

# Essays on International Macroeconomics and Corporate Finance

A Dissertation  
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By

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TO CHINA AND MY PARENTS

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## EXECUTIVE SUMMARY

My dissertation interests lie at the intersection of international macroeconomics and finance. I am particularly interested in the determinants driving financial activity and economic performance in the era of globalization. Most of my research to date has been devoted to three main areas: corporate saving, financing and investment decisions; countries' external balance sheet with valuation effects and macro-finance linkage.

My interest in the effect of financial frictions, institutional environments on decisions of economic agents started with my PhD dissertation. The first essay sheds new light on corporate saving behaviour and determinants, and more importantly, the process whereby firms accumulate savings. The second essay focuses on the consequences of corporate debt financing by examining how ownership structure and financial market development influence firms' leverage choice. The last essay examines valuation effects and investigates its effect on external wealth and excess returns of China.

In the first chapter, I use matched customs and firm-level data from Q1 2002 to Q4 2009 to examine which factors influence corporate savings decisions in China. The investigation illustrates that the precautionary motive plays a crucial role in explaining firms' savings behaviours. I start by documenting that a firm's savings are highly sensitive to its ownership structure. This negative association indicates that private firms tend to save more than state-owned enterprise when firms with valuable future investment opportunities and firms with limited access to finance might accumulate precautionary savings. To address endogeneity concerns, difference-in-difference estimations support the causal impact of precautionary motives on corporate savings. Strikingly, I find that export firms tended to save more during the recent crisis. This finding challenges the mainstream view that an unexpected negative shock would cause a decline in

external demand for the export-oriented industry, causing its savings to drop significantly. One interpretation of the results is that the precautionary motive under financial friction increases corporate propensity to save. The results highlight the importance of developing Chinese financial markets in order to channel savings to investment. One policy implication is that the low dividend payment by state-owned firms is less of a factor in causing the gap between saving and investment than the IMF has suggested.

In the second chapter, I explore the effects of ownership concentration on corporate debt financing decisions when the state is the largest shareholder. Based on the unique institutional environment of China and hand-collected shareholder information, I empirically examine the competing views about the relationship between ownership structure and a firm's leverage choice. Surprisingly, I find that leverage and short-term debt ratio are lower when the largest shareholder is government-related than otherwise. Controlling for other factors, I also provide evidence that higher leverage and short-term debt ratio are associated with less concentrated in ownership structure. Finally, I develop the instrumental variables (IV) linked to financial reform that diffused ownership concentration to identify the causal inference between ownership structure and leverage choice. One interpretation of my results is that capital market frictions in the form of ownership concentration and large government shareholding play an important role in debt financing choice due to financial repression policies.

The final chapter, starting with the methodologies of Lane and Milesi-Ferretti (2007), I construct estimates of China's external assets and liabilities at the market price for the period 1997-2009. In this paper, I study China's net foreign assets position with valuation adjustment and excess returns between gross assets and liabilities. Also, I decompose the returns differential into FDI, portfolio equity, debt and foreign reserves. I show that net foreign assets, which are mainly dominated by

foreign reserve assets and FDI liabilities, have grown rapidly since 2001 and exceeded 35% of GDP in 2009. My most striking and strong finding is the considerable size of negative excess returns as much as 6.6% per year. This occurs mainly because of the asymmetric structure of the external balance sheet of China: short position in equity and long position in debt. Finally, I find a robust return effect: the outstanding performance of inward FDI compared to outward FDI and portfolio equity and debt investment by foreign reserves. This finding indicates that China has not yet transformed from a successful world factory into a profitable world creditor. My findings might facilitate understanding of the external balance of Chinese and foreign reserves with capital account regulation policy under state controlled foreign asset investment.

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# CHAPTER 1

## CAN THE PRECAUTIONARY MOTIVE EXPLAIN THE CHINESE CORPORATE SAVINGS PUZZLE?\*

### Abstract

This paper uses matched customs and firm-level data from Q1 2002 to Q4 2009 to examine which factors influence corporate savings decisions in China. The investigation illustrates that the precautionary motive plays a crucial role in explaining firms' savings behaviors. I start by documenting that a firm's savings are highly sensitive to its ownership structure. This negative association indicates that private firms tend to save more than state-owned enterprise (SOE) when firms with valuable future investment opportunities and firms with limited access to finance might accumulate precautionary savings. To address endogeneity concerns, difference-in-difference estimations support the causal impact of precautionary motives on corporate savings. Strikingly, I find that export firms tended to save more during the recent crisis. This finding challenges the mainstream view that an unexpected negative shock would cause a decline in external demand for the export-oriented industry, causing its savings to drop significantly. One interpretation of the results is that the precautionary motive under financial friction increases corporate propensity to save. The results highlight the importance of developing Chinese financial markets in order to channel savings to investment. One policy implication is that the low dividend payment by state-owned firms is less of a factor in causing the gap between saving and investment than the IMF has suggested.

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## 1.1 Introduction

China's national savings rate as of 2009 is more than twice the overall world rate and finds few historic parallels among other economies. It has increased more than 15 percentage points, from 39% to 54% of GDP over the past five years (IMF, 2010). The extraordinarily high savings rate, which is determined by various economic and institutional factors, results in a large gap between savings and investment, and, therefore, massive current account surplus and global imbalance<sup>1</sup>. Why is the savings rate so high? Not only is the question challenging, but it also has important policy implications<sup>2</sup>. However, previous studies have mainly focused only on household savings in China (Modigliani and Cao, 2004; Chamon and Prasad, 2010).

Several studies find that the real driver of the recent Chinese savings boom is the corporate sector, in which savings shot up to more than 26% of GDP in 2007 from about 15% of GDP at the beginning of the decade (Anderson, 2009). Savings in the corporate sector increased relative to savings in other sectors. According to the IMF (2010), the rise in corporate savings reflects a combination of rapid growth, limited competition, financial underdevelopment, and low input costs. Despite high profits, Chinese firms pay very low dividends in comparison with firms in both developed and emerging markets (Porter, 2009). Therefore, IMF suggests that China should manage high corporate savings by raising the costs of factor inputs (including capital), widening corporate ownership, boosting dividend payouts, and increasing competition in domestic markets.

Goldstein and Lardy (2009) argue that an undervalued exchange rate boosts relative competitiveness and thus corporate profits in the manufacturing sector, which often results in current account surpluses. Lin (2009) emphasizes that in China

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<sup>1</sup> This literature includes Blanchard and Giavazzi (2005); Kuijs (2005, 2006); Aziz and Cui (2007); IMF (2009); Wei and Zhang (2009); Wolf (2006, 2010); Kraay (2000); and Ma and Wang (2010).

<sup>2</sup> Bernanke (2005) analyzes the U.S. current account deficits by focusing on the "savings glut" in emerging Asia and oil-producing countries, which has been said to be an underlying cause for the housing bubble. Portes (2009) points out an underlying cause of the crisis is the interaction of global imbalances with the financial market's "search for yield" when the real interest rate is lower.

the high level of corporate savings can partly be attributed to a financial structure dominated by state-owned banks and an equity market with restricted entry, both of which favour large firms. Similarly, Prasad (2009) notes that the restricted financial system provides cheap capital to favoured firms, most of which are large state-owned firms. As a response, Prasad and others recommend appreciation of the currency and development of the domestic financial market<sup>3</sup>.

In contrast, Bayoumi et al. (2010) employ firm level data to compare the corporate savings rate across countries<sup>4</sup>. First, they find that Chinese firms do not have a significantly higher savings rate (relative to total assets) than the global average because corporations in most countries have a high savings rate<sup>5</sup>. The rising corporate savings rate is also consistent with a global trend. Second, revisiting the aggregate flow-of-funds data<sup>6</sup>, they show that corporate gross savings rates are high and have been rising in a number of countries. South Korea and Japan, in particular, tend to have substantially higher than average savings rates by their corporate sectors. Third, they find no significant difference in the savings behaviour between the majority of Chinese firms that are state-owned and those that are privately owned and publicly listed. In addition, they find that the dividend pay-out ratio averages 16% for Chinese listed firms compared to less than 13% for firms in the rest of the world. Finally, they suggest that, to understand why China's national savings

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<sup>3</sup> Prasad (2009) suggests that a broader array of financial markets - insurance, corporate bond markets, and a variety of derivatives markets such as currency futures—would provide more instruments for savings, borrowing, and hedging risk. Also, more channels for raising funds means firms could rely less on retained earnings for financing their investments.

<sup>4</sup> To my knowledge, this is the first research on the Chinese corporate savings puzzle with firm level data that identifies export firms and excludes financial firms. The previous studies mainly rely on macro level data: expenditure-based and production-based approaches. The latter, so called “flow of fund” statistics, allows for decomposing the national savings by sector.

<sup>5</sup> Interestingly, they note that, to the extent that these financial assets are liquid and significant, corporate savings may be higher than currently reported under their definition.

<sup>6</sup> Bayoumi et al. (2010) also check the quality of macro level from China's National Bureau of Statistics, which have major limitations for studying China's savings. Due to that data limitation, they adopt the definition of firm-level corporate savings to match more closely with that of aggregate corporate savings in the flow of funds data.

rate is so high, the corporate sector is the wrong place to start.

The conflicting results of Goldstein and Lardy (2009), Lin (2009), and Prasad (2009) on the one hand, and Bayoumi et al. (2010), on the other, show that the existing empirical evidence on Chinese corporate savings puzzle is far from conclusive. My aim in this paper is to fill this gap.

First, this paper empirically studies corporate savings behavior in China using an extensive, hand-collected dataset of all publicly listed non-financial firms between 2002Q1 and 2009Q4. Second, the paper explores which factors influence corporate savings decisions; the factors include firm level fundamentals, firm's ownership structure, industry, and local macroeconomic conditions. Third, following Bayoumi et al. (2010), I overcome the data limitations by adopting a measure of corporate cash saving which is closer to a liquidity perspective. In addition, to address the effect of the precautionary motive on corporate savings, I construct a unique database that contains information on ultimate corporate control, ownership concentration and location information. And lastly, I supplement these data by matching them with hand-collected information about export firms in our samples.

In this paper, the empirical strategy not only explores what drives corporate savings, but also studies the joint effects between future investment opportunities (Tobin's  $q$  and industry average  $q$  alternatively) and ownership. To address endogeneity concerns, I apply difference-in-difference (DID) estimations to analyze the change in corporate savings distinguishing between export firms (the treatment group) and non-export firms (the control group) in response to the recent crisis. The financial crisis of 2008 was a negative shock to external demand for the products of export industries, which has not been previously explored. Moreover, as an additional investigation of identification, I conduct a sensitivity check between privately owned export firms and privately owned non-export firms. Finally, I explore the consistency of results by checking the subsample of export firms for robustness.

The results agree with the macro evidence provided by flow of fund statistics. Corporate savings in China are relatively high, which has been a critical factor in the increasing national savings<sup>7</sup>. In contrast to evidence from previous studies, corporate saving by the firms in our sample is negatively associated with state-ownership. This negative correlation indicates that private firms tend to save more, in circumstances when firms with valuable future investment opportunities and limited access to finance might accumulate precautionary savings<sup>8</sup>. Indeed, firms that have accumulated more cash savings tend to have higher leverage, less inventory, a higher share of intangible assets, and higher expected profitable investment opportunities, and tend to be located in areas that give them limited access to the financing available in the wealthier city. Finally, my findings cast doubt on the IMF view that the governance structure of state-owned firms and the resulting low dividend payouts are a major cause of the gap between saving and investment.

The magnitudes of the precautionary motive are both statistically and economically significant. Both DID and joint effect results support the causal impact of the precautionary motive on corporate savings. Surprisingly, firms in the export industry tended to save more during the recent crisis. This finding challenges the mainstream view that the unexpected negative shock would cause a decline in external demand for exports, hence a fall in the export industry's savings. Generally speaking, firms with valuable investment opportunities and volatile cash flow should accumulate precautionary cash balances. This is because, if these firms found themselves short of funds, then they might have to forgo profitable investments. Therefore, firms that might need external finance in the future might choose to save during the good times (McLean, 2011). One interpretation of the results is that the precautionary motive under financial frictions increases the corporate propensity to save. In addition, the effects of the financial crisis on corporate investment support

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<sup>7</sup> The finding of Prasad (2010) is in the line with my predictions: the share of corporate savings has risen markedly, accounting for almost half of national savings by 2007–08.

<sup>8</sup> Almeida, Campello and Weisbach (2004) and Riddick and Whited (2007) respectively find a positive response of cash savings to future investment opportunities.

this story; investment declined significantly following the external demand shock. Finally, after further sensitivity investigation and robustness checks, the findings show that the precautionary motive plays a crucial role in explaining firms' savings behavior.

This paper contributes to several strands of literature. First, it connects with a growing body of research on corporate savings and precautionary motive. Ever since Keynes (1936)<sup>9</sup>, it has been well documented that cash flow volatility could affect firm's cash saving behavior (Opler et al., 1999). The mechanism of corporate saving is consistent with the findings of Carroll et al. (2007) about precautionary saving. In their models, precautionary motive is the response of current spending to future risk, conditional on current circumstances. Similarly results are obtained by Sandri (2010) with a model emphasizing the uninsurable idiosyncratic investment risk. The uninsurable risk of losing invested capital forces entrepreneurs to rely on self-financing, so that when business opportunities open up entrepreneurs increase saving to finance the investment. The idea of financial friction may be playing an important role in precautionary saving is common to other recent insightful papers. Acharya, et al. (2007) develop a model showing that firms accumulate cash savings instead of reducing debt when the correlation between operating income and investment opportunities is low (i.e., "funding gap").

Empirically, Bate et al (2008) find the increase in US's industry cash flow risk as the main determinant of cash saving. They show that the increasing cash saving of US firms may be caused by the precautionary motive. Several studies have also shown that that the higher the level of corporate governance, the more shareholders are able to exercise their rights and prevent firms from hoarding cash (Cardarelli and Ueda (2006)). Kalcheva and Lins (2007) show that cash saving is valued more highly in firms with low agency costs than in firms with high agency costs. To the best of

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<sup>9</sup> Keynes (1936) defined the precautionary motive as preparation for contingencies requiring sudden expenditures or unforeseen opportunities for advantageous purchases. A further motive for holding cash is to hold an asset with fixed monetary value in order to meet a subsequent liability which also has fixed monetary value.

my knowledge, my paper is the first empirical study to systematically explain the Chinese corporate saving puzzle under the precautionary motive.

This paper also contributes to a growing body of research about financial development and state misallocation of saving and investment (Bai et al., 2006; Song et al. 2011). Caballero et al. (2008) present a model to emphasizing heterogeneity across counties in the capacity to provide financial asset due to the level of financial market development. Mendoza et al. (2009) show that lower domestic risk sharing and underdevelopment financial market increase precautionary savings in developing countries.

The underdeveloped financial market also has a role to play in the high level of retained earnings among profitable Chinese firms. One restriction on financing is a ceiling on deposit rates, which means that firms have faced very low or sometimes even slightly negative real rates of return on their bank deposits. Moreover, the lack of alternative financing mechanisms, such as a deep corporate bond market, has led firms to retain their earnings in order to finance future investment projects (Prasad, 2010). Similarly, Lardy (2008) and IMF (2009) suggest that, the more liberalized the financial market, the less firms hoard cash, because they have easier access to funding and are less worried about being shut out of financial markets<sup>10</sup>. My paper also contributes rich evidence of the negative relationship between access to finance and corporate saving within a fast growing economy in an environment where financing opportunities are restricted.

The remainder of the paper is structured as follows. In section II, I provide the basic stylized facts based on macro evidence. In section III, I explain the measurement of variables; describe the sample and sources; present descriptive statistics; and describe the identification methods. In section IV, I report the results of the regressions and sensitivity investigation. In section V, I present various robustness checks. The last section will conclude with policy implications.

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<sup>10</sup> For a more detailed discussion of the role of restricted financing opportunities and an undervalued exchange rate in boosting national saving, see Riedel et al (2007) and Lardy (2008).

## 1.2 Stylized Facts

This section sets out the stylized facts about saving, investment, and financing in China based on annual macro data from the IMF, World Bank, OECD and CEIC. I use the measurement from flow of fund data, which is the less biased estimate, and also adjust the factors for inflation, tax revision and inventory change.

**High National Savings Rate:** Figure 1.1.1 shows China's national savings rate for selected years from 2000-09. The rate rose rapidly, beginning at 40% of GDP, reaching 50% of GDP in 2008, and finally exceeding 54% of GDP in 2009. This has been an enormous increase of more than 14 percentage points over the past nine years. China's large national savings has been mostly absorbed by domestic investment. During 2000-09, the growth in national savings was accompanied by growth in investment, from 35% of GDP in 2000 to 45% of GDP in 2009; the growth in investment, however, was slightly less than the growth in national savings. The saving-investment gap corresponded to a large current account surplus. Figure 1.1.2 shows the international comparison of savings rates from 2000-09. China's national savings rate of 54% is currently more than twice the average savings rate of 27% among advanced economies.

**Rising Corporate, household and government savings:** Figure 1.1.3 provides more detailed information about the decomposition of national saving: corporate (including financial firms), household and government. The corporate savings rate was greater than 23% of GDP in 2007 and more than doubled since the last decade. The share of corporate savings has risen markedly, accounting for almost half of national savings by 2000-07. The household savings rate is high but has remained relatively stable in the past five years. Government savings picked up rapidly from 2004 and rose from 2% in 2000 to the peak of 12% of 2007. Figure 1.1.4 presents the international comparison of the decompositions. China's household saving from 1992-2002 and 2003-07 is much higher than the average level of OECD countries. The corporate and government saving rate of OECD countries from 2003-08 is slightly

lower than China's from 1992-02. However, from 2003-07, China's corporate and government savings increased by more than 10% of GDP. However, the household savings rate only increased about 1%. Overall, the increased corporate and government savings has contributed the most to the rise of China's national savings.

**Restricted financing opportunities and financial market underdevelopment:**

Figure 1.1.5-1.1.7 show the investment, financing and performance between state owned firms and private firms. Investment growth has been especially rapid in non-state owned companies, both private and foreign companies. Private companies are likely the most financially constrained, have limited access to the formal financing market, and have to rely heavily on retained earnings (corporate savings) to finance their investments. On the other hand, since the early 2000s, profits in the corporate sector have risen markedly, especially among private companies. Figure 1.1.9 shows the significant gap between the deposit and lending rate from 2000-2009. Firms have faced very low or sometimes even slightly negative real rates of return on their bank deposits. Also, financial frictions indicate a disincentive to channel savings into investment.

In the following sections, I will use firm level data to compare the saving patterns based on macro data and examine the factors contributing to the accumulation of so much corporate saving. Also, I will take advantage of these unique institutional features in China to explore the effects of different ownership structures on corporate saving behaviour.

### **1.3 Data and Empirical Strategies**

As discussed above, Bayoumi et al (2010) have contributed pioneering work about the Chinese corporate saving puzzle. However, the limitation of their research, as they note, is that, if the question is related to a corporation's access to liquidity, then it would be appropriate to include minority stock investment and inter-corporate loans in addition to deposit and internal cash as savings. In this paper, I will adopt the measure of corporate cash savings which is closer to a liquidity

perspective. The empirical strategy is similar to that used in Mclean (2011) and Frésard (2010). In addition, the annual data of gross saving, which is equal to profits minus dividend, might be under reported<sup>11</sup> as well and more biased at a yearly base. Therefore, I define the cash saving as the holdings of the cash and other liquid assets divided by lagged asset, the liquidity measure of corporate saving<sup>12</sup>.

For the empirical analysis, I construct a unique data base of all non- financial listed companies in China from Q12002 to Q42009. Meanwhile, I collect information of the firm fundamentals, ownership information, industry allocation, location and macroeconomic conditions from various sources. In Table 1.1, I provide detailed definitions of each variable used in the paper. The sample consists of quarterly data on 1721 non-financial publicly traded companies listed on the Shanghai and Shenzhen stock exchanges. I employ the CCER China Stock Database<sup>13</sup> to obtain the stock returns and financial statements. To be included in the sample, a company must have been listed for at least one year, and have filed the necessary financial information required for the analysis. The ownership related data, namely, the percentage of shares held by the large shareholders (the largest to the tenth largest shareholders) and their identity (government-related or not) are collected mainly from annual reports of individual companies.

[Table 1.1 about here]

[Figure 1.2.1 about here]

The China Securities Regulatory Commission (CSRC) claims that a listed firm in China may have six types of shares: state, institutional (or legal person), foreign, insider, employee, and individual shares (A-shares). State shares are either shares retained by the state or shares issued to the state through debt-equity swap when

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<sup>11</sup> Cai and Liu (2009) find that China's firms tend to hide profits to avoid tax.

<sup>12</sup> The cash saving is the measure of the stock value rather than the flow value. Meanwhile, I investigate measure at robustness check section as well.

<sup>13</sup> CCER Database is provided by *SinoFin Information Services*, which is the major financial data service company in China and is funded by China Centre of Economics Research of Peking University. For more information, see Jiang, Lee and Yue (2010, JFE).

privatizing a state-owned enterprise. Institutional shares (also called “legal person” shares) are shares owned by Chinese domestic legal entities, including domestic mutual funds, insurance companies, government agencies and other enterprises. Many of these legal entities are fully or partially owned by different levels of governments (provincial, municipal, or county). Foreign shares are shares owned by investors with non-mainland Chinese residency, including foreign investors and residents of Hong Kong, Macau, and Taiwan.

But, as Chen, Firth and Xu (2009) argue, the reliance of prior studies on the legal definition of shares to infer investor type is very simplistic and ignores institutional realities. Most importantly, legal person shares can be owned by a number of heterogeneous entities, ranging from solely state owned enterprises to private firms. These entities have different objectives and incentives, so grouping them together, as done in previous studies, distorts the results and leads to erroneous conclusions. Similarly, state shares can be owned by different types of investors.

[Figure 1.2.2 about here]

I collected the ownership information by hand to obtain more precise information of the ultimate ownership. This investigation is based on ownership information data from CSRC. The main data used are the largest 10 shareholders for each listed firm, with shareholders’ name, share percentage and ownership type. The ownership data is finally categorized into 4 types: state, domestic institutional, domestic individual, and foreign. I define a dummy “type” for state ownership, which equals one if it is state-owned, and zero otherwise. Overall, state ownership represents 68% of all samples.

Moreover, I exploit the detail of the export firm data from the Ministry of Commerce and Ministry of Customs. I obtain the customs data from the internal statistics, reports and publications of functional agencies (MOC and Customs Clearance of Reporting) between Q1 2002 and Q4 2009. Collecting the export data involves using a web crawler (Java program) to download each individual export

document and hand-matching it with firm level financial data. The dataset also contains information about trade partners and currency transactions. The information and industry allocation is consistent with OECD's China economic studies (2010)'s findings. Finally, I chose the following firms as our industry sample: Major Export Industries in China: C1 Textile, Apparel and Leather; C5 Electronics; C7 Electrical Equipment Manufacturing; G81 Communication and Related Equipment Manufacturing; and G83 Computer and Related Equipment Manufacturing. Overall, my sample consists of 11,582 observations of our export firms, which represent 27% of all samples.

Table 1.2 presents the sample distribution. Panel A reports the yearly distribution; Panel B shows the industry distribution following CSRC classification; Panel C provides the information about ownership distribution. Panel D presents the export firm distribution. Also, I report the distributions within industry by ownership types.

[Table 1.2 about here]

[Table 1.3 series about here]

[Figure 1.3 series about here]

Table 1.2 and 1.3.1 report some descriptive statistics for our sample. In total, I have 11,036 firm-year observations. Chinese firms all have December year-ends, and the financial information for year  $t$  is based on fiscal year-end  $t-1$  financial reports. I report the mean, median, and standard deviations for the variables. All variables are winsorized at 1% and 99%, except for reform dummy variable, ownership measures, and macroeconomic and location indicators. The average cash saving in our sample is 15.1% of firm assets, which is high but not exceptional among the highest global level<sup>14</sup>.

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<sup>14</sup> For international experience, see Kalcheva and Lins (2007) and Lin, Servaes and Tufano (2010). The overall mean is 12%, which ranges from a low of 4% for firms from Argentina to a high of 16% for Norwegian and Japanese firms.

Table 1.3.2 reports some descriptive statistics for our sample by ownership. Notably, the average cash saving over total assets of private firms is 1.3 percentage points to higher than state- owned firms. Table 1.3.3 reports some descriptive statistics for our sample by expert industry. The average cash saving over total assets of export firms is 2.1 percentage points to higher than non-export firms. Table 1.3.4 reports some descriptive statistics for our sample within export industries. The average cash saving over total assets of private export firms is 1.1 percentage points to higher than state- owned firms. Table 1.3.5 reports some descriptive statistics for our sample between industries by ownership. The average cash saving over total assets of private export firms is 2.5 percentage points to higher than private non-export firms. Table 1.3.6 reports some descriptive statistics for our sample before-after financial crisis. The average cash saving over total assets of firms after 2008Q1 is 2.3 percentage points to higher than before the crisis.

[Figure 1.4-1.8 series about here]

Figures 1.4-1.8.2 show the cross sectional average of cash savings from 2000-2009 by ownership, industry and within subsamples. To summarize, our firm level corporate saving pattern is similar to the pattern shown by the macro data. In the next section, I will employ different identification techniques to explore the drivers of corporate savings.

### **1.3.2. Empirical Strategies**

Why do corporations save cash and liquid assets? In particular, Almeida, Campello and Weisbach (2004) present the idea of precautionary cash savings. Specifically, they show that, when future projects are valuable and when future external financing is uncertain, corporate saving becomes a key element of a firm's financial choices. This is consistent with the general view that enhanced financial flexibility, in other words, ensuring a firm's ability to finance present and future investment undertakings, is the main goal of managers' financial decisions. They show that firms save more intensively when they anticipate valuable future growth

opportunities - when their Tobin's q (market-to-book ratio) is high – and when their access to external financing is limited (Frésard, 2009).

To explore why Chinese corporations accumulate huge savings, I analyse the factors that influence their saving decisions. Following the approach by Bates, Kahle and Stulz (2009) on the U.S. experience, I employ three kinds of regression techniques to examine the effects from firm fundamentals, ownership, and macroeconomic conditions. To start with, I apply the baseline regression with OLS, random effect and fixed effect regressions. Also, I conduct an additional test of the joint effects of ownership, investment opportunities, and access to finance. I start with a baseline estimate of cash saving by the following reduced form regression

$$Saving_{j,t} = \alpha + \beta_1 Ownership_{j,t} + \sum_{i=2}^n \beta_i FirmFactors_{j,t-1} + \delta AccessFinance_t + Contols + \eta_k + \lambda_c + \theta_t + \varepsilon_{k,c,t} \quad (1)$$

The dependent variable in all regressions is the natural log of (cash saving/ total assets). With this specification, the coefficient  $\beta_1$  is interpreted as measuring the correlation between saving and state ownership (government agencies, state-owned firms, and state controlled firms) of the firm in contrast to private ownership (domestic institutions, individuals and foreign entities), holding constant sector, macroeconomic indicators, time, and other firm characteristics. The coefficient  $\delta$  is interpreted as measuring the correlation between saving and access to finance, which indicates the local financial market's development, holding constant sector, macroeconomic indicators, time, and other firm characteristics. In the following panel regressions, I also control for the firm-specific and macro level factors, sector ( $\eta_k$ ), province ( $\lambda_c$ ) and time ( $\theta_t$ ) effects, where, for firm i in year t, all independent variables are as defined in Table 1.1.

Regarding the firm level factors, I examine the series of variables that are generally believed to affect the marginal costs and benefits of cash saving<sup>15</sup>. I also adopt major factors summarized from Cardarelli and Ueda (2006). Their finding is

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<sup>15</sup> See Opler et al. (1999) for a summary of firm level factors on corporate cash saving.

that firms that have accumulated more cash saving relative to their total assets tend to have higher leverage, a higher share of intangible assets, and higher Tobin's  $q$  (which proxies for higher expected profitable investment opportunities). At the same time, however, cash-rich firms are also the ones with larger excess cash flow (the difference between gross savings and capital spending), suggesting that strong profitability has also played a role.

Moreover, most studies use Tobin's  $q$  based on stock market valuation to capture future investment opportunities. Riddick and Whited (2009) question whether those explain a firm's propensities to invest because they did adjust for measurement error in Tobin's  $q$ . Also, the market to book value of  $q$  might be systematically biased and serially correlated (Bond and Cummins, 2001). Following the approach by Kalcheva and Lins (2007), I adopt the less biased measurement, industry average  $q$ . I also study the interaction with ownership and further interaction with access to finance. I expect to shed light on more sensitive impacts on cash saving by checking the joint effects.

Turner (1988) finds that the domestic savings are negatively related to the real exchange rate. Recently, Antràs and Caballero (2009) study how financial frictions and the saving rate shape the long-run effects of trade liberalization on income, consumption and the distribution of wealth in financially underdeveloped economies. I also include access to finance, macroeconomic conditions, and location proxy into my analysis. I employ an indicator variable denoting whether the firm is based in a city that is an Economic Zone or SEZ (Shenzhen, Zhuhai, Xiamen, Shantou, and Hainan) as a measure of trade openness. Generally speaking, SEZ cities have more liberal trade policies than other local governments, particularly for private and foreign firms (see Calomiris, Fisman and Wang (2010) for an extended discussion). Also, I use an indicator variable denoting whether the firm is based in a city located in a coastal area. Usually, coastal cities have better access to the global market in terms of international trade.

Opler et al. (1999) found that firms tend to hold more liquid assets if their

industry has average cash flow volatility. From this approach, I note that cash savings vary with industry characteristics. To address the endogeneity concerns, I adopt the difference-in-difference approach in which I compare the saving behaviour of export firms before and after the financial crisis. The financial crisis allows us to test the effect of an unexpected external demand shock on export firms; I find that the shock has had direct impact on corporate saving behaviour.

To identify the sensitivity results, I analyse the private firms only between treatment group and control group. Of course, the firm fixed effects subsume the level effect of cash saving and control for all sources, observed or unobserved, of time-invariance in Tobin's  $q$  across firms. Standard errors are heteroskedasticity-consistent and clustered at the firm level, following Duchin, Ozbas and Sensoy (2010). The following specification will be employed to identify the causal impact between precautionary motive and corporate savings by employing difference-in-difference (DID) estimation.

$$\begin{aligned}
 Saving_{i,t} = & \alpha_1 + b_1Crisis_t + c_1Export_i + d_1Export_i * Crisis_t + \beta_1Ownership_{j,t} \\
 & + \sum_{i=2}^n \beta_i FirmFactors_{j,t-1} + \delta AccessFinance_t + Control + \varepsilon_{i,t} \quad (2)
 \end{aligned}$$

Where  $Crisis_t$  is a dummy variable for the financial crisis period, which started in 2008 Q1. The dummy variable  $Export_i$  captures possible differences between exports and non-exports groups prior to the crisis shock. The time period dummy,  $Export_i$ , captures aggregate factors that would cause changes in saving even in the absence of a policy change. The coefficient of interest,  $d_1$  multiplies the interaction term,  $Export_i * Crisis_t$ , which is the same as a dummy variable equal to one for those observations in the treatment group in the second period. Importantly, the coefficient of interest,  $d_1$ , measures the cash saving gap between export firms and others after the financial crisis.

The DID method is appropriate if the control group and treatment meet up with common shock and treatment is random. In this paper, the cash saving decision might be the function of unobservable factors. For example, the effects of ownership

structure from export and other firms might obscure our result. Due to this concern, I select the subsample of privately owned firms from export and non- export firms, and then apply DID estimation to explore the robustness of the result. In addition, I also provide evidence of the determinate of investment regression, which is consistent with our results.

## **1.4 Results**

In this section, I first report the results of our cash savings regression models and joint effect regression models and then report difference-in-difference results of our cash saving and investment model.

### **1.4.1. The Baseline Regressions of Cash Saving**

Table 1.4 shows that changes in firm characteristics are the major drivers of cash saving from 2002Q1 to 2009 Q4.

In model (1), I attribute the increase in cash savings to changes in specific firm characteristics. First, leverage and cash savings are positively and significantly related. This is consistent with previous research suggesting that it is more worthwhile for firms to reduce debt than to hold more precautionary cash balances when leverage is high (Opler, et al, 1999). Second, cash savings are negatively associated with “hard” assets such as inventory, receivables, and fixed capital, which is consistent with international experience (Capkun, and Weiss, 2009). Third, size displays a positive sign, indicating that larger firms tend to save more cash. Fourth, the fixed asset over total asset, the index of the tangibility of firms, is negatively correlated with cash saving. It means that firms characterized by a larger share of intangible assets (e.g., patents and goodwill) should hold more cash savings, given the higher cost of external finance for these type of non-collaterizable assets, also consistent with global evidence by IMF (2006).

Importantly, the investment opportunity, measured by Tobin’s  $q$  and industry average  $q$ , is positively correlated with a firm’s cash saving. It suggests that a firm

with a higher Tobin's  $q$  should accumulate more cash, as cash shortages would mean these firms have to forgo highly profitable projects, which is in line with Aleida, Campello and Weisbach (2004). Finally, similar to the finding of size effect, the profitability proxy, ROA (return of asset), is positively related with cash saving. It also suggests that better performing firms accumulate large cash savings.

[Table 1.4 about here]

In model (2), I start by documenting that corporate savings are sensitive to ownership structure. Specifically, model (2) of table 1.4 includes the state ownership dummy and concentration index, HHI5, in the analysis. Interestingly, I observe a negative and significant association between cash saving and state ownership, with a coefficient for state dummy estimated at 0.004, significant at less than the 5% level. It indicates that privately owned firms tend to accumulate higher cash savings. Also, firms appear to save more when they have more concentrated ownership. Firms with a more concentrated ownership structure are likely to save more cash, which is in line with the finding that, the greater the voice the shareholders have in governance, the more shareholders are able to exercise their rights and prevent firms from hoarding cash (Cardarelli and Ueda, 2006).

Model (2) presents the most important finding of this paper. This finding confirms the idea that, on average, private firms accumulate more cash savings compared with state owned firms. Based on the annual income statement, Bayoumi et al (2010) find that there is no significant difference in savings behaviour between Chinese majority state-owned and private listed firms. My results are different from their findings due to my high frequency and quality quarterly data <sup>16</sup>and more precise measurement of savings.

In model (3), I observe the positive relationship between macroeconomic condition (log GDP per capital) of firm location and cash saving. This relationship indicates that, on average, a firm tends to save more in a wealthier city. This suggests

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<sup>16</sup> I take advantage of using quarterly data over yearly data from 2002Q1 to 2009Q4. The high frequency of quarterly data allows us to have more observations to measure cash saving within 7 years.

that the relationship of “Piercing the Corporate Veil”<sup>17</sup> between household and corporate saving would not hold in China.

Also, firm located in economic zones and coastal areas tends to have higher saving. One explanation might be that they are more open to international trade compared with other areas, and thus might accumulate more cash saving due to the firm gaining more profits by exporting abroad based on cheap exchange rates.

Furthermore, I find the negative relationship between cash savings and access to finance, which is the measurement of financial development. This finding suggests that firms located in more financially developed cities tend to have less cash saving. This finding provides evidence that, on average, firms accumulate more cash savings when they have limited access to finance because they are located in a city with a less developed financial market.

In models (4) and (5), our results of fixed effect and random effect are consistent with model (3). In summary, in the table 1.4, I find that inventory is negatively related to cash savings. Larger firms tend to have higher cash savings. So do firms with a larger share of intangible assets, higher leverage and investment opportunity (Tobin’s  $q$  and industry average  $q$ ), and more concentrated ownership, as well as firms in coastal and economic zones. Macroeconomic conditions also affect cash savings.

The baseline regressions of cash savings present the central findings of my paper, which will be checked in the following section. In table 1.4, using insights on ownership and access to finance, I explore why private firms tend to accumulate more cash savings<sup>18</sup>.

#### **1.4.2 Interaction Effects Regressions of Cash Saving**

In table 1.5, I directly assess whether ownership and investment opportunity

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<sup>17</sup> Poterba (1987): indicates that, in the United States, a \$1 increase in corporate saving is likely to reduce household saving by \$0.50-0.75.

<sup>18</sup> A similar result has been provided by Cull and Xu (2005). They find that the share of private ownership has a positive effect on profit reinvestment rates.

affect a firm's cash saving decision. I regress cash saving with an interaction between ownership and investment opportunity (Tobin's  $q$  and Industry average  $q$ ) and a further interaction between ownership and access to finance.

In model (1) through model (3), I examine whether the absence of a relationship between investment opportunity and cash savings changes when ownership is explicitly considered. To accomplish this, I add an interaction term between Ownership and Tobin's  $q$ , but find that this interaction is significant only at random effect regressions. In contrast, if I interact ownership with industry average  $q$ , I find that cash saving has a significantly negative correlation with the interaction between industry  $q$  and ownership dummy. Overall, the first two models of Table 1.5 indicate that cash savings are highly sensitive to ownership. Also, when industry average investment opportunity is more profitable, private firms tend to save more.

[Table 1.5 about here]

In addition, in model (1)-(3), I repeat the previous tests using the interaction between ownership and access to finance. As a result, cash saving is significantly and positively related with the interaction between access to finance and ownership. This finding suggests that private firms tend to save more when the firm is located in a city with less developed financial markets. However, this joint effect does not apply in random and fixed effects models.

Consistent with model (3), model (4)-(5) shows what is driving cash savings when a firm is privately owned, if we only consider the industry average  $q$ . Therefore, I estimate the model with an interaction between Industry average  $q$  and ownership. As discussed above, the results show that the coefficient is negative and more significant than the results in Model (3). Meanwhile, the result of access to finance has not changed too much and is still negatively correlated with cash saving. When we include the location index for a coastal city, we still observe the positive correlation and significance at less than the 5% level. The results show that if we control for industry average investment opportunity, firms at coastal cities appear to

accumulate more cash savings.

Models (7)-(9) repeat tests similar to model (4)-(6), using the interaction between industry average  $q$  and ownership dummy. In model (7), I include the economic zone in the analysis and find that the sign has not changed and is significantly correlated with firm's cash savings. The joint effect between ownership and industry average  $q$  and between ownership and access to finance are consistent with what we find in previous regressions.

Taken together, our results on the determinants of cash savings in Table 1.5 provide some explicit evidence that investment opportunity, with its associated ownership structure, is linked to higher levels of cash savings. Also, our results present an interesting joint relationship between ownership and access to finance. The interaction regressions suggest that private firms in cities with less developed financial markets<sup>19</sup> tend to accumulate more cash savings. However, the explanatory power of industry average  $q$  is better when we exclude Tobin's  $q$ . Therefore, after more sensitivity checks by ownership dummy, it is clear that privately owned firms have sufficient internal resources, which might enable them to better cope with future investment opportunities, particularly when their access to capital markets is limited. Therefore, when privately owned firms find themselves short of funds, they might have to forgo profitable investments. In the next section, I will identify the precautionary motive for firms to accumulate cash savings during a crisis.

#### **1.4.3. Difference in Difference Regressions of Cash Saving and Investment**

In the baseline regression section, we find that private firms tend to save more when firms with valuable future investment opportunities and limited access to finance might accumulate precautionary savings. How can we identify the causal relationship between cash saving and precautionary motive? The global financial crisis of 2008 created an opportunity to draw crisp inferences about corporate saving and investment behavior. In line with recent crisis studies by Ivashina and

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<sup>19</sup> Our results are consistent with the recent survey by Ayyagari, Demirguc-Kunt and Maksimovic (2010) about "formal versus informal finance in China."

Scharfstein (2009) on bank lending, Campello et al. (2010) on liquidity management and investment, and Duchin, et al. (2010) on external finance and investment, I employ the difference-in-difference method to shed light on the effect of a financial crisis on corporate cash saving and investment decisions.

To analyze the impact of a crisis on corporate cash saving and investment, I first examine the change in cash saving between export firms and non-export firms, both in the pre-crisis and after-crisis period. The model (1) at Table 1.6 presents the estimations from the firm level factors. It shows that the quarterly cash saving over assets by the average firm significantly increased by 1.3 percentage points after the crisis. The magnitude of rising cash saving is consistent with the aggregate statistics. In addition, I find negative correlations between cash savings with inventory. The coefficients of leverage, size, intangibility, Tobin's  $q$ , Profitability (ROA), Industry Q and cash saving remain significantly positive.

[Table 1.6 about here]

In model (2), I include the ownership structure in the analysis. First, there is a significantly positive correlation between the crisis interactions with the export firm dummy and cash saving. It indicates that corporations saved more cash after the crisis. Also, I again find negative correlations between cash savings with inventory. The coefficients of leverage, intangibility, profitability (ROA), Industry Q and cash saving remain significantly positive. As a result, I find the state owned dummy is negative correlated with cash saving. Moreover, the ownership concentration index is positively related with cash saving. Those findings show that private firms and firms with more concentrated ownership save more, controlling for other factors.

In model (3), I include the factors of macroeconomic condition, location and access to finance into our analysis. The previous results are fairly stable and similar. Except for the positive impact between crisis and firm cash saving, I find that, on average, wealthier cities tend to have high corporate cash saving. Similarly, firms located in coastal cities and economic zones have higher cash saving. Furthermore,

the relationship between access to finance, the measurement of financial development, and cash saving appears negative. It shows that firms located in cities with more developed financial markets tend to accumulate less cash savings. Notably, all of the results are statistically significant and remain statistically significant under each model.

Overall, Table 1.6 displays the difference-in-difference method to identify the impact on cash saving during the crisis period. The financial crisis of 2008 provides a direct negative shock to the external demand of export industry. Therefore, I simply select the export firms as the treatment group and other firms as the control group. The fairly stable results show that corporate cash saving increases significantly following the crisis. Additional fixed effects and random effects regressions also show that export firms increased cash saving significantly during the crisis period.

This finding challenges the mainstream view of the positive relationship between cash reserves and product market performance (Frésard, 2010). The implication from established studies is that the worse performing firms might tend to have less saving. After the crisis of external demand shock, export firms should have had worse performance and then lower savings. This paper shows that, after the negative external demand shock, the declining performance of export firms tended to increase the cash saving ratio<sup>20</sup>. One interpretation of this result is that the precautionary motive under financial friction increases corporate propensity to save. Especially in the case of restricted financing opportunities and less developed financial markets, private firms have to hoard cash for future investment opportunities. Therefore, firms retain cash for precautionary reasons. As a result, having sufficient internal resources enables them to cope better with external shocks, particularly when their access to finance is limited.

[Table 1.7 about here]

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<sup>20</sup> Table 1.3-1.6: the summary statistics by crisis period also show the declining profitability of the export firms. The difference of average ROA remains significantly negative after the crisis.

Table 1.7 presents several analyses to address concerns about plausible impacts on corporate investment. Model (1) shows that investment as a fraction of assets declined by 4 percentage points during crisis periods. This result is consistent with the average summary statistics that the average capital expenditure decreased after the crisis. Similarly, in model (2) and (3), with further investigations of random and fixed effects, I find that investment and Tobin's q decline significantly following the crisis. During a crisis, when the precautionary motive causes firms to save more, they forgo current investment opportunities, although the resulting cash reserves may position them to take advantage of future investment opportunities..

## 1.5 Robustness Checks

To assess the validity of the results, I employ several robustness checks in this section. One concern is whether an export firm's cash saving behavior is driven mainly by ownership structure. In addition, state owned firms might not share the same factors as private owned firms have.

To address these concerns, I repeat the difference-in-difference approach again only for private owned firms. The treatment group would be the privately owned export firms and the control group would be other private owned firms. Table 1.8 shows that the quarterly cash saving over assets by the average firm significantly increase by 1.7 percentage points after the crisis. The coefficients for OLS, Fixed effect and random effect are higher than all samples above.

[Table 1.8 about here]

In addition, I again find negative correlations between cash savings with inventory. On the other, the coefficients of intangibility, ROA, industry Q and cash saving remain significantly positive. Moreover, the ownership concentration index is positively related to cash saving. The findings show that firms with more concentrated ownership save more, controlling other factors. In table 1.8 I find that, on average, wealthier cities tend to have higher corporate cash saving. Similarly, the firms located at coastal cities and economic zones have higher cash saving.

Furthermore, the relationship between access to finance, the measurement of financial development, and cash saving appears negative.

In addition to the fact that state owned firms can easily access finance, we also have to consider the supports or subsidies from the government. Because of the different characteristics of state owned firms, I exclude them from the DID regressions. Our regressions remain stable with statistically significant results for privately owned firms when we remove the effect of state owned firms, which are 69% of the sample.

Another potential issue related to the sampling is whether export firms have a unique pattern of corporate savings and drivers. To test whether the relationship between cash savings, ownership structure, investment opportunity and ROA are different for firms of different industries, I split the sample into export firms and others. In table 1.9, I replicate the similar baseline and interaction factors regressions and provide more robust results within the export industry.

[Table 1. 9 about here]

In model (1), the results of most firm level factors remain stable and consistent with previous studies. However, I cannot find the significantly negative correlation between ownership and cash savings. Also, the power of explanation has declined and the joint effect between ownership and Tobin's q is not significant. Moreover, the correlation between coastal city, economic zone and cash saving is not significant either. Fortunately, in model( 2) and (3), ownership and cash saving are significantly negative correlated at fixed effect and random effect regressions. As a matter of fact, privately owned export firms also have high cash saving compared with state owned export firms.

In model (4)-(6), I find no relation between cash saving and the interaction between ownership and investment opportunity (Tobin's q and industry average q). However, the coefficients of ownership and cash saving are significant negative. Those finding suggest that, within the export industry, private firms tend to save

more. Moreover, the results show that leverage, ROA, inventory and industry average  $q$  are sensitive to cash saving. On the other hand, the relationship between access to finance and cash saving provides the evidence that corporations save more if they are located in cities with less developed financial markets.

## 1.6 Conclusion

The increasing importance of China in the world economy contrasts with our limited understanding of how firms have achieved remarkable success in expanding growth and accumulating huge amount of savings. The issue of high saving in China has recently attracted much attention, in large part due to the heavily debated issues about global imbalance and the financial crisis. Prior dominant views about corporate saving have two totally different opinions. IMF (2009) finds that the high corporate savings rate is mainly due to corporate governance problems in state-owned firms, especially the low dividends paid out by those firms. On the other hand, Bayoumi et al (2010) find that there is no significant difference in the savings behaviour and dividend patterns between Chinese majority state-owned and private listed firms.

In this paper, from the liquidity perspective, I take a careful look at the saving decisions of Chinese firms, using a hand-collected database of all publicly traded companies in China from 2002Q1 to 2009Q4. I find that privately owned firms and export firms remain significantly higher in corporate cash saving. This paper shows that the precautionary motive plays a crucial role in explaining firms' savings behaviors. This negative association indicates that privately owned firms tend to save more precisely when firms with valuable future investment opportunities and limited access to finance might accumulate precautionary savings.

To address endogeneity concerns, difference-in-difference (DID) estimations support the causal impact of the precautionary motive on corporate savings. Surprisingly, I find that export firms tended to save more during the recent crisis. My interpretation of our results is that the precautionary motive under financial friction

increases corporate propensity to save<sup>21</sup>.

My findings have several policy implications. The usual view of corporate governance of state owned companies suggests that state owned companies should pay dividends. In my approach, however, I find that the precautionary motive and ownership structure play crucial roles in explaining firms' savings behavior. As evidence of the precautionary motive, private firms have a higher saving rate. Therefore, how to encourage the investment of private savings, rather than the dividend behavior of SOE, turns out to be central to the debate.

Finally, it is worth mentioning that not only private firms but export firms have more cash savings. Why do export firms accumulate high cash savings as well? The relationship between exchange rate policy and corporate cash saving might receive more attention and further investigation.

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<sup>21</sup> The alternative approach will be the effects of international capital market. This is material for future research.

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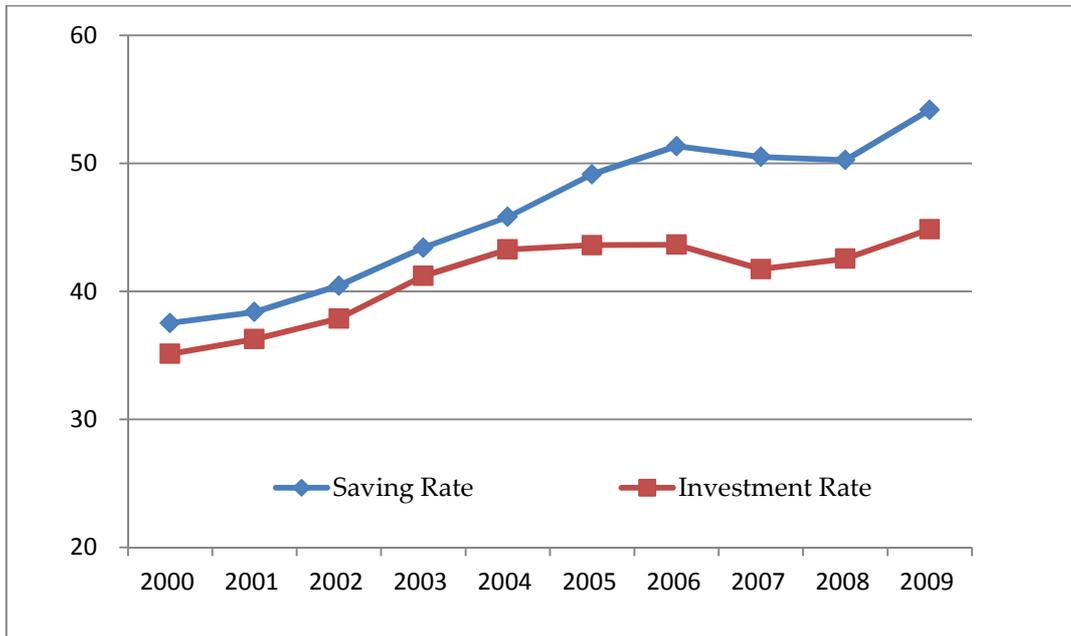
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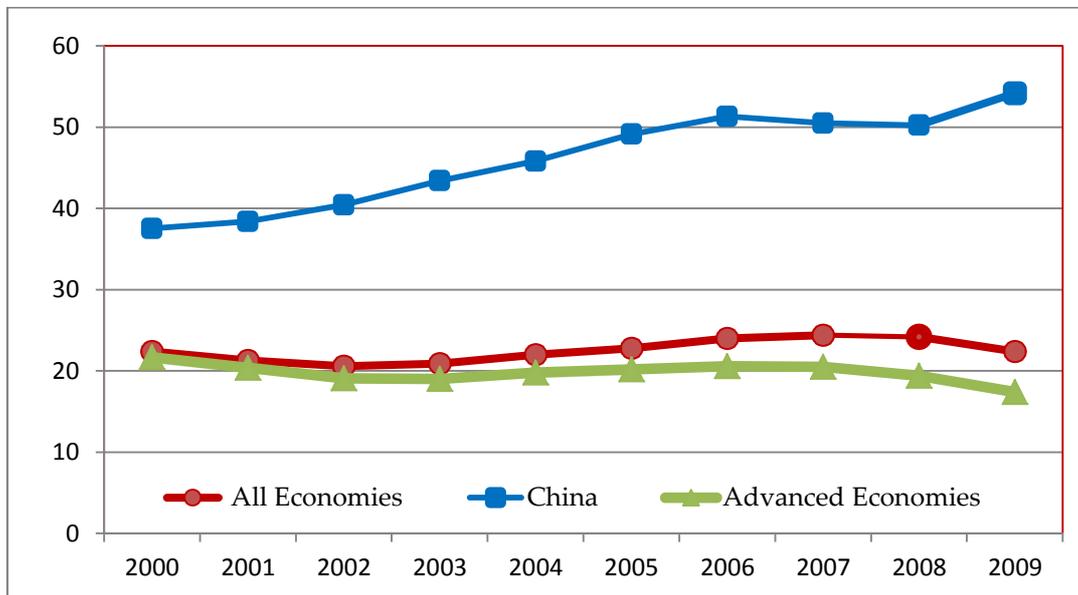
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**Figure 1.1.1**  
**China: National Saving and Investment (% GDP)**

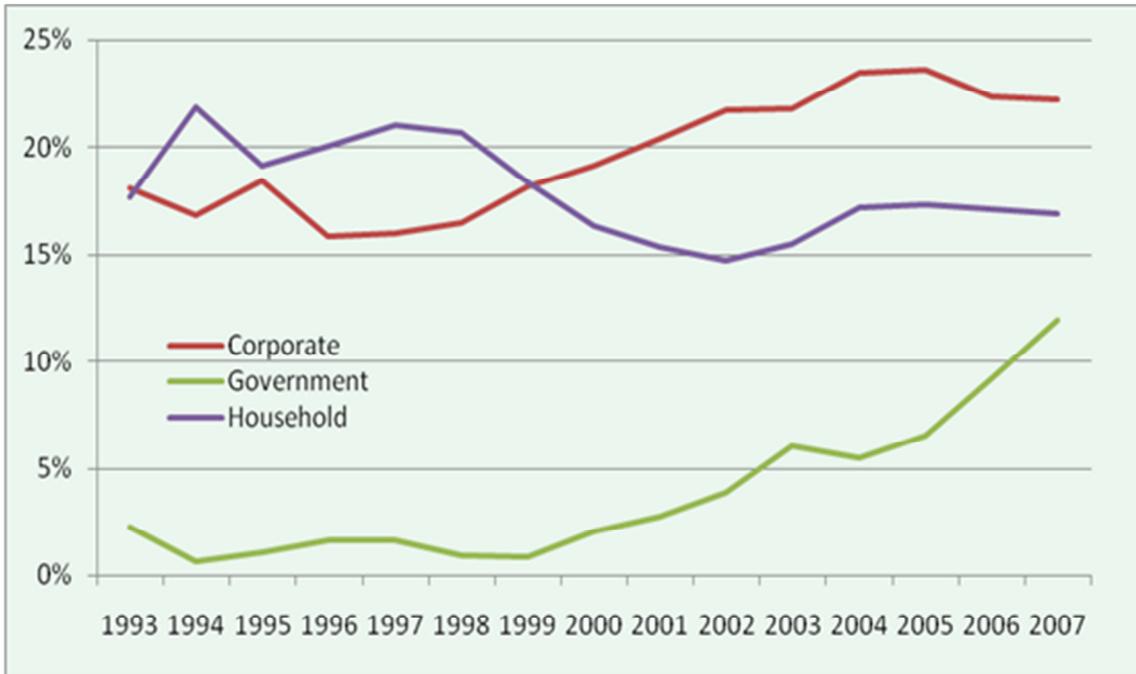


**Figure 1.1.2**  
**National Saving (% GDP): International Comparison**

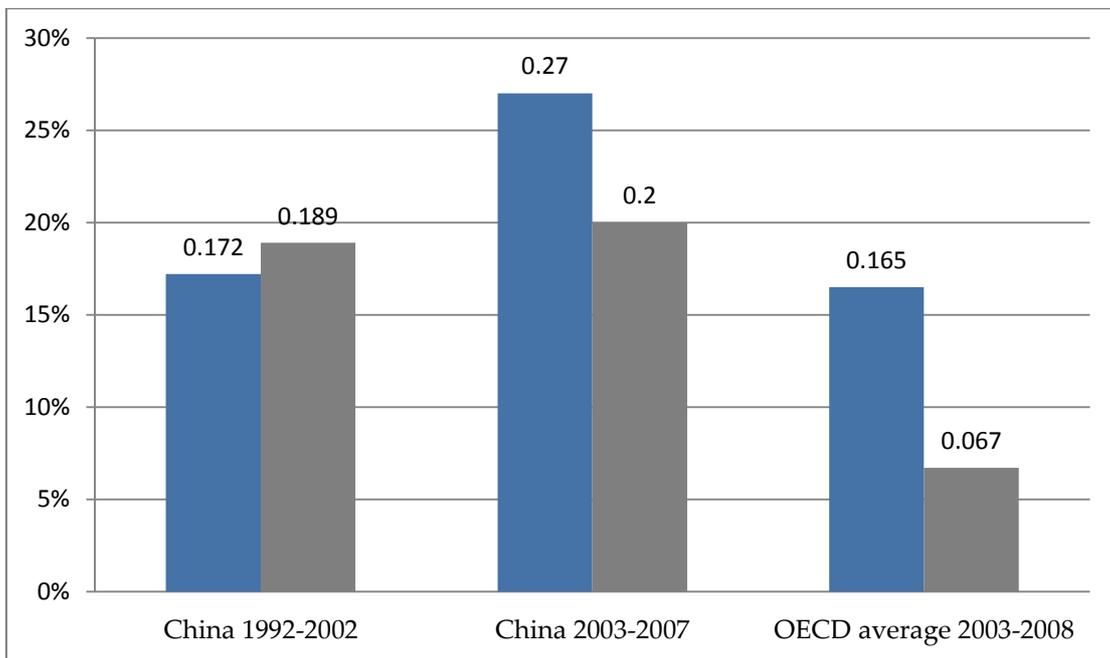


Source: China Statistical Yearbook, CEIC, IMF and OECD, 2010

**Figure 1.1.3**  
**China: National Saving Decompositions (% GDP)**



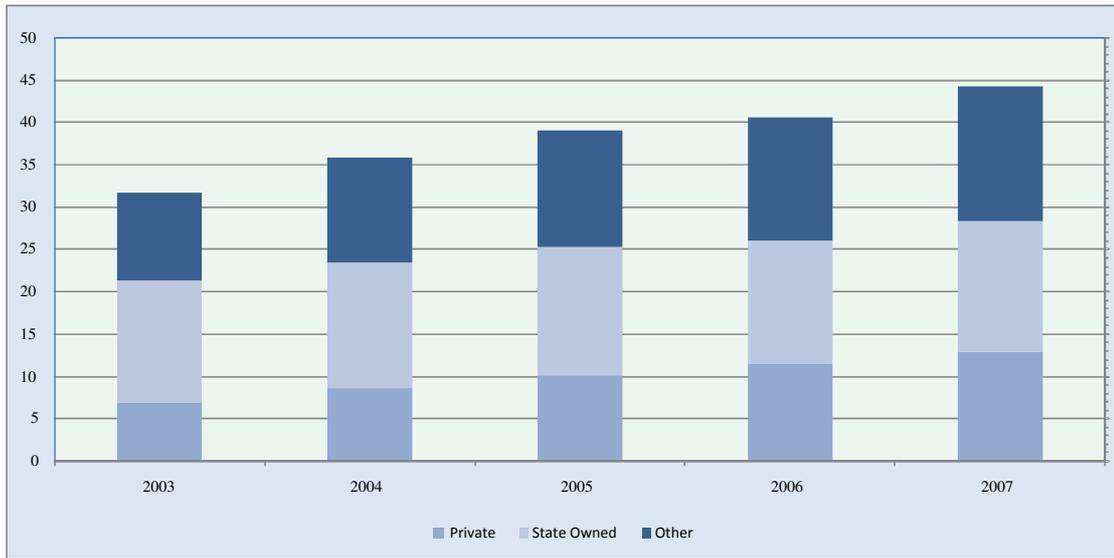
**Figure 1.1.4**  
**National Saving Decompositions: International Comparison (% GDP)**



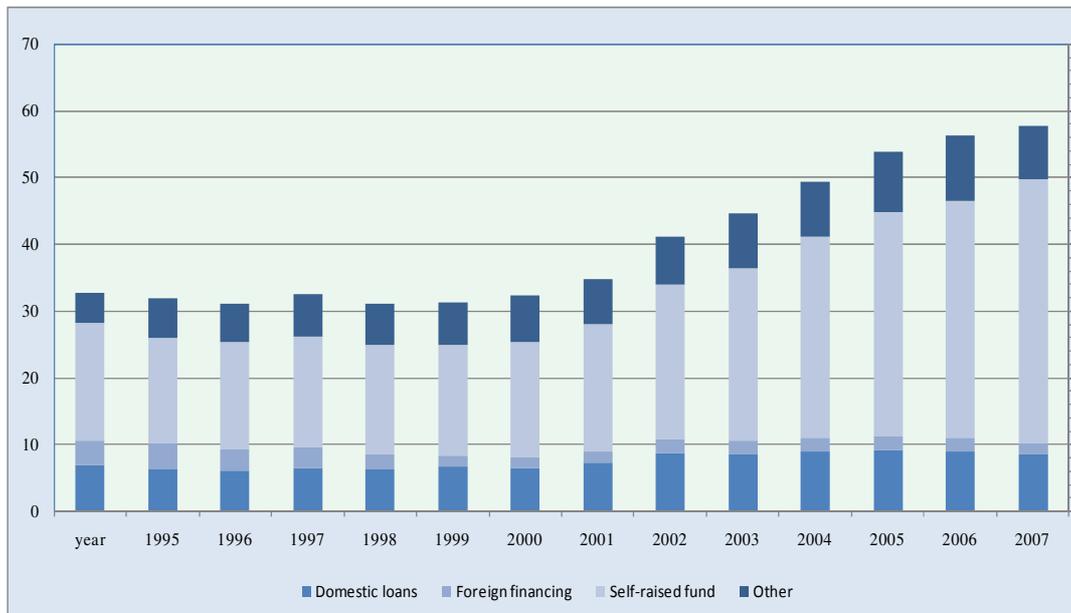
**Corporate Saving+ Government Saving/ GDP**  
**Household Saving/ GDP**

Source: China Statistical Yearbook, CEIC, IMF and OECD, 2010

**Figure 1.1.5**  
**China: Domestic Enterprise Investment Spending (% GDP)**

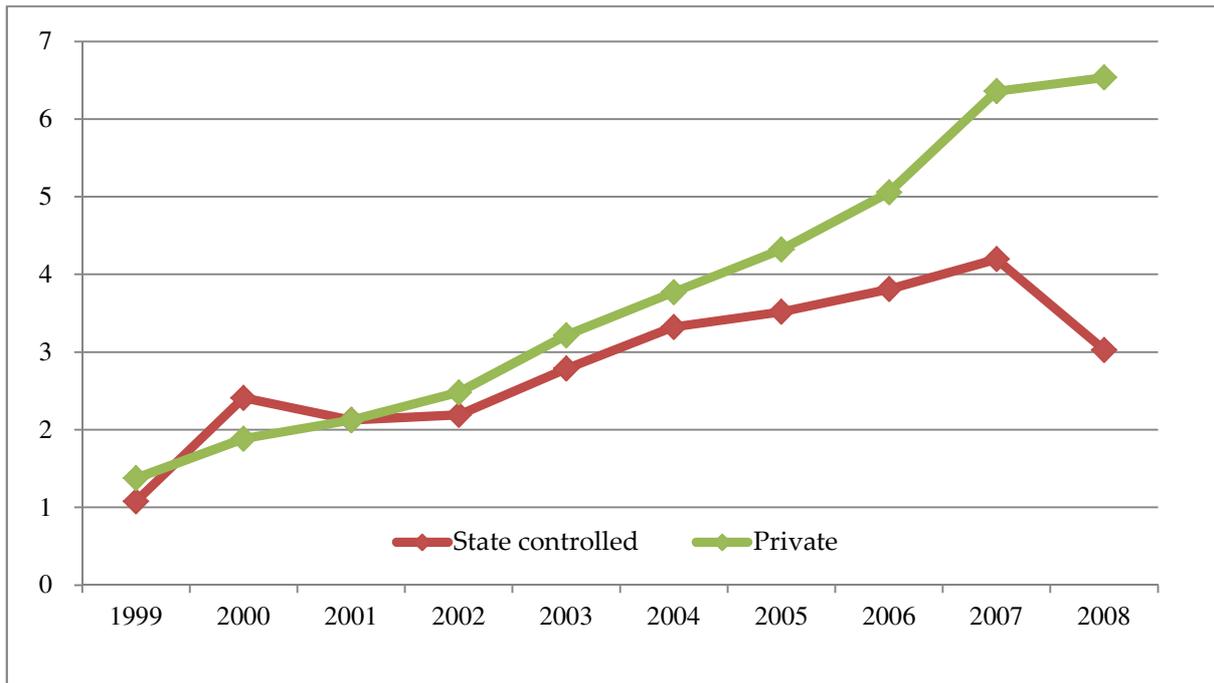


**Figure 1.1.6**  
**China: Fixed Asset Investment Financing (% GDP)**

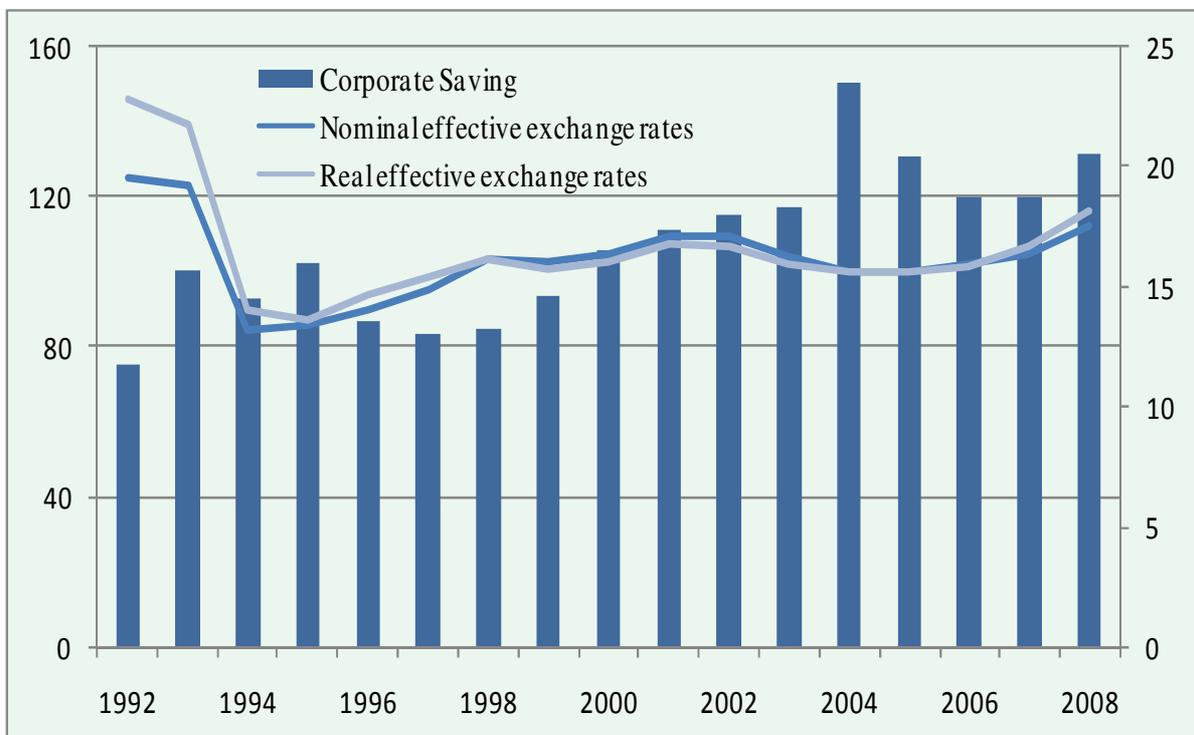


Source: China Statistical Yearbook, CEIC, IMF and OECD, 2010

**Figure 1.1.7**  
**China: Industrial Enterprise Profits (% GDP)**

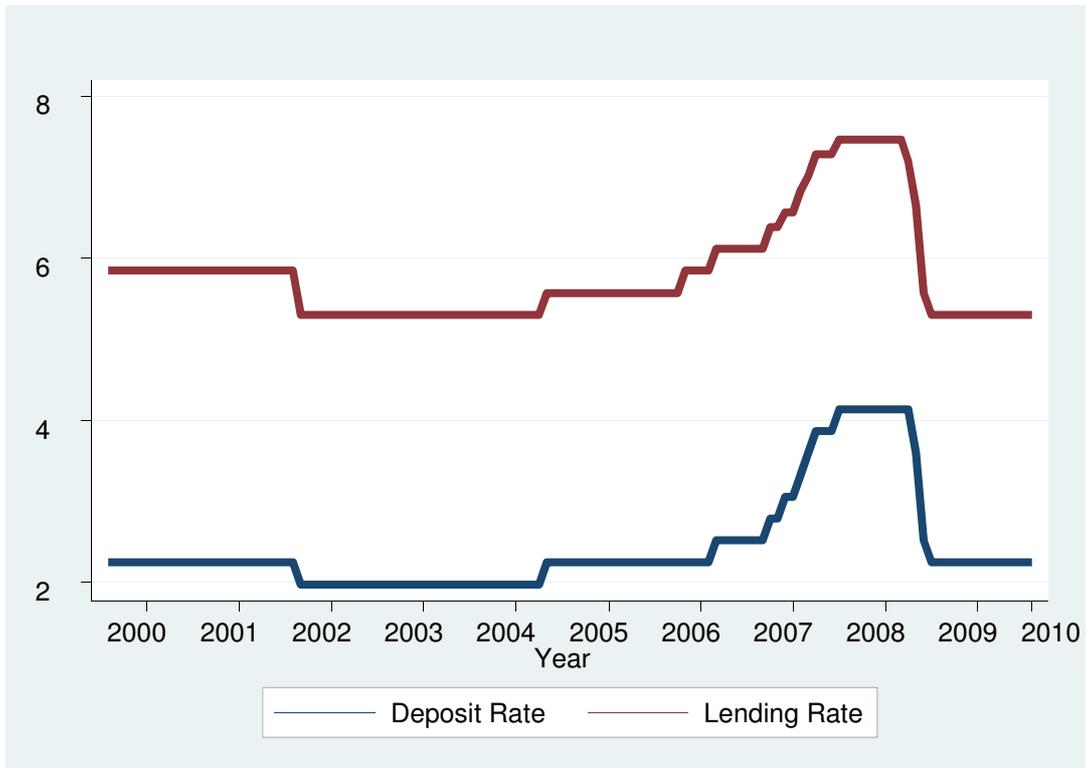


**Figure 1.1.8**  
**China: Corporate Saving Rate and Exchange Rates Movement**  
**(%Y to Y)**

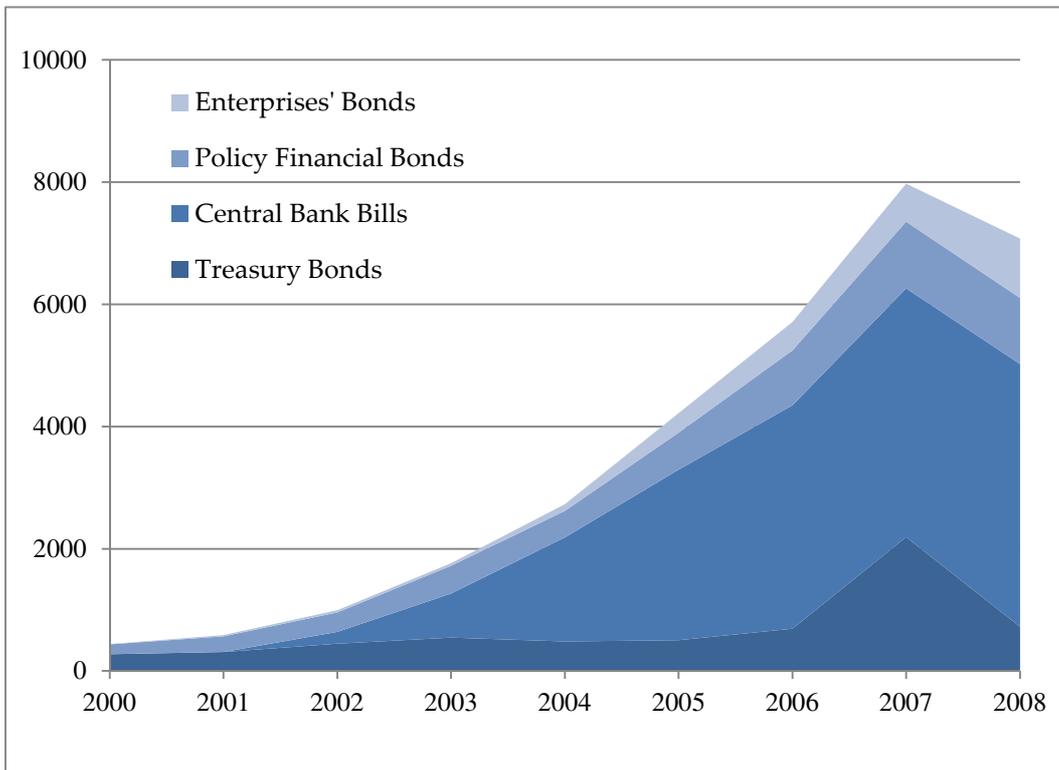


Source: China Statistical Yearbook, CEIC, IMF and OECD, 2010

**Figure 1.1.9**  
**China: Deposit and lending Rate (Percent per annum)**



**Figure 1.1.10**  
**China: Bond market issuance (CNY Billion)**



Source: China Statistical Yearbook, CEIC, IMF

Figure 1.2.1: Geographic Distribution of Companies (2009)

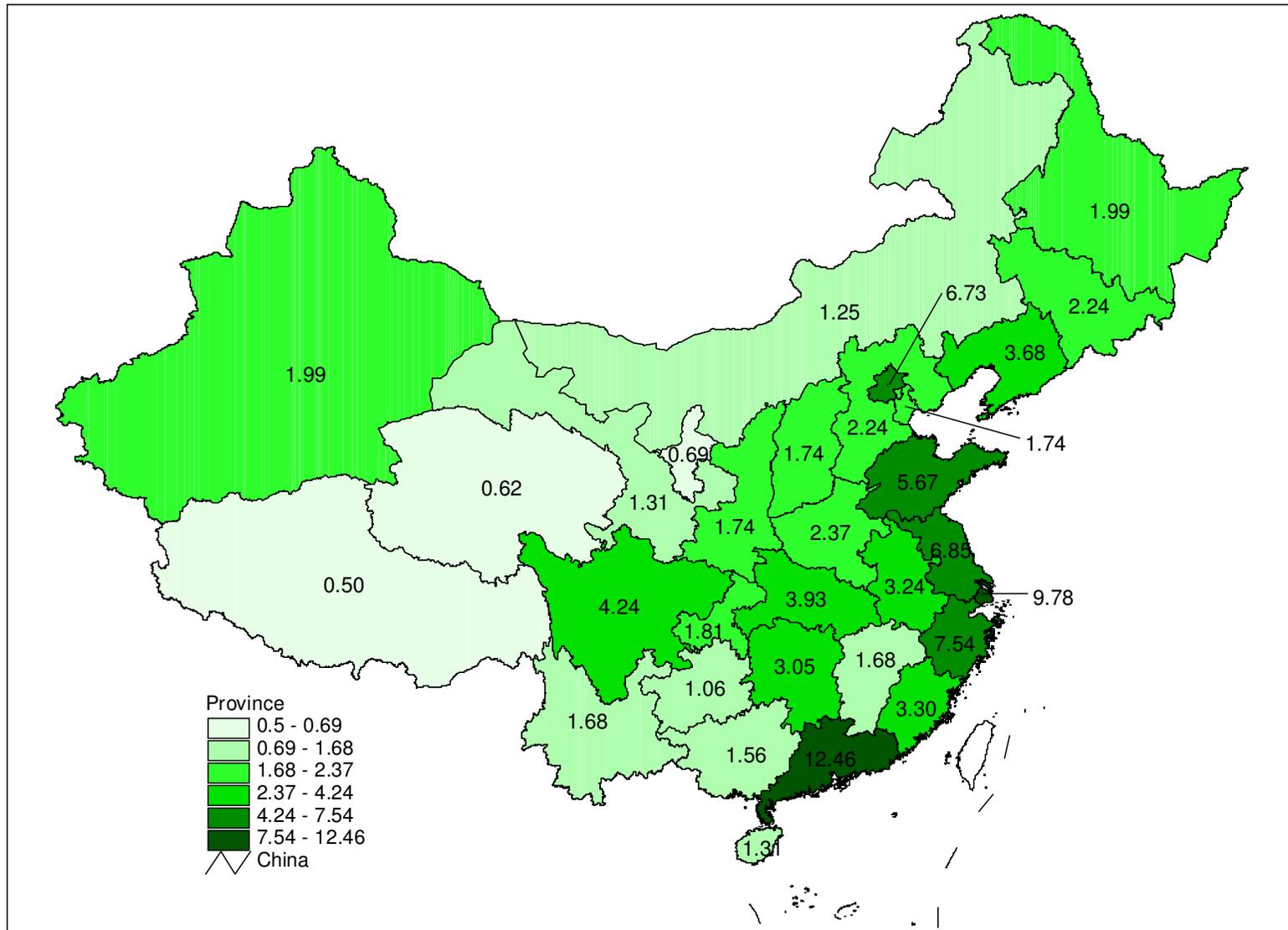


Figure 1.2.2: Ownership Structure of Chinese Listed Firms

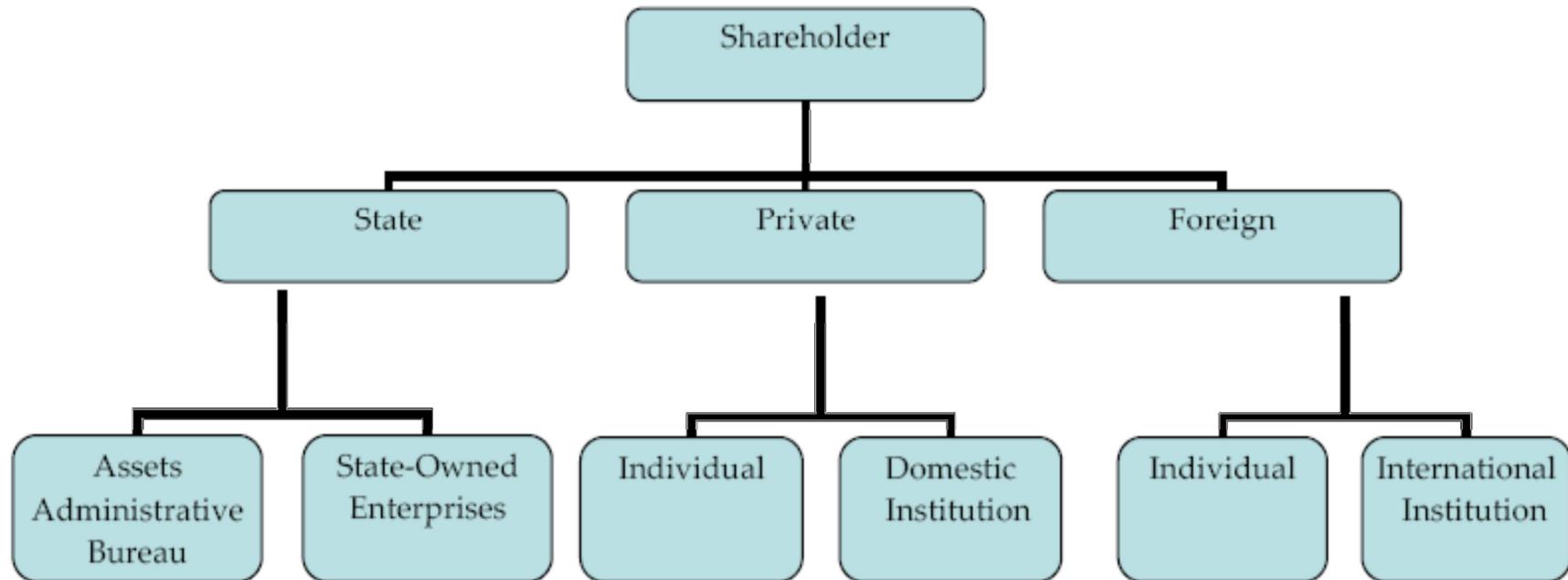


Figure 1.3.1: The Sample Distribution of Major Variables

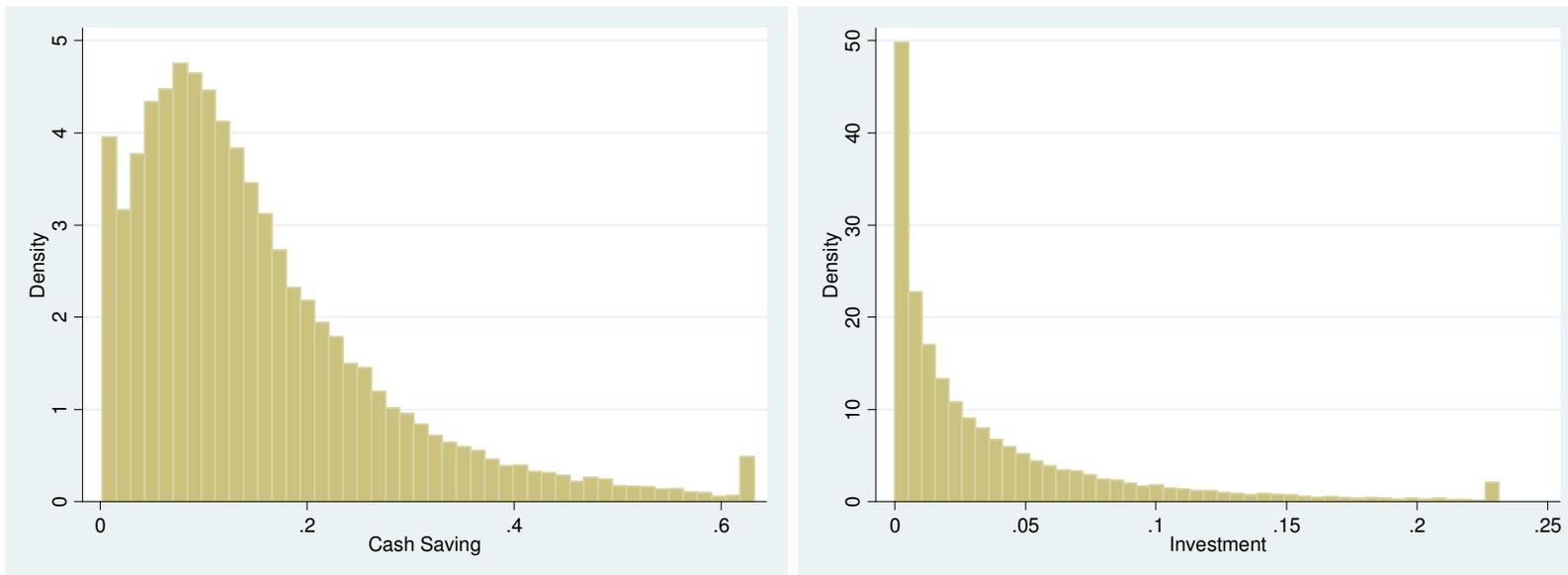
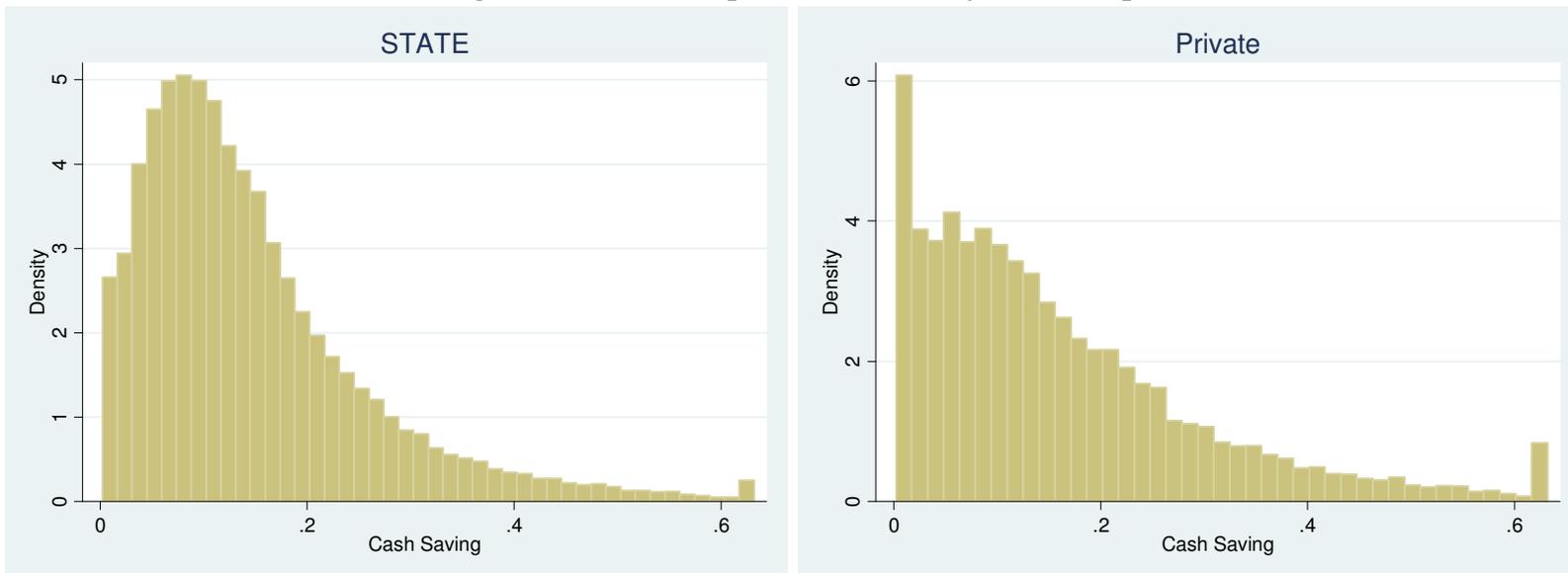
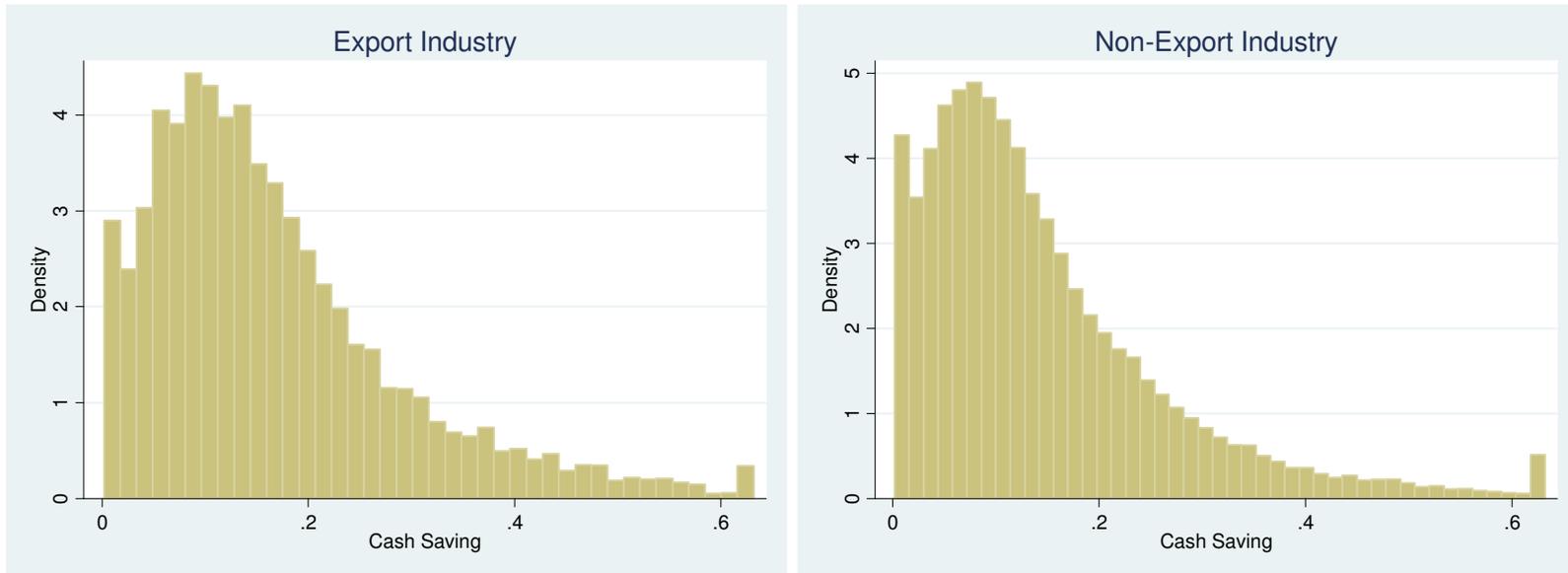


Figure 1.3.2: The Sample Distribution by Ownership



**Figure 1.3.3: The Sample Distribution by Industry**



**Figure 1.3.4: The Sample Distribution before and after crisis**

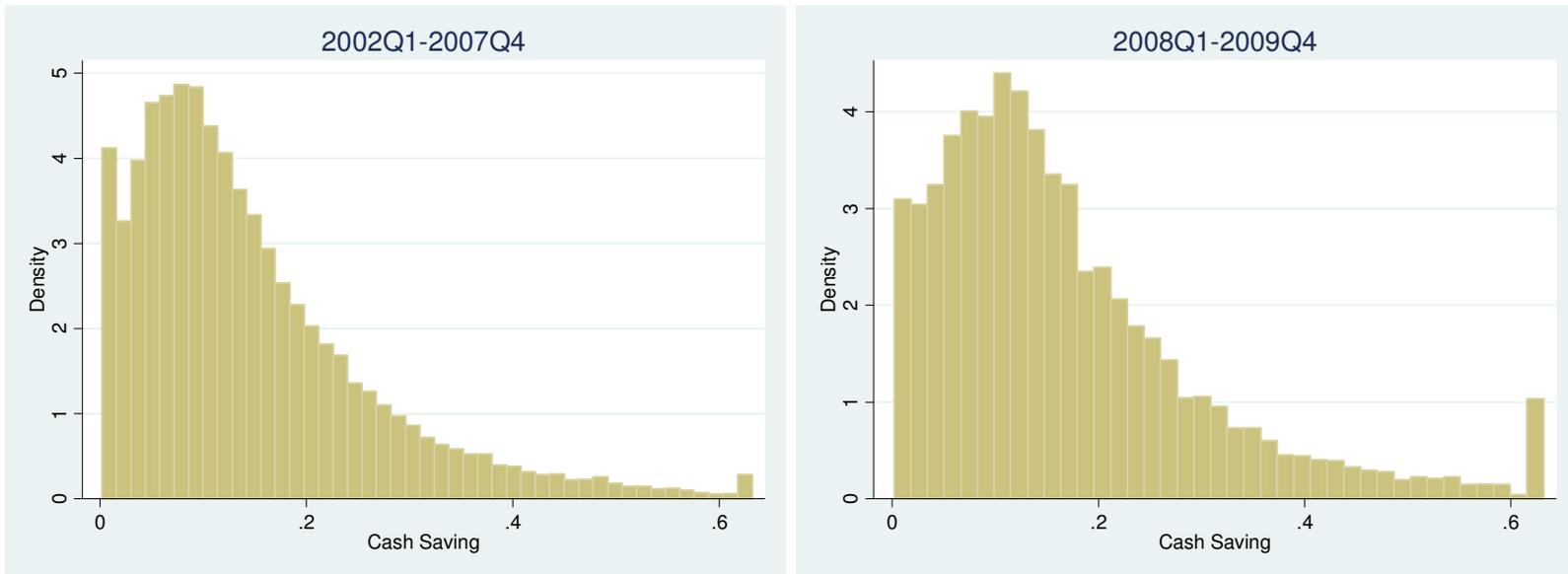


Figure 1.4: Cross Sectional Average of Major Variables: Cash Saving and Investment  
2002Q1 - 2009Q4

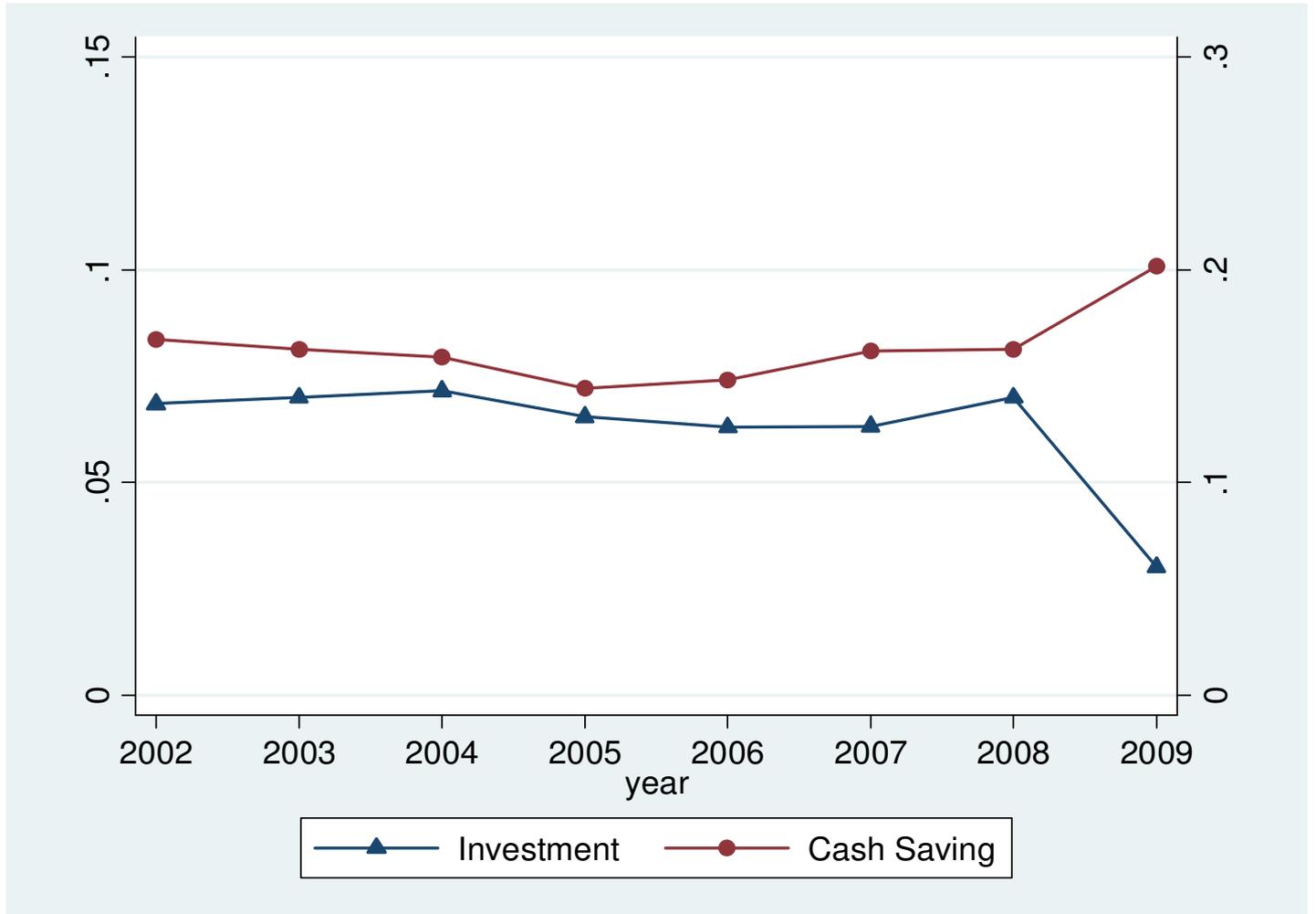
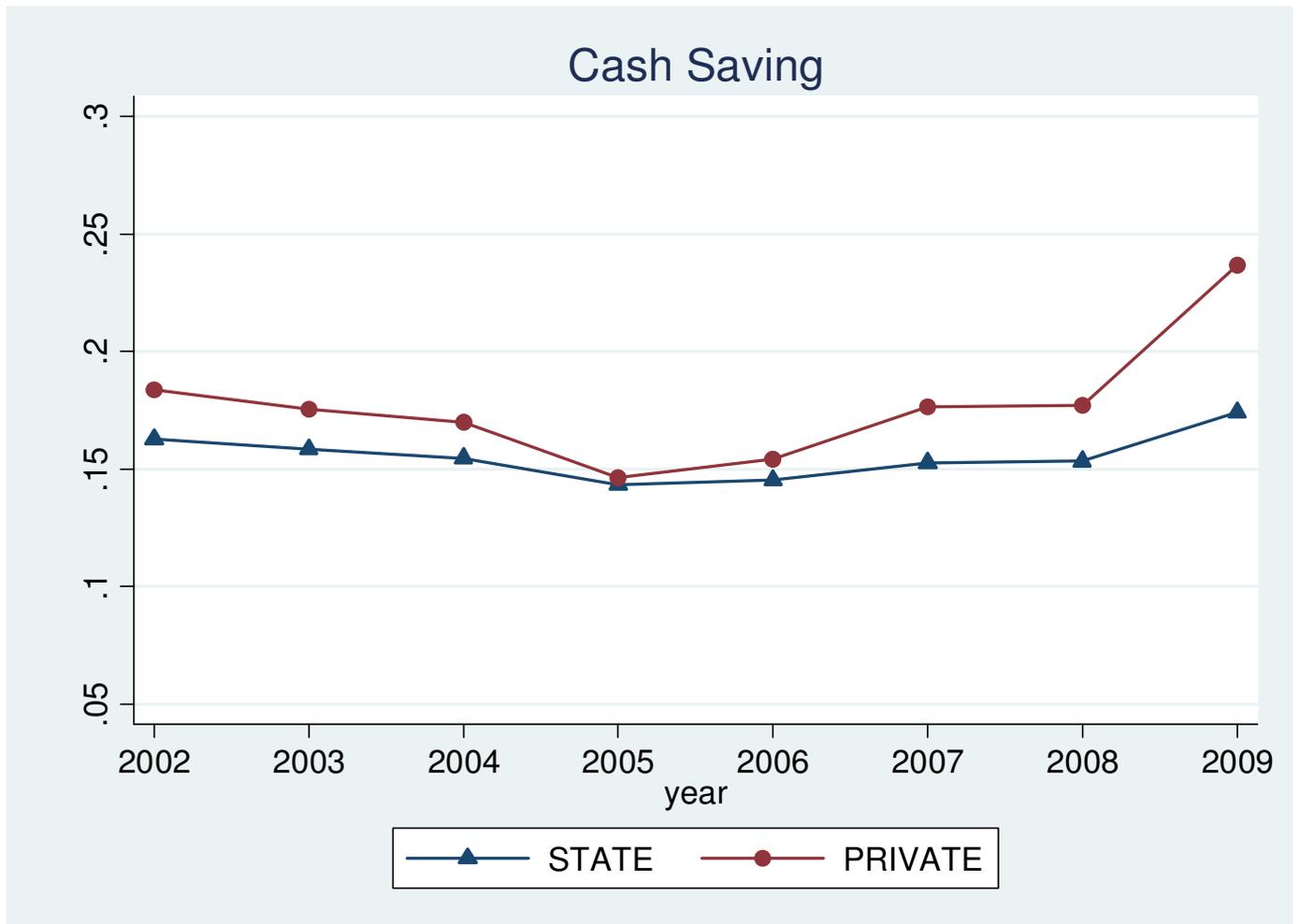


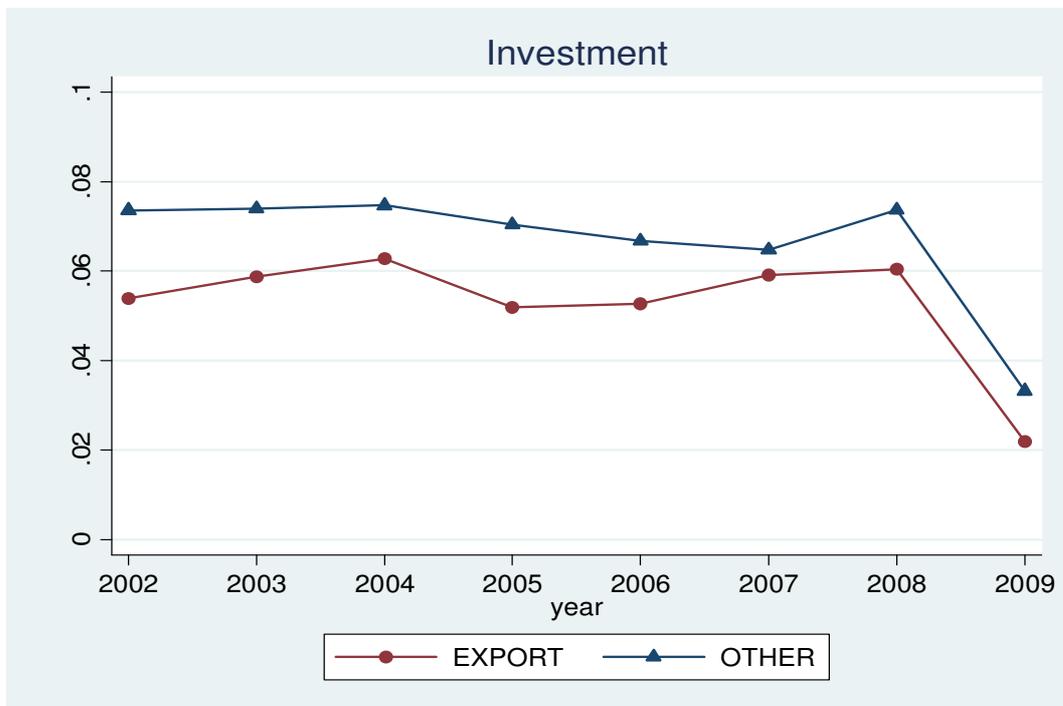
Figure 1.5: Cross Sectional Average of Cash Saving by Ownership Types  
2002Q1 - 2009Q4



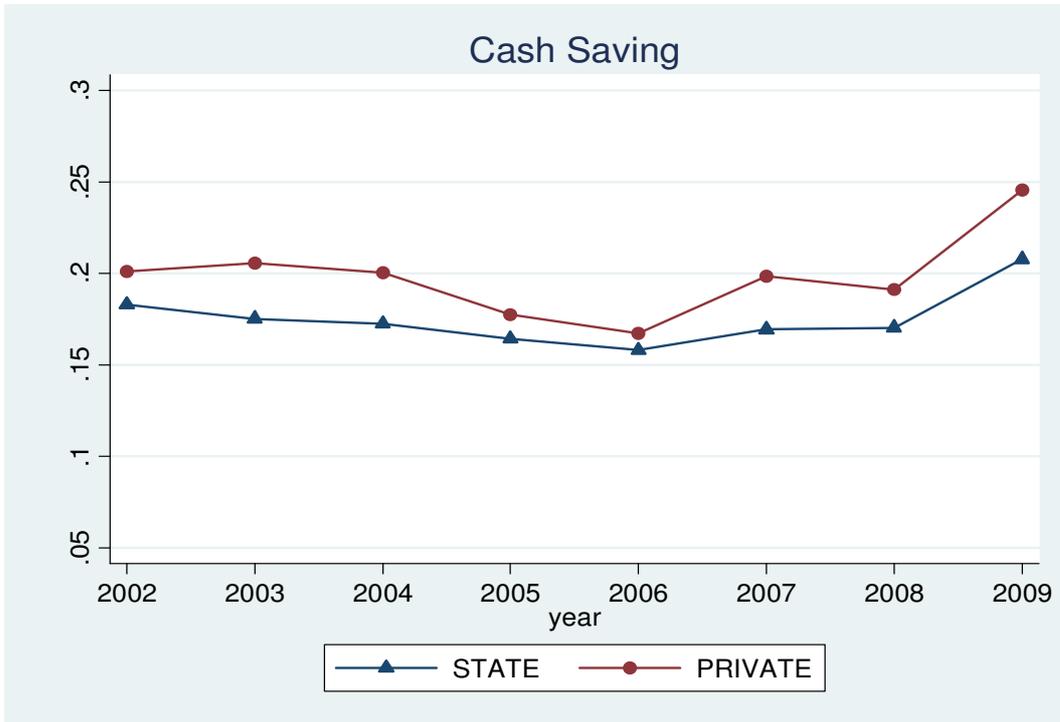
**Figure 1.6.1: Cross Sectional Average of Cash Saving by Industry  
2002Q1 - 2009Q4**



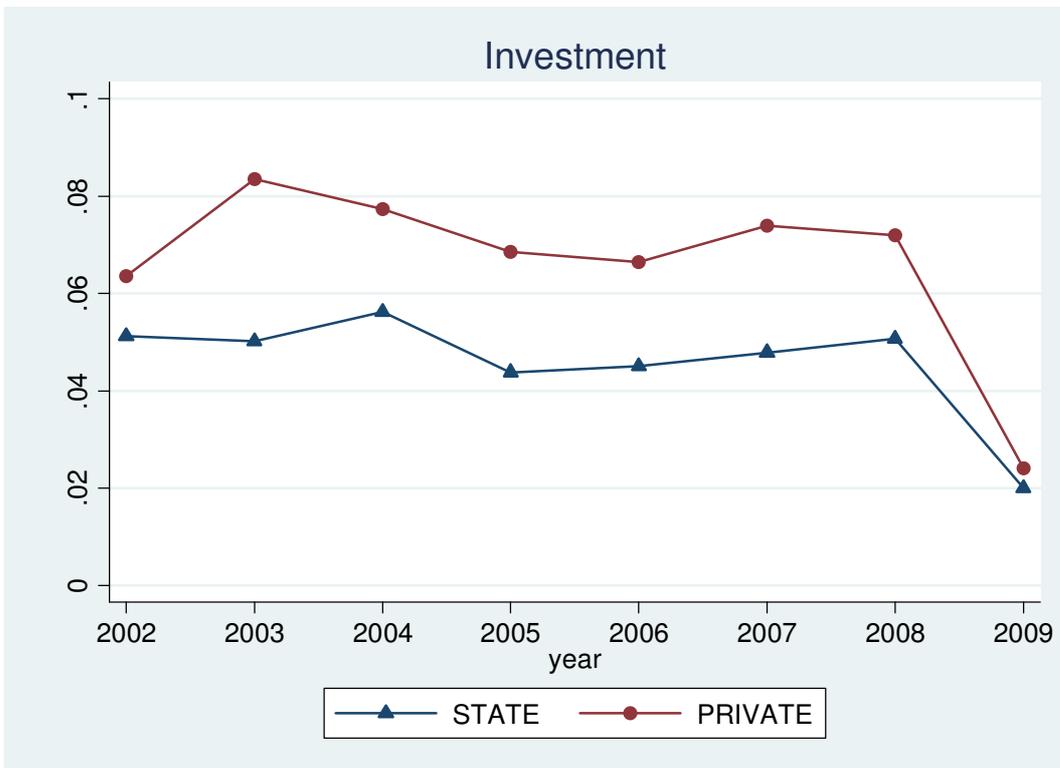
**Figure 1.6.2: Cross Sectional Average of Investment by Industry  
2002Q1 - 2009Q4**



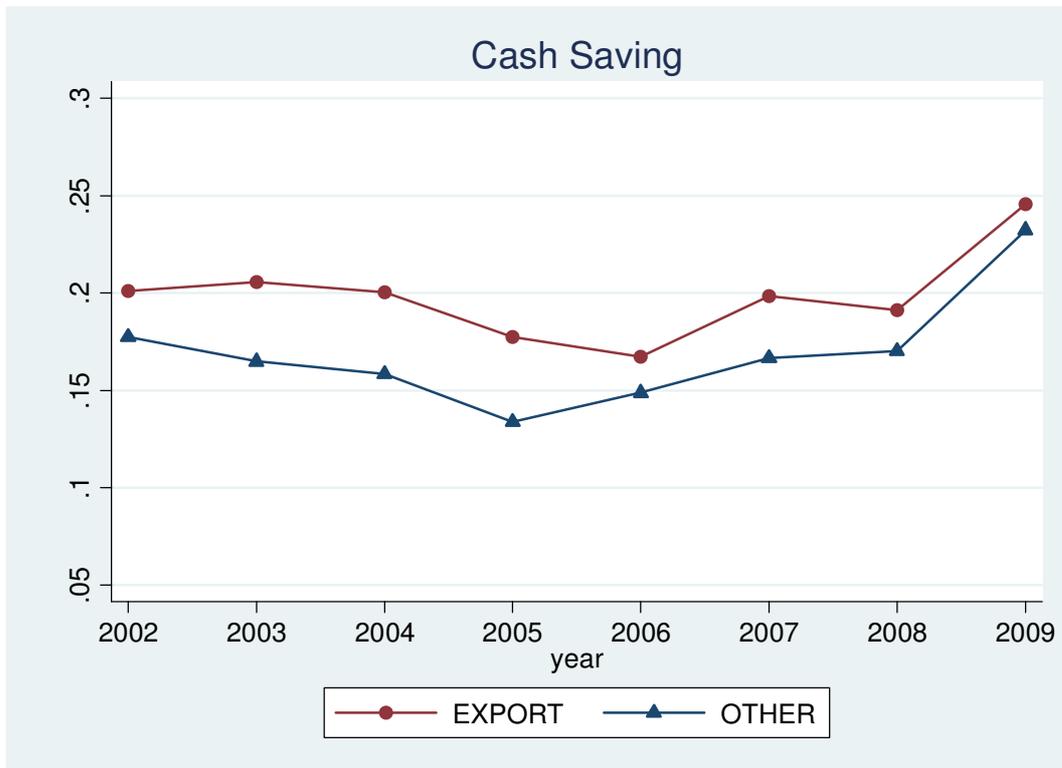
**Figure 1.7.1: Cross Sectional Average of Cash Saving by Ownership  
2002Q1 - 2009Q4 Export Industry Only**



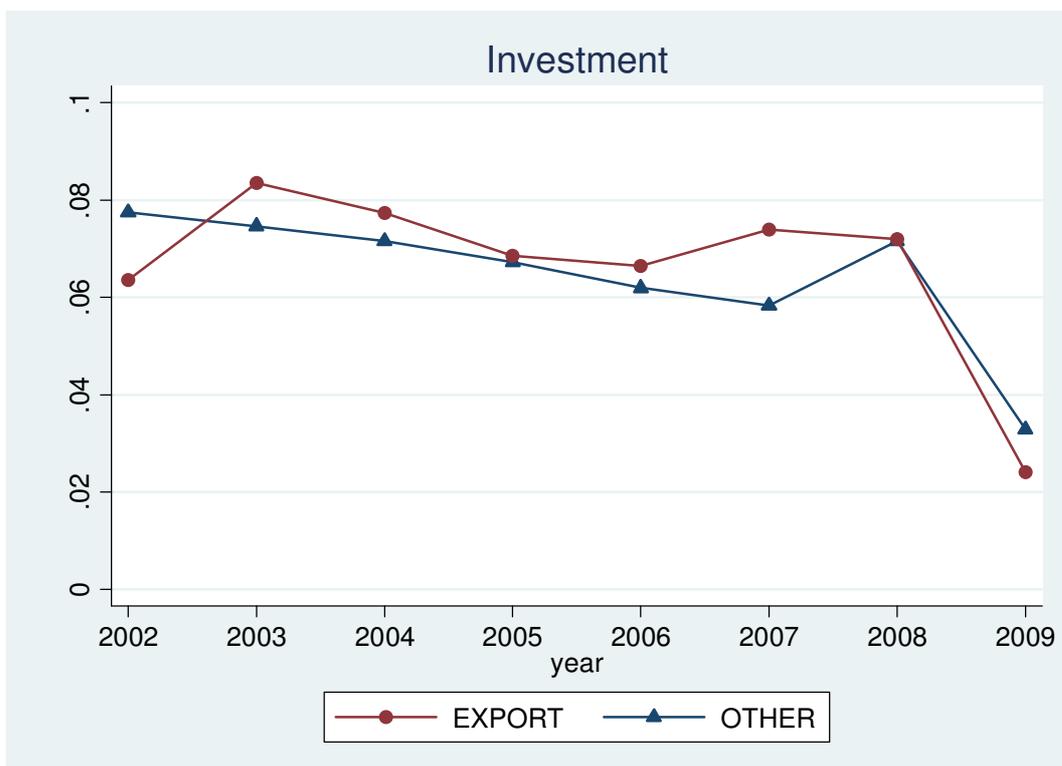
**Figure 1.7.2: Cross Sectional Average of Investment by Ownership  
2002Q1 - 2009Q4 Export Industry Only**



**Figure 1.8.1: Cross Sectional Average of Cash Saving by Industry**  
2002Q1 - 2009Q4 Private Only



**Figure 1.8.2: Cross Sectional Average of Investment by Industry**  
2002Q1 - 2009Q4 Private Only



**Table 1.1: Variable Definitions**

<b>Variable</b>	<b>Definition</b>
CASH SAVING	= (Cash + short-term marketable securities) / total asset;
TOTAL ASSETS	= Book value of total assets;
INVESTMENT	= Capital expenditures/ total asset;
LEVEAGE	= Total debt divided by total assets;
INVENTORY	= Inventory / by total asset;
SIZE	= Log(total assets);
FIXED ASSETS	= Fixed asset/total assets;
TOBIN'S Q	= Market assets / Total assets;
ROA	= Net profit before tax/ total assets;
LGDP	= Log(GDP per capita) at the provincial level;
ACCESS TO FINANCE	= Total loans of financial institutions/GDP at the city level;
COASTAL	= 1 if locates in a coastal province, 0 otherwise;
ECONOMIC ZONE	= 1 if locates in a special economic zone, 0 otherwise;
HHI5	= Herfindahl-Hirschman Index of the 5 largest shareholders( the sum of square of percentage);
OWNERSHIP	= A state indicator variable of the nature of the largest shareholder; It equals 1 if the firm's largest shareholder is government-owned(government agencies, state-owned firms, and state controlled firms), and 0 if the firm's largest shareholder is non-government owned;

**Table 1.2: Sample Distribution****Panel A: Yearly Distribution**

Year	2002	2003	2004	2005	2006	2007	2008	2009	Total
N	1167	1221	1303	1284	1352	1465	1523	1721	11036
Percent (%)	10.57	11.06	11.81	11.63	12.25	13.27	13.8	15.59	100

**Panel B: Industry Distribution**

Industry	No of Obs.	Percent	No of firms	Percent
Agriculture, Forestry, Fishing and Hunting	1,158	2.60	47	2.50
Mining	769	1.73	40	2.13
Manufacturing	26,012	58.51	1,090	57.95
Production and Supply Industry of Electric Force, Gas and Water	1,876	4.22	65	3.46
Building Industry	902	2.03	43	2.29
Traffic and Storage Industry	1,897	4.27	73	3.88
IT Industry	2,782	6.26	135	7.18
Wholesale and Retail	2,945	6.62	112	5.95
Finance and Insurance	40	0.09	7	0.37
Real Estate	1,939	4.36	81	4.31
Social Services	1,327	2.98	57	3.03
Propagation and Culture Industry	360	0.81	19	1.01
Conglomerates	2,429	5.46	90	4.78
Others	25	0.06	22	1.17

**Panel C: Ownership Distribution**

	Private	Non-Private
N	13553	29356
Percent (%)	31.59	68.41

**Panel D: Export Industry Distribution<sup>1</sup>**

		Treatment Group Export Industry	Control Group Non Export Industry	Sum
<b>Private</b>	N	4016	9537	13553
	Percent (%)	30	70	31.59
<b>Non-Private</b>	N	7566	21790	29356
	Percent (%)	26	74	68.41
<b>Sum</b>	N	11582	31327	42909
	Percent (%)	27	73	100

Note: Major Export Industries in China: C1 Textile, Apparel and Leather; C5 Electron; C7 Electrician Equipment Manufacturing; G81 Communication and Related Equipment Manufacturing and G83 Computer and Related Equipment Manufacturing (OECD, 2010)

**Table 1.3.1: Descriptive Statistics**

VARIABLE	Observations	Mean	Std. Dev.	Median
<b>Measures</b>				
Cash Saving	44035	0.151	0.120	0.121
Investment	39444	0.036	0.046	0.018
<b>Firm Level Variables</b>				
Leverage	44217	0.529	0.308	0.505
Inventory	16621	0.164	0.141	0.130
Size	44434	21.272	1.093	21.167
Fixed Asset	43441	0.386	0.258	0.343
Tobin's Q	44263	0.920	0.767	0.774
Industry Tobin's Q	44431	0.772	0.046	0.771
ROA	44214	0.016	0.045	0.013
Ownership	42909	0.684	0.465	1.000
HHI5	42847	0.198	0.134	0.163
<b>Macroeconomic and Location Indicators</b>				
LGDP	44452	9.053	0.921	9.132
Access to Finance	39740	1.068	0.566	0.908
Costal	44433	0.550	0.497	1.000
Economic Zone	42956	0.097	0.297	0.000

This table reports summary statistics for all variables used in the analysis. Variables are winzorized at the 1% tails. Number of observations, mean, median and standard deviation are reported. The sample years are 1998 – 2009, and for all listed firms in Shanghai Stock Exchange and Shenzhen Stock Exchange.

**Table 1.3.2: Summary Statistics by Ownership**

VARIABLE	Private				State			Difference	
	N	Mean	SD	Median	N	Mean	SD	Median	Mean
<b>Measures</b>									
Cash Saving	13437	0.160	0.136	0.125	29083	0.147	0.111	0.119	0.013
Investment	12026	0.033	0.045	0.015	26152	0.037	0.047	0.02	-0.004
<b>Firm Level Variables</b>									
Leverage	13468	0.573	0.405	0.515	29216	0.507	0.237	0.502	0.065
Inventory	4340	0.181	0.157	0.134	11727	0.158	0.135	0.128	0.023
Size	13545	20.833	0.961	20.803	29339	21.492	1.092	21.389	-0.658
Fixed Asset	13237	0.306	0.216	0.271	28701	0.423	0.268	0.383	-0.117
Tobin's Q	13503	1.023	0.997	0.776	29275	0.874	0.632	0.775	0.149
Industry Tobin's Q	13553	0.769	0.044	0.771	29356	0.774	0.047	0.775	-0.006
ROA	13479	0.016	0.052	0.014	29197	0.017	0.041	0.013	-0.001
HHI5	12700	0.146	0.103	0.118	28780	0.223	0.14	0.197	-0.077
<b>Macroeconomic and Location Indicators</b>									
LGDP	13551	9.201	1.026	9.363	29349	8.981	0.865	9.002	0.220
Access to Finance	12778	1.071	0.725	0.903	25741	1.069	0.478	0.909	0.002
Costal	13551	0.619	0.486	1.000	29330	0.512	0.5	1.000	0.108
Economic Zone	12732	0.117	0.322	0.000	28853	0.088	0.284	0.000	0.029

This table reports summary statistics for all variables used in the analysis. Variables are winzorized at the 1% tails. Number of observations, mean, median and standard deviation are reported. The sample years are 1998 – 2009, and for all listed firms in Shanghai Stock Exchange and Shenzhen Stock Exchange.

**Table 1.3.3: Summary Statistics by Export Industry**

VARIABLE	Export Industry				Non- Export Industry				Difference
	N	Mean	SD	Median	N	Mean	SD	Median	Mean
<b>Measures</b>									
Cash Saving	11859	0.167	0.122	0.138	32176	0.146	0.119	0.115	0.021
Investment	10626	0.031	0.040	0.016	28818	0.038	0.048	0.019	-0.007
<b>Firm Level Variables</b>									
Leverage	11900	0.512	0.289	0.486	32317	0.535	0.315	0.513	-0.023
Inventory	4347	0.182	0.104	0.164	12274	0.157	0.151	0.114	0.025
Size	11956	21.097	1.022	21.043	32478	21.337	1.111	21.218	-0.240
Fixed Asset	11706	0.321	0.203	0.282	31735	0.411	0.271	0.374	-0.089
Tobin's Q	11947	0.918	0.766	0.766	32316	0.921	0.768	0.777	-0.003
Industry Tobin's Q	11964	0.764	0.028	0.775	32467	0.776	0.051	0.771	-0.012
ROA	11901	0.015	0.044	0.012	32313	0.017	0.046	0.014	-0.002
Ownership	11582	0.653	0.476	1.000	31327	0.696	0.460	1.000	-0.042
HHI5	11573	0.194	0.124	0.163	31274	0.199	0.138	0.163	-0.006
<b>Macroeconomic and Location Indicators</b>									
LGDP	11964	9.204	0.857	9.267	32488	8.997	0.938	9.047	0.207
Access to Finance	10771	1.044	0.434	0.897	28969	1.077	0.608	0.913	-0.033
Costal	11964	0.598	0.490	1.000	32469	0.533	0.499	1.000	0.065
Economic Zone	11616	0.099	0.299	0.000	31340	0.097	0.296	0.000	0.002

This table reports summary statistics for all variables used in the analysis. Variables are winzorized at the 1% tails. Number of observations, mean, median and standard deviation are reported. The sample years are 1998 – 2009, and for all listed firms in Shanghai Stock Exchange and Shenzhen Stock Exchange.

**Table 1.3.4: Summary Statistics by ownership within Export Industry**

VARIABLE	Private				State				Difference
	N	Mean	SD	Median	N	Mean	SD	Median	Mean
<b>Measures</b>									
Cash Saving	9448	0.152	0.137	0.115	21594	0.142	0.109	0.115	0.01
Investment	8437	0.032	0.045	0.013	19439	0.041	0.049	0.022	-0.009
<b>Firm Level Variables</b>									
Leverage	9469	0.597	0.43	0.53	21697	0.504	0.228	0.505	0.093
Inventory	3068	0.182	0.174	0.121	8772	0.149	0.143	0.111	0.032
Size	9532	20.834	0.936	20.81	21778	21.577	1.110	21.455	-0.743
Fixed Asset	9300	0.315	0.227	0.277	21313	0.454	0.279	0.425	-0.139
Tobin's Q	9491	1.031	1.021	0.78	21720	0.873	0.620	0.777	0.158
Industry Tobin's Q	9537	0.772	0.047	0.77	21790	0.777	0.053	0.771	-0.005
ROA	9482	0.015	0.054	0.012	21672	0.019	0.041	0.014	-0.004
HHI5	8852	0.143	0.104	0.116	21411	0.225	0.144	0.198	-0.081
<b>Macroeconomic and Location Indicators</b>									
LGDP	9535	9.082	1.082	9.265	21783	8.957	0.868	8.996	0.126
Access to Finance	8944	1.091	0.826	0.903	19110	1.072	0.484	0.920	0.019
Costal	9535	0.584	0.493	1.000	21764	0.505	0.500	1.000	0.079
Economic Zone	8871	0.132	0.338	0.000	21454	0.081	0.273	0.000	0.051

This table reports summary statistics for all variables used in the analysis. Variables are winzorized at the 1% tails. Number of observations, mean, median and standard deviation are reported. The sample years are 1998 – 2009, and for all listed firms in Shanghai Stock Exchange and Shenzhen Stock Exchange.

**Table 1.3.5: Summary Statistics by Ownership between Industries**

VARIABLE	Private-Export				Private-Non-Export				Difference
	N	Mean	SD	Median	N	Mean	SD	Median	Mean
<b>Measures</b>									
Cash Saving	3989	0.178	0.132	0.149	9448	0.152	0.137	0.115	0.025
Investment	3589	0.037	0.045	0.021	8437	0.032	0.045	0.013	0.006
<b>Firm Level Variables</b>									
Leverage	3999	0.515	0.332	0.481	9469	0.597	0.430	0.530	-0.082
Inventory	1272	0.180	0.108	0.154	3068	0.182	0.174	0.121	-0.002
Size	4013	20.832	1.020	20.760	9532	20.834	0.936	20.810	-0.002
Fixed Asset	3937	0.286	0.185	0.258	9300	0.315	0.227	0.277	-0.029
Tobin's Q	4012	1.004	0.937	0.766	9491	1.031	1.021	0.780	-0.027
Industry Tobin's Q	4016	0.761	0.034	0.771	9537	0.772	0.047	0.770	-0.011
ROA	3997	0.020	0.048	0.017	9482	0.015	0.054	0.012	0.006
HHI5	3848	0.151	0.101	0.122	8852	0.143	0.104	0.116	0.008
<b>Macroeconomic and Location Indicators</b>									
LGDP	4016	9.483	0.812	9.552	9535	9.082	1.082	9.265	0.401
Access to Finance	3834	1.026	0.395	0.908	8944	1.091	0.826	0.903	-0.065
Costal	4016	0.703	0.457	1.000	9535	0.584	0.493	1.000	0.119
Economic Zone	3861	0.084	0.277	0.000	8871	0.132	0.338	0.000	-0.048

This table reports summary statistics for all variables used in the analysis. Variables are winzorized at the 1% tails. Number of observations, mean, median and standard deviation are reported. The sample years are 1998 – 2009, and for all listed firms in Shanghai Stock Exchange and Shenzhen Stock Exchange.

**Table 1.3.6: Summary Statistics by Crisis Period**

VARIABLE	2002Q1-2007Q4				2008Q1-2009Q4				Difference
	N	Mean	SD	Median	N	Mean	SD	Median	Mean
<b>Measures</b>									
Cash Saving	34432	0.146	0.116	0.117	9603	0.169	0.132	0.136	-0.023
Investment	31580	0.036	0.046	0.018	7864	0.035	0.045	0.019	0.001
<b>Firm Level Variables</b>									
Leverage	34620	0.526	0.305	0.503	9597	0.538	0.319	0.514	-0.012
Inventory	14438	0.160	0.136	0.128	2183	0.190	0.165	0.146	-0.030
Size	34828	21.209	1.037	21.113	9606	21.501	1.250	21.390	-0.292
Fixed Asset	33863	0.419	0.266	0.377	9578	0.270	0.186	0.239	0.149
Tobin's Q	34671	0.696	0.350	0.753	9592	1.729	1.200	1.513	-1.033
Industry Tobin's Q	34813	0.772	0.045	0.771	9618	0.772	0.052	0.771	0.000
ROA	34639	0.022	0.054	0.019	9575	0.015	0.042	0.012	0.007
Ownership	33476	0.708	0.455	1.000	9433	0.601	0.490	1.000	0.107
HHI5	33367	0.205	0.136	0.170	9480	0.173	0.126	0.143	0.032
<b>Macroeconomic and Location Indicators</b>									
LGDP	34842	8.916	0.902	8.988	9610	9.546	0.814	9.552	-0.630
Access to Finance	30155	1.050	0.445	0.903	9585	1.123	0.839	0.924	-0.073
Costal	34842	0.546	0.498	1.000	9591	0.566	0.496	1.000	-0.020
Economic Zone	33468	0.088	0.283	0.000	9488	0.132	0.338	0.000	-0.044

This table reports summary statistics for all variables used in the analysis. Variables are winzorized at the 1% tails. Number of observations, mean, median and standard deviation are reported. The sample years are 1998 – 2009, and for all listed firms in Shanghai Stock Exchange and Shenzhen Stock Exchange.

**Table 1.4: Baseline Regressions of Cash Saving**

Variables	OLS	OLS	OLS	FE	RE
	1	2	3	4	5
<i>Firm Level Variables</i>					
<b>Leverage</b>	0.098 (22.82)***	0.136 (22.27)***	0.128 (19.65)***	0.071 (10.26)***	0.088 (14.46)***
<b>Inventory</b>	-0.163 (28.63)***	-0.162 (26.96)***	-0.163 (25.77)***	-0.234 (23.96)***	-0.221 (25.26)***
<b>Size</b>	0.003 (3.33)***	0.001 (0.73)	0.002 (2.57)**	0.009 (4.28)***	0.001 (0.70)
<b>Fixed Asset</b>	-0.153 (42.59)***	-0.169 (45.73)***	-0.164 (42.02)***	-0.146 (29.26)***	-0.148 (33.81)***
<b>Tobin's Q</b>	0.002 (1.40)	0.000 (0.13)	0.002 (1.01)	0.003 (3.08)***	0.002 (1.57)
<b>ROA</b>	0.432 (17.64)***	0.397 (14.73)***	0.391 (13.75)***	0.176 (8.96)***	0.196 (10.15)***
<b>Industry Q</b>	0.090 (4.32)***	0.070 (3.13)***	0.077 (3.16)***	0.244 (1.15)	0.016 (0.26)
<b>OWNERSHIP</b>		-0.004 (2.18)**	-0.002 (0.87)	-0.010 (3.00)***	-0.008 (2.76)***
<b>HHI5</b>		0.074 (11.95)***	0.074 (11.07)***	0.032 (2.74)***	0.077 (8.09)***
<i>Macroeconomic and Location Variables</i>					
<b>LGDP</b>			0.013 (9.28)***	0.032 (10.97)***	0.009 (4.51)***
<b>ACCESS TO FINANCE</b>			-0.008 (2.22)**	0.002 (1.05)	0.002 (1.25)
<b>Coastal</b>			0.005 (2.25)**	0.035 (1.31)	0.013 (2.65)***
<b>Economic Zone</b>			0.007 (2.35)**	0.028 (5.14)***	0.018 (3.85)***
<b>Constant</b>	0.270 (12.93)***	0.257 (11.58)***	0.161 (6.32)***	0.166 (0.97)	0.346 (6.32)***
<b>Observations</b>	16333	15421	13554	13554	13554
<b>R-squared</b>	0.23	0.24	0.25	0.14	

**Table 1.5: Interaction Effects Regressions of Cash Saving**

**Panel A**

Variables	OLS	FE	RE	OLS	FE	RE	OLS	FE	RE
	1	2	3	4	5	6	7	8	9
<b>Leverage</b>	0.127 (19.59)***	0.070 (10.21)***	0.088 (14.39)***	0.127 (19.59)***	0.070 (10.21)***	0.088 (14.39)***	0.125 (19.53)***	0.070 (10.24)***	0.087 (14.32)***
<b>Inventory</b>	-0.163 (25.78)***	-0.234 (23.97)***	-0.221 (25.28)***	-0.163 (25.78)***	-0.234 (23.97)***	-0.221 (25.28)***	-0.163 (25.87)***	-0.234 (24.03)***	-0.222 (25.46)***
<b>Size</b>	0.002 (2.53)**	0.009 (4.30)***	0.001 (0.72)	0.002 (2.53)**	0.009 (4.30)***	0.001 (0.72)	0.003 (3.57)***	0.008 (3.65)***	0.000 (0.12)
<b>Fixed Asset</b>	-0.165 (42.06)***	-0.146 (29.30)***	-0.148 (33.89)***	-0.165 (42.06)***	-0.146 (29.30)***	-0.148 (33.89)***	-0.161 (42.17)***	-0.144 (28.96)***	-0.146 (33.17)***
<b>Tobin's Q</b>	0.002 (0.57)	0.005 (3.36)***	0.004 (2.66)***	0.002 (0.57)	0.005 (3.36)***	0.004 (2.66)***	0.007 (3.69)***	0.009 (6.30)***	0.008 (5.89)***
<b>ROA</b>	0.388 (13.65)***	0.174 (8.88)***	0.194 (10.05)***	0.388 (13.65)***	0.174 (8.88)***	0.194 (10.05)***	0.387 (13.79)***	0.169 (8.62)***	0.189 (9.81)***
<b>Industry Q</b>	0.078 (3.22)***	0.244 (1.15)	0.016 (0.26)	0.078 (3.22)***	0.244 (1.15)	0.016 (0.26)	0.077 (3.17)***	0.191 (0.90)	0.026 (0.43)
<b>Ownership</b>	-0.004 (1.07)	-0.008 (2.01)**	-0.004 (1.37)	-0.004 (1.07)	-0.008 (2.01)**	-0.004 (1.37)	-0.002 (1.11)	-0.011 (3.13)***	-0.008 (2.81)***
<b>HHI5</b>	0.075 (11.09)***	0.033 (2.81)***	0.078 (8.18)***	0.075 (11.09)***	0.033 (2.81)***	0.078 (8.18)***	0.073 (10.93)***	0.032 (2.80)***	0.078 (8.20)***
<b>Ownership*Tobin's Q</b>	-0.006 (1.92)*	-0.003 (1.63)	-0.004 (2.22)**						
<b>Ownership*Ind Q</b>	-0.013 (9.21)***	-0.032 (10.92)***	-0.009 (4.44)***	-0.013 (9.21)***	-0.032 (10.92)***	-0.009 (4.44)***	-0.017 (14.02)***	-0.027 (9.04)***	-0.004 (1.74)*

**Table 1.5 : Interaction Effect Regressions of Cash Saving  
Panel B**

Variables	OLS	FE	RE	OLS	FE	RE	OLS	FE	RE
	1	2	3	4	5	6	7	8	9
<i>Macroeconomic and Location Variables</i>									
<b>LGDP</b>	0.005 (2.24)**	0.034 (1.26)	0.012 (2.60)***	0.005 (2.24)**	0.034 (1.26)	0.012 (2.60)***	0.010 (4.60)***	-0.008 (0.31)	0.005 (1.07)
<b>Access to Finance</b>	-0.007 (2.30)**	-0.029 (5.29)***	-0.019 (4.03)***	-0.007 (2.30)**	-0.029 (5.29)***	-0.019 (4.03)***	-0.008 (2.77)***	-0.031 (5.57)***	-0.018 (3.95)***
<b>Ownership*Access to Finance</b>	0.007 (2.13)**	0.002 (1.21)	0.002 (1.47)	0.007 (2.13)**	0.002 (1.21)	0.002 (1.47)	0.028 (10.67)***	0.023 (5.17)***	0.025 (6.44)***
<b>Coastal</b>				0.006 (1.92)*	0.003 (1.63)	0.004 (2.22)**			
<b>Economic Zone</b>							0.007 (11.60)***	0.006 (5.85)***	0.006 (7.21)***
<b>Constant</b>	0.157 (6.10)***	0.163 (0.96)	0.342 (6.25)***	0.157 (6.10)***	0.163 (0.96)	0.342 (6.25)***	0.123 (4.99)***	0.189 (1.11)	0.307 (5.59)***
<b>Observations</b>	13554	13554	13554	13554	13554	13554	13554	13554	13554
<b>R-squared</b>	0.25	0.14		0.25	0.14		0.26	0.14	

Table 1.6: Difference in Difference Regressions of Cash Saving

Variables	OLS	FE	RE
	1	2	3
<i>DID Dummies</i>			
Crisis (2008Q1-2009Q4)	0.000 (0.12)	0.003 (0.95)	0.005 (1.80)*
Export Industry	0.002 (0.42)	0.001 (0.18)	0.002 (0.42)
<b>Export×Crisis</b>	<b>0.013</b> <b>(3.05)***</b>	<b>0.012</b> <b>(2.68)***</b>	<b>0.012</b> <b>(2.58)***</b>
Leverage	0.097 (28.54)***	0.136 (28.63)***	0.128 (25.50)***
Inventory	-0.166 (26.76)***	-0.164 (25.69)***	-0.166 (24.74)***
Size	0.002 (2.71)***	0.000 (0.38)	0.002 (1.81)*
Fixed Asset	-0.152 (44.35)***	-0.167 (46.78)***	-0.165 (43.31)***
Tobin's Q	0.003 (2.40)**	0.000 (0.06)	0.001 (0.40)
ROA	0.442 (20.51)***	0.406 (17.43)***	0.396 (16.17)***
Industry Q	0.104 (5.16)***	0.087 (3.74)***	0.087 (3.42)***
Ownership		-0.004 (2.37)**	-0.002 (1.13)
HHI5		0.071 (11.42)***	0.071 (10.53)***
LGDP			0.014 (11.51)***
Access to Finance			-0.008 (5.77)***
Coastal			0.006 (2.90)***
Economic Zone			0.006 (2.17)**
Constant	0.242 (11.33)***	0.236 (9.89)***	0.123 (4.54)***
Observations	16333	15421	13554
R-squared	0.23	0.24	0.25

Table 1.7: Difference in Difference Regressions of Investment

Variables	Investment		
	OLS	FE	RE
	1	2	3
<i>DID Dummies</i>			
<b>Crisis (2008Q1-2009Q4)</b>	-0.002 (1.40)	-0.003 (1.89)*	-0.004 (2.64)***
<b>Export Industry</b>	0.001 (0.71)	0.001 (0.39)	0.001 (0.58)
<b>Export×Crisis</b>	-0.004 (1.94)*	-0.003 (1.65)*	-0.003 (1.69)*
<b>Leverage</b>	0.005 (3.95)***	0.016 (7.65)***	0.016 (7.33)***
<b>Inventory</b>	-0.055 (25.34)***	-0.058 (25.31)***	-0.055 (23.62)***
<b>Size</b>	0.003 (8.55)***	0.002 (4.77)***	0.002 (5.67)***
<b>Fixed Asset</b>	0.020 (13.07)***	0.020 (12.09)***	0.020 (11.74)***
<b>Tobin's Q</b>	-0.004 (6.80)***	-0.005 (6.17)***	-0.004 (5.87)***
<b>ROA</b>	0.263 (22.97)***	0.285 (21.93)***	0.291 (21.40)***
<b>Industry Q</b>	-0.019 (2.23)**	0.012 (1.10)	0.009 (0.71)
<b>Ownership</b>		0.001 (0.66)	0.001 (1.18)
<b>HHI5</b>		0.011 (4.05)***	0.010 (3.60)***
<b>LGDP</b>			0.001 (1.48)
<b>Access to Finance</b>			0.001 (1.69)*
<b>Coastal</b>			0.002 (2.31)**
<b>Economic Zone</b>			0.005 (5.23)***
<b>Constant</b>	-0.050 (5.06)***	-0.024 (2.11)**	-0.021 (1.72)*
<b>Observations</b>	14687	13915	12934
<b>R-squared</b>	0.14	0.14	0.15

**Table 1.8: Difference in Difference Regressions of Cash Saving Between Industries  
(Private Only)**

Variables	OLS	FE	RE
	1	2	3
<i>DID Dummies</i>			
<b>Crisis (2008Q1-2009Q4)</b>	0.012 (1.68)*	0.011 (1.53)	0.002 (0.25)
<b>Export Industry</b>	-0.010 (1.23)	-0.009 (1.11)	-0.013 (1.63)
<b>Export×Crisis</b>	0.017 (1.88)*	0.015 (1.69)*	0.013 (1.45)
<b>Leverage</b>	0.087 (13.96)***	0.173 (12.25)***	0.165 (11.62)***
<b>Inventory</b>	-0.198 (17.87)***	-0.190 (15.16)***	-0.198 (15.72)***
<b>Size</b>	0.005 (2.65)***	0.001 (0.53)	0.001 (0.43)
<b>Fixed Asset</b>	-0.181 (19.53)***	-0.202 (20.79)***	-0.202 (20.61)***
<b>Tobin's Q</b>	0.005 (1.69)*	0.001 (0.20)	0.002 (0.56)
<b>ROA</b>	0.421 (9.46)***	0.316 (6.52)***	0.290 (5.85)***
<b>Industry Q</b>	0.014 (0.29)	0.050 (1.00)	0.054 (1.05)
<b>HHI5</b>			0.020 (8.55)***
<i>Macroeconomic and Location Variables</i>			
<b>LGDP</b>			0.002 (0.68)
<b>Access to Finance</b>			-0.008 (1.80)*
<b>Coastal</b>			0.003 (0.48)
<b>Economic Zone</b>	0.398 (7.39)***	0.269 (4.66)***	0.122 (1.99)**
<b>Constant</b>	4261 0.28	4034 0.31	3784 0.32
<b>Observations</b>	-0.012	-0.011	0.002
<b>R-squared</b>	(1.68)*	(1.53)	(0.25)

Table 1.9: Robustness Check: Cash Saving Regressions within Industry (Export Industry only)

Panel A

Variables	OLS	FE	RE	OLS	FE	RE	OLS	FE	RE
	1	2	3	4	5	6	7	8	9
<i>Firm Level Variables</i>									
<b>Leverage</b>	0.101 (9.28)***	0.023 (1.79)*	0.057 (4.89)***	0.101 (9.28)***	0.023 (1.79)*	0.057 (4.89)***	0.101 (9.28)***	0.023 (1.77)*	0.056 (4.87)***
<b>Inventory</b>	-0.191 (12.79)***	-0.284 (14.65)***	-0.279 (15.36)***	-0.191 (12.79)***	-0.284 (14.65)***	-0.279 (15.36)***	-0.191 (12.80)***	-0.280 (14.52)***	-0.276 (15.25)***
<b>Size</b>	0.008 (4.36)***	0.009 (2.50)**	0.006 (2.19)**	0.008 (4.36)***	0.009 (2.50)**	0.006 (2.19)**	0.008 (4.35)***	0.009 (2.44)**	0.006 (2.13)**
<b>Fixed Asset</b>	-0.153 (16.58)***	-0.161 (16.63)***	-0.149 (16.64)***	-0.153 (16.58)***	-0.161 (16.63)***	-0.149 (16.64)***	-0.153 (16.60)***	-0.160 (16.52)***	-0.149 (16.55)***
<b>Tobin's Q</b>	0.006 (1.65)*	0.002 (0.92)	0.001 (0.32)	0.006 (1.65)*	0.002 (0.92)	0.001 (0.32)	0.003 (0.54)	0.007 (1.77)*	0.004 (1.08)
<b>ROA</b>	0.403 (7.63)***	0.148 (4.45)***	0.163 (4.93)***	0.403 (7.63)***	0.148 (4.45)***	0.163 (4.93)***	0.403 (7.63)***	0.146 (4.40)***	0.161 (4.88)***
<b>Industry Q</b>	0.166 (2.93)***	4.473 (5.36)***	0.127 (0.80)	0.166 (2.93)***	4.473 (5.36)***	0.127 (0.80)	0.167 (2.94)***	4.442 (5.31)***	0.131 (0.83)
<b>Ownership</b>	-0.003 (0.45)	-0.018 (3.09)***	-0.016 (2.87)***	-0.003 (0.45)	-0.018 (3.09)***	-0.016 (2.87)***	-0.004 (0.96)	-0.015 (2.96)***	-0.012 (2.66)***
<b>HHI5</b>	0.023 (1.71)*	0.032 (1.46)	0.029 (1.57)	0.023 (1.71)*	0.032 (1.46)	0.029 (1.57)	0.023 (1.71)*	0.031 (1.44)	0.029 (1.61)
<b>Ownership*Tobin's Q</b>	-0.001 (0.25)	-0.004 (1.10)	-0.004 (1.20)						
<b>Ownership*Ind Q</b>				-0.001 (0.25)	-0.004 (1.10)	-0.004 (1.20)			

**Table1. 9 : Robustness Check: Cash Saving Regressions within Industry (Export Industry only)**  
**Panel B**

Variables	OLS	FE	RE	OLS	FE	RE	OLS	FE	RE
	1	2	3	4	5	6	7	8	9
<i>Macroeconomic and Location Variables</i>									
<b>LGDP</b>	0.015 (5.64)***	0.053 (8.91)***	0.022 (4.92)***	0.015 (5.64)***	0.053 (8.91)***	0.022 (4.92)***	0.015 (5.64)***	0.052 (8.77)***	0.022 (4.81)***
<b>Access to Finance</b>	-0.026 (5.14)***	-0.008 (0.73)	-0.015 (1.87)*	-0.026 (5.14)***	-0.008 (0.73)	-0.015 (1.87)*	-0.028 (3.78)***	-0.013 (1.07)	-0.019 (2.05)**
<b>Ownership*Access to Finance</b>							-0.002 (0.45)	-0.003 (0.94)	-0.003 (0.93)
<b>Coastal</b>	0.006 (1.27)	0.000 (.)	0.025 (2.45)**	0.006 (1.27)	0.000 (.)	0.025 (2.45)**	0.006 (1.26)	0.000 (.)	0.024 (2.36)**
<b>Economic Zone</b>	0.004 (0.62)	0.030 (3.17)***	0.019 (2.30)**	0.004 (0.62)	0.030 (3.17)***	0.019 (2.30)**	0.004 (0.66)	0.034 (3.54)***	0.022 (2.67)***
<b>Constant</b>	-0.169 (2.72)***	-2.833 (4.43)***	0.240 (1.73)*	-0.169 (2.72)***	-2.833 (4.43)***	0.240 (1.73)*	-0.173 (2.75)***	-2.820 (4.40)***	0.230 (1.66)*
<b>Observations</b>	3586	3586	3586	3586	3586	3586	3586	3586	3586
<b>R-squared</b>	0.21	0.18		0.21	0.18		0.21	0.18	

## CHAPTER 2

### CORPORATE OWNERSHIP STRUCTURE AND LEVERAGE CHOICE: EVIDENCE FROM CHINA\*

#### Abstract

I explore the effects of ownership concentration on corporate debt financing decisions when the state is the largest shareholder. Based on the unique institutional environment of China and hand-collected shareholder information, I empirically examine the competing views about the relationship between ownership structure and a firm's leverage choice. Surprisingly, I find that leverage and short-term debt ratio are lower when the largest shareholder is government-related than otherwise. Controlling for other factors, I also provide evidence that higher leverage and short-term debt ratio are associated with less concentrated in ownership structure. Finally, I develop the instrumental variables (IV) linked to financial reform that diffused ownership concentration to identify the causal inference between ownership structure and leverage choice. One interpretation of my results is that capital market frictions in the form of ownership concentration and large government shareholding play an important role in debt financing choice due to financial repression policies.

*JEL Classification Code:* G14; G15; G32, G38

*Keywords:* Ownership Concentration, State Ownership, Capital Structure, China

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## 2.1 Introduction

Does ownership matter? The relationship between corporate ownership structure and firm financing decisions and performance has been the subject of numerous studies. How do entrepreneurs, shareholders, and managers minimize the loss of value resulting from the corporate ownership structure?

The fundamental problem of the costly coordination between different classes of shareholders might lead to severe agency problems. Stulz (2005) summarizes the “twin agency problems” which exist in modern corporations: the benefits of monitoring between the owners and managers (e.g. Berle and Means, 1932; Jensen and Meckling, 1976) and the cost of control by large shareholders (Shleifer and Vishny, 1986; La Porta, Lopez-de-Silanes, Shleifer and Vishny (LLSV), 1998). Several recent articles have studied the role of the largest shareholders’ impact on firms by explicitly addressing the endogeneity of ownership structure. Most of them have focused on the treatment effects of largest shareholders (Becker et al., 2010; Calomiris, Fisman and Wang, 2010). More specifically, are there any predictable effects of large shareholdings or government shareholdings on firms’ financing choices? The existing empirical evidence on this subject is far from conclusive and, at times, the results are conflicting.

The increasing importance of China in the world economy contrasts with my limited understanding of how firms have achieved remarkable growth and what has determined their financing decisions. Allen, Qian and Qian (2005) suggest that China may be an important counterexample to the finance and growth literature, because the fastest growing private firms have relied less on debt finance, especially from credit markets. Also, the high rates of GDP growth must imply that the informal financial sector has sufficiently made up for the shortcomings of the formal financial system dominated by state-owned banks. Under China’s financially repressive regimes, access to external financing is regulated by the government. Consequently, different types of economic agents have different levels of ability to obtain debt

financing, and thus have different costs of financing and performance (Li, Yue and Zhao, 2009).

Based on recent research by the World Bank (2010), despite fast expansion of the private sector, China has retained a fairly large sector of state-owned enterprises (SOEs), with 112,000 non-financial SOEs employing over 35 million people in 2007. Continuous reform and restructuring in the 1990s have led to steady improvement of SOEs' profitability since 1998, a trend that continued until it was affected by the global financial crisis in late 2008. This trend has stoked a new global competition among competing economic models instead of rival political ideologies. But the free-market tide has now receded. In its place comes state capitalism, a system in which the state functions as the leading economic actor (Bremmer, 2009). For global policy reasons<sup>1</sup>, China provides an excellent laboratory to study the relationship between corporate ownership concentration with state shareholding and corporate leverage choice.

To answer those questions and puzzles, I investigate the effect of ownership concentration on corporate financing decisions when the state is the largest shareholder. My analysis is based on financial statements of listed companies (non-financial) over the period 1998-2008 and hand-collected information about the type and size of holdings. I first focus on two important aspects of ownership structures of Chinese firms: the extent of ownership concentration and the nature of the largest shareholder (i.e., whether government-related or not). In my sample of firms in China, about 41% of all shares outstanding are owned by the largest shareholder and about 72% of these largest shareholders are government-related. I take advantage of these unique institutional features in China to evaluate the impact of different ownership structures.

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<sup>1</sup> Bremmer (2009) argue that state capitalism "has introduced massive inefficiencies into global markets and injected populist politics into economic decision-making." Therefore, "deeper state intervention in an economy means that bureaucratic waste, inefficiency and corruption are more likely to hold back growth."

Specifically, my analysis is linked to the non-tradable share reform<sup>2</sup> that occurred in 2005. This reform has provided an excellent laboratory for studying the impact of large shareholders on firms' leverage choices for the following two reasons. Primarily, the reform caused an exogenous shock to ownership concentration in form of reduction of share-holdings that were not available for trade, which had been the largest share holdings. Second, this non-tradable share reform did not have a direct impact on corporate leverage choice. My instrument for ownership concentration is the year dummy of reform. This variable is a valid instrument if the presence of a non-tradable reform is correlated with the trading frequency of outstanding shares but affects the dependent variables only through its effect on ownership concentration.

This paper is the first to show that ownership concentration with state shareholding has a negative impact on corporate leverage choice. Second, my analysis studies the debt-financing puzzle between the demand and supply side in a unique institutional environment<sup>3</sup>. Third, this paper contributes to existing research on large shareholders' impact on firms by explicitly addressing the endogeneity of ownership structure. Finally, as I investigate an emerging country such as China, the results might offer a new angle to improve the efficiency of growth by developing well-functioning financial markets and promoting privatization reform by reducing entry barriers.

The remainder of the paper is structured as follows. In section 2, I describe briefly the stylized facts of China's stock market and reform. In section 3, I review the relevant literature and develop my research hypotheses. In section 4, I explain the measurement of variables; describe my sample and data sources, and present descriptive statistics. In section 5, I describe my identification methods and report the results of my main regressions and various robustness checks. In section 6, I discuss the policy implications, the limitation of my analysis and further research questions.

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<sup>2</sup> For more detail, please see discussion in section 2.

<sup>3</sup> See Figure 2.1: Graphical Illustration of Debt Financing.

## 2.2 Stylized Facts

China operates two stock exchanges, one located in Shanghai and the other located in Shenzhen. Instruments traded on both exchanges include shares (A shares and B shares), convertible bonds, warrants, closed-end mutual funds, ETFs, corporate and government bonds, and repos. Aside from B shares, all instruments are denominated only in local currency. Starting in 2006, China's stock markets witnessed a stellar rise. The Shanghai Composite Index doubled in both 2006 and 2007. In 2007, the combined market capitalization of both exchanges in Shanghai and Shenzhen reached almost 140% of GDP, making China's stock market the second-largest in Asia after Japan's. In a global comparison, China's stock market capitalization was the third largest. Average daily trading volume reached USD 26 billion, making it one of the most actively traded markets worldwide. However, after the stock market started to crash in October 2008, market capitalization declined to around 50% of nominal GDP as of the end of 2008 (DB, 2009 and CSRC, 2009)<sup>4</sup>. Table 2.2 present my sample distribution by location, industry and year, which represents 98% of the total listed firms.

[Table 2.2 about here]

Historically, the Chinese domestic A-shares have been divided into tradable and non-tradable shares, though both types of shares have the same cash flow and voting rights. This unique split share structure can lead to divergent interests and incentive conflicts between tradable and non-tradable shareholders, and has long been recognized as the source of many corporate governance problems in China. This split share structure was the outcome of partial privatization implemented in the early 1990s. Typical holders of non-tradable shares were the state and institutions (also called legal persons), while typical holders of tradable shares were domestic and foreign individual investors, as well as domestic institutional investors (Li, Wang, Cheung and Jiang, 2010). By the end of 2004, the total shares of listed Chinese

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<sup>4</sup> See Figure 2.6.1 and 2.6.2 at appendix.

companies were 714.9 billion, of which 454.3 billion shares, or 64% of the total, were non-tradable. Of the non-tradable shares, 74% were state-owned (CSRC, 2009).

To help solve the fundamental governance problems, the Chinese government initiated a split share structure reform program in 2005. The China Securities Regulatory Commission announced two pilot batches involving 42 listed companies. This time, to make the reform palatable to the tradable shareholders, the government stated that the tradable shareholders had to be compensated and that the compensation should be the result of mutual agreement between the two types of shareholders (tradable and non-tradable). The reform involves the non-tradable shareholders proposing a compensation package to the tradable shareholders. Negotiations then ensue between the major non-tradable and tradable shareholders, and the initial proposal is revised into a formal plan that is voted upon by the respective shareholders. The plan needs approval from at least two-thirds of the total voting shares and two-thirds of the voting tradable shares represented by investors who attend the shareholders' meeting, participate in the proxy voting, or cast their votes via the online voting system (Firth, Lin and Zou, 2010; CSRC, 2009).

In August 2005, the reform was expanded to all listed firms. By the end of 2007, 1,254 firms completed the reform, representing over 97% of the market capitalization at the time. Only 33 listed companies had not completed the reform. The reform paves the way to a substantial dilution of government ownership of firms and therefore to an enhanced role for minority investors, leading to a more vibrant market for corporate control and to greater liquidity<sup>5</sup>. It is also associated with a large (current and future) increase in the supply of shares (Beltratti and Bortolotti, 2006)<sup>6</sup>. The reform of non-tradable shares was a landmark in improving the infrastructure and the efficiency of China's capital markets (CSRC, 2009). This reform has provided an excellent laboratory for studying the impact of large shareholders on firms' debt financing decision. In addition, this reform can help us identify the causal relationship and solve the problem of the endogeneity of ownership structure.

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<sup>5</sup> See Sun and Tong (2003); Calomiris, Fisman and Wang (2010) for a detailed explanation.

<sup>6</sup> See Figure 2.2 for detailed information.

### 2.3 Literature Review and Hypotheses Development

Ever since the pioneering work by Modigliani and Miller (1963), generations of economists have contributed to studying the effects of debt financing on firm fundamentals. The increase of corporate leverage has caused some concerns among policy makers who are responsible for the stability of the financial system (Bernanke, Campbell and Whited, 1990). Although most studies examine corporate financing choices, and thus focus on the importance of firm characteristics, there is a growing literature considering how institutional differences affect capital structure choices, (Booth, Aivazian, Demirguc-Kunt, and Maksimovic, 2001; Claessens, Djankov and Nenova, 2001; Demirguc-Kunt and Maksimovic, 1996, 1998, 1999).

However, there are ambiguous findings about how much difference inside ownership makes in financing decisions. Stulz (1988) finds that higher inside ownership should be associated with higher leverage. In fact, some studies suggest the opposite.<sup>7</sup> Holderness and Sheehan (1998) find that firms with individual majority shareholders tend to have lower debt-to-asset ratios than similar-size firms with diffuse ownership structure. Holderness, Kroszner, and Sheehan (1999) report that, though managerial stock ownership increased substantially between 1925 and 1995, the average leverage ratio did not increase. They also find a negative relationship between inside ownership and leverage in 1995. Finally, Mikkelsen and Partch (1989) find no relationship between leverage and managerial stock ownership. The rest of this paper aims to fill this void. However, there is little empirical support for the proposition that leverage increases with ownership concentration.

Beginning in the mid-1990s, studies of equity ownership concentration have been expanded internationally to include countries other than developed countries<sup>8</sup>. This body of evidence reveals that concentrated ownership structures are more

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<sup>7</sup> In his survey, Holderness (2003) questions Stulz's reasoning that greater leverage allows managers to increase their voting control for a given level of equity investment. Debt is thus one way to relax the wealth constraints that are inherent when a single individual or small group of individuals seeks to gain voting control of a large public corporation.

<sup>8</sup> Other important papers on ownership concentration include Demsetz and Lehn (1985), McConnell and Servaes (1990), and Mikkelsen and Partch (1989). See the survey paper by Holderness (2007).

typical of ownership structures around the world than are the relatively diffuse structures observed in large and publicly traded U.S. and U.K. firms. LLS (1999) study the ownership of the largest shareholders, taking a sample of the 20 largest public firms in 27 wealthy countries. Lins (2003) investigates whether non-management block holdings or managerial stock ownership is related to the firm's value across a sample of 1433 firms from 18 emerging economies. Unfortunately, most of the previous studies did not identify the causal inference well due to the endogeneity of ownership structure. Becker et al (2010) argues that a large shareholder may restrain managers from extracting rents and thereby improve firm performance, thus benefiting all shareholders. Other theories have predicted that a block in a firm may be costly. Large shareholders may reduce the liquidity of a firm's shares or influence firm policies in some way that is not in the interest of small shareholders.

Meanwhile, several pioneering researchers have started to study the impact of market frictions on corporate debt financing, which is connected with the supply of debt. Faulkender and Petersen (2006) argue that most existing studies emphasize the demand side factors of debt, such as firms' financing needs and choices. The implicit assumption is that there are no supply frictions: firms can borrow as much as they want. Therefore, the supply side of debt financing has been largely left out. Moreover, firms with a bond rating have higher leverage ratios than those without a bond rating, when controlling for the demand side of debt. This is because the identification of a supply effect with cross-sectional evidence is complicated by concerns over the direction of causality and potential endogeneity. Leary (2009) explores the relevance of capital market supply friction for corporate leverage choice using two major changes in bank funding constraints in the U.S. Brav (2009) investigates the financial policies of both public and private firms in the UK. As for developing countries, Vig (2008) investigates the effect of a securitization reform that strengthened secured creditors' rights on corporate debt structure in India.

In the case of China, concentrated ownership may be a reasonable response to a lack of investor protection. If the law does not protect the owners from the

controllers, the owners will seek to be controllers. Unlike the manager-owner agency conflicts common to firms with diffuse ownership structures, the conflicts of interests between controlling shareholders and minority shareholders become dominant in Chinese firms with high ownership concentration.

Durnev, Li, Morck, and Yeung (2004) show that, compared to other transitional economies, China has one of the most poorly functioning financial markets, which can be linked to weak property rights, corporate opacity and the legal system. Boyreau-Debray and Wei (2004) find that China's state-dominated financial system causes regional segmentation of capital markets and misallocation of capital resulting from the government's reallocation of capital from more productive to less productive regions.

Piotroski and Wong (2009) identify four key institutional arrangements that influence the supply and demand for information about Chinese listed firms: the state's controlling ownership of listed firms, the government's control of capital markets, the limited protection of property rights combined with weak market institutions, and a lack of independence of local auditors. Financial distortion resulting from the bureaucratic allocation system forces firms to transfer scarce financial resources within firms to relieve their financial constraints (Fan, Li, Zheng, 2009).

Gul, Kim, and Qiu (2010) find that concentrated ownership can produce two opposing effects on firm-specific return variation, depending on whether the managerial entrenchment effect or the incentive alignment effect dominates. Lin (2008) tests the relationship between large shareholders and firm value using a recent reform in China's equity market. She finds that large shareholders expropriated less through related party transactions after the reform when the discrepancy between their voting rights and cash-flow rights prior to the reform is larger. She also finds that minority shareholders gain from the reform: firms earn higher excess returns related to the reform announcements when the discrepancy is larger. The implication of her paper is that the discrepancy between large shareholders' voting rights and cash-flow rights can lead to efficiency losses.

In addition, I also study whether the nature of the largest shareholder in Chinese listed firms influences debt financing decisions<sup>9</sup>. For the majority of these listed firms, the largest shareholder is a central government agency, a regional government or a large state-owned enterprise (SOE). Since government ownership is likely to lead to inefficient corporate governance, I expect that protection for minority shareholders may be weaker when the largest shareholder of a firm is government-related than when the largest shareholder is non-government-related. After the discussion of the literature debate and the institutional background of China's stock market, I suggest a number of testable hypotheses in the alternative form:

**H1A:** *Leverage is lower when the largest shareholder is government- related than otherwise, other things being equal.*

**H1B:** *Long-term leverage is higher when the largest shareholder is government-related than otherwise, other things being equal.*

**H1C:** *Short-term debt ratio is lower when the largest shareholder is government-related than otherwise, other things being equal.*

**H2A:** *Leverage is lower when the ownership structure is more concentrated than otherwise, other things being equal.*

**H2B:** *Long-term leverage is higher when the ownership structure is more concentrated than otherwise, other things being equal.*

**H2C:** *Short-term debt ratio is lower when the ownership structure is more concentrated than otherwise, other things being equal.*

## **2.4 Data and Measurement of Variables**

My sample consists of 1,637 non-financial public companies, listed on the Shanghai and Shenzhen stock exchanges during the period 1998 to 2008. I use the CCER China Stock Database<sup>11</sup> to obtain the stock returns and financial statements. I

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<sup>9</sup> Faulkender and Petersen (2005) point out the importance of the source of debt financing from the supply side.

<sup>11</sup> CCER Database is provided by *SinoFin Information Services*, which is the major financial data service company in China and funded by China Centre of Economics Research of Peking University. For more information, see Jiang, Lee and Yue (2010, *Journal of Financial Economics*).

included a company in my sample if it had been listed for at least one year and had filed the financial information required for my analysis. The ownership related data, namely, the percentage of shares held by the largest shareholders (largest to tenth largest) and their identity (government-related or not) are collected mainly from annual reports of individual companies.

Following the definition by Frank and Goyal (2005) and availability of firm level data in China, I define the measurements of leverage as follows:

- 1) Book Leverage: defined as the proportion of total debt to book value of total assets (total debt/total assets). Total debt is defined as the sum of the value of short-term and long-term debt.
- 2) Market Leverage: defined as the proportion of total debt to market value of the total assets (total debt/total market assets). Market value of total assets is computed as the sum of book value of total debt and market value of equity;
- 3) Long-Term Book Leverage: defined as the proportion of long-term debt to book value of the total assets (long-term debt/total assets). Total debt is defined to be the sum of the value of short-term and long-term debt.
- 4) Long-Term Market Leverage: defined as the proportion of long-term debt to market value of the total assets (long-term debt/total market assets).
- 5) Short-Term Debt Ratio: defined as the proportion of short-term debt divided by total debt.

China Securities Regulatory Commission (CSRC) claims that a listed firm in China has six types of shares: state, institutional (or legal person), foreign, insider, employee, and individual shares (A-shares). State shares are either shares retained by the state or shares issued to the state through a debt-equity swap when privatizing a state-owned enterprise. Institutional shares (also called “legal person” shares) are shares owned by Chinese domestic legal entities, including domestic mutual funds, insurance companies, government agencies and other enterprises. Many of these legal entities are fully or partially owned by different levels of government (provincial, municipal, or county). Foreign shares are shares owned by investors with

non-mainland Chinese residency, including foreign investors and residents of Hong Kong, Macau, and Taiwan.

As Chen, Firth and Xu (2009) argue, prior studies that rely on the legal definition of shares to infer investor type are very simplistic and ignore institutional realities. Most importantly, legal person shares can be owned by a number of heterogeneous entities, ranging from solely state owned enterprises to private firms. Because these entities have different objectives and incentives, grouping them together, as done in previous studies, distorts the results and leads to erroneous conclusions. Similarly, state shares can be owned by different types of investors.

My careful investigation is based on ownership information data from *CCER Data*. The main data used are the largest 10 shareholders for each listed firm, with shareholder's name, share percentage and ownership type. In order to get more refined ownership data, I collect the ownership data by hand. The process is completed as follows:

- 1) As the shareholders' names are available, I search on the Guolian Yellow Page website, which has ownership type for millions of enterprises. The ownership type for nearly half of the shareholders can be found on the website.
- 2) If the ownership type is not found in the first step, then I search through Google. Using critical words: "shareholder name" + "public firms" / "private firms", I try to look for relevant information on the firm's ownership type. First, I browse the firm's website for the ownership information if it is available. Second, I look at news reports, government announcements, firms' introduction at job hunting websites, and other relevant information on the ownership type.
- 3) If ownership type is missing for several years, while only the latest ownership type is available, I search further in Google for the history of shareholders' ownership. For example, some shareholders are originally state-owned or collectively owned, while they are privatized during the

sample years. I try to figure out the threshold year for the privatization, and correct the ownership data accordingly.

The ownership data is finally categorized into 4 types: state, domestic institutional, domestic individual, and foreign. I define a dummy “type” for state ownership, which equals one if it is state-owned, and zero otherwise.

Table 2.2 presents some descriptive statistics for my sample. In total, I have 8,002 firm-year observations. Chinese firms all have December year-ends, and the financial information for year  $t$  is based on fiscal year-end  $t-1$  financial reports. I report the mean, median, and standard deviations for the variables. All variables are winsorized at 1% and 99%, except for the reform dummy variable, ownership measures, and macroeconomic and location indicators.

[Table 2.2 about here]

Table 2.3.1 reports descriptive statistics for my research variables. In the table,  $LEVBA = \text{Total debt divided by total assets}$ ;  $LEVMA = \text{Total debt divided by market assets}$ ;  $LLEVBA = \text{Long-term debt divided by total assets}$ ;  $LLEVMA = \text{Long-term debt divided by market assets}$ ;  $STD = \text{Short-term debt divided by total debt}$ . The mean and median of  $LEVBA$  are 0.37 and 0.36, respectively, while the mean and median of  $LEVMA$  are 0.19 and 0.15, respectively. The mean and median of  $LLEVBA$  are 0.12 and 0.08, respectively, while the mean and mean of  $LLEVMA$  are 0.06 and 0.03, respectively. The mean and median of short-term debt ratio are 0.68 and 0.74, respectively. In addition, I provide the detailed statistics summary by ownership between state owned and private at Table 2.3.2.

In Table 2.3.3, I present the statistical summary between institutional owner, private individual, and foreign owner to show the difference from private ownership. Overall, private ownership has higher leverage compared with state ownership. Consequently, foreign ownership has higher leverage compared with domestic ownership on average.

Figure 2.3 and Figure 2.4 describe the sample distribution and trends of leverage. This suggests that, compared with other countries, book leverage increased

substantially over the past 10 years. However, it is difficult to identify the trend of market leverage, due to booms and busts in China's stock market.

[Figure 2.3. series about here]

[Figure 2 .4. about here]

Figure 2.5 series report the time series of different leverage measures by ownership types. Simply, I classify it as state if the firm's largest shareholder is government-owned (government agencies, state-owned firms, and state controlled firms) and private if the firm's largest shareholder is non-government owned. In the figure, the private firms have higher book leverage before year 2006, and a higher short-term debt ratio over all years in my sample. In contrast, the state firms have higher long-term leverage for both book and market measurements. Private firms appear to borrow less long-term debt due to the financially repressive environment in China, which is consistent with my discussion in the previous section: State owned firms may be able to borrow from the bank at lower cost and may have easier access to the corporate bond market or the commercial paper market to raise new debt and pay back original debt.

## **2.5 Results and Robustness Check**

To test the hypothesis developed above, I am especially interested in finding out how leverage varies with firm ownership concentration and the role of state ownership, conditional on firm characteristics, macroeconomic conditions and geographic indicators.

In section one, I run the following reduced form regression under different specifications of leverage: book, market, long-term leverage and short-term debt ratio. In the second section, I employ a non-tradable reform index as a policy IV to solve the concern about endogeneity between ownership structure and leverage choice. In the robustness check section, I exploit the result of an alternative measurement of performance: value added over total assets.

### **2.5.1 Baseline Regression**

Following Rajan and Zingales (1995), I estimate the following regression model:

$$\text{Leverage}_{j,t} = \alpha + \beta_1 \text{OwnershipCR}_{j,t} + \beta_2 \text{StateOwnership}_{j,t} + \beta_3 \text{OwnershipCR} \\ * \text{StateOwnership}_{j,t} + \text{Controls} + \eta_k + \lambda_c + \theta_t + \varepsilon_{k,c,t}$$

Where, for firm *i* in year *t*, all variables are as defined in Table 2.1. My measure for ownership concentration, *OwnershipCR*, is the percentage of shares held by the top 5 largest shareholders or the Herfindahl-Hirschman Index of the 3 largest shareholders at year *t*. *StateOwnership* is a dummy variable representing the nature of the largest shareholder, which equals 1 if the largest shareholder is government-related and 0 otherwise.

With this specification, the coefficient  $\beta_1$  should be interpreted as measuring the correlation between leverage and ownership concentration of the firm holding sector, macroeconomic indicators, year, and other firm characteristics constant. The coefficient  $\beta_2$  should be interpreted as measuring the correlation between leverage and state ownership (government agencies, state-owned firms, and state controlled firms) of the firm in contrast to private ownership (domestic institutions, individuals and foreign entities), holding sector, macroeconomic indicators, year, and other firm characteristics constant.

I also interact *OwnershipCR* with the *StateOwnership* dummy to test the joint relationship between leverage and ownership concentration. These interactions allow us to examine the sensitivity of leverage to state shareholding. In the following panel regressions, I also control the firm-specific and macro level factors, sector ( $\eta_k$ ), province ( $\lambda_c$ ) and year ( $\theta_t$ ) effects.

Results are presented in column (1)-(4) of Table 2.5.1-2.5.5 for different specifications of leverage measures: book leverage, market leverage, long-term debt-to-assets, and short-term debt ratio. I use a panel data with time and industry dummies because it is thus possible to observe the changes and shocks of each time and the industry intercepts and effects of omitted explanatory variables.

## 2.5.2 Main Results

Table 2.5.1-2.5.5 present the results of the leverage regressions<sup>12</sup>. In columns (1) and (2) of Table 2.5.1, I present the results of regressions that explain book leverage considering ownership concentration, the nature of the largest shareholder, firm level variables, and macroeconomic and location variables. In columns (3) and (4), concentration and state control variables interact among themselves in order to evaluate whether there is any influence of the state as the largest shareholder on ownership concentration variables. Table 2.5.1-Table 2.5.4 report the market leverage, long-term book leverage, and long-term market leverage regressions, respectively.

The top half of Table 2.5.1-Table 2.5.2 reports the coefficient estimates of my ownership variables. These coefficient estimates indicate that leverage is negatively related to state ownership of the largest shareholder across all model specifications for both book and market leverage, as illustrated in the full model (1) and (2) in Table 2.5.1 and Table 2.5.2.

[Table 2.5.1-2.5.2 about here]

Based on the full model of (1) and (2) in Table 2.5.1, the coefficients on *TOPGOV* are both significantly negative. These significantly negative coefficients are consistent with Table 2.5.2 market leverage regression, and support the view that the firms with a government-related largest shareholder have lower leverage than firms with a non-government-related largest shareholder. These results are strongly consistent with H1A. As shown in Table 2.5.1 - 2.5.2, the coefficient for *TOPHOLD5* is significantly negative and the coefficient for *HH3* is significantly negative, suggesting a negative relationship between my measure of total leverage and ownership concentration. These results are strongly consistent with H2A.

The interaction variables provide additional insights into how ownership structure affects financing choices. To investigate this relationship, I include a variable that interacts ownership concentration with a state holding dummy variable. Consistent with my predictions, the leverage decreases when the state shareholding percentage by the largest shareholder increases.

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<sup>12</sup> Table 2.4 reports the correlation matrix as well, which are consistent with our main findings.

The remainder of the variables of Table 2.5.1-2.5.2 reports the coefficient estimates of my firm-specific and macroeconomic indicators. These coefficient estimates indicate that leverage is positively related to asset tangibility, firm size, and log-GDP per capita, and negatively related to profitability, employment cost over asset, and market-to-book ratio.

The top half of Table 2.5.3-2.5.4 reports the coefficient estimates of my ownership variables. Based on the full model of (1) and (2) in Table 2.5.3 and Table 2.5.4, the coefficients on *TOPGOV* are both significantly positive; these coefficient estimates are insignificant for state ownership of the largest shareholder. In addition, the coefficients for *HHI5* and *TOPHOLD5* are also insignificant. These results are inconsistent with H1B and H2B.

[Table 2.5.3-2.5.4 about here]

The interaction variables provide interesting insights into how ownership structure affects long-term debt financing choices. To investigate this relationship, I include an interaction term of ownership concentration and a state holding dummy variable. Surprisingly, in Table 2.5.3, state shareholding, concentration measure and their interaction terms all become statistically significant, consistent with the prediction that state shareholding by the largest shareholder increases long-term leverage.

Furthermore, a more concentrated ownership structure leads to a higher long-term leverage ratio, while the positive effect is reduced by state shareholding. Put differently, the marginal effect of ownership concentration is larger for firms with a private entity as the largest shareholder than for firms with a state entity as the largest shareholder. In summary, state shareholding and concentration do not affect long-term leverage separately, and only the interaction among them could lead to higher long-term leverage. Similar results are presented in Table 2.5.4 when market long-term leverage is used, though the coefficients for *HHI5* and its interaction term with state shareholding are not significant.

The variables of Table 2.5.3-2.5.4 report the coefficient estimates of my firm-specific and macroeconomic indicators. These coefficient estimates indicate that

long-term leverage is positively related to asset tangibility and firm size, and negatively related to profitability, employment cost over asset, and log-GDP per capita.

The top half of Table 2.5.5 reports the coefficient estimates of my ownership variables. These coefficient estimates indicate that short-term debt ratio is negatively related to state ownership of the largest shareholder in model (2), while the estimate in model (1) is insignificant. The significantly negative coefficient in model (2) supports the view that firms with government-related entities as the largest shareholder have less short-term debt than the non-government-related ones. These results are consistent with H1C.

As shown in Table 2.5.5, the coefficients for HH3 and TOPHOLD5 are significantly negative, suggesting a negative relation between my measure of short-term ratio and ownership concentration. These results are consistent with H2C. Similarly, Custodio, Ferreira and Laureano (2010) document a largely decrease in corporate debt maturity of U.S. firms from 1976 to 2008.

The interaction variables provide additional insights into how ownership structure affects short-term debt ratio. To investigate this relationship, I include an interaction term of ownership concentration with a state holding dummy variable. However, the interaction terms are not statistically significant.

[Table 2.5.5 about here]

The variables of Table 2.5 report the coefficient estimates of my firm-specific and macroeconomic indicators. These coefficient estimates indicate that short-term debt ratio is positively related to employment cost over assets and log-GDP per capita, and negatively related to profitability, asset tangibility, and firm size.

### **2.5.3 Robustness Check**

I have performed several robustness checks. So far, I have not considered any potential bias that might arise from leverage choice regressions<sup>13</sup>. The OLS panel

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<sup>13</sup> Frank and Goyal (2005) suggest that the problem with cross-sectional tests is that financial policy decisions are made jointly with investment and payout policy decisions. Thus, it is difficult to make causal inferences about debt ratios. A natural idea is thus to look for plausibly exogenous changes in a

estimation of leverage regressions in Table 2.5.1-2.5.5 might ignore a potential problem of endogeneity<sup>14</sup>. My result might be driven by non-random pairs across industry and province. Also, if ownership and leverage choice are endogenously determined, the panel regression cannot be used to make inferences about the causality relationship.

In this section, I employ the non-tradable reform index as a policy IV to solve the concern about endogeneity between ownership structure and leverage choice. As I discussed in the part 2, the non-tradable policy IV has direct impact on ownership concentration and will not influence leverage choice directly. Therefore, due to this external policy change, it will not be difficult to disentangle endogeneity and causality problems in order to draw inferences as to whether a firm's ownership structure affects its leverage choice.

[Table 2.6 about here]

The top half of Table 2.6 reports the coefficient estimates of my ownership variables. Based on the full model of (1), (2) and (4) in Table 2.6, the coefficients on *TOPGOV* are both significantly negative, with *HHI5* and *TOPHOLD5* instrumented with reform dummy respectively. These significantly negative coefficients support the view that firms with a government-related largest shareholder have less total leverage than firms with a non-government-related largest shareholder. These results are consistent with H1A. As shown in model (1)-(4) in Table 2.6, the coefficients for *HHI5* and *TOPHOLD5* are all significantly negative, suggesting a negative relation between my measure of total leverage and ownership concentration. These results are strongly consistent with H2A.

However, long-term leverage choice is still not affected by state shareholding and ownership concentration in IV regression model (5)-(8) in Table 2.6, which is inconsistent with H1B and H2B. Short-term debt ratio is negatively affected by state

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firm's environment and then see how leverage responds. Vig (2009) investigates the effect of legal reform on corporate debt structure, employing the natural experimental difference-in-difference.

<sup>14</sup> Petersen (2008) provides a very useful discussion and framework for application to corporate finance.

shareholding in model (10) in Table 2.6, which is consistent with H1C, while insignificant in model (9). Furthermore, concentration measures are insignificant across model (7)-(10) in Table 2.6, which is inconsistent with H2C.

Additional robustness checks consider whether my results are sensitive to the size of the sample. In this section, I use an alternative measure of performance in my leverage regression. After considering ROE, I apply generalized method of moments (GMM) estimations to a sub-sample consisting of each firm in each year from 2005 to 2008.

[Table 2.7 about here]

The top half of Table 2.7 reports the coefficient estimates of my ownership variables. These coefficient estimates indicate that total leverage and short-term debt ratio are all negatively related to state ownership of the largest shareholder across all model specifications. In addition, the coefficients for HHI5 and TOPHOLD5 are significantly negative in model (1)-(4) and (9)-(10) in Table 2.7, suggesting a negative relationship between my measure of total leverage, short-term debt ratio, and ownership concentration. Consistent with H1A, H1C, H2A and H2C, these significantly negative coefficients support the view that firms with government-related largest shareholder and concentrated ownership structure have less total leverage and short-term debt ratio than firms with a non-government-related largest shareholder.

However, long-term debt regression model (5)-(8) in Table 2.7 yields insignificant results for state ownership of the largest shareholder and ownership concentration, which are inconsistent with H1B and H2B. A possible explanation is that state shareholding and ownership concentration cannot affect long-term leverage separately, which leads to the insignificant results in model (5)-(8) without interaction terms.

## **2.6 Concluding Remarks**

Using a large sample of Chinese listed firms over the period 1998-2008, this study investigates whether and how corporate debt financing decisions are

associated with ownership structure characteristics unique to China. The corporate-level governance variables I examine are ownership concentration and the nature of the largest shareholder (whether government-related or not). My main findings are as follows.

First, I observe negative relationships between ownership concentration and leverage and between ownership concentration and short-term debt ratio: as the percentage of shares held by the five largest shareholders increases, the leverage and short-term debt ratio decrease. Second, I find that leverage (book and market) and short-term debt ratio are lower when the largest shareholder is government-related than otherwise. Third, I notice that the correlation between long-term leverage (book and market) and ownership concentration is positive: as the percentage of shares held by the five largest shareholders increases, long-term leverage will also increase. Fourth, I find that long-term leverage is higher when the largest shareholder is government-related than otherwise. Finally, I employ the non-tradable reform dummy as an instrumental variable to control for potential endogenous ownership concentration. The 2SLS regression results show similar results between ownership concentration with state shareholding and leverage choice

My results have challenged previous research on the relationship between leverage and ownership concentration. Stulz (1988) finds that if insiders are concerned about control, they will choose high leverage so that they can afford a large proportional stake in the firm's cash flow, leading to a positive association between leverage and ownership. I also test the competing views between the demand side and supply side of debt financing. My results are that state-controlled firms have lower total leverage and more long-term debt than privately-controlled firms because of better access to capital in the form of equity and long-term debt.

Overall, my results support the view that ownership structure plays a vital role in corporate debt financing decisions when the capital market in a country is underdeveloped. When these twin agency problems are significant, diffuse ownership is inefficient and corporate insiders must co-invest with other investors, retaining substantial equity. Stulz (2005) suggests that the resulting ownership

concentration limits economic growth, financial development, and the ability of a country to take advantage of financial globalization.

My results are consistent with the evidence provided by Huang and Zhu (2007). They find that the government is the debtor not only for Treasury bonds, but also for most corporate bonds issued by large state-owned firms. Indeed, state-owned firms may borrow from banks at lower cost and more easily access the corporate bond or commercial paper market to raise new debt (of longer maturity) and pay back original debt. Privately controlled firms have no access to the long-term debt market and have to borrow more working capital or short-term loans, which might increase their leverage ratios.

Taken as a whole, my results provide some useful policy implications for emerging markets such as China. How to develop domestic financial markets will be the key step of future reform, which might encourage competition among different ownership structures, reduce the risk from short-term debt financing, and increase the efficiency of corporate investment.

I also want to admit some limitations of my research, which might provide room for future research. First, I don't include the firm's investment choice into my analysis, which might explore more information from the demand side of debt. Second, it is perhaps even more challenging to identify a valid instrument with more than one policy change and external shocks simultaneously. Finally, in the future, I will employ the methods of difference-in-difference to detect more sensitive effects<sup>15</sup> of policy change.

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<sup>15</sup> See the toolkit (Duflo, Glennerster and Kremer, 2007)

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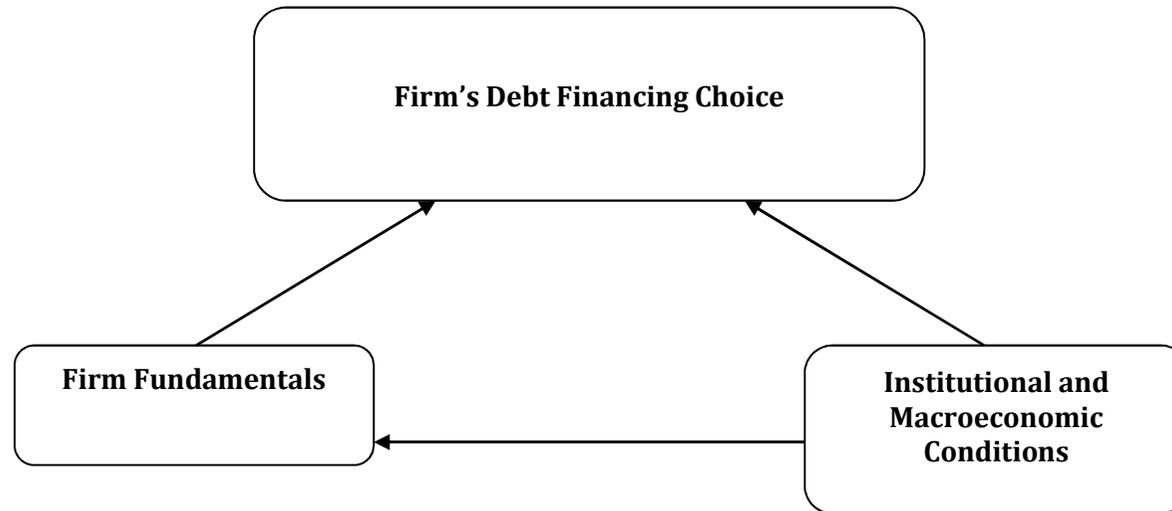
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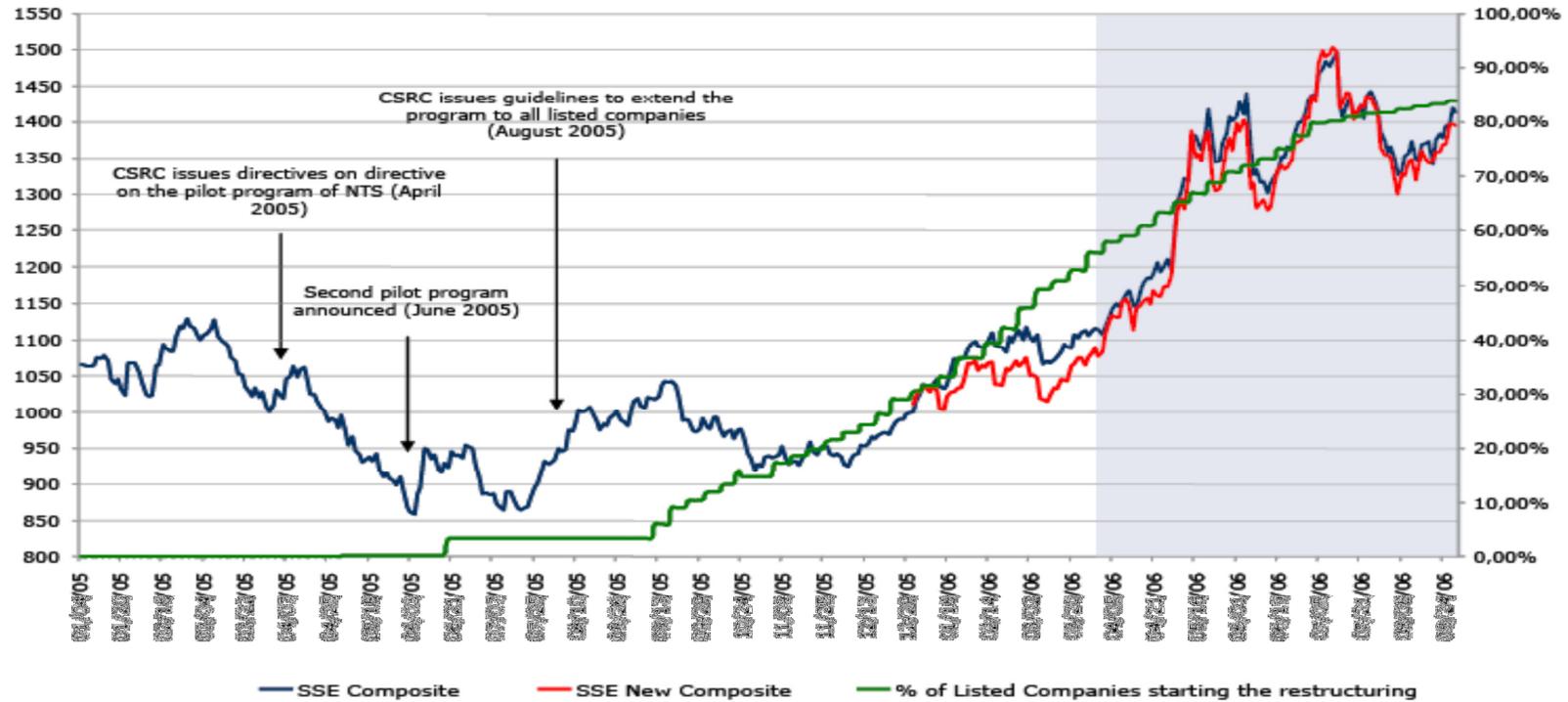
Figure 2.1: Graphical Illustration of Debt Financing



**Demand for Debt: The relative benefits and costs of debt**  
**Firm level:** Size, Profitability, Asset Tangibility, Growth Opportunity; Ownership Concentration Index;  
**Province Level:** Geographic and Special Economic Region;

**Supply for Debt: The source of debt**  
**Firm level:** State-Ownership;  
**Province Level:** GDP per Capita, Financial Market Development;

Figure 2.2: Market Performance and Progress of NTS Reform

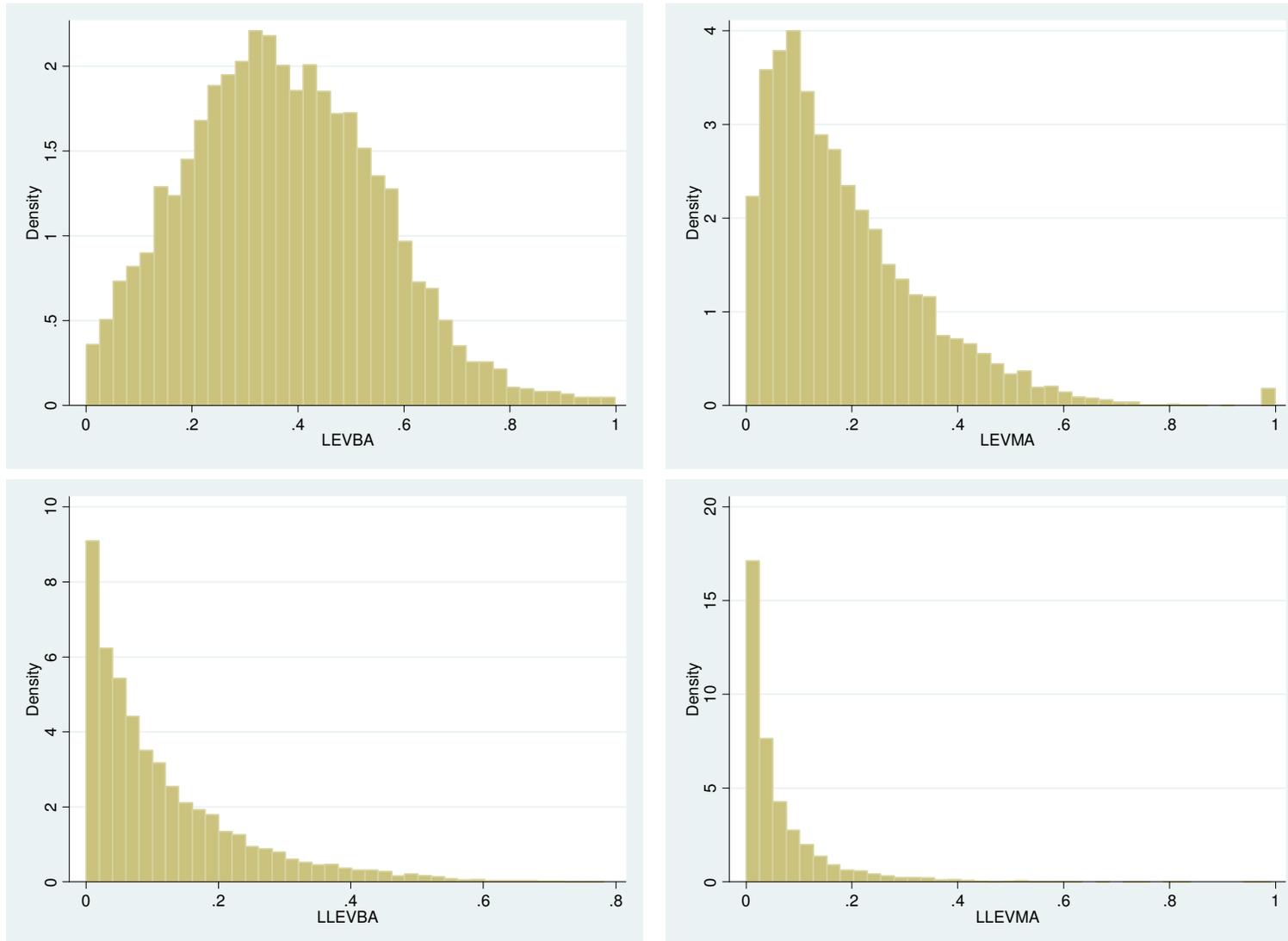


The figure reports the daily Return Index for the Shanghai Stock Exchange Composite Index and the Shanghai Stock Exchange A share Index (left scale) and the percentage of the companies entered the NTS reform program (right scale) from January 2005 to March 2007.

Source: Beltratti and Bortolotti (2006)

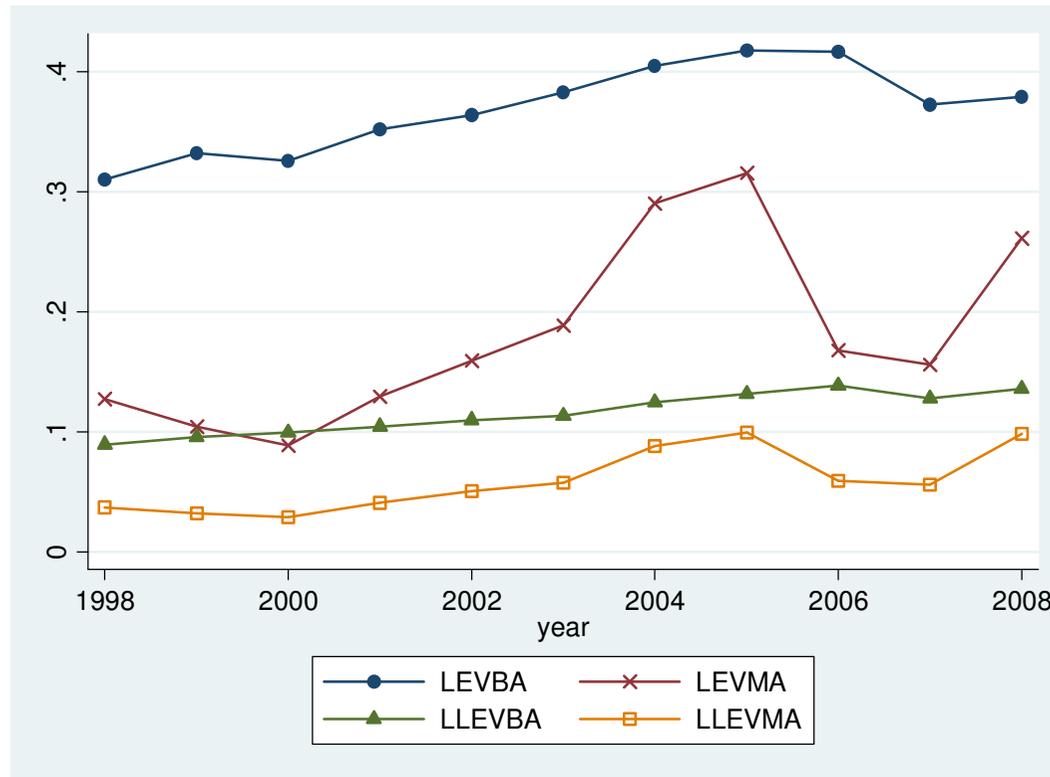
**Figure 2.3: The Sample Distribution of Leverage Measures (Averages over Sample Period)**

**Leverage measures:** LEVBA = Total debt divided by total assets; LEVMA = Total debt divided by market assets  
LLEVBA = Long-term debt divided by total assets; LLEVMA = Long-term debt divided by market assets.

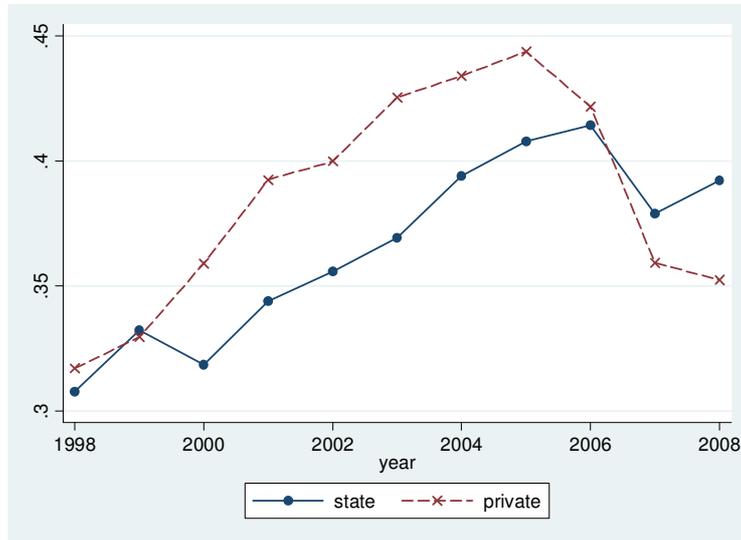


**Figure 2.4: Time Series of Average Leverage Measures**

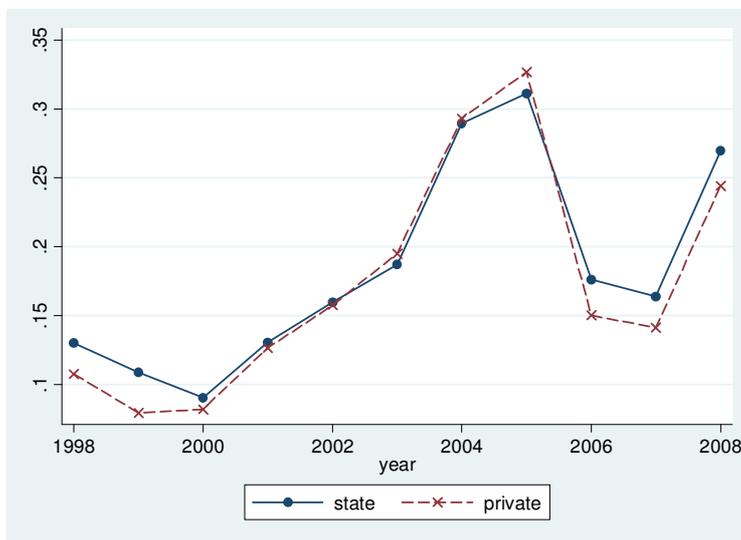
**Leverage measures:** LEVBA = Total debt divided by total assets; LEVMA = Total debt divided by market assets;  
LLEVBA = Long-term debt divided by total assets; LLEVMA = Long-term debt divided by market assets



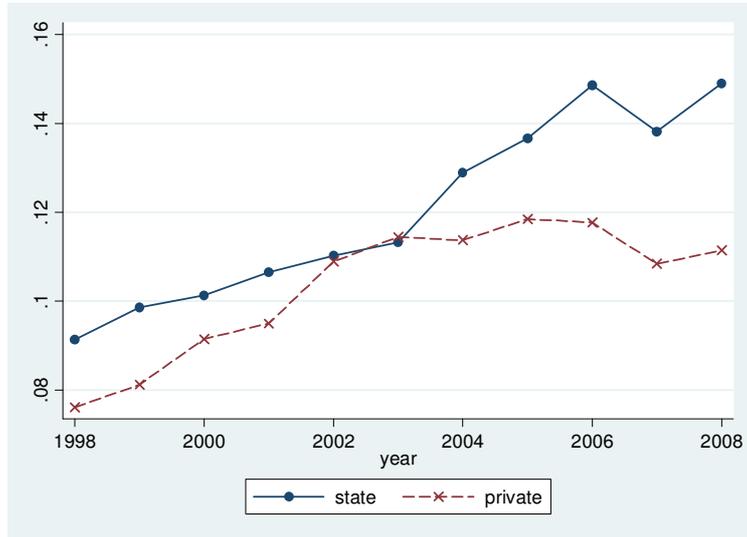
**Figure 2.5.1: Time Series of Average Book Leverage by Ownership Types**



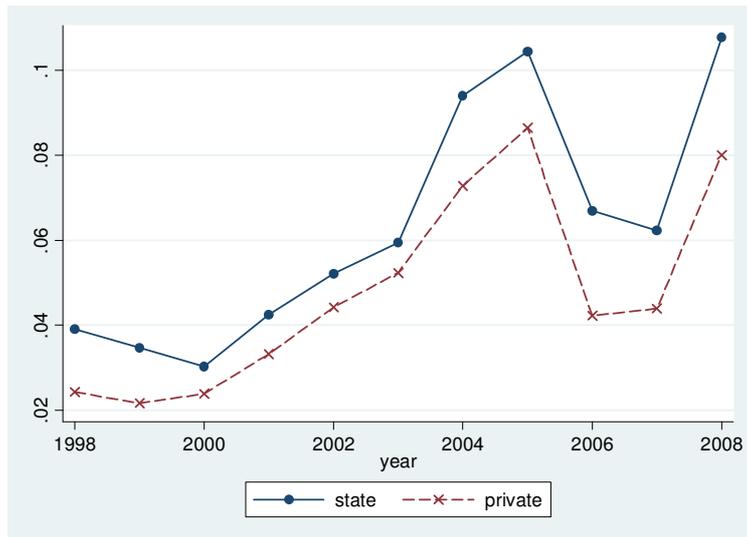
**Figure 2.5.2: Time Series of Average Market Leverage by Ownership Types**



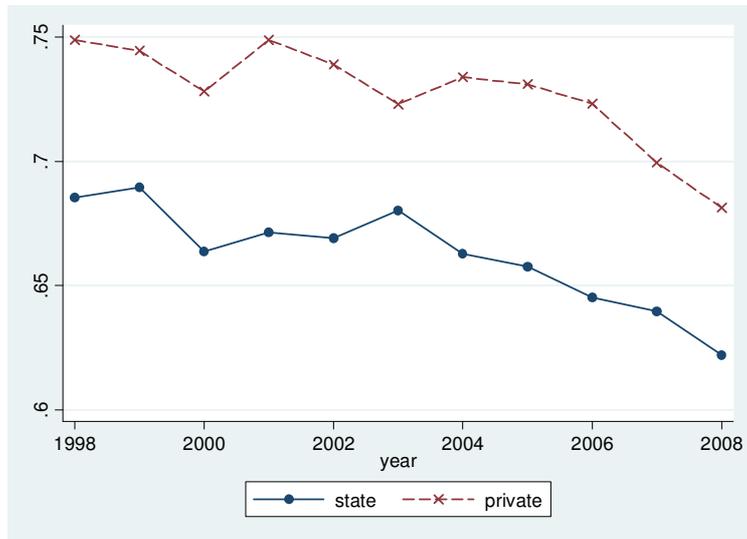
**Figure 2.5.3: Time Series of Average Long-Term Book Leverage by Ownership Types**



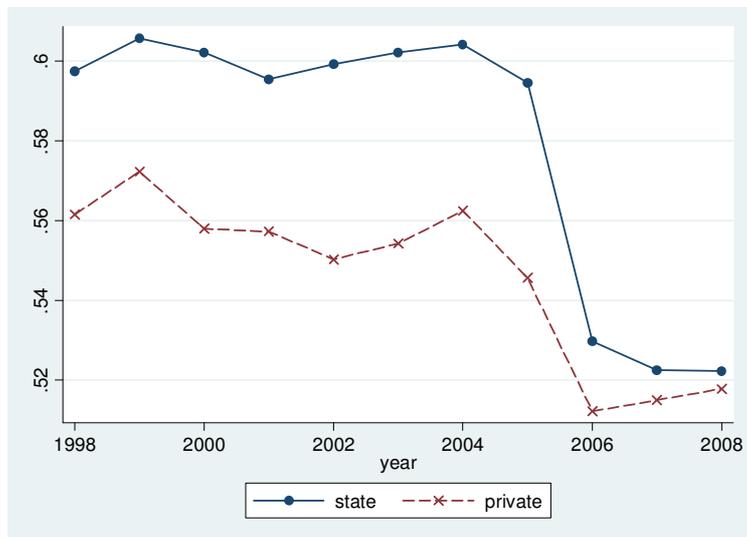
**Figure 2.5.4: Time Series of Average Long-Term Market Leverage by Ownership Types**



**Figure 2.5.5: Time Series of Average Short-Term Debt Ratio by Ownership Types**

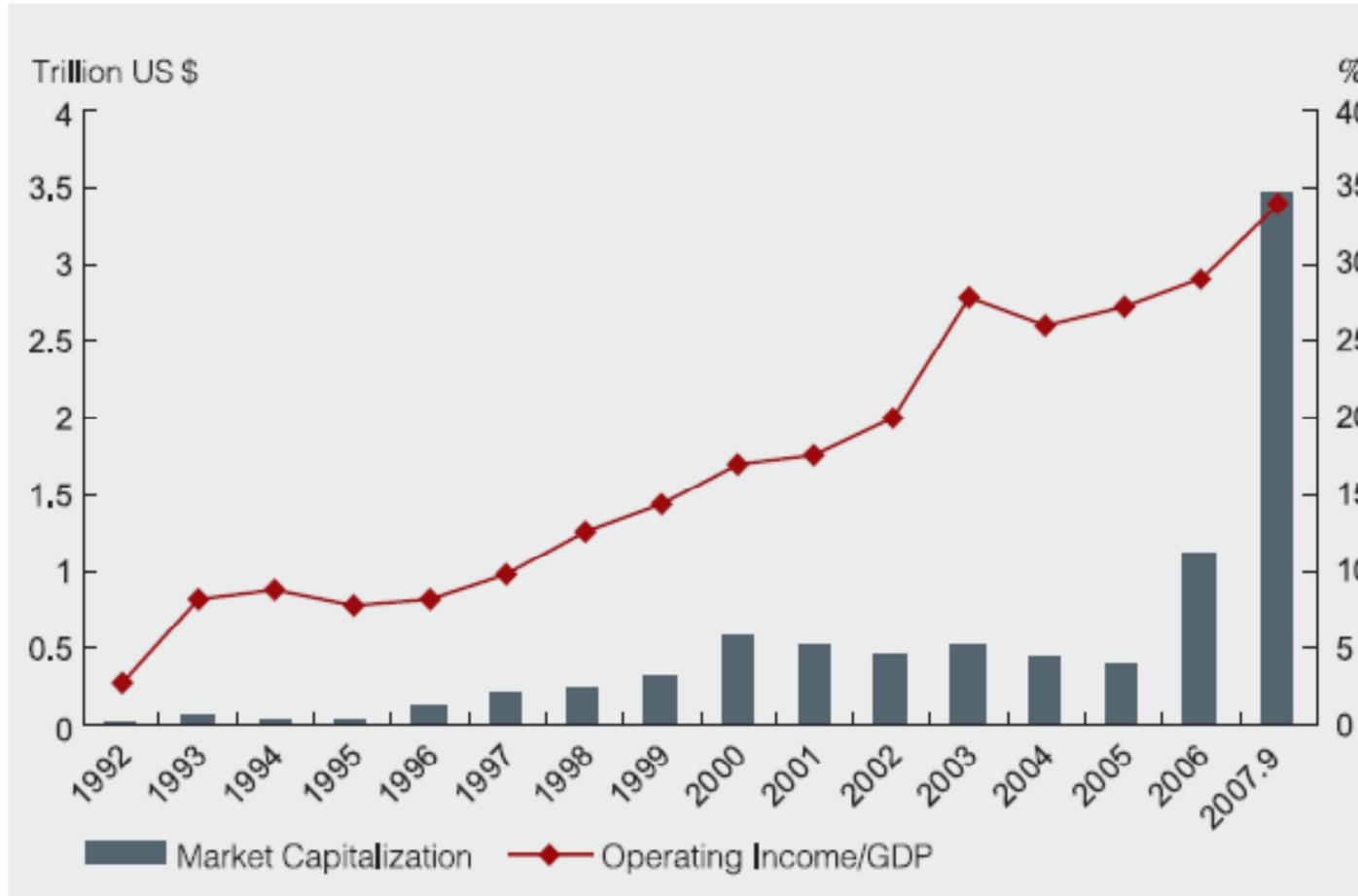


**Figure 2.5.6: Time Series of Top 5 Shareholder's Share by TOPGOV**



## Appendix

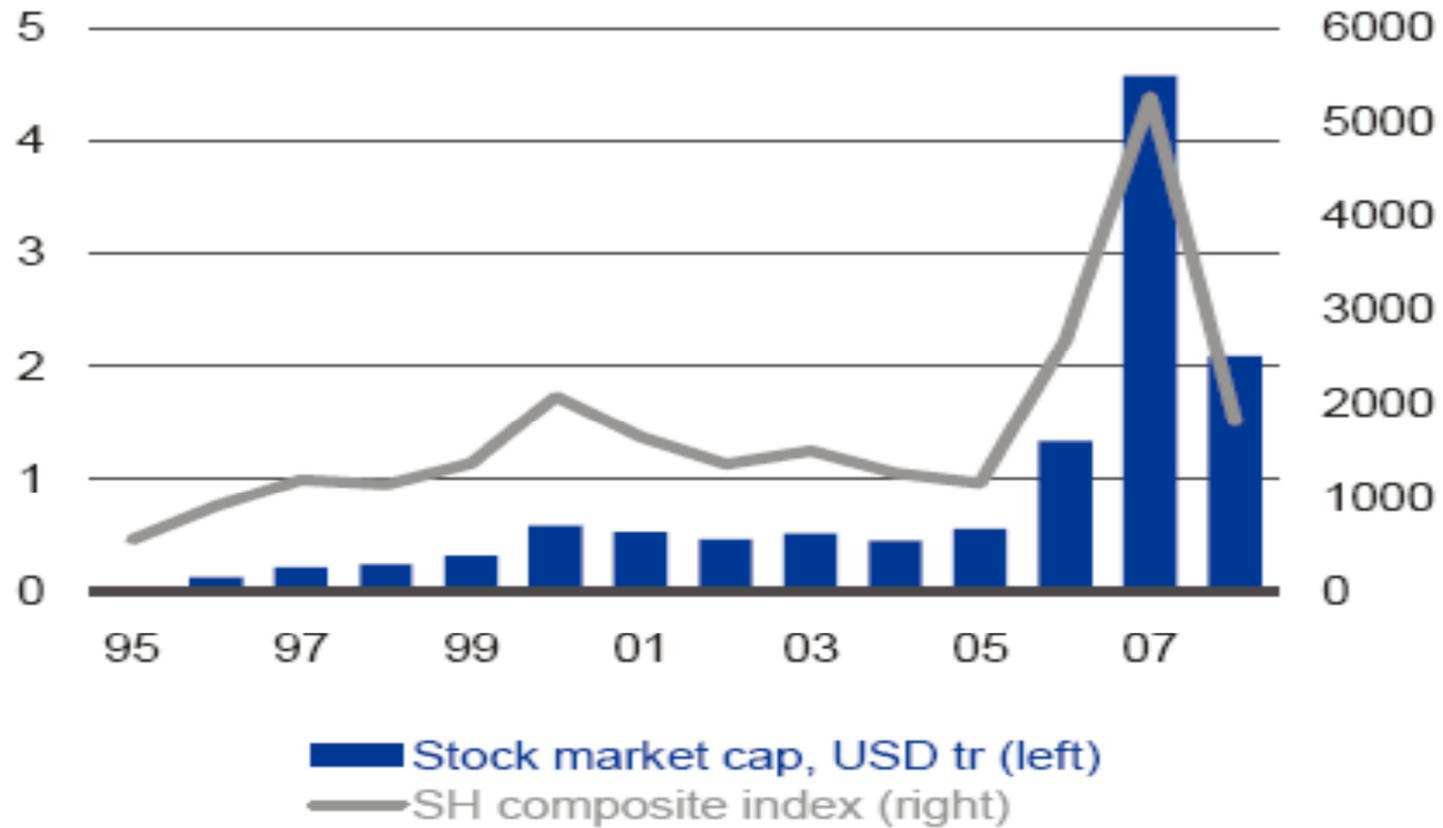
Figure 2.6.1: Total Market Capitalization and Contributions of listed companies



Note: 2007 data based on Q3 report of listed companies.

Source: CSRC and *China Securities and Futures Statistical Yearbook*, 2008.

Figure 2.6.2: Abrupt end to stock market boom



Sources: CEIC, DB Research (2009)

**Table 2.1: Variable Definitions**

<b>Variable</b>	<b>Definition</b>
TOTAL DEBT	= The sum of long-term debt and short-term debt
TOTAL ASSETS	= Book value of total assets;
MARKET ASSETS	= Market value of total assets computed as the sum of book value of total debt and market value of equity;
LEVBA	= Total debt divided by total assets;
LEVMA	= Total debt divided by market assets;
LLEVBA	= Long term debt divided by total assets;
LLEVMA	= Long term debt divided by market assets;
SHORT TERM DEBT	= Short term debt divided by total debt;
LAT	= Log(total assets);
PFT	= Operation profit/total assets;
TGB	= Fixed asset/total assets;
Q	= Market assets / Total assets;
EMPLOYMENT COST	= Cash paid to and for employees / total assets;
RFM	= 1 if after Non-Tradable Share Reform, 0 otherwise
ROA	= Net profit before tax/ total assets;
LGDP	= Log(GDP per capita) at the provincial level;
CRDMK	= Total loans of financial institutions/GDP at the provincial level;
CST	= 1 if locates in a coastal province, 0 otherwise;
SPE	= 1 if locates in a special economic region, 0 otherwise;
TOPHOLD5	= The percentage of shares held by the Top 5 largest shareholders at the year-end;
HHI5	= Herfindahl-Hirschman Index of the 5 largest shareholders ( the sum of square of percentage);
TOPGOV	= A state indicator variable of the nature of the largest shareholder; It equals 1 if the firm's largest shareholder is government-owned(government agencies, state-owned firms, and state controlled firms), and 0 if the firm's largest shareholder is non-government owned;

**Table 2.2: Sample Distribution**

**Panel A: Yearly Distribution**

<b>Year</b>	<b>1998</b>	<b>1999</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>Total</b>
N	543	551	655	696	715	768	791	762	805	858	858	8002
Percent (%)	6.79	6.89	8.19	8.70	8.94	9.60	9.89	9.52	10.06	10.72	10.72	100

**Panel B: Industry Distribution<sup>1</sup>**

<b>GICS Industry Code</b>	<b>1010</b>	<b>1510</b>	<b>2010</b>	<b>2020</b>	<b>2030</b>	<b>2510</b>	<b>2520</b>	<b>2530</b>	<b>2540</b>	<b>2550</b>	<b>3010</b>
N	154	1922	1316	53	363	335	537	157	43	400	55
Percent (%)	1.93	24.12	16.51	0.67	4.56	4.20	6.74	1.97	0.54	5.02	0.69
<b>GICS Industry Code</b>	<b>3020</b>	<b>3030</b>	<b>3510</b>	<b>3520</b>	<b>4020</b>	<b>4040</b>	<b>4510</b>	<b>4520</b>	<b>4530</b>	<b>5010</b>	<b>5510</b>
N	460	11	54	490	12	525	86	531	12	6	447
Percent (%)	5.77	0.14	0.68	6.15	0.15	6.59	1.08	6.66	0.15	0.08	5.61

<sup>1</sup>The industry category is based on the Global Industry Classification Standard (GICS)

<b>GICS Industry Code</b>	<b>Industry Name</b>	<b>GICS Industry Code</b>	<b>Industry Name</b>
1010	Energy	3020	Food, Beverage & Tobacco
1050	Materials	3030	Household & Personal Products
2010	Capital Goods	3510	Health Care Equipment & Services
2020	Commercial & Professional Services	3520	Pharmaceuticals, Biotechnology & Life Sciences
2030	Transportation	4020	Diversified Financials
2510	Automobiles & Components	4040	Real Estate
2520	Consumer Durables & Apparel	4510	Software & Services
2530	Consumer Services	4520	Technology Hardware & Equipment
2540	Media	4530	Semiconductors & Semiconductor Equipment
2550	Retailing	5010	Telecommunication Services
3010	Food & Staples Retailing	5510	Utilities

**Table 2.3.1: Descriptive Statistics**

VARIABLE	Observations	Mean	Median	Std. Dev.
<b>Leverage Measures</b>				
LEVBA	8002	0.3727	0.3641	0.1775
LEVMA	8006	0.1871	0.1515	0.1423
LLEVBA	8002	0.1178	0.0790	0.1173
LLEVMA	8006	0.0615	0.0321	0.0785
SHORT TERM DEBT	8006	0.6762	0.7407	0.2595
<b>Firm Level Variables</b>				
TGB	13173	0.4118	0.3724	0.2575
LAT	13178	21.1659	21.0479	0.9954
ROA	13172	0.0392	0.0429	0.0726
Q	13168	2.5247	2.0883	1.5137
EMPAST	13173	0.0419	0.0349	0.0298
RFM	13185	0.3098	0	0.4624
<b>Concentration Measures</b>				
TOPGOV	13168	0.7189	1	0.4496
HHI5	13112	0.2130	0.1773	0.1435
TOPHOLD5	13112	0.5676	0.5786	0.1425
<b>Macroeconomic and Location Indicators</b>				
LGDP	13131	9.6659	9.5925	0.7328
CRDMK	13104	1.1425	0.9878	0.5184
CST	13185	0.5468	1	0.4978
SPE	13168	0.0952	0	0.2935

This table reports summary statistics for all variables used in the analysis. Leverage measures: LEVBA= Total debt divided by total assets; LEVMA = Total debt divided by market assets; LLEVBA = Long term debt divided by total assets; LLEVMA=Long term debt divided by market assets; SHORT TERM DEBT=short-term debt/total debt. Firm-specific control variables: TGB=fixed asset/total asset; LAT=log (total asset); ROA=net profit before tax/total asset; ROE=net profit before tax/total equity; Q=market value of total assets / book value of total assets; EMPAST=cash paid to and for employees/total asset. Concentration measures: TOPGOV is a state indicator variable of the nature of the largest shareholder; It equals 1 if the firm's largest shareholder is government-owned (government agencies, state-owned firms, and state controlled firms), and 0 if the firm's largest shareholder is non-government owned. HHI5 is sum squared largest 5 largest shareholders' percentage; TOPHOLD5 is summation of largest 5 largest shareholders' percentage. Macroeconomic indicators: LGDP=log (GDP per capita) at provincial level; CRDMK=total loans of financial institutions/GDP at provincial level; CST=1 if coastal provinces/cities, 0 otherwise; SPE=1 if special economic region, 0 otherwise. Variables are winzorized at the 1% tails. Number of observations, mean, median and standard deviation are reported. The sample years are 1998 – 2008, and for all listed firms in Shanghai Stock Exchange and Shenzhen Stock Exchange.

**Table 2.3.2: Summary Statistics by Ownership**

Variables	N	State			Private			N	
		Mean	Median	SD	Mean	Median	SD		
LEVBA	6017	0.37	0.36	0.18	1978	0.39	0.38	0.18	7995
LEVMA	6021	0.19	0.15	0.14	1978	0.19	0.15	0.15	8006
LLEVBA	6017	0.12	0.08	0.12	1978	0.11	0.07	0.11	7995
LLEVMA	6021	0.06	0.03	0.08	1978	0.05	0.03	0.07	8006
SHORT TERM DEBT	6021	0.66	0.72	0.26	1978	0.72	0.79	0.24	7999
TGB	9457	0.44	0.40	0.27	3699	0.33	0.30	0.22	13156
LAT	9461	21.28	21.16	1.01	3700	20.87	20.81	0.89	13161
ROA	9457	0.04	0.04	0.07	3698	0.04	0.05	0.08	13155
Q	9456	2.45	2.06	1.41	3695	2.71	2.18	1.73	13151
EMPAST	9456	0.04	0.04	0.03	3700	0.04	0.03	0.03	13156
RMF	9466	0.28	0	0.45	3702	0.38	0	0.49	13185
TOPGOV	9466	1	1	0	3702	0	0	0	13168
HHI5	9434	0.24	0.21	0.15	3678	0.15	0.12	0.11	13112
TOPHOLD5	9434	0.58	0.59	0.14	3678	0.54	0.55	0.14	13112
LGDP	9454	9.62	9.53	0.75	3660	9.79	9.75	0.68	13114
CRDMK	9431	1.17	1.02	0.55	3656	1.08	0.91	0.43	13087
CST	9466	0.52	1	0.50	3702	0.62	1	0.49	13168
SPE	9466	0.09	0	0.28	3702	0.11	0	0.32	13168

This table reports summary statistics for all variables used in the analysis. Leverage measures: LEVBA= Total debt divided by total assets; LEVMA = Total debt divided by market assets; LLEVBA = Long term debt divided by total assets; LLEVMA=Long term debt divided by market assets; SHORT TERM DEBT=short-term debt/total debt. Firm-specific control variables: TGB=fixed asset/total asset; LAT=log (total asset); ROA=net profit before tax/total asset; ROE=net profit before tax/total equity; Q=market value of total assets / book value of total assets; EMPAST=cash paid to and for employees/total asset. Concentration measures: TOPGOV is a state indicator variable of the nature of the largest shareholder; It equals 1 if the firm's largest shareholder is government-owned (government agencies, state-owned firms, and state controlled firms), and 0 if the firm's largest shareholder is non-government owned. HHI5 is sum squared largest 5 largest shareholders' percentage; TOPHOLD5 is summation of largest 5 largest shareholders' percentage. Macroeconomic indicators: LGDP=log (GDP per capita) at provincial level; CRDMK=total loans of financial institutions/GDP at provincial level; CST=1 if coastal provinces/cities, 0 otherwise; SPE=1 if special economic region, 0 otherwise. Variables are winzorized at the 1% tails. Number of observations, mean, median and standard deviation are reported. The sample years are 1998 – 2008, and for all listed firms in Shanghai Stock Exchange and Shenzhen Stock Exchange.

**Table 2.3.3: Summary Statistics by Private Ownership**

Variables	Private											
	Institution				Individual				Foreign			
	N	Mean	Median	SD	N	Mean	Median	SD	N	Mean	Median	SD
LEVBA	1709	0.39	0.39	0.18	127	0.35	0.33	0.14	142	0.40	0.39	0.21
LEVMA	1709	0.19	0.15	0.14	127	0.21	0.15	0.18	142	0.20	0.15	0.16
LLEVBA	1709	0.10	0.07	0.11	127	0.09	0.06	0.09	142	0.17	0.09	0.17
LLEVMA	1709	0.05	0.03	0.07	127	0.06	0.03	0.09	142	0.09	0.04	0.12
SHORT TERM DEBT	1709	0.73	0.79	0.23	127	0.75	0.79	0.20	142	0.61	0.65	0.30
TGB	3140	0.33	0.30	0.21	331	0.24	0.22	0.15	228	0.45	0.41	0.28
LAT	3141	20.86	20.82	0.88	331	20.61	20.50	0.75	228	21.36	21.15	1.05
ROA	3140	0.03	0.04	0.08	330	0.07	0.07	0.06	228	0.03	0.04	0.08
Q	3136	2.74	2.19	1.77	331	2.58	2.20	1.67	228	2.47	2.08	1.29
EMPAST	3141	0.04	0.03	0.03	331	0.06	0.05	0.03	228	0.05	0.04	0.04
RFM	3142	0.38	0	0.49	332	0.37	0	0.48	228	0.38	0	0.49
TOPGOV	3142	0	0	0	332	0	0	0	228	0	0	0
HHI5	3131	0.15	0.12	0.11	321	0.11	0.10	0.08	226	0.16	0.15	0.09
TOPHOLD5	3131	0.53	0.54	0.14	321	0.56	0.56	0.13	226	0.61	0.65	0.16
LGDP	3123	9.73	9.68	0.67	312	10.22	10.37	0.52	225	10.11	10.25	0.64
CRDMK	3121	1.07	0.91	0.43	310	1.13	1.07	0.39	225	1.15	1.07	0.45
CST	3142	0.59	1	0.49	332	0.71	1	0.45	228	0.80	1	0.40
SPE	3142	0.11	0	0.31	332	0.11	0	0.32	228	0.23	0	0.42

This table reports summary statistics for all variables used in the analysis. Leverage measures: LEVBA= Total debt divided by total assets; LEVMA = Total debt divided by market assets; LLEVBA = Long term debt divided by total assets; LLEVMA=Long term debt divided by market assets; SHORT TERM DEBT=short-term debt/total debt. Firm-specific control variables: TGB=fixed asset/total asset; LAT=log (total asset); ROA=net profit before tax/total asset; ROE=net profit before tax/total equity; Q=market value of total assets / book value of total assets; EMPAST=cash paid to and for employees/total asset. Concentration measures: TOPGOV is a state indicator variable of the nature of the largest shareholder; It equals 1 if the firm's largest shareholder is government-owned (government agencies, state-owned firms, and state controlled firms), and 0 if the firm's largest shareholder is non-government owned. HHI5 is sum squared largest 5 largest shareholders' percentage; TOPHOLD5 is summation of largest 5 largest shareholders' percentage. Macroeconomic indicators: LGDP=log (GDP per capita) at provincial level; CRDMK=total loans of financial institutions/GDP at provincial level; CST=1 if coastal provinces/cities, 0 otherwise; SPE=1 if special economic region, 0 otherwise. Variables are winzorized at the 1% tails. Number of observations, mean, median and standard deviation are reported. The sample years are 1998 – 2008, and for all listed firms in Shanghai Stock Exchange and Shenzhen Stock Exchange.

**Table 2.4: Correlation Matrix**

This table reports summary statistics for all variables used in the analysis. Leverage measures: LEVBA= Total debt divided by total assets; LEVMA = Total debt divided by market assets; LLEVBA = Long term debt divided by total assets; LLEVMA=Long term debt divided by market assets; SHORT TERM DEBT=short-term debt/total debt. Firm-specific control variables: TGB=fixed asset/total asset; LAT=log (total asset); ROA=net profit before tax/total asset; ROE=net profit before tax/total equity; Q=market value of total assets / book value of total assets; EMPAST=cash paid to and for employees/total asset. Concentration measures: TOPGOV is a state indicator variable of the nature of the largest shareholder; It equals 1 if the firm's largest shareholder is government-owned (government agencies, state-owned firms, and state controlled firms), and 0 if the firm's largest shareholder is non-government owned. HHI5 is sum squared largest 5 largest shareholders' percentage; TOPHOLD5 is summation of largest 5 largest shareholders' percentage. Macroeconomic indicators: LGDP=log (GDP per capita) at provincial level; CRDMK=total loans of financial institutions/GDP at provincial level; CST=1 if coastal provinces/cities, 0 otherwise; SPE=1 if special economic region, 0 otherwise. Variables are winzorized at the 1% tails. Number of observations, mean, median and standard deviation are reported. The sample years are 1998 – 2008, and for all listed firms in Shanghai Stock Exchange and Shenzhen Stock Exchange.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
LEVBA																	
LEVMA	0.69																
LLEVBA	0.45	0.40															
LLEVMA	0.41	0.65	0.85														
SHORT TERM DEBT	0.05	-0.04	-0.78	-0.63													
TGB	0.02	0.09	0.20	0.21	-0.23												
LAT	0.13	0.35	0.26	0.37	-0.21	0.11											
ROA	-0.40	-0.32	-0.05	-0.08	-0.16	-0.03	0.14										
ROE	-0.22	-0.60	-0.16	-0.38	0.04	-0.09	-0.45	0.18									
Q	0.10	0.10	0.11	0.12	-0.05	-0.11	0.22	0.03	-0.06								
RFM	-0.15	-0.08	0.02	0.02	-0.12	0.20	0.18	0.17	0.00	-0.22							
TOPGOV	-0.14	-0.11	0.03	0.03	-0.13	0.18	0.07	0.17	0.08	-0.28	0.75						
HHI3	0.11	0.16	0.01	0.07	0.05	-0.18	0.27	0.03	-0.11	0.41	-0.10	-0.10					
TOPHOLD5	-0.01	-0.04	-0.03	-0.04	0.03	-0.05	0.03	0.02	0.02	-0.11	0.10	0.12	0.27				
LGDP	0.06	0.02	-0.03	-0.03	0.05	-0.06	0.08	0.03	-0.01	0.01	-0.06	-0.07	0.48	-0.16			
CRDMK	0.03	-0.03	0.02	-0.01	-0.03	-0.08	-0.01	-0.04	0.05	-0.02	-0.05	-0.02	0.01	-0.08	0.29		
CST	-0.38	-0.26	-0.07	-0.08	-0.13	0.21	0.15	0.80	0.09	0.10	0.18	0.19	0.08	0.02	0.02	-0.08	
SPE	-0.05	-0.01	0.09	0.08	-0.10	0.14	0.26	0.66	-0.04	0.13	0.10	0.11	0.12	0.02	0.04	-0.04	0.79
EMPAST	-0.16	-0.12	-0.20	-0.17	0.14	0.10	-0.03	0.10	0.07	0.02	0.06	0.03	0.04	0.19	0.04	0.03	0.38

**Table 2.5.1: Book Leverage Regressions: Expropriation Hypothesis**

Variables	(1)	(2)	(3)	(4)	(5)	(6)
<b>TOPGOV</b>	<b>-0.0209***</b>	<b>-0.0202***</b>	<b>-0.0227***</b>	<b>0.0228</b>	<b>-0.0198*</b>	<b>0.0195</b>
	<b>[0.0060]</b>	<b>[0.0059]</b>	<b>[0.0059]</b>	<b>[0.0197]</b>	<b>[0.0101]</b>	<b>[0.0178]</b>
<b>HHI3</b>	<b>-0.0706***</b>	<b>-0.1034***</b>		<b>-0.1072*</b>	<b>-0.0785**</b>	
	<b>[0.0240]</b>	<b>[0.0179]</b>		<b>[0.0565]</b>	<b>[0.0394]</b>	
<b>TOPHOLD5</b>	<b>-0.0482*</b>		<b>-0.0963***</b>	<b>0.0258</b>		<b>-0.0324</b>
	<b>[0.0247]</b>		<b>[0.0184]</b>	<b>[0.0416]</b>		<b>[0.0291]</b>
TGB	0.0189*	0.0194*	0.0171	0.0199*	0.0200*	0.0189*
	[0.0109]	[0.0109]	[0.0109]	[0.0109]	[0.0109]	[0.0109]
LAT	0.0514***	0.0510***	0.0509***	0.0517***	0.0511***	0.0514***
	[0.0036]	[0.0036]	[0.0036]	[0.0036]	[0.0036]	[0.0036]
ROA	-0.8145***	-0.8174***	-0.8168***	-0.8154***	-0.8183***	-0.8179***
	[0.0285]	[0.0285]	[0.0285]	[0.0285]	[0.0285]	[0.0285]
Q	-0.0042**	-0.0046***	-0.0040**	-0.0057**	-0.0057**	-0.0053**
	[0.0017]	[0.0017]	[0.0017]	[0.0024]	[0.0024]	[0.0024]
EMPAST	-0.7594***	-0.7611***	-0.7685***	-0.7620***	-0.7600***	-0.7657***
	[0.0901]	[0.0902]	[0.0901]	[0.0903]	[0.0903]	[0.0900]
LGDP	0.0194**	0.0197**	0.0189**	0.0193**	0.0196**	0.0188**
	[0.0077]	[0.0077]	[0.0077]	[0.0077]	[0.0077]	[0.0077]
CRDMK	-0.0083	-0.0085	-0.0084	-0.0084	-0.0085	-0.0085
	[0.0056]	[0.0056]	[0.0056]	[0.0056]	[0.0056]	[0.0056]
CST	-0.0048	-0.0045	-0.0044	-0.0053	-0.0045	-0.0049
	[0.0093]	[0.0093]	[0.0093]	[0.0093]	[0.0093]	[0.0093]
SPE	0.0085	0.0086	0.0089	0.0086	0.0083	0.0085
	[0.0147]	[0.0147]	[0.0147]	[0.0146]	[0.0147]	[0.0147]
QG				0.0023	0.0017	0.0021
				[0.0026]	[0.0026]	[0.0026]
<b>HHI3G</b>				<b>0.0589</b>	<b>-0.0306</b>	
				<b>[0.0604]</b>	<b>[0.0411]</b>	
<b>TOPHOLD5G</b>				<b>-0.1111**</b>		<b>-0.0902***</b>
				<b>[0.0457]</b>		<b>[0.0311]</b>
Year Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Industry Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Observations	7873	7873	7873	7873	7873	7873
R2	0.2218	0.2225	0.2182	0.2211	0.2228	0.2186

This table reports panel regressions for book leverage. Dependent variable: LEVBA=total debt/(total debt + total equity). TOPGOV=1 if largest shareholder is government related, HHI5 is Herfindahl-Hirschman Index of 3 largest shareholders, TOPHOLD5 is shares of top 5 largest shareholders. TGB= Fixed asset/total assets, LAT= Log(total assets), ROA=net profit before tax/total asset, Q= (market value of equity + total debt) / (total equity + total debt), LGDP=Log(GDP per capita), Cash paid to and for employees / total assets, CRDMK= Total loans of financial institutions/GDP at the provincial level, CST=1 if coastal provinces/cities, SPE=1 if special economic region. QG=Q\* TOPGOV, HHI5G= HHI5\* TOPGOