR_{it} + \beta_3 \log Sales_{it} + \beta_4 \log GDP_{it} + \beta_5 SOR_{it} + \beta_6 D06_{it} + \beta_7 (D06_{it} \times SOR_{it}) + u_{it}$$

3. Data and Methodology

3.1 Data

To conduct this study both a qualitative and a quantitative approach have been used. The qualitative approach consists of collected data through databases to the literature section, the hypotheses development section and the methodology section in this study. When gathering this data, the following online databases were used: Business Source Premier, Emerald, CSMAR, Science Direct, GUPEA, Libris, and Google Scholar. Frequently used search words were: “Split-Share Structure Reform”, “State-Owned Enterprises” (SOEs), “Ownership Structure”, “Corporate Governance”, “Privatization Theory” and most of them in combination with “China”. The used articles for this study have all been published in professional magazines and academic journals. Most of these articles have also been previewed before published.

Furthermore, the quantitative approach consists of the numerical data used in this study. This data have been collected from the Chinese database CSMAR. The data consists of 1135 companies, which are all listed on either the Shanghai Stock Exchange or the Shenzhen Stock

Exchange in China. *Table 1* below presents the distribution of the firms by industry classification.

Table 1. Distribution of 1135 firms by industry classification

Industry	N of Firms	% of Total Sample
Commerce	119	10.49%
Conglomerates	43	3.79%
Industrials	722	63.61%
Properties	119	10.48%
Public Utility	132	11.63%
Total	1135	100%

The data have been collected on a yearly basis from 2003-01-01 to 2008-12-31, generating 6810 observations in total. The announcement of the Split-Share Structure reform was made in the end of April 2005. However, this was a negotiation process and the changes occurred gradually with the start in the end of 2005 (Hou and Lee 2011). Therefore, an effect of the reform could not be seen before 2006. The time period was selected from 2003 to 2008, in order to estimate whether a significant effect on the performance of the SOEs has occurred due to the reform. The variable Tobin's q is used as the dependent variable in the regression model. The explanatory variables are Profit Margin, Debt Ratio, logSales, logGDP, State-Ownership Ratio, Dummy2006 and Dummy2006xState-Ownership Ratio. Data on these multiples have all been collected from the CSMAR database directly, apart from the State-Ownership Ratio that was calculated manually using excel. Firms that did not exist during the whole period between 2003-01-01 and 2008-12-31 have been excluded to avoid unbalanced data. In addition, all financial firms have been excluded, as their financial data are not comparable to other firms. Finally, to avoid misleading results derived from outliers, extreme values have been excluded in the data.

3.2 Variables

3.2.1 Dependent variables

After investigating similar studies and articles made in the area, the variables used in this study were decided on. The dependent variable, Tobin's q, has been used to capture improvements in performance of the SOEs after the Split-Share Structure reform in 2005. Tobin's q is the total market value of a firm divided by the total asset value. A Tobin's q value between zero and one implies that the firm is undervalued, i.e. that it costs more to replace the firm's assets than the firm is worth. A value above one implies that the firm is

overvalued and worth more than the costs of its assets. A high Tobin's q value therefore implies a more profitable firm. We argue that Tobin's q is the best measure to use to estimate future growth and performance opportunities.

3.2.2 Explanatory variables

The explanatory variables included in this study are Profit Margin (PM), Debt Ratio (DR), logSales, logGDP, State-Ownership Ratio (SOR), Dummy2006 (D06) and Dummy2006xState-Ownership Ratio (D06xSOR). The variables, PM, DR, logSales, logGDP and SOR are used as control variables in our regression model. The variable PM is a ratio of profitability. The higher value, the more profitable has the firm been. We argue that PM is the past growth experience and thereby affect the Tobin's q, which estimates future growth. Furthermore, PM was used instead of the profitability multiples, ROE and ROA. According to Sun and Tong (2003), listed companies in China have the right to issue up to 30% of outstanding stocks annually after their listings at the stock exchange. A large amount of the SOEs are taking advantages of this rule and the multiples ROE and ROA would therefore be incorrectly interpreted if these were included in the regression model.

Moreover, DR is a proxy for firm leverage. This variable is used to control for possible effects from leverage. Since a large amount of the Chinese SOEs has issues regarding high debt ratios (Sun and Tong 2003), this is an important variable to include in our regression model. Further, the variable logSales, the natural logarithm of revenues, is a proxy for firm size. Larger SOEs tends to have a larger market share and thereby more market power. On the other hand, large SOEs encounter more government bureaucracy and larger agency problems, which are adverse to a firm's performance. Hence, this makes logSales, an important variable to include in our regression models. In addition, the variable logGDP, the natural logarithm of GDP, is included in our regression model. Since the Chinese economy is rapidly growing, GDP is an important variable to include in order to control for general changes in economic activities through time. Both revenues and GDP are set to logarithmic form in order to narrow the variables range (Wooldridge 2013, s.157). Furthermore, the variable State-Ownership Ratio shows the proportion of firm shares owned by the government.

In addition, D06 is a dummy variable that captures improvements in performance of the SOEs after the Split-Share Structure reform in 2005. The dummy variable is set to 2006, as an effect of the reform could not be seen before 2006. The variable D06 equals one if the year is 2006

or afterwards and zero if the year is before 2006. This variable will thereby answer the first research question in this study. Further, the variable D06xSOR is an interaction term including the variable D06 times SOR. The interaction term captures if the change in state ownership has an effect on performance of the SOEs after the Split-Share Structure reform in 2005 and will thereby answer the second research question in this study.

The measurement of the variables are presented in *Table 2* below:

Table 2. Measurement of variables

Variables	Regression Model	Measurement
Tobin's q	Tobin's q	Total market value of firm divided by total asset value
Profit Margin	PM	Net income divided by sales
Debt Ratio	DR	Total debt divided by total assets
logSales	logSales	The natural logarithm of annual sales revenue
logGDP	logGDP	The natural logarithm of gross domestic product
State-Ownership Ratio	SOR	State shares divided by total shares of a firm
Dummy2006	D06	Dummy variable = 1 if data collected after 2006, dummy variable = 0 before 2006
Dummy2006xState-Ownership Ratio	D06xSOR	Interaction term, dummy variable for year 2006 times State-Ownership Ratio

3.3 Methodology

3.3.1 Panel Data

The data used in this study is called panel data. Panel data, also referred to as longitudinal data, is a special type of data in which the same cross-sectional unit, i.e. a firm, is observed over a given time period. At each time period, the same unit is observed. This provides useful information on dynamics of the observed unit (Gujarati and Porter s.591, 2009). Panel data can be either balanced or unbalanced. Balanced panel data includes all observations, i.e. each variable are observed for each unit and each time period. Unbalanced panel data is instead a panel that includes missing values (Stock and Watson s.350-351, 2007). The data used in this study contains no missing values and is therefore considered to be of a balanced character.

One can say that panel data is a combination of cross-sectional and time-series data. This leads to several advantages when using panel data before cross-sectional or time-series data. First, panel data will give more reliable results, as it includes more informative data, less collinearity among variables and uses more degrees of freedom. Second, by studying repeated cross-sectional observations, panel data are better suited to study the dynamics of change in each unit. Third, the use of panel data enables studies of more complicated behavioural models. Despite these advantages, panel data also pose several estimation and interpretation problems. Problems that troubles cross-sectional data (e.g., heteroskedasticity) and time-series data (e.g., autocorrelation) need to be addressed also in this panel data, as panel data involve both these dimensions. Several estimation techniques can be used in order to address for heteroskedasticity and autocorrelation. The two most prominent are the Breusch-Pagan Specification test to identify heteroskedasticity and the Wooldridge test to identify autocorrelation (Gujarati and Porter s. 592, 2009). This will be further explained in coming sections.

3.3.2 Pooled Panel Model

To estimate a Pooled Panel model would be the simplest way to deal with panel data. The approach to estimate this model would be to pool all data in the dataset, both the cross-sectional observations and the time-series observations, in a single equation. This approach would imply a possibility to estimate the regression model using a regular OLS model (Brooks s. 488, 2008).

However, using a regular OLS model would result in some severe limitations and specific models must to be applied to deal with these limitations. These will be presented further, but first, the limitations due to using the OLS model need to be investigated. First, and most importantly, pooling the data will indirectly assume that the relationship between the variables and the average values of the variables are constant over time and across all units in the sample (Brooks s. 488, 2008). It can also be noted that, since the pooled OLS model relies on a between units comparison, the estimates from the Pooled Panel model tend to be greatly biased due to unobserved heterogeneity, u_{it} and x_{it} are correlated in the model. To solve for the unobserved heterogeneity, specific techniques have to be applied and these will be presented in sections below (Baltagi, 2005).

The Pooled Panel regression is presented below (Brooks s. 487, 2008):

$$y_{it} = \alpha + \beta x_{it} + u_{it}$$

When describing panel data, it is important to have some additional notation to observe both the unit observed and the time period at which the unit is observed. Above, the subscript i refers to the i numbers of cross-sectional observation and t refers to the t numbers of time period at which it is observed. The variable y_{it} is the dependent variable, for the i firms at time period t . The variable α is the intercept term, β is a k -times-1 vector of parameters to be estimated on the explanatory variables, and x_{it} is a k -times-1 vector of observations on the explanatory variables for the i firm at the t time period. Finally, the u_{it} denotes a k -times-1 vector of parameters to be estimated on the explanatory variables (Brooks s. 488, 2008).

3.3.3 Breusch-Pagan Lagrange Multiplier Test

The Breusch-Pagan Lagrange Multiplier Test was used in this study to test whether the estimated variances of the residuals from the stated regression model are dependent on the values of the explanatory variables. More specifically, it tests for heteroskedasticity in the regression model (Wooldridge s.222, 2013). The null hypothesis suggests that the variances across units are zero, i.e. there are no random effects, no significant differences across units, and no heteroskedasticity in the model. If the null hypothesis is rejected there is an appearance of heteroskedasticity in the model. This has to be corrected for in order to avoid misleading interpretation of the t-values. Heteroskedasticity can be corrected by using robust standard errors. Under the null hypothesis, the Breusch-Pagan Lagrange Multiplier Test follows a chi-square distribution with one degree of freedom (Gujarati and Porter s. 605, 2009). The equation for this test is presented below (Baltagi, 2005):

$$\lambda = \frac{nT}{2(T-1)} \frac{\sum_{i=1}^n (\sum_{t=1}^T u_{it})^2}{\sum_{i=1}^n \sum_{t=1}^T u_{it}^2} - 1 \text{ and } \sim \chi_1^2$$

$$\text{were } H_0: \text{var}(\varepsilon_{it}) = 0$$

If the null hypothesis fails to be rejected, there are no heteroskedasticity in the model and the regular Pooled Panel model can be used.

3.3.4 Wooldridge Test

The Wooldridge test for serial correlation in panel data was used in this study to investigate whether serial correlation occurs in the regression model or not. Serial correlation occurs in a panel data model when the errors in different time periods are correlated. The null hypothesis states that there is no serial correlation in the model, and a failure to reject the null hypothesis would imply that the errors in different time periods are not correlated (Wooldridge s.334-339, 2013).

3.3.5 Fixed Effects Model

Since the Pooled Panel model causes some severe limitations regarding the estimation of the pooled equation, the Fixed Effects model and the Random Effects model were used in order to deal with these limitations. The main difference between the two is that the Fixed Effects model, unlike the Random Effects model, allows arbitrary correlation between the variation across units and explanatory variables included in the model (Wooldridge s. 398, 2013).

To understand how the Fixed Effects model works, the Pooled Panel regression is presented below where the error term, u_{it} , is decomposed into a unit specific effect, a_i , and a “reminder disturbance”, v_{it} , which varies over time and between units (Brooks s. 490-491, 2008):

$$y_{it} = \alpha + \beta x_{it} + u_{it}$$

where $u_{it} = a_i + v_{it}$ and $a_i = 0$

The unit specific effect, a_i , includes all of the variables that affect y_{it} cross-sectionally, but do not change over time and the “reminder disturbance”, v_{it} , captures everything that is left unexplained about y_{it} (Brooks s. 491, 2008).

The Fixed Effects model controls for variables that differ across units but are constant over time and can be used for multiple time periods (Gujarati and Porter s. 356, 2009). So, if one expects that something within the unit may impact or bias the predictor, the Fixed Effects model should be used, as the Fixed Effects model will control for this. This explains why the unit specific effect, a_i , is said to be zero in the regression above. The Fixed Effects model will remove the effect of all time-invariant characteristics from the predictor variables and only the predictors “net” effect will be assessed. The fixed effects approach proposes different intercepts for each unit. These intercepts are constant over time and the relationships between

the explanatory variables and the dependent variables are assumed to be the same, both cross-sectionally and temporally (Brooks s. 491, 2008).

3.3.6 Random Effects Model

The Random Effects model is an alternative to the Fixed Effects model and is in general used when there is a reason to expect that differences across units influence the dependent variable. The regression for the Random Effects model are presented below (Brooks s. 498, 2008):

$$y_{it} = \alpha + \beta x_{it} + u_{it}$$

were $u_{it} = a_i + v_{it}$

The Random Effects model includes all the Fixed Effects assumptions plus the additional requirement that the unit specific effect, a_i , is independent of all explanatory variables in all time periods, whether they are fixed over time or not (Wooldridge s. 395, 2013). As for the Fixed Effects model, the Random Effects approach proposes different intercepts for each unit. Again, these intercepts are constant over time and the relationships between the explanatory variables and the dependent variables are assumed to be the same, both cross-sectionally and temporally. However, Brooks (2008) states that the difference is that under the Random Effects model, the intercepts for each cross-sectional unit are assumed to emerge from a common intercept, α , plus a random variable, a_i , that varies cross-sectionally, but is constant over time. More specifically, the unit specific effect, a_i , measures the random deviation of the intercept term of each unit from the so-called “global” intercept term, α . The assumptions behind the new cross-sectional error term, a_i , is as follow; a_i has zero mean, is independent of the individual observation error term, v_{it} , has constant variance and is independent of the explanatory variables in the model (Brooks s. 498, 2008). This explains why the a_i term is not set to zero in this model, but in the Fixed Effects model.

3.3.7 Differences between the Random Effects and the Fixed Effects Model

One advantage of using the Random Effects model over the Fixed Effects model is that it allows for explanatory variables that are constant over time. In the Fixed Effects model, the time-invariant variables are absorbed by the different intercepts (Wooldridge s. 395, 2013). However, some time-invariant variables that might influence the predictor variables may be unavailable and if these are not specified in the Random Effects model, it will lead to an omitted variable bias in the model (Wooldridge s. 397, 2013).

Furthermore, the Random Effects model estimates coefficients of time-invariant variables and the Fixed Effects model controls for those time-invariant variables, but will not estimate them directly. On the other hand, the Fixed Effects model controls for all time-invariant variables, whereas the Random Effects model can estimate only the time-invariant variables that are included in the model (Gujarati and Porter s. 607, 2009). Since the approach of the Random Effects model does not remove the time-invariant variables, the impact of these variables can be enumerated. Also, the Random Effects model uses more degrees of freedom and therefore produces more efficient estimates than the Fixed Effects model. However, the Random Effects model has one major drawback. The model is only valid when the composite error term, u_{it} , is uncorrelated with all of the explanatory variables. This is not the case in the Fixed Effects model where arbitrary correlation between the variation across units and explanatory variables are allowed as mentioned earlier (Brooks s. 600, 2008).

3.3.8 Hausman Specification Test

Generally, the Hausman Specification test is used when two models can be applied to answer the same question: the Fixed Effects model vs. the Random Effects model in this study. The Hausman Specification test formally tests for statistically significant differences in the coefficients on the time-varying explanatory variables between the two models. If the Hausman test fails to reject the null hypothesis the Random Effects model is the one appropriate to use to estimate the regression. In practice, a failure to reject the null hypothesis means that the sampling variation is so large in the Fixed Effects estimates that it is not possible to conclude any significant differences that are statistically significant. Also, one reason can be that the Random Effects estimates and the Fixed Effects estimates are so close that it does not matter which one to use or that the key assumption behind the Random Effects model (a_i is uncorrelated with each explanatory variable) is false. If this assumption does not hold, and the null hypothesis is rejected and the Fixed Effects estimates should be used (Wooldridge s. 399, 2013).

$$H = [\widehat{\beta}_{FE} - \widehat{\beta}_{RE}][Var(\widehat{\beta}_{FE} - \widehat{\beta}_{RE})]^{-1}[\widehat{\beta}_{FE} - \widehat{\beta}_{RE}] \text{ and } \sim \chi_{k-1}^2$$

This test statistic follows a chi-squared distribution, under the null hypothesis, with k-1 degrees of freedom. k is the number of time-varying explanatory variables in the model.

Even if the Breusch-Pagan Multiplier test and the Hausman Specification test are utilized, Wooldridge (2013) emphasizes the importance of computing all the three regression models: the Pooled Panel model, the Fixed Effects model and the Random Effects model. This is because a comparison between the sets of estimates can help to determine the nature of the biases caused by leaving the unobserved effect, a_i , entirely in the error term (as the Pooled Panel model or partially as the Random Effects model). However, it is important to note that even if the unit specific effect, a_i , is uncorrelated with all explanatory variables in all time periods, the standard errors and the t-statistics of the Pooled Panel model are generally invalid. This is because they ignore the often considerable serial correlation in the composite errors, $u_{it} = a_i + v_{it}$ (Wooldridge s. 397, 2013)

4. Empirical results and analysis

4.1 Descriptive Statistics of the variables

Table 3 below presents the descriptive statistics for the included variables in the regression model. The mean, standard deviation, minimum and maximum values of all variables are presented. The descriptive statistics are based on the adjusted data set including 1135 listed companies in the Shanghai Stock Exchange and the Shenzhen Stock Exchange, generating 6810 observations in total. The data have been collected on a yearly basis from 2003-01-01 to 2008-12-31.

Table 3. Descriptive Statistics of the Variables

Variables	Mean	Std.Dev	Min	Max
Tobin's q	1.445	0.584	0.990	7.182
PM	0.032	0.258	-3.442	3.830
DR	0.515	0.211	0.009	2.424
logSales	21.936	1.335	16.483	26.657
logGDP	12.227	0.287	11.819	12.657
SOR	0.312	0.244	0.000	0.971
D06	0.500	0.500	0.000	1.000
D06xSOR	0.133	0.206	0.000	0.971
N:	6810			
n:	1135			
T:	6			

As can be seen in *Table 3* above, the dependent variable Tobin's q has a minimum value of approximately one and a maximum value of 7.182. These are reasonable numbers, as a Tobin's q value should not go below one. If the value is below one, it implies that the firm is undervalued, i.e. that it costs more to replace the firm's assets than the firm is worth. The maximum value of 7.182 shows that there are Chinese SOEs which are very profitable and thereby overvalued.

The explanatory variable PM has a minimum value of -3.442 and a maximum value of 3.830, which shows that Chinese SOEs can have both large deficits and large profits. The explanatory variable DR has a minimum value of 0.009 and a maximum value of 2.424, which is far above 100%. This makes China an exceptional case and clearly shows China's large issue regarding high debt ratios of the SOEs (Sun and Tong 2003). The explanatory variable logSales has a minimum value of 16.483 and a maximum value of 26.657. These values are presented in log-form and shows that there are both larger and smaller SOEs existing in China. The explanatory variable logGDP has a minimum value of 11.819 and a maximum value of 12.657. These values are also presented in log-form and shows that the GDP value has changed during the studied time period. The explanatory variable SOR has a minimum value of zero and a maximum value of 0.971. This indicates that there exists 100% privately owned SOEs in China and also that the highest state ownership ratio of all studied SOEs is 97.1%. The explanatory variable D06 equals zero if the year is before 2006 and one if the year is 2006 or afterwards. Finally, the explanatory variable D06xSOR has a minimum value of zero and a maximum value of 0.971. This shows that SOEs included in this study are between 100% privately owned and 97.1% state-owned after year 2006.

The descriptive statistics of the variables over the studied time period are also presented in *Appendix 2*, followed by more detailed explanations regarding the variables changes over time.

4.2 Pair-wise Correlation Matrix

The explanatory variables in the regression model are not only likely to be correlated with the dependent variable, but also with each other. The Pair-wise Correlation Matrix in *Table 4* below presents the correlation coefficients of all variables included in the regression model used in this study. If the correlation between two variables exceeds 0.9, a problem of multicollinearity arises (Wooldridge, 2013). This is a statistical problem that needs to be dealt with. As seen in *Table 4* below, none of the explanatory variables has a correlation that exceeds 0.9. This indicates that the set of explanatory variables does not suffer from the multicollinearity problem.

Table 4. Pair-wise Correlation Matrix

Variables	Tobin's q	PM	DR	logSales	logGDP	SOR	D06	D06xSOR
Tobin's q	1.0000							
PM	0.0428	1.0000						
DR	-0.0818	-0.2777	1.0000					
logSales	-0.1839	0.2138	0.1132	1.0000				
logGDP	0.2918	0.0163	0.1435	0.1902	1.0000			
SOR	-0.1731	0.0862	-0.0916	0.1761	-0.1977	1.0000		
D06	0.3029	0.0121	0.1319	0.1617	0.8731	-0.1848	1.0000	
D06xSOR	0.0984	0.0506	0.0537	0.2347	0.5312	0.3744	0.6459	1.0000

4.3 Regression results

By testing the Pooled Panel regression model for serial correlation, using the Wooldridge test for serial correlation, we could conclude that the model did not suffer from this type of correlation. The null hypothesis failed to be rejected, i.e. no autocorrelation could be concluded in the regression. However, by using the Breusch-Pagan Lagrangian Multiplier test the appearance of heteroskedasticity could be concluded in the model. To correct for heteroskedasticity we used robust standard errors.

The Hausman Specification test implied that the Random Effects model was the most appropriate model to use to estimate our regression. Since, the null hypothesis failed to be rejected in this test. As seen in *Table 5* below, the coefficients for the Random Effects model are the ones most significant between the Fixed Effects model and the Random Effects model.

This further proves the result of the Hausman test. However, Wooldridge (2013) emphasizes the importance of computing all the three regression models: the Pooled Panel model, the Fixed Effects model and the Random Effects model. We have therefore computed all these regression models, the results of which are presented in *Table 5* below. Note that all models have been adjusted using robust standard errors to correct for the appearance of heteroskedasticity.

Table 5. Estimation results

	(1)	(2)	(3)
	Fixed-effects	Random-effects	Pooled
Variables	Tobin's q	Tobin's q	Tobin's q
PM	0.125*** (0.0579)	0.144*** (0.0521)	0.156*** (0.0267)
DR	-0.216*** (0.0996)	-0.245*** (0.0699)	-0.255*** (-0.0812)
logSales	-0.0417*** (0.0222)	-0.0935*** (0.0105)	-0.103*** (-0.0935)
logGDP	0.251*** (0.0336)	0.305*** (0.028)	0.316*** (0.0406)
SOR	-0.0753 (0.0704)	-0.0812** (0.0329)	-0.0804** (0.0401)
D06	0.328*** (0.022)	0.318*** (0.0214)	0.311*** (0.0277)
D06xSOR	-0.293*** (0.0618)	-0.267*** (0.0621)	-0.247*** (0.0487)
Constant	-0.703 (0.421)	-0.206 (0.351)	-0.141 (0.482)
Weighted statistics			
Observations	6810	6810	6810
R-squared (Overall)	0.1606	0.1766	0.1761
Rho	0.3563	0.2624	
Breusch-Pagan Lagrangian Multiplier Test: Chibar2 (01) = 1157.43 Prob > Chibar2 = 0.0000			
Wooldridge test for Autocorrelation: F (1, 1134) = 1.739 Prob > F = 0.1876			
Hausman Test: Chi2 (6) = 0.78 Prob > Chi2 = 0.9925			

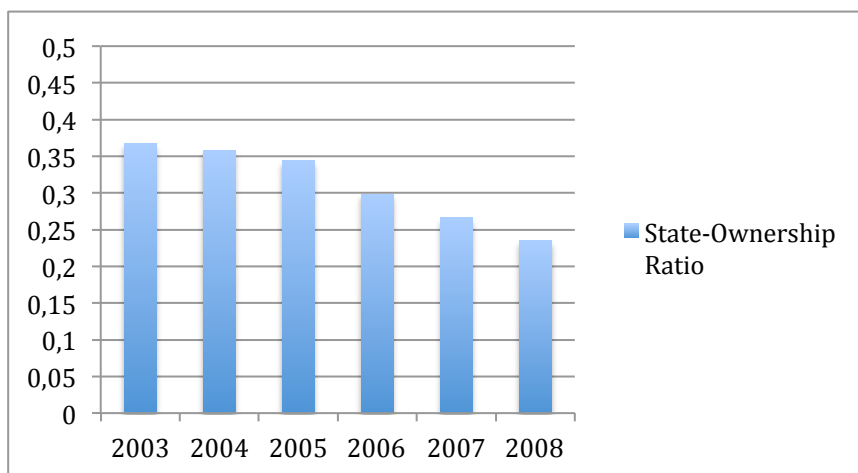
1. Std. errors are presented in parentheses.

2. *, **, *** Denote a significance at the 0.10, 0.05, 0.01 level or better.

4.3.1 Interpretation of the ownership structure ratio

The fact that the general ownership structure in the Chinese SOEs, despite the privatization reform, still consists of three large groups of shareholders, the state, legal person and other minority shares, makes the feature of China's privatization process unique (Sun and Tong 2003). The Chinese government still retains a substantial proportion of the ownership. *Diagram 1* below shows the mean value of the State-Ownership Ratio of all listed Chinese SOEs on both the Shanghai Stock Exchange and the Shenzhen Stock Exchange during the time period 2003 to 2008. Despite the substantial proportion of state ownership of the SOEs, a clear negative trend is seen in the State-Ownership Ratio where the mean value in 2003 has decreased from 0.368 to 0.235 in 2008. This implicates a decline of the proportion of state-owned shares in the Chinese SOEs. The largest decline is seen after 2005, which implicates an effect of the Split-Share Structure reform in 2005, where the state ownership has decreased due to the reform.

Diagram 1. State-Ownership Ratio



4.3.2 Interpretation of the Random Effects Model

A regression study was used in order to consider whether the improvements over time, after the Split-Share Structure reform, are due to changes in the ownership structure of the SOEs. As mentioned, the Random Effects model is the superior one according to the Hausman Specification test ($p > 0,05$), so the coefficients of the Random Effects model are the ones we will focus on in this study.

According to the Random Effects regression, the R^2 overall value is 0.1766. This means that the model explains 17.66% of the variance around the dependent variable, Tobin's q. The F-value of the model is strongly significant with a p-value of 0.0000. This implies that the variables included in the model are all valid. Wooldridge (2013) highlights the importance of discussing whether the regression model suffers from problems of omitted variables and thereby a biased estimator. We argue our regression model is unbiased due to the relatively high R^2 overall value of 0.1766. Moreover, our sample consists of 1135 companies and 6810 observations in total, which makes the suspicions of biasness lower. In addition, the Random Effects model shows significant results for all included explanatory variables at a high significance level. These further imply that even if we have a biased estimator, our highly significant coefficients will make our interpretation more reliable (Wooldridge, 2013).

The following interpretation can be made according to the estimated results in *Table 5*. PM is significant at a 1% significance level and has a positive effect on Tobin's q. If PM increases by one percent, the value of Tobin's q will increase by 0.144 units. DR is significant at a 1% significance level and implies that if the DR increases by one percent, the value of Tobin's q will decrease by 0.245 units, i.e. debt ratio has a negative impact on Tobin's q. Further, the variable logSales is significant at a 1% significance level and has a negative impact on Tobin's q. If logSales increases by one percent, the value of Tobin's q will decrease by 0.0935 units. The variable logGDP is significant at a 1% significance level and has a positive effect on Tobin's q. More specific, if logGDP increases by one percent, the value of Tobin's q will increase by 0.305 units. The variable State-Ownership Ratio is significant at a 5% significance level and has a negative impact on Tobin's q. More specific, if the proportion of state ownership in a firm increases by one percent, the value of Tobin's q will decrease by 0.0812 units. All estimated values in the Random Effects regression model are also economically significant. This as the effect of the included explanatory variables is large enough to have a meaningful effect on the dependent variable.

4.3.3 Interpretation of D06

The explanatory variable D06 is a dummy variable and will answer our first research question. According to the estimation results in *Table 5*, D06 is significant at a 1% significance level and has a positive effect on Tobin's q. More specific, the value of Tobin's q increases by 0.318 units after the year 2006. This implies the fact that there have occurred significant improvements in performance of the SOEs in China after the Split-Share Structure

reform was introduced in 2005. This result is in line with our first hypothesis, where improvements of the performance of the SOEs were expected after the Split-Share Structure reform. As earlier mentioned, the State-Ownership Ratio has decreased due to the reform, which suggests that the SOEs have become more privately owned after the Split-Share Structure reform. One can therefore draw the conclusion that private ownership has affected the SOEs positively. This result aligns with earlier studies in the area where Megginson and Neffer (2001) support the assertion that less state owned SOEs are both more efficient and profitable. This is also supported by Sun and Tong (2003), who in their research conclude that state ownership has a negative effect on performance of the SOEs after a privatization process. By abolishing the earlier trading restrictions for state shareholders (Hou and Lee 2011), the Chinese government has been successful in their attempt to improve the earlier unsatisfactory result of the SOEs after the Split-Share Structure reform. Since the state shareholders, after the reform, will have a greater interest in increasing the market value of the SOEs, the Split-Share Structure reform has benefited minority private shareholders. This will further help China to reach their target of an establishment of a modern corporate system.

Chen et.al (2008) suggest in their research that state ownership can be superior under special conditions, such as a weak legal environment where the institutional situation is underdeveloped. By the estimation results from this study we can conclude that the legal environment in China allows for private SOEs to improve their business, since the overall effect of the reform is positive where the SOEs are more profitable after the reform, than before. The estimation result further implies that the business environment has been developed due to the Split-Share Structure reform as the reform has made it easier for the SOEs to improve their performance. Furthermore, Boubakri and Cosset (1998) argue that competent managers, entrepreneurs and capital are the main factors for a successful privatization process. The positive result from this study implies that China possesses these important ingredients and that the rapid economic growth seen in China during the last decades may have contributed to this success. According to the estimation result from this study, where D06 has a positive value implicating significant improvements in performance of the SOEs in China after the Split-Share Structure reform, a conclusion can be drawn that private ownership is superior to state ownership in consideration to improvements in performance.

4.3.4 Interpretation of D06xSOR

The explanatory variable D06xSOR will answer our second research question. This is an interaction term including the dummy variable for the year 2006 times the state-ownership ratio. D06xSOR is significant at a 1% significance level and has a negative impact on Tobin's q. More specific, the value of Tobin's q will decrease by 0.267 units for every percent increase in state ownership after 2006. As seen in *Table 5* above, the value of the interaction term, D06xSOR, is more negative than the value of the variable SOR. This implies that the effect of state ownership on Tobin's q after the Split-Share Structure reform is more negative than before the reform. This is not in accordance with our second hypothesis, were a less negative value of the interaction term, D06xSOR, than for the variable SOR, was expected after the Split-Share Structure reform.

The effect of state ownership after the reform was expected to be less negative than before the reform, as the main target of the reform was to further liberalize state-owned shares into full circulation (Liao et al. 2014). Before the reform, these shares could not be traded on the stock market. Although, the fact that state ownership still has a negative effect on performance of the SOEs after the Split-Share Structure reform in 2005 aligns with the assertion by Sun and Tong (2003), who, suggest that private ownership acts different from state ownership. In addition, as earlier discussed by Hou and Lee (2011), the ownership structure has a severe impact on a firm's corporate governance. The fact that private ownership leads to a better performing SOE can be explained due to the opposite motives and objectives that face the SOEs, depending on whether the SOE is privately or state-owned. When the government is more interested in acquiring political credits, the private owners have instead strong interest in maximizing the profit of the SOE and thereby increase its market value (Hou and Lee, 2011). On the one hand, the motives of the state shareholders and the private shareholders will converge after the reform since both parts now benefit from a higher market value of the SOE. On the other hand, the effect of the reform is still an ongoing process and the motives are therefore not that converged yet. This can explain the more negative value on the interaction term, D06xSOR, than for the variable SOR, from the estimation results in *Table 5*.

The result from this study states that the government still owns a large proportion in many SOEs in China. This can be seen in *Diagram 1*, where the mean value of the state-ownership ratio in 2008 still has a remarkably high value, despite the privatization process. If the government has a higher interest in acquiring political credits than increase the market value

of the firm, the SOE will become less efficient, which has a negative impact on the value of Tobin's q . This explains the negative value of the interaction term, $D06 \times \text{SOR}$. When a company has a high state-ownership ratio, the government is able to manage the firm both directly, through the implementation of the government policies, and indirectly by the government's influence over the management team (Hou and Lee, 2011). This implies that the motives by the government become the ones dominant in the SOE and, therefore, the performance of the SOE is negatively affected.

4.3.5 Equivocal Result

The problematic situation regarding the classification scheme and the unclear definitions in the owner categories make the results of this study questionable. The government can own a SOE in China through both state shares and state-owned legal person shares (Sun and Tong 2003). According to the classification scheme, these two types of state owners falls into the state share and the legal person share categories. This proves that the ownership classification scheme fails in clarifying the identity of one type of legal person shareholder, which can actually be owned by the government. Therefore, the change in ownership structure towards a more privatized ownership structure does not necessarily imply that the SOE is less government owned. Thus, the result of this study, where the performance of the SOEs decreases the more state owned the SOE becomes, does not necessarily mean that the change in performance is due to the privatization. The government in China can still be the dominant owner of the SOEs, but in another shape. The results might therefore be equivocal.

5. Conclusions and Further Research

The evidence from this study reveals that the Split-Share Structure reform has had a positive impact on the performance of the SOEs in China after the Split-Share Structure reform in 2005. The State-Ownership Ratio has decreased due to the reform, which suggests that the SOEs have become more privately owned after the reform. One can therefore draw the conclusion that private ownership has affected the SOEs positive. By abolishing the earlier trading restrictions for state shareholders, the Chinese government has been successful in their attempt to improve the earlier unsatisfied result of the SOEs. Since the state shareholders, after the reform, will have a greater interest in increasing the market value of the SOEs, the Split-Share Structure reform has benefitted minority private shareholders. This result can be interpreted through the Random Effects model where a dummy variable was included in the regression model for year 2006. This dummy variable captured improvements in performance of the SOEs after the reform in 2005.

The evidence from this study reveals further that the state ownership ratio has decreased over time in line with the Split-Share Structure reform in 2005. It can be stated that state ownership has a more negative effect on performance of the SOEs after the Split-Share Structure reform in 2005 than before the reform. This was not in accordance with our hypothesis. The fact that private ownership leads to a better performing SOE can be explained due to the opposite motives and goals that face the firm, depending on whether it is privately or state owned. When the private owners have a strong interest in maximizing the profit of the firm and thereby increasing its market value, the government is more interested in acquiring political credits. After the reform, the motives of the state shareholders and the private shareholders will converge since both parts now benefit from a higher market value of the SOE. On the other hand, the effect of the reform is still an ongoing process and the motives are therefore not that converged yet. Hence the more negative value on the interaction term. This result can be interpreted through the Random Effects model where an interaction term was included in the regression model including the dummy variable for the year 2006 times the state ownership ratio. This interaction term captured if the change in state ownership has a more negative effect on the performance of the SOEs after the reform in 2005 than before the reform.

The result from this study has academically contributed to an empirical study to further understand the privatization process in China. The objective of this study is to contribute to the already existing privatization theory and also fill the gap of deficiency empirical studies that consider the privatization process in China. Further, this study has contributed with an input of the overall effect on the performance of the SOEs in China, after the Split-Share Structure reform, in consideration to level of state ownership.

This study only investigates the effect of the privatization process on listed SOEs in China. For future research, it would therefore be interesting to study the unlisted SOEs in China to obtain an even more reliable result. Moreover, it would be interesting to measure the ultimate state ownership ratio in consideration to performance of the SOEs and thereby find the optimal level of state ownership. Yet another interesting topic for future research would be to study the problematic regarding the classification scheme, since the definitions in the owner categories are unclear.

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Appendix 1

The first stage of the reform started in 1979 to 1983 with the introduction of a more decentralized system and profit retention. Instead of the old system where all production and capital allocation decisions were centralized from the government, a pilot reform program called Gangquan Rangli was introduced. This program enabled SOEs to retain 3% of their profits in order to get incentives to improve their productivity and efficiency (Sun and Tong 2003). One consequence of Gangquan Rangli was that SOEs now were motivated to bargain with the government. Some SOEs even tried to hide their profits from the government, which resulted in a decline of government revenues. The government therefore implemented two new measures. The first measure introduced SOEs to pay taxes instead of turning in their profits to the government. The second measure introduced SOEs to fund their investments through borrowing capital from the bank instead of receiving them from the government directly.

The second stage of the reform took place between the years 1983 to 1987 and was called Bogaidi. This stage made SOEs even more aware of their use of capital, by replacing all government allocation to instead borrow all capital from the bank. As a result, the total debt ratio of all SOEs was extremely high, for instance in 1994 as high as an average total debt ratio of 67.9%. As much as 27.6% of all SOEs had higher total debts than total assets (Wu, 1997). As a result from the first and second stage of the reform, the SOEs' paid the bank interest instead of paying the government taxes.

As a third stage of the reform the Contractual Management System (Chengbaozhi) took place from 1987 to 1992. The main focus in this stage was to separate the government ownership from the control of the firms' operations and the SOEs were therefore allowed free hands to operate but had to hand in a certain amount of tax to the government each year.

The last stage, Corporatization, took place in 1992 when the 14th party congress announced the establishment of a modern corporate system, with the target of constructing a socialist market economy (Sun and Tong 2003).

Appendix 2

Table 3.b. Descriptive Statistics of the variables over the studied time period

Variables		2003	2004	2005	2006	2007	2008
Tobin's q	Mean	1.390	1.282	1.134	1.257	2.037	1.573
	Std.Dev	0.381	0.287	0.206	0.308	0.870	0.630
	Min	0.374	0.647	0.774	0.622	0.369	0.099
	Max	5.267	4.988	2.990	3.529	7.182	6.451
PM	Mean	0.360	0.380	0.012	0.013	0.048	0.044
	Std.Dev	0.245	0.217	0.247	0.293	0.271	0.264
	Min	-2.905	-2.498	-3.442	-3.191	-2.759	-2.726
	Max	2.021	1.374	1.105	3.830	2.546	2.436
DR	Mean	0.455	0.49	0.517	0.540	0.544	0.544
	Std.Dev	0.193	0.192	0.198	0.213	0.223	0.227
	Min	0.014	0.009	0.012	0.038	0.029	0.048
	Max	1.940	1.955	2.041	2.228	2.424	2.360
logSales	Mean	21.532	21.75	21.88	21.984	22.175	22.297
	Std.Dev	1.212	1.228	1.282	1.324	1.360	1.442
	Min	16.687	17.269	17.495	16.957	16.548	16.483
	Max	25.73	26.055	26.160	26.237	26.346	26.658
logGDP	Mean	11.819	11.982	12.128	12.285	12.491	12.657
	Std.Dev	0.000	0.000	0.000	0.000	0.000	0.000
	Min	11.819	11.982	12.128	12.285	12.491	12.657
	Max	11.819	11.982	12.128	12.285	12.491	12.657
SOR	Mean	0.368	0.358	0.344	0.298	0.266	0.235
	Std.Dev	0.257	0.256	0.252	0.228	0.220	0.216
	Min	0.000	0.000	0.000	0.000	0.000	0.000
	Max	0.850	0.850	0.850	0.821	0.821	0.971

In *Table 3.b* above, the mean, standard deviation, minimum and maximum values of all variables are presented over the studied time period. By studying the mean value over time, a positive trend can be seen in the variables DR, logSales and logGDP, while the variable SOR shows a negative trend over the studied time period. DR has a mean value of 0.455 in 2003 but is slowly increasing to 0.544 in 2008. This means that the Chinese SOEs have increased their proportion of debt, by borrowing more capital. Further, a positive trend with a higher value in logSales 2008 implies that the SOEs grows and become larger in size over time. Also, the positive trend faced in logGDP emphasizes the rapidly growing Chinese economy. This can be seen in *Table 3.b* above, where the logGDP value in 2003 was 11.819 and in 2008 had increased to 12.657. In contrast, a clear negative trend is seen in the SOR, where the mean value in 2003 was 0.368, which has decreased to 0.235 in 2008. This implicates a clear

decline of the proportion of state-owned shares in the Chinese SOEs. The largest decline is seen after 2005, which implicates an effect of the Split-Share Structure reform in 2005. The mean value of Tobin's q and PM have been more fluctuating. Both Tobin's q and PM shows opportunistic numbers after the reform in 2005.