Block ownership and information disclosure in privatized firms-Evidence of Web disclosure from China

Abstract

This paper examines whether the different types of block shareholdings will have a different impact on the extent of Web voluntary disclosure during the differential privatization stages. Prior literature suggests that block ownership may have a substitutive or complementary monitoring effect on corporate disclosure. However, for economies transferring from state endowment to being privately held such as China, the inconsistent roles of state, legal persons and private blockholders with tradable shares have caused concerns in terms of their influence on a company's voluntary disclosure. Our results show that state and private blockholders with tradable shares have diverse Web reporting policies during the differential privatization stage. The state and legal person shares are less likely to engage in Internet voluntary disclosure and private blockholders appear inattentive to Web disclosure too in highly privatized firms. The findings indicate the possibility of information asymmetry in highly privatized firms, namely that a reporting choice may exist due to the blockholder's intention rather than public's interests. The results suggest that reinforcement of the institutional environment and continuous scrutiny of a firm's reporting practices should be emphasized during privatization.

Keywords: Block ownership, Web disclosure, reporting transparency, privatization, China

1. Introduction

Extant theory points that voluntary disclosure including Internet information is a reflection of managerial attention to communicate to various stakeholders and to reduce agency cost resulting from information asymmetry (Ashbaugh et al., 1999; Healy and Palepu, 2001; Kelton and Yang, 2008). To improve disclosure transparency, the influence of corporate governance mechanisms is received increasing attention but results remain inconclusive in terms of either substitutive or complementary effects. Most of the related empirical findings are also predominantly based on developed economies[1]. For emerging markets, disclosure practice is at a comparatively earlier stage; therefore, emerging markets are criticized for providing insufficient accounting information (Fang and Wong, 2002), for being ineffectively monitored by blockholders (Jung and Kwon, 2002) and with lax institutional environments (Mitton, 2002). The special features of emerging markets raise questions on whether conventional governing mechanisms such as block ownership affect a company's reporting policy as in developed economies. This paper accordingly examines the association between the evolution of ownership structure and the company's voluntary disclosure in China. In particular, we focus on whether the different types of block shareholdings, tradable or non-tradable, will have a different impact on the extent of Web voluntary disclosure during the differential privatization stages.

China has undergone a social and economic revolution since the early 1990's. Compared to developed economies, one distinct characteristic of this revolution is that of a "mixed economy", involving the combining of state and private forms of capitalism. During the privatization process, listed Chinese companies typically have a complicated ownership structure, which includes state ownership, legal person ownership and public stocks held by private shareholders. While legal person shareholders are held by private institutions and are more profit driven than state representatives, private legal person shares as well as state ownership are not allowed to be traded in

[1] For U.S.: Lang and Lundholm, 1993; Ashbaugh, Johnstone and Warfield, 1999; Gelb, 2000; Kelton and Yang, 2008. For U.K.: Craven and Marston, 1999; Meek, Roberts and Gray, 1995; Rowbottom, Allen and Lymer, 2005; Jones and Xiao,

the public as per government policy (Ng et al., 2009). This ownership division of tradable or non-tradable shares has caused concerns in information asymmetry, namely inside trading and financial fraud in China (Chen et al., 2006). Another problem arises from the uneven distribution of block ownership, namely, that of the state and legal person shareholdings far exceeding those of private blockholders. For example, for the year 2006, 7.94% of shares fall under the top 10 private blockholders compared to 47.26% under the top 10 state and legal person shareholders. This difference implies a possibility of weak monitoring by private blockholders when there is control contestability among blockholders.

China is ranked third in the world in terms of PC usage (eTForecasts, 2007 (a)) and the second highest in terms of online users (eTForecasts, 2007 (b))[2]. These statistics indicate that the Internet has become an increasingly important medium for communication in China. As mentioned by Ettredge et al. (2002), companies are more able to deliver information to a broader audience via the Internet in a timely manner, whilst also permitting the distribution of alternative types of disclosures not required by regulatory bodies. To increase the level of information dissemination, the China Securities Regulatory Commission (CSRC) encourages listed Chinese companies to disclose information on designated, official government websites (China listed companies web), but it does not require companies to make disclosures on their corporate websites. Thus, this institutional setting provides a unique setting to examine how companies voluntarily use the Internet to disseminate information and its relation with different types of block ownership.

To conduct our investigation, we collect data on 1057 companies listed on the Shanghai Exchange (SE) and the Shenzhen Exchange (SZE). This data is available on the Internet. 32 disclosure items which include four categories (financial reporting, policy and business activities, corporate governance and practice, Web management) are obtained for analysis. All the obtained

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[2] The top three countries in terms of PC users are the U.S. (24.2%), Japan (7.83%) and China (7.44%); the top three countries in terms of Internet users are the U.S.(17.3%), China (10.8%) and Japan (7.5%).

scores are transformed into a point ranking for empirical analysis. Considering the endogeneity of disclosure with firm growth and as companies may choose to selectively disclose, we use Heckman's selection model and treatment effect model to develop our analysis. Our results show that in the year 2006, 250 (22.59%) firms still lacked accessible websites. Non-tradable ownership held by state and legal persons is negatively associated with the extent of Web disclosure in highly privatized firms as compared to those with a low degree of privatization. The tradable block ownership held by the top 10 private shareholders is positively related to Web disclosure in firms with low privatization; but there is no apparent association in companies with a high degree of privatization. The regressions on each disclosure category and robustness test using percentage disclosure scores are consistent with major findings.

The results reveal the possibility of information asymmetry in highly privatized firms, that state and legal person shares are less likely to engage in Internet voluntary disclosure and private blockholders appear inattentive to Web disclosure too. This finding agrees with the Property Right Theory that claims an inconsistence between ownership and control rights may cause economically inefficient decisions, including, among others, voluntary reporting policies (Kim and Mahoney, 2005). Since China has become a rapidly growing economy and more international investors have entered the Chinese market, public disclosure has become vital for the development of an efficient market in China (Cheung et al., 2010). Our findings help to understand the condition of reporting in China and imply that continuous scrutiny of a company's information disclosure and improvement in institutional governance practices should be emphasized for economies where state ownership is still influential during the privatization process..

In general, this study provide new evidence regarding Web voluntary disclosure in an emerging market and is distinguished from prior studies in several ways: First, the monitoring effect of blockholders is based on assumption that block ownership is tradable in developed economics. In China, shares held by private legal persons are non-tradable and might actually be government

interests in disguise. Thus the distinction between types of blockholders may help to delineate the blockholders' influence and is particularly important for an economy transferring from being state owned to privately held. Second, the opposite effect of non-tradable ownership and private block ownership demonstrates diverse reporting policies in the differential privatization stage. That means a reporting choice may exist due to the blockholder's intention rather than public's interests. This issue is also not addressed in prior literature. Finally, we use a wider range of Web information content, classifying them into 4 categories to measure the extent of voluntary disclosure, and adopt a large sample of 1057 companies listed on both the Shanghai and Shenzhen Stock Exchange. Thus, the results obtained from our sample are more representative and useful for generating implications, irrespective of variations in company size and information content.

The remainder of this paper is organized as follows: section 2 describes the function and determinants of Web disclosure; section 3 elaborates on existing literature and develops the hypothesis; section 4 discusses the sample, variables and models; section 5 presents summary statistics and empirical findings; and section 6 makes a conclusion.

2 Function and determinates of Web disclosure

Web disclosure has been emphasized as an important means of communication as well as a supplementary to traditional paper-based corporate reporting. Ashbaugh et al. (1999), being the early ones to study Internet Financial Reporting (IFR), find that timely providing information to both potential and existing investors is a major incentive for US firms to make voluntarily financial reporting on the Internet. Lymer (1999) provides an analysis of developments in electronic corporate reporting across Europe. He proposes that the Internet extends the possibilities for management of business information both within and between businesses. He suggests that issues regarding Internet communication by businesses should be addressed by companies and regulators as the distribution of the digital data grows. Ettredge et al. (2002) emphasize the scope of Internet reporting. They find that companies with demand for external capital and traditional disclosure quality will have wider

Internet reporting content provided with more non-required filing items, in addition to basic financial information. Xiao et al. (2002) present the opinions on Internet-based financial reporting of a group of expert academics, auditors, preparers, regulators and users gathered via an open-ended questionnaire. They indicate that these experts agree that the Internet will have a significant impact on financial reporting in UK firms and that this impact will be constrained by technological and non-technological factors. All of these findings support the recognized role of corporate Internet disclosure to be an information supplementary because of its timeliness and flexibility.

With the improvement in information technology, in addition to serving as a voluntary information mechanism, the corporate web site is further considered as a convenient tool to reach various stakeholders and extend business scope Lymer (1999) stipulates that European corporations are facing greater social and ethical responsibility for the environment they operate in. The Internet, which offers new ways of undertaking commerce, could also be one way to help satisfy information demands for greater transparency of corporate activity. Healy and Palepu (2001) propose that companies could use the Internet to access all investors and provide daily updates of important information. Rowbottom et al. (2005) count the frequency of disclosure items requested by web users on corporate web site in order to understand a stakeholder's interest. They suggest that investigation on Web utilization could help to maintain investor relationship. DeYoung (2005) focusing on the impact of the Internet on business, proposes that Internet websites become a more integral part of banks' business plans and finds that Internet-only bank startups offer better prices than the average branching bank startups, although they have low average levels of profits. These findings indicate that the corporate websites could be a cost-efficient tool to improve communication with various stakeholders and expand business scope.

Considering factors affecting a company's Web disclosure, researchers have identified some firm characteristics relevant to the level of Web information disclosure. Ashbaugh et al. (1999) find larger and more profitable firms engaging much more in IFR. Craven and Marston (1999) also find

larger firms have a higher level of IFR. They indicate that signaling reporting quality, and reducing agency costs and information asymmetry among shareholders, managers and debtors are the incentives for large companies to improve IFR. Xiao et al. (2004) analyze Internet-based disclosure by Chinese listed firms. They find that Internet reporting is positively and significantly related to a firm's auditing reputation and the proportion of institutional ownership (also called legal person ownership), but not related to state ownership, foreign investors, or private investors. Kelton and Yang (2008) examine the association between corporate governing mechanisms and IFR disclosure transparency. They find that firms with weak shareholder rights, a lower percentage of block ownership, and a more diligent committee engage in a higher level of IFR.

For the impact of block ownership on corporate Internet disclosure, currently there are inconsistent findings in the literature, either in a complementary or substitutive (Ho and Wong, 2001). It is complementary when governance mechanisms strengthen the internal control of the firm and thus increase reporting quality due to less information being withheld by management. On the other hand, it is substitutive when governance mechanisms reduce managerial opportunistic behaviors in the firm, resulting in a decrease in the need for more external monitoring and disclosure.

For the impact of blockholders, based on traditional agency theory, a firm with less diffused ownership might require less external monitoring since the blockholders could watch management. Thus firms with blockholders are expected to have less of a need for information disclosure due to the substitutive monitoring effect by blockholders. An example presenting such a condition comes from Kelton and Yang (2008) in which a firm's Internet-based disclosure is negatively related to block ownership. In contrast, Xiao et al. (2004), using 300 of the largest Chinese companies of year 2001, find that voluntary Internet corporate disclosure is positively and significantly associated with the proportion of legal person ownership. They explain the complementary function on disclosure by blockholders is due to legal person blockholders being geared more toward profit-making than fulfilling political and social goals like state shareholding representatives.

3. Literature and Hypothesis

3.1 Ownership Structure and Disclosure in China

Chinese firms have faced dramatic changes in ownership structure since the early 1990s. The changes are a result of the transition from a formal centrally planned economy to a market-oriented economy. In the transforming stage, listed Chinese companies typically have several distinct classes of ownership including state ownership, legal person ownership and public stocks held by private shareholders. This categorization is called "ownership division".

The first class ownership is state-owned shares which are not publicly tradable. The state ownership representatives are deemed to be less attentive to a company's performance since they lack a direct personal stake in the company. They are usually assumed to have a higher priority of fulfilling political purposes as compared to the goal of achieving an efficient and profitable company (Xiao et al., 2004). Thus, state ownership has received acknowledgement as a major explanation for the inefficiency of corporate governance in China (Qiang, 2003). The second class ownership is legal person shares. Most of the legal shares in China are transferred from state ownership and then released to the public gradually. This design tends to curb the stock price volatility resulting from a huge volume of shares being released by the government in a short period of time in order to maintain adequate development of capital markets (Huo, 2003). Like state ownership, legal person shares are not publicly tradable. But, holders can participate in the company's operation and their compensation is not governed by the government. Since they are more profit driven than representatives of state ownership, it is expected that companies with a higher proportion of legal person ownership will have higher performance (Xu and Wang, 1999; Sun and Tong, 2003). The third class of ownership is public stocks. Stocks denominated in Renminbi (RMB) is referred to as A-stock and traded by local individuals. Stock denominated in non-RMB, is called B-stock and is traded by foreign investors. Both A-stock and B-stock belong to

private shareholders and are comparable to general stocks traded on the public market in developed economies.

Together with the economic revolution has come a higher reporting requirement in China's capital market. With the Shanghai and Shenzhen Stock exchanges being established in 1990 and 1991, the two markets have expanded direct incentives and pressures for market-oriented financial disclosure (Wang, 1995). In 1992, the state councils issued new accounting standards, namely the Accounting standards for Business Enterprises (ASBE), as a basic conceptual framework for accounting practice. The Chinese Securities Regulatory Commission (CSRC) further issues the Implementing Rules on Information Disclosure by Public Issuing Companies (IRID) in 1993 and the Standards of Contents and Formats of Information Disclosure by Public Issuing Companies (SOCFID) in 1994. Working in tandem with these regulations and standards, the company law (1993) also requires all shareholding companies to prepare an audited financial report at the end of the year. In general, under the new accounting standards and disclosure regime, the public companies in China, like others in developed economics, should make initial disclosure, periodic disclosure and non-periodic disclosure.

Although there is remarkable progress on corporate reporting for China firms, some problems have arisen regarding disclosure in China. First, the new accounting standards (1992) do not require listed companies to distribute annual reports to shareholders (Xiao, 1999). In stead, all listed firms in China are required to publish their reports in a national publication authorized by the CSRC. Second, voluntary disclosure such as forecasting and detailed account information may be just an "old habit" inherited from the old accounting regime (Xiao, 1999). For example, Liu and Zhang (1996) find inadequate reporting on company policies, extraordinary items and the lack of timelines for disclosed information in China. Xiao (1999), surveying 10 companies disclosure content, finds surprising details of accounts including the names and amount of main suppliers and debtors— those are usually the proprietary information for most companies in developed economies. Third, the most serious

problem is that, under CSRC's monitoring, most of the information released by public companies is based on company's incentives to comply with mandatory disclosure requirements. Although the degree of compliance is high, companies tended not to disclose material information not enumerated in regulations (Xiao, 1999). That means, a true condition and performance of listed companies could not be reached by public investors.

To improve these problems, in 1997, CSRC revised NO. 2 of SOCFID: the Annual Report to impose reporting responsibility on the board and management. It requires companies to include the Supervisory Board's Report and the information related to the annual general meeting held in the annual report. The updated SOCFID also requires the disclosure of material events of mergers, acquisitions, assets re-organizations, and related party transactions. Starting from 1999, the CSRC further suggests listed companies to make whole entire annual reports available on the Internet, while just publishing condensed key information in paper-based publications.

At the same time, external monitoring mechanisms, including the auditing standardization and corporate governance enforcement, have gained more attention under pressure from different stakeholders in local and international capital markets. The CSRC and Chinese Institute of Certified Public Accountants (CICPA), following International Auditing Standards, implemented a series of auditing standards and require auditors to issue qualified opinions for GAAP violation and scope restriction (Zhou, 2004). CSRC also imposes costly penalties on auditors who violate auditing standards, including revoking auditor's and CPA firm licenses or dismissing CPA firms (Defond, Wong and Li, 2000).

Although many regulations regarding reporting have been promulgated in recent years, some researchers find that there is still some room for improvement of reporting on the part of China's listed firms. The major criticism roots from the special feature of China's stock market: the segmentation of tradable and non-tradable share. Under ownership segmentation, there are about two-thirds of the total shares which are not tradable. The majority of non-tradable shareholders and

management, who have access to key information, can easily extract benefits from minority shareholders and use information asymmetry to do inside trading or financial fraud (Lin, 2004; Chen, Firth, Gao and Rui, 2006). According to property right theory, state owned enterprises (SOE) belong to everyone and to no one (Qiang, 2003). The inconsistency between ownership and control rights may cause economically inefficient decisions (Kim and Mahoney, 2005). Thus we expect that the high proportion of state and legal shares may negatively affect the extent of Web voluntary disclosure and hypothesize:

H1: Non-tradable shareholdings are negatively related to the level of Web disclosure.

3.2 Tradable block shareholdings and voluntary disclosure

Since the large proportion of non-tradable shares have been predominantly criticized for creating inefficiency in China's capital markets, China implemented its "Reform of Ownership Division" to transfer more state and legal shares into private shares. The major work of this reform is to expedite privatization by reallocating state shares and legal shares into constrained shares which will be released to the public in a short period of time. As shown in Figure 1, the proportion of state shares decreased from 35.35% to 3.35%, constrained shares increased from 0 to 43.94% from year 2003 to year 2006. According to the policy of ownership segmentation reform, the constrained shares are going to be released to public investors in Shanghai and Shenzhen Stock exchanges gradually.

Figure 1 is about here

This ownership evolution has reflected its result on the increased tradable shares and private block shareholdings. According to Figure 2, the tradable shares have increased from 38.60% to 47.34% from the year 2003 to 2006. However, some problems arise from the rapid ownership transformation stipulated by the government. First, the state and legal person blockholders have

shares far exceeding those of private blockholders. For example, in year 2006, the total shares held by top 10 private blockholders is 7.94% (CIRTOP10 in Table 4), as compared to 47.26% of the top 10 state and legal persons (TOP10 minus CIRTOP10 in Table 4). The big difference among different types of block ownership implies a possibility of weak monitoring by private blockholders when there is control contestability against state and legal person shareholders.

Figure 2 is about here

Secondly, although the legal person shares are counted as private shares in China, many companies which converted from state owned enterprises are still controlled by the state under the name of a specific legal person (Clarke, 2003). For example, the proportion of legal person ownership of Shenzhen Properties & Resources Development Ltd. in September of 2006 was 71.79%. However 59.75% of this stake belonged to Shenzhen Construction Investment Holding Co. Ltd., which is owned by the local government. This example indicates that some companies with a higher level of private legal person shares may still in effect be under government control, though the indirect shareholding is not identified clearly.

The traditional agency theory points out that companies with diffused ownership have higher disclosure needs due to less scrutiny by block shareholders (Fama and Jensen, 1983; Mitchell et al., 1995; Eng and Mak, 2003). That means that more block ownership will reduce the Web information needed due to the substitutive monitoring effect by blockholders (Kelton and Yang, 2008). And this theory is based on the context of well developed economies in which most blockholders hold private and tradable shareholdings. In contrast, recent literature shows that legal person block ownership might have a complementary monitoring effect to request more Internet reporting due to profit-making motivation (Xiao et al., 2004). Based on these inconsistent findings and the uncertain

role of private legal person shares (due to the inability to judge its ultimate control ownership), we then distinguish private tradable block ownership (hereafter private block ownership) from those held by state and legal persons, and hypothesize:

H2 (a): Private tradable block shareholdings are negatively related to the level of Web disclosure.

H2 (b): Private tradable block shareholdings are positively related to the level of Web disclosure.

3.3 Blockholders and disclosure in the differential stage of privatization

Since there is an apparent ownership structure change during the privatization process, we further consider how the variation of private block shareholdings affects company's disclosure policy during the differential stage of privatization.

For low privatization companies, the state representatives have the political responsibility of initiating the privatization process. The private block shareholders also require more joiners from the public market to enhance the degree of privatization and stock circulation. In contrast, for high privatization companies, private block shareholders may have other considerations rather than stock circulation. As suggested by Stein (2003) and Lang and Lundholm (1993), management of an evolving environment may lead to decreased levels of reporting due to their individual opportunism. Specifically, in booming economies where competition is severe and there is a lack legitimate protection, block shareholders may have an intention to make less voluntary disclosures due to the need to protect proprietary information from potential competitors (Darrough and Stoughton, 1990; Verirecchia, 1983). Hence for an economy transfering from being state controlled to being privately held, private blockholders might have incentives to adjust the disclosure policy based on the information effect of the differential privatization stage. Thus we hypothesize:

H3: There might be differential relation between block shareholdings and the extent of Web disclosure for firms at the differential privatization stage.

4. Sample and Variables

4.1 Sample derivation

The sample for this study is drawn from firms listed on the Shanghai Stock Exchange (SSE) and Shenzhen Stock Exchange (SZSE) of China. We search the Internet between October 2006 to February 2007 for each firm's Website and recorded disclosure items by hand. We further examine other official government websites such as the website of China's listed companies <www.cnlist.com>, the Shanghai Stock Exchange website <www.sse.com.cn>, Shenzhen Stock Exchange website <www.szse.cn> and Hong Kong Stock Exchange website <www.hkex.com.hk> for supplementary information and cross validation. Ownership and financial data are obtained from the Taiwan Economic Journal Data Bank.

As shown in Table 1, the sample consists of 1057 observations in which 646 firms are listed on the Shanghai Stock Exchange and 411 firms on the Shenzhen Stock Exchange. Panel A shows that there are 251 (21.85%) firms without a Website. In comparison to the U.S., Singapore, Japan and other international samples[3], the higher ratio of no websites indicates that there is space in the future to utilize the website as a communication tool in the Chinese market. Panel B provides the utilization of the Internet by industry classifications. The industry classifications are specified by each exchange where 5 industries are represented by the Shanghai Exchange and 22 by the Shenzhen exchange. In general, industrial enterprises demonstrate a higher degree of web utilization.

Table 1 is about here

4.2 Measurement of Disclosure Index

[3] The non-utilization ratio of Web Site for US firms of 1998 is 12.76% (Ashbaugh, Johnstone and Warfield, 1999), for Singapore firms of 1997 is 12.23% (Ettredge, Richardson and Scholz, 2002), for Japan FT1000 of 1998 is 8% (Marston, 2003), for 50 biggest companies in the USA, UK, Canada, Australia and Hong Kong is 0.4% (Allam and Lymer, 2003).

The timeliness and flexibility in content as well as presentation format have imposed a great scope for Web disclosure to all user groups (Craven and Marston, 1999; Ettredge et al., 2002). Therefore, based on the unique nature of Web disclosure, we adopt a wider range of scope that includes 4 categories of information: financial reporting, policy and business activities, corporate governance practices and Web management. Compared to the restricted scope on Internet Financial Reporting (IFR) that is emphasized in Ashbaugh et al. (1999), Craven and Marston (1999), Debreceny et al. (2002) and Kelton and Yang (2008), we expect more categories on disclosure content could help to observe disclosure variation among firms. We develop a disclosure index of 32 items based on Debreceny et al. (2002), Xiao et al. (2004), Kelton and Yang (2008). Table 2 presents the definitions of the disclosure items used in this study.

Table 2 is about here

The first category is Financial Reporting (FR) that includes 10 items that are the latest and the prior period's annual report, the interim report, the quarterly report and the monthly sales amount. Following Kelton and Yang. (2008), financial information not directly shown on Internet, but reached by hyperlinks is also counted. The second category is policy and business activities (BUSINESS). As mentioned by Lymer (1997) and Xiao et al. (2004), to reduce information asymmetry for stakeholders, companies could provide important policy and non-financial information such as updates of company's news and activities, product information, environmental information, audit information. Based on these suggestions, we use 10 items including the company's policy, industry ratios, risk management, employee training, ethic codes and so on. The third category is corporate governance practice (Governance). Following Xiao et al. (2004) and Kelton and Yang (2008), we include 10 items covering board, management and investors issues. Considering the importance of Web presentation format (Xiao et al., 2004; Kelton and Yang, 2008), the last category is Web management (Web). We examine whether the information on a company's

Web is provided in English and updated.

Each disclosure item is assigned as 1 or a 0 depending on whether it is disclosed or not. The higher aggregate score is an indication of the firm's intention to maintain better investor relations. The raw points received are divided by the maximum possible points assigned to each category in order to compare the extent of voluntary disclosure among categories. For regression analysis, we use the rank of disclosure points received to indicate how well a company makes Web disclosure. Following Berger et al. (2005), the raw scores are ranked in ascending order and converted to a uniform scale over [0,1] using the formula (order-1)/(n-1) where n is the number of observations. This procedure makes the ranks comparable across categories and periods.

4.3 Empirical Models

4.3.1 Heckman's two-step estimation process

To examine the relation between the extent of Web disclosure and ownership structure, we establish the following empirical model:

$$\begin{aligned} RSCORE_i = {} & \phi_0 + \phi_1 STATELEGAL_i + \phi_2 CIRTOP10_i + \phi_3 BOARDMGMT_i \\ & + \phi_4 INDBOARD_i + \phi_5 TOBINQ_i + \phi_6 BIG4AUD_i \\ & + \phi_7 STD(STKRET)_i + \phi_8 STKRET_i + \phi_9 EPS_i \\ & + \phi_{10} LASSET_i + \phi_{11} DEBT_i + \varepsilon_i \end{aligned} \tag{1}$$

, where RSCORE is the rank of Web disclosure obtained for each company *i*. STATELEGAL is the non-tradable equity held by state and legal persons in testing Hypothesis 1. CIRTOP10 is the fraction of tradable shares owned by the private top 10 blockholders in testing Hypothesis 2.

To compare the impact between private tradable blockholdings and total blockholdings, we further run analyses with the aggregate top10 block shareholders (TOP10) that include shares held by state, legal persons and private blockholders. Since TOP10 almost overlaps with STATELEGAL (TOP10=55.20% and STATELEGAL= 49.10% in Table 4), we skip the STATELEGAL variable and keep TOP10 to avoid multi-collinearity in model 2.

$$
\begin{aligned}
RSCORE_i = {} & \beta_0 + \beta_1 TOP10_i + \beta_2 BOARDMGMT_i \\
& + \beta_3 INDBOARD_i + \beta_4 TOBINQ_i + \beta_5 BIG4AUD_i \\
& + \beta_6 STD(STKRET)_i + \beta_7 STKRET\beta_i + \beta_8 EPS_i \\
& + \beta_9 LASSET_i + \beta_{10} DEBT_i + \upsilon_i .
\end{aligned} \tag{2}
$$

Most of the control variables have been commonly used in prior studies and are discussed in Section 3.4.

The typical approach (Lang and Lundholm, 1993; Eng and Mak, 2003) assumes that the disclosure score results from random occurrences and ignores the unobservable occurrences that make the response variable occurring according to some unknown but systematic selection method (Heckman, 1979). Therefore, to account for the selection bias, we use Heckman's two-step estimation process. We first estimate a Probit model using a binary dependent variable (DISCLOSE) for the unobserved disclosure decision and a set of independent variables which 'select' whether Web disclosure is observed or not, then incorporate the values of Mill's ratio (reflecting the conditional probability of the observation being in the observed sample) into Model 1 and Model 2. The selected variables used in the Probit estimation include the ownership of state and legal persons (STATELEGAL), shares denominated by non REM (B_STOCK), ownership by the largest shareholders (TOP10 and CIRTOP10), board and executives (BOARDMGMT), company's growth (TOBINQ), auditing firms engaged (BIG4AUD), standard deviation of stock returns (STD(STKRET)), stock returns (STKRET), profitability (EPS), location of Exchange (Exchange=1 for Shanghai Exchange and 0 for Shenzhen Exchange), and industry type to count the differential disclosure behavior of various industries (Ashbaugh, 1999). The industry type includes IND1 for Industrial, IND2 for Trading, IND3 for Real Estate, IND4 for Utilities, and IND5 for Others, but IND1 is excluded to avoid a dummy trap. Specification of the selection model is as follows:

$$
\begin{aligned}
DISCLOSE_i = {} & \kappa_0 + \kappa_1 STATELEGAL_i + \kappa_2 B\_STOCK_i + \kappa_3 CIRTOP10_i \\
& + \kappa_4 BOARDMGMT_i + \kappa_5 INDBOARD_i + \kappa_6 TOBINQ_i \\
& + \kappa_7 BIG4AUD_i + \kappa_8 STD(STKRET)_i + \kappa_9 STKRET \\
& + \kappa_{10} EPS_i + \kappa_{11} LASSET_i + \kappa_{12} DEBT_i + \kappa_{13} EXCHANGE_i \\
& + \kappa_{14} IND2_i + \kappa_{15} IND3_i + \kappa_{16} IND4_i + \kappa_{17} IND5_i + \omega_i
\end{aligned} \tag{3.1}
$$

$$
\begin{aligned}
DISCLOSE_i = {} & \lambda_0 + \lambda_1 STATELEGAL_i + \lambda_2 B\_STOCK_i + \lambda_3 TOP10_i \\
& + \lambda_4 BOARDMGMT_i + \lambda_5 INDBOARD_i + \lambda_6 TOBINQ_i \\
& + \lambda_7 BIG4AUD_i + \lambda_8 STD(STKRET)_i + \lambda_9 STKRET \\
& + \lambda_{10} EPS_i + \lambda_{11} LASSET_i + \lambda_{12} DEBT_i + \lambda_{13} EXCHANGE_i \\
& + \lambda_{14} IND2_i + \lambda_{15} IND3_i + \lambda_{16} IND4_i + \lambda_{17} IND5_i + \psi_i
\end{aligned} \tag{3.2}
$$

, where DISCLOSE equals 1 if a company elects to make Web disclosure.

4.3.2 Treatment effect model for the endogeneity of Web disclosure

Except for the sample selection problem, one more concern is the endogeneity between Web disclosure and a firm's growth. According to Khurana, Pereira and Martin (2006), growing firms may have a higher level of disclosure and visa versa. To avoid bias from OLS estimation, following Wooldridge's procedure (2002), we incorporate the inverse Mill's ratio into the outcome score model and adopt the treatment effect model including the simultaneous equation as follows:

$$
\begin{aligned}
RSCORE_i = {} & \mu_0 + \mu_1 STATELEGAL_i + \mu_2 CIRTOP10_i + \mu_3 BOARDMGMT_i \\
& + \mu_4 INDBOARD_i + \mu_5 TOBINQ_i + \mu_6 BIG4AUD_i \\
& + \mu_7 STD(STKRET)_i + \mu_8 STKRET_i + \mu_9 EPS_i \\
& + \mu_{10} LASSET_i + \mu_{11} DEBT_i + \sigma_i
\end{aligned} \tag{4}
$$

$$
\begin{aligned}
TOBINQ_i = {} & \varphi_0 + \varphi_1 CIRTOP10_i + \varphi_2 SALEGROWTH_i + \varphi_3 INCOMEGROWTH_i \\
& + \varphi_4 FIXASSETBUY_i + \varphi_5 DIVIDEND_i + \tau_i
\end{aligned}
$$

, where SALEGROWTH and INCOMEGROWTH is the company's sales growth and net income growth for the year 2006; FIXASSETBUY is annual expenditure to buy new fixed assets; DIVIDEND is the cash dividend per share. The explanatory variables of the firm's growth are based on Khurana, Pereira and Martin (2006).

Considering the different nature of block holders, we further observe the impact of aggregate blockholders as follows:

$$\begin{aligned} RSCORE_i = {} & \theta_0 + \theta_1 TOP10_i + \theta_2 BOARDMGMT_i \\ & + \theta_3 INDBOARD_i + \theta_4 TOBINQ_i + \theta_5 TOP4AUD_i \\ & + \theta_6 STD(STKRET)_i + \theta_7 STKRET_i + \theta_8 EPS_i \\ & + \theta_9 LASSET_i + \theta_{10} DEBT_i + \eta_i \end{aligned} \tag{5}$$

$$\begin{aligned} TOBINQ_i = {} & \rho_0 + \rho_1 TOP10_i + \rho_2 SALEGROWTH_i + \rho_3 INCOMEGROWTH_i \\ & + \rho_4 FIXASSETBUY_i + \rho_5 DIVIDEND_i + \varsigma_i . \end{aligned}$$

4.4 Control Variables

We first consider two internal governance factors that may influence corporate voluntary disclosure. According to incentive theory, management with higher stockholdings are more likely to pursue actions which benefit themselves as well as other investors, given how they directly bear more economic consequences from their actions (Jensen and Meckling, 1976). As a result, higher equity holdings by management can reduce a company's' need for monitoring and stakeholders' demand for information disclosure (Eng and Mak, 2003; Gelb, 2000). Managerial ownership includes fraction of shares owned by top managers, the CEO, the board members (BOARDMGMT). Another internal governance factor related to corporate voluntary disclosure is the proportion of outside directors (INDBOARD). Since outside directors are more inclined to encourage firms to disclose more information, companies with a higher proportion of outside directors are expected to have a higher level of voluntary disclosure (Eng and Mak, 2003).

In addition to the internal governance factors, some firm characteristics including firm size, firm performance, growth opportunity, reporting quality and leverage are also considered relevant to firm Web disclosure. Large firms are expected to disclose more information than small firms (Ashbaugh et al., 1999; Craven and Marston, 1999; Kelton and Yang, 2008). The firm size is measured as the natural logarithm of the asset (LASSET). The annual market-adjusted return

(STKRET) measures a broad range of performance. Market-adjusted return is computed by subtracting the value-weighted market return from the return on the firm's stock. We also consider earnings per share (EPS) to represent a company's profitability. Previous empirical results for the relationship with firm performance is mixed (Ashbaugh et al., 1999; Xiao et al.; 2004). Growth opportunity is measured by Tobin's Q (Kelton and Yang, 2008). The numerator of Tobin's Q is the year-end market value of common stock plus debt. The denominator is the year-end book value of a firm's total assets. Companies with high growth are expected to disclose more information than those with a low or no growth. BIG4AUD presents the dummy for companies engaged with the top 4 international accounting firms who are expected to have a higher request on overall reporting quality (Kelton and Yang, 2008). For Leverage, Xiao et al. (2004) and Eng and Mak (2003) indicate that increased leverage is expected to reduce disclosure given that leverage assists in controlling the free cash flow problem and agency costs. We adopt the natural logarithm of debt (LDEBT) as the proxy of debt. Finally, we include the variation in return (STD(STKRET)) because information asymmetry and managerial opportunistic behaviors increase as the stock price has greater variation. Thus higher extent voluntary disclosure could help to mitigate information asymmetries (Lang and Lundholm, 1993) or to avoid a firm's litigation on failure to disclose on a more timely basis (Alexander, 1991).

5. Empirical Results

5.1 Descriptive Statistics

5.1.1 Web disclosure scores

Table 3 provides descriptive statistics for the Web disclosure scores by categories. The average percentage score for financial reporting is 0.28 for the full sample and 0.36 for the sub-sample. The corporate governance and practice and Web management categories seem to have a higher average score of 0.41 and 0.41 but with a higher deviation of 0.35 and 0.39 on a voluntary

basis. However, the policy and business activities category is about 0.13, thus presenting the passive attitude in the reporting businesses' plan and activities for the public. The average total points received and percentage score of all 32 items is 9 and 0.28. In general, the maximum/minimum score for total points received and percentage score of all 32 items is 24/0.75 and 0/0, indicating variation on Web reporting policies for China firms.

Table 3 is about here

5.1.2 Ownership structure

Table 4 shows the summary statistics for 1057 firms for the year 2006 in China. The average shares held by state and legal institutions (STATELEGAL) are 49.10%; by public, 47.60% (PUBLIC); and by B-stock shareholders, 2.44% (B-STOCK). The fraction of circulated stocks (50.04%) is close to non-circulated stock (49.10%), indicating the progress of privatization in China. For the block shareholdings, the fraction of ownership held by the top 10 blockholders including state, legal persons and private shareholders (TOP10) is 55.20%. In contrast, equity held by the top 10 private shareholders, whose stock is tradable, is 7.94% (CIRTOP10). The big difference between TOP10 and CIRTOP10 indicates a high degree of ownership concentration in state and legal person shares. Average ownership owned by the board and top management (BOARDMGMT) is about 0.04%. The ratio is lower than other types of ownership. Finally, the average proportion of independent directors of board by each firm is 0.37% (INDBOARD).

Table 4 is about here

5.2 Multivariate Analysis

5.2.1 Heckman's two-step estimation on voluntary Web disclosure

Prior to a discussion of the outcome model (Model 1 and 2), we will briefly discuss the results of the selection model (Model 3.1 and Model 3.2) presented in Table 5. Overall, the selection model approximates a fair means of discrimination, as measured by a ROC curve area of 0.66 for model 3.1 and 0.67 for model 3.2 (Hosmer and Lemeshow, 2002). We find higher ownership by the board and executives, engagement with big audit firm, and larger size contribute to Web disclosure decision (positive and significant coefficients). Firms with more leverage are less likely to make Web disclosures (negative and significant coefficients).

Table 5 is about here

Table 6 summaries the results of the outcome models on voluntary Web disclosure. The results show that the model has a significant Wald Chi square value. The λ term in the last three columns is the coefficient for the inverse Mill's ratio taken from the probit selection equation. The coefficient of CIRTOP10 is significantly positive, indicating that higher ownership of equity by private blockholders can enhance corporate disclosure on the Web (coefficient=0.0015 and p=0.023). However, when CIRTOP10 is replaced by non-circulated ownership TOP10, the relation between Web disclosure and ownership of non-circulated blockholders becomes insignificant (coefficient=-0.0003, p=0.690).

These results demonstrate that private block ownership is significantly influential in voluntary Web disclosure, while state and legal person ownership is not. This result differs from Eng and Mak (2003) and Kelton and Yang (2008). Eng and Mak (2003) find blockholdings, whether held by individuals or institutions, are not associated with the level of voluntary disclosure in Singapore. Kelton and Yang (2008), by analyzing companies listed in NASDAQ National market, find that block ownership is negative and significant for Internet financial reporting (substitutive monitoring effect). In contrast, our findings suggest that private block shareholdings have a supplementary

monitoring effect, that the Web voluntary disclosure is increased by a greater percentage of private and tradable block ownership.

Table 6 is about here

5.2.2 Ownership structure and Web disclosure in the differential privatization stage

Table 6 further shows how the equity held by private block shareholders (CIRTOP10) relates to Web disclosure in the differential privatization stage. We re-perform the Model 1 analysis by separating the whole sample into two high degree privatization (STATELEGAL<mean) and low degree privatization (STATELEGAL>mean) subgroups. In low privatization firms, there is a significant positive coefficient for private block ownership (coefficient=0.0032, p=0.002); but the coefficient of STATELEGAL is insignificant. While in high privatization companies, the coefficient of STATELEGAL is significantly negative (coefficient=-0.0028, p =0.049), the coefficients of CIRTOP10 become insignificant. The opposite sign of non-tradable ownership (STATELEGAL) and private tradable block ownership (CIRTOP10) demonstrates that non-tradable shareholders and private tradable blockholders may have diverse reporting policies in the differential privatization stage.

For non-tradable shareholdings, the negative coefficient in high privatization indicates that direct or indirect government control may increase the intervention in a company's reporting policy, even after firms reach an average degree of privatization. This finding is consistent with the Property Theory that claims non-tradable shares may cause inefficient decisions, including the reporting policy.

For block private ownership, the coefficients are positive and significant in low privatization firms, but not in high privatization firms. This finding indicates that private blockholders are more inclined to make voluntary Web disclosure before reaching the average level of privatization,

whilst they become inattentive to Web disclosure after privatization. The possible explanation for reporting change by private blockholders is that the private blockholders may have stronger incentives to require outside investors from the public market to join the firms during the early privatization stages, but they may become more conservative in releasing news in the later privatization stage due to individual opportunism (Stein, 2003; Lang and Lundholm, 1993; Bozec and Claude, 2007), protection of proprietary information from the competition (Darrough and Stoughton, 1990; Verirecchia, 1983) or just because of ineffective governance mechanisms in the institutional environment in China (Tam, 2000; Gul and Zhao, 2001). This finding is consistent with the low score obtained on the policy and business activities category, compared to other reporting categories (0.13 for full sample and 0.16 for subsample).

Overall, the findings support Hypothesis 3 that there is a differential relationship between block shareholders and the extent of voluntary disclosure during the differential privatization stage, and these findings are not mentioned in previous literature.

Of the control variables, Table 6 shows that managerial ownership held by the board and executives (BOARDMGMT) and the proportion of independence of the board (INDBOARD) have positive and significant coefficients in Model 1 and Model 2, indicating that individual managerial ownership and independence of the board are associated with a higher level of Web disclosure. Company's growth (TOBINQ), performance (EPS), and size (LASSET) have positive and significant coefficients, while stock return (STKRET) has significant and negative coefficients, a result that is consistent with prior studies.

5.2.3 Endogeneity of Web disclosure

Table 7 demonstrates the results of the treatment effect model that incorporates the sample selection and endogeneity of Tobin's Q and Web disclosure. The results are similar to Table 6 that the circulated stocks held by private blockholders are positive and significantly related to the extent of Web disclosure, while there is no significant association between shares held by state and

legal persons and Web voluntary disclosure. For the condition under differential privatization stages, we also find similar results, namely that private block ownership is significant and positively related to Web voluntary disclosure in low privatization firms and non-tradable shares held by state and legal persons is negatively related to Web voluntary disclosure. The λ term in the last column is statistically significant; hence, the method considering endogeneity as well as adjusting for sample selection significantly adjusts for bias in the reported slope coefficients.

Table 7 is about here

5.2.4 Results by each disclosure category

Table 8 presents the relation between Web disclosure and block ownership by four reporting categories. Panel A shows the results of the selection model of the Heckman two-stage method (Model 1) and Panel B shows results considering firm growth as endogenous variable (Model 4). We find that non-tradable equity of high privatization firms is negatively related to each reporting category, while tradable equity owned by the private top10 stockholders in low privatization firms is positively related to each reporting category. And these results are similar to Table 6 and Table 7. We also find high privatization companies with a higher growth opportunity (TOBINQ) and earnings (EPS) have a lower level of Web disclosure. The results in Panel B are similar to Panel A, with the exception that growth opportunity is not significantly related to any individual disclosure item, indicating the endogeneity of a firm's growth opportunity in our model. Furthermore, the coefficients for selection bias parameter λ are significant for RFF, BUSINESS, and WEB in high degree privatization companies, indicating selective decision in making Web disclosure after privatization.

In general, the results of the four Web disclosure items are similar to the results for the total score shown in Table 6 and Table 7. The results for each category delineate more details on the

relation between block ownership and information categories.

Table 8 is about here

5.3 Robustness test

The robustness of regression results are examined by adopting a percentage score ranging from 0 to 1 as an alternative measure of Web disclosure. The results are similar to the ones reported in Table 6, Table 7 and Table 8 which use score ranking as a proxy for the extent of disclosure. We also utilize market to book ratio (M_B) as an alternative to the company's growing opportunity. The coefficient of M_B is less significant than Tobins's Q but the significance of other variables reflects similar results. The robustness test suggests that our main results are robust for estimating the relationship between the extent of Web disclosure and block ownership in China.

6. Conclusions

This paper examines the relation between the extent of Web disclosure and the ownership structure of 1057 firms listed in China. China has undergone a social and economic revolution since the early 1990's. During the privatization process, listed Chinese companies typically have a complicated ownership structure including state ownership, legal person ownership and public stocks held by private shareholders. However, the distinction between tradable and non-tradable shares and the uneven distribution of block ownership, where state and legal person shareholdings far exceed those of private blockholders, have caused concern for information asymmetry among Chinese firms. Based on this institutional setting, we focus on two issues that are not addressed in prior literature. First, whether the different types of block shareholdings, tradable or non-tradable, will have a different impact on the extent of Web voluntary disclosure. Second, whether blockholders have diverse Web reporting policies in differential privatization stages.

By using the Heckman two-step estimation process and controlling the endogeneity of disclosure and firm growth, we find that non-tradable shares and tradable private block shareholdings have a different impact on Web reporting. The non-tradable shares that consist of state and legal person shares are found to be negatively associated with the extent of Web information in high privatization firms, but this phenomenon is not distinct in low privatization firms. This finding agrees with Property Theory and indicates that state and legal person ownership may curtail the extent of Web disclosure even when companies reach a stage of high privatization where state and legal person ownership are below average. In contrast, the results show that the equity held by the top 10 private blockholders is positively related to the extent of Web disclosure in privatized firms, but this association turns insignificant in highly privatized companies. We provide an explanation for this relation based on the information effect that private block holders may distinguish themselves from others on such dimensions as reporting quality and performance to attract public capital and increase stock liquidity, while they become inattentive to Web reporting after privatization. A rent-seeking behavior by concealing proprietary information from potential competitors and the public may also explain for the change in reporting policy by private blockholders.

Since China has become one of the top IT users in the world and plays an important role in international capital markets, the manner in which businesses enhance reporting transparency and timeliness via voluntary disclosure has become a notable issue. The findings reveal a specific agency problem, namely that information asymmetry may exist in companies of emerging markets where the “mixed economy” combining state and private forms of capitalism exists. Our results suggest that continuous scrutiny of a company’s information disclosure should be conducted, and an improvement in the legitimacy and the institutional environment regarding reporting transparency should be emphasized in the post-privatization stage where state ownership is still influential.

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Table 1
Distribution of Sample

This table summarizes sample distribution. Panel A provides web information disclosure of two Exchanges in China. Panel B represents the condition of utilization of web as disclosure tool by exchange and industry. The industry categories are defined according to each Exchange.

Panel A : Sample distribution by exchange

Exchange	Shanghai (SE)		Shenzhen (SZE)		Total	
	No.	%	No.	%	No.	%
With website	516	79.88	310	75.43	826	78.15
Without website	130	20.12	101	24.57	251	21.85
Total	646	100.00	411	100.00	1057	100.00

Panel B: Sample distribution by industry

	No Web		With web		Total	
	No.	%	No.	%	No.	%
Shanghai Exchange(SE)						
Industrial	83	12.85	343	53.10	426	65.94
Trading	18	2.79	39	6.04	57	8.82
Real Estate	13	1.72	51	6.87	64	9.91
Utilities	4	0.43	14	1.86	18	2.79
Other	12	2.43	69	10.73	81	12.54
Shanghai Subtotal	130	20.12	516	79.88	646	100.00
Shenzhen Exchange(SZE)						
Agriculture and Fishing	3	0.73	6	1.46	9	2.19
Mining	5	1.14	2	0.23	7	1.7
Food	3	0.73	12	2.92	15	3.65
Textiles	6	1.46	17	4.14	23	5.60
Furniture	1	0.24	1	0.24	2	0.49
Paper	1	0.24	3	0.73	4	0.97
Oil and Plastic	11	2.68	44	10.71	55	13.38
Electronic	4	0.97	9	2.19	13	3.16
Metals	8	1.95	25	6.08	33	8.03
Machinery	13	3.16	58	14.11	71	17.27
Medical	8	1.95	21	5.11	29	7.06
Other Manufacturing	1	0.24	3	0.73	4	0.97
Gas and Water	3	0.73	16	3.89	19	4.62
Construction	1	0.24	5	1.22	6	1.46
Shipping	0	0.00	14	3.41	14	3.43
Telecommunication	5	1.22	14	3.41	19	4.62
Wholesale and Retail	10	2.43	17	4.14	27	6.57
Real Estate	7	1.70	10	2.43	17	4.14
Society Service	5	1.22	10	2.43	15	3.65
Press and Media	1	0.24	0	0.00	1	0.24
Other	5	1.22	23	5.60	28	6.81
Shenzhen subtotal	101	24.57	310	75.43	411	100.00
Total	251	21.85	826	78.15	1057	100.00

Table 2
Definition of Web Disclosure Items

Category	Definition of disclosure items
1. Financial Reporting (FR) (Total 10 points)	
Latest annual report	Providing 2005 annual report
Prior annual report	Providing 2004 and prior year's annual report
Interim report	Providing 2006 June-30 financial statement
Quarterly report	Providing 2006 March, 31 and prior quarterly report
Latest condensed balance sheet	Providing 2005 condensed balance sheet
Prior condensed balance sheet	Providing 2004 and prior year's condensed balance sheet
Latest condensed income statement	Providing 2005 condensed income statement
Prior condensed income statement	Providing 2004 and prior year's condensed income statement
Latest monthly revenue	Providing sales of Nine of 2006
Prior monthly revenue	Providing sales prior and of August of 2006
2. Policy and Business Activities (BUSINESS) (Total 10 points)	
Assets impairment	Providing detail and principle for assets impairment assessment
Asset valuation	Providing detail and principle for assets valuation
Consulting fee to auditing firm	Providing information about non-audit payment to auditing firm
R&D plan	Providing information of R&D plan and expenditure
Industry performance ratios	Providing key ratios and explanation of belonged industry
Risk management structure	Description of company's risk attitude and principle
Employee training	Providing information of employee's on-job training program
Licenses obtained by employee	Providing information of employee's licenses
Ethic codes	Providing information of employee's ethic code
Environment and safety	Providing information of job environment and safety
3. Corporate Governance and Practice (GOVERNANCE) (Total 10 points)	
Corporate Governance policy	Description of general corporate governance policy
Board and Supervisor	Providing information of board and supervisor
Management team	Providing information of management team
Remuneration	Report the compensation of board and supervisor
Dividend	Providing dividend information prior and of 2005
Stock price	Providing daily closing stock price
Shareholder meeting	Announcement of timing and place for 2005 meeting
Investor conference	Providing investor conference information on web
Predictive risk and uncertainty	Providing information of significant uncertainty related to business including market, industry and credit aspects
Significant information	Providing company's significant information
4. Web Management (WEB) (Total 2 points)	
Web by English	Having web by English
Web information is updated	Providing updating information on web

Table 3
Web Disclosure Scores

This table provides descriptive statistics for the web disclosure scores by categories. Full sample includes companies listed in Shanghai Exchange and Shenzhen Exchange, while the subsample contains only companies make disclosure on web. The score is the points received for each category. The percentage score is the points received for each category divided by the numbers of points assigned to the category. The total score is the sum of four categories.

	Full Sample (N=1057)		Subsmple with disclosure (N=826)	
	Score	Percentage Score	Score	Percentage Score
(1) Financial Reporting				
Mean	2.85	0.28	3.64	0.36
Median	2.00	0.20	4.00	0.40
Standard Deviation	3.17	0.32	3.15	0.32
Maximum	8.00	0.80	8.00	0.80
Minimum	0.00	0.00	0.00	0.00
(2) Policy and Business activities				
Mean	1.25	0.13	1.60	0.16
Median	0.00	0.00	2.00	0.20
Standard Deviation	1.47	0.15	1.48	0.15
Maximum	6.00	0.60	6.00	0.60
Minimum	1.25	0.00	0.00	0.00
(3) Corporate Governance and Practice				
Mean	4.08	0.41	5.22	0.52
Median	4.00	0.40	6.00	0.60
Standard Deviation	3.55	0.35	3.19	0.32
Maximum	10.00	1.00	10.00	1.00
Minimum	0.00	0.00	0.00	0.00
(4) Web Management				
Mean	0.82	0.41	1.05	0.52
Median	1.00	0.50	1.00	0.50
Standard Deviation	0.78	0.39	0.74	0.37
Maximum	2.00	1.00	2.00	1.00
Minimum	0.00	0.00	0.0	0.00
Total Score				
Mean	9.00	0.28	11.51	0.36
Median	7.00	0.22	13.00	0.41
Standard Deviation	8.09	0.25	7.39	0.23
Maximum	24.00	0.75	24.00	0.75
Minimum	0.00	0.00	1.00	0.03

Table 4
Descriptive Statistics

This table shows the descriptive statistics for 1057 firms of year 2006 in China. Web disclosure score is the percentage score by using raw points received for each category divided by the total points assigned to each category. The total score is the sum of four categories: financial reporting (FR), policy and business activities (BUSINESS), corporate governance and practice (GOVERNANCE) and Web management (WEB). The detailed definition of each category is listed on Table 2. STATELEGAL is the non-tradable equity by state and legal person. Public is the tradable shares owned by local investors. B-STOCK is the shares denominated in USD (for Shanghai Exchange) and in HKD (for Shenzhen Exchange). Top10 is the fraction of shares owned top 10 shareholders including state, legal person and private blockholders. CIRTOP is the fraction of shares owned by top 10 private shareholders. BOARDMGMT is the fraction of shares owned by top managers, the CEO, the board members and supervisors. INDBOARD is the proportion of independent directors of each firm. Tobin's Q is calculated by using the year-end market value of common stock plus debt divided by book value of assets. BIG4AUD equals 1 for companies engaged with top 4 international accounting firms. STKRET is annual market-adjusted return (STKRET) computed by subtracting the value-weighted market return from the return on the firm's stock. STD(STKRET)) is the standard deviation of market-adjusted annual returns over the preceding 6 years (2000-2005). EPS is earnings per share. ASSET is book value of assets. DEBT is total debt divided by total assets.

	Mean	Median	Min	Max	Standard Deviation
Web Disclosure Score					
FR	0.28	0.20	0.00	0.80	0.32
BUSINESS	0.13	0.00	0.00	0.60	0.15
GOVERNANCE	0.41	0.40	0.00	1.00	0.35
WEB MGMT	0.40	0.41	0.00	1.00	0.39
TOTAL SCORE	0.28	0.22	0.00	0.75	0.25
Ownership Variables (%)					
STATELEGAL	49.91	51.27	0.00	90.15	13.14
PUBLIC	47.60	47.35	0.00	100.00	14.94
B-STOCK	2.44	0.00	0.00	54.34	8.84
TOP10	55.20	56.20	8.58	95.59	13.43
CIRTOP10	7.94	4.63	0.56	75.22	8.47
BOARDMGMT	0.04	0.00	0.00	2.06	0.15
INDBOARD	0.37	0.36	0.13	0.83	0.07
Control Variables					
TOBIN'S Q	1.93	1.64	0.88	7.31	0.94
BIG4AUD	0.05	0.00	1.00	0.00	0.21
STKRET(%)	-30.85	-45.29	-120.32	173.58	62.49
STD(RETURN) (%)	38.15	35.29	19.85	138.24	7.44
EPS	0.18	0.14	-1.45	1.20	0.28
ASSET(thousand)	2182520	1288865	128152	26265551	2749875
DEBT (%)	44.05	43.33	2.69	222.81	21.18

Table 5
Results of Probit Selection Model: test of selection in making web disclosure

This table presents results of selection model of Heckman two-stage method. The dependent variable is a binary choice to make web disclose or not by China listed companies in 2006. Most variables are defined on Table 4. Exchange is a dummy equal 1 if listed in Shanghai Exchange, otherwise equal 0. IND2 is dummy for trading industry, IND3 for Real Estate, IND4 for Utilities and IND5 for others. Model (3.2) uses TOP10 to replace CIRTOP10 in model (3.1). Exchange and industry dummy are included but not reported for brief. Significant levels (P-values) are in parentheses. *, **,*** indicate significance at 10 percent, 5 percent, and 1 percent respectively.

Model (3.1):

$$\begin{aligned} DISCLOSE_i = {} & \kappa_0 + \kappa_1 STATELEGAL_i + \kappa_2 B\_STOCK_i + \kappa_3 CIRTOP10_i \\ & + \kappa_4 BOARDMGMT_i + \kappa_5 INDBOARD_i + \kappa_6 TOBINQ_i \\ & + \kappa_7 BIG4AUD_i + \kappa_8 STD(STKRET)_i + \kappa_9 STKRET \\ & + \kappa_{10} EPS_i + \kappa_{11} LASSET_i + \kappa_{12} DEBT_i + \kappa_{13} EXCHANGE_i \\ & + \kappa_{14} IND2_i + \kappa_{15} IND3_i + \kappa_{16} IND4_i + \kappa_{17} IND5_i + \omega_i \end{aligned}$$

	Model 3.1	Model 3.2
Intercept	-3.162 (0.003)*	-3.174 (0.002)**
STATELEGAL	0.002 (0.541)	0.001 (0.987)
B_STOCK	0.002 (0.951)	0.001 (0.987)
CIRTOP10	0.001 (0.992)	
TOP10		-0.006 (-0.400)
BOARDMGMT	1.068 (0.065)*	1.049 (0.066)*
INDBOARD	0.483 (-0.794)	0.497 (0.441)
TOBINQ	-0.055 (0.386)	-0.039 (0.547)
BIG4AUD	0.691 (0.046)**	0.531 (0.081)*
STD(STKRET)	0.002 (0.405)	0.002 (0.421)
STKRET	0.001 (0.705)	0.001 (0.711)
EPS	0.103 (0.597)	0.150 (0.432)
LASSET	0.269 (0.000)***	0.275 (0.000)***
DEBT	-0.005 (0.034)**	-0.005 (0.030)**
ROC Curve Area	0.6606	0.6674
Obs.	1057	1057
Pseudo Rsquare	0.06	0.06

Table 6
Results of Outcome Model: privatization and web disclosure

This table presents results of selection model of Heckman two-stage method. The dependent variable is the ranks by score obtained for each company. Variables definitions are on Table 4. The λ term is the coefficient for the inverse Mill's ratio taken from the probit selection equation. Low privatization/High privatization subgroup is the subgroup whose state ownership over/below average state ownership.

Model (1):

$$RSCORE_i = \phi_0 + \phi_1 STATELEGAL_i + \phi_2 CIRTOP10_i + \phi_3 BOARDMGMT_i + \phi_4 INDBOARD_i + \phi_5 TOBINQ_i + \phi_6 BIG4AUD_i + \phi_7 STD(STKRET)_i + \phi_8 STKRET_i + \phi_9 EPS_i + \phi_{10} LASSET_i + \phi_{11} DEBT_i + \varepsilon_i$$

`	Full Sample		Low Privatization	High Privatization
	Model 1	Model 2	Model 1	Model 1
Intercept	-0.0653 (0.836)	-0.1248 (0.682)	-0.4852 (0.262)	1.0488 (0.007)**
STATELEGAL	0.0001 (0.859)		0.0007 (0.715)	-0.0028 (0.049)**
CIRTOP10	0.0015 (0.023)**		0.0032 (0.002)**	-0.0004 (0.635)
TOP10		-0.0003 (0.690)		
BOARDMGMT	0.1126 (0.068)*	0.1270 (0.041)**	0.1424 (0.133)	0.0538 (0.477)
INDBOARD	0.2089 (0.081)*	0.2564 (0.030)**	0.2348 (0.167)	-0.0583 (0.756)
TOBINQ	0.0202 (0.086)*	0.0244 (0.039)**	0.0192 (0.206)	0.0385 (0.093)*
BIG4AUD	0.0442 (0.293)	0.0472 (0.243)	0.0355 (0.522)	0.0511 (0.391)
STD(STKRET)	0.0003 (0.494)	0.0005 (0.245)	0.0001 (0.874)	0.0005 (0.382)
STKRET	-0.0003 (0.086)*	-0.0002 (0.054)*	-0.0003 (0.279)	-0.0004 (0.095)*
EPS	0.0707 (0.039)**	0.0933 (0.006)**	0.0351 (0.455)	0.1164 (0.021)**
LASSET	0.0321 (0.079)*	0.0361 (0.046)**	0.0566 (0.032)**	-0.0282 (0.203)
DEBT	-0.0005 (0.306)	-0.0006 (0.261)	-0.0003 (0.583)	0.0001 (0.930)
λ	0.1201 (0.370)	0.1333 (0.646)	0.1824 (0.243)	-0.1119 (0.468)
Obs.	1057	1057	575	478
Wald Chi2 (16)	85.26	79.86	64.46	45.27
Prob>chi2	0.0000	0.0000	0.0000	0.0025

Table 7
Results of Treatment Effect Model: privatization and web disclosure

This table analyzes the relation of ownership structure and the extent of web disclosure by incorporating the sample selection and endogeneity of Tobin'Q and web disclosure. The dependent variable is the ranks by score obtained for each company. Variables definitions are listed on Table 4. The λ term is the coefficient for the inverse Mill's ratio taken from the probit selection equation. Low privatization/High privatization subgroup is the subgroup whose state ownership over/below average state ownership. *, **,*** indicate significance at 10 percent, 5 percent, and 1 percent respectively.

	Full Sample		Low Privatization	High Privatization
	Model 4	Model 5		
Intercept	0.2623 (0.412)	-0.2453 (0.435)	-0.2702 (0.498)	1.4837 (0.011)
STATELEGAL	0.0006 (0.540)		0.0016 (0.530)	-0.0015 (0.371)
CIRTOP10	0.0016 (0.092)*		0.0030 (0.028)**	0.0003 (0.811)
TOP10		-0.0000 (0.996)		
BOARDMGMT	0.1156 (0.033)**	0.1350 (0.014)**	0.1457 (0.058)*	0.0612 (0.439)
INDBOARD	0.2045 (0.174)	0.2633 (0.077)*	0.1631 (0.424)	0.1310 (0.569)
TOBINQ	-0.0224 (-0.62)	-0.0299 (-1.14)	-0.0082 (0.852)	-0.0548 (0.373)
BIG4AUD	0.0669 (0.188)	0.0794 (0.098)*	0.0571 (0.463)	0.0698 (0.260)
STD(STKRET)	0.0005 (0.392)	0.0008 (0.16)	0.0005 (0.561)	0.0006 (0.468)
STKRET	0.0001 (0.848)	0.0001 (0.716)	-0.0001 (0.712)	0.0004 (0.350)
EPS	0.0721 (0.085)*	0.0963 (0.017)**	0.0366 (0.532)	0.1190 (0.041)**
LASSET	0.0138 (0.465)	0.0150 (0.417)	0.0428 (0.072)*	-0.0539 (0.100)*
DEBT	-0.0006 (0.342)	-0.0007 (0.226)	-0.0002 (0.848)	-0.0008 (0.392)
λ	-0.2345 (0.112)	-0.2071 (0.134)	-0.1939 (0.373)	-0.3838 (0.055)*
Obs.	1016	1016	553	463
Pseudo Rsquare	0.075	0.067	0.107	0.062
F-statistics(p value)	9.47 (0.000)	9.38 (0.000)	7.69 (0.000)	4.09 (0.000)

Table 8
Outcome for Differential Internet Disclosure Categories

This table presents relation between four categories of web disclosure items, governance structure and firm characteristics. The dependent variables are the ranks by score obtained for each category: required financial filings (RFF); financial policy and business activities (BUSINESS), Corporate Governance and Practice (GOVERNANCE) and Web management (WEB).Panel A shows results of selection model of Heckman two-stage method (model 1) and Panel B shows results considering firm growth opportunity as endogenous variables (model 4). The dependent variable is the rank by score obtained for each category. Models are described in Section 3. Variable definitions are on Table 4. The λ term is the coefficient for the inverse Mill's ratio taken from the probit selection equation. Low privatization/High privatization subgroup is the subgroup whose state ownership over/below average state ownership. *, **,*** indicate significance at 10 percent, 5 percent, and 1 percent respectively.

	FR		BUSINESS		GOVERNANCE		WEB	
	Low Privatization	High Privatization	Low Privatization	High Privatization	Low Privatization	High Privatization	Low Privatization	High Privatization
Panel A: Results for Heckman's selection model (Model 1)								
Intercept	-0.4662	1.0228*	-0.6818	0.9369	-0.1357	0.4136	-0.6913	1.4060
STATELEGAL	0.0014	-0.0065**	0.0002	-0.0041*	0.0001	-0.0013	0.0028	-0.0018
CIRTOP10	0.0034**	-0.0020	0.0033**	-0.0023	0.0030**	-0.0004	0.0015	0.0017
BOARDMGMT	0.1440	0.0921	0.0679	0.0506	0.0287	0.0796	0.2123*	-0.1039
INDBOARD	0.1530	-0.1328	0.3721	-0.2024	0.2430	0.0522	0.2268	-0.3065
TOBINQ	0.0320	0.0646*	0.0095	0.0670*	0.0262	0.0301	-0.0074	0.0232
BIG4AUD	-0.0258	0.1140	-0.0306	0.0106	0.0122	0.0935	0.0152	-0.0483
STD(STKRET)	-0.0001	-0.0011**	-0.0003	0.0011	-0.0006	0.0002	0.0008	0.0004
STKRET	-0.0003	0.0003	-0.0003	-0.0014	-0.0002	-0.0002	0.0001	-0.0002
EPS	0.0039	0.2356**	0.0380	0.2488**	0.0766	0.1220**	-0.0213	-0.0288
LASSET	0.0522	-0.0264	0.0641*	-0.0293	0.0362	0.0040	0.0517	-0.0530
DEBT	-0.0012	0.0039	-0.0011	-0.0001	-0.0005	-0.0006	0.0002	0.0021
λ	0.0228	-0.1810	0.0786	-0.2105	-0.0026	0.1053	0.1528	-0.5288*
Obs.	575	478	575	478	575	478	575	478
Wald Chi2 (16)	52.79	57.24	48.94	54.52	62.21	36.19	46.57	24.40
Prob>chi2	0.0002	0.0001	0.0008	0.0001	0.0000	0.0290	0.0017	0.3267

Panel B: Endogeneity of Web Disclosure (Model 4)

Intercept	-0.5680	1.2657**	-0.07293	1.2269**	-0.3044	0.6534	0.1063	2.090**
STATELEGAL	0.0024	-0.0046**	-0.0004	-0.0027	0.0003	-0.0006	0.0023	-0.003
CIRTOP10	0.0032**	-0.0014	0.0025*	-0.0023	0.0026**	-0.0001	0.0014	0.0017
BOARDMGMT	0.1891**	0.0883	0.0913	0.0229	0.0633	0.0794	0.1478**	-0.1499
INDBOARD	0.1158	0.0105	0.2941	-0.0761	0.1263	0.1612	0.0786	-0.1052
TOBINQ	-0.0087	0.0150	0.0218	0.0451	0.0266	-0.0180	-0.0079	-0.0349
BIG4AUD	0.0431	0.1228**	0.0008	0.0362	0.0282	0.1010*	-0.0175	-0.0284
STD(STKRET)	0.0006	0.0004	-0.0000	0.0008	0.0000	0.0003	0.0006	0.0001
STKRET	-0.0001	-0.0004	-0.0005	-0.0009*	-0.0004	0.0002	0.000	0.0006
EPS	0.0201	0.2088**	0.0267	0.2090**	0.0537	0.1120*	-0.0175	-0.0043
LASSET	0.0540	-0.0450	0.0673**	-0.0503	0.0470**	-0.0103	0.0087	-0.0967**
DEBT	-0.0010	-0.0000	-0.0003	-0.0002	-0.0002	-0.0011	0.0011	0.0012
λ	-0.0518	-0.4100**	-0.1531	-0.4851**	-0.2673	-0.1895	-0.4273**	-0.8229**
Obs.	553	463	553	463	553	463	553	463
Pseudo Rsquare	0.080	0.087	0.0817	0.082	0.109	0.053	0.082	0.078
F-statistics(p value)	5.90(0.000)	6.13(0.000)	5.19(0.000)	4.42(0.000)	7.80(0.000)	3.33(0.0001)	7.04(0.000)	4.12(0.000)

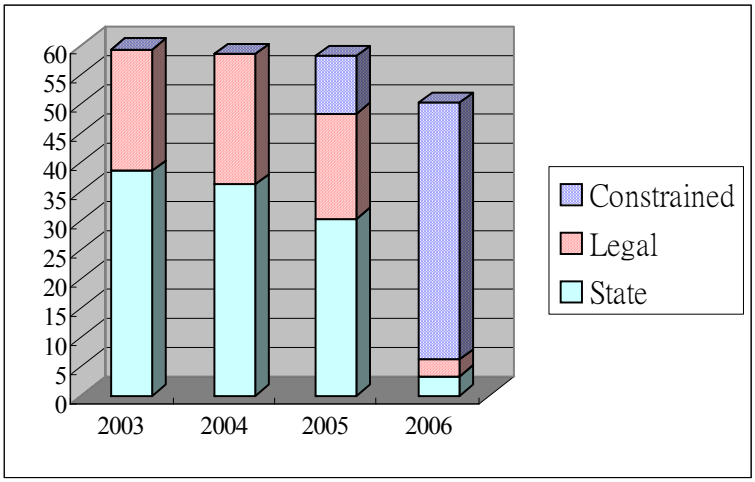

Figure 1: Non-tradable stocks

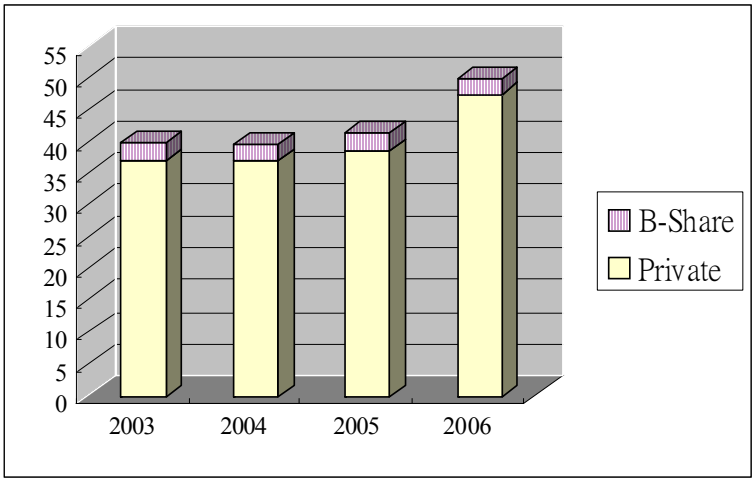

Figure 2: Tradable stocks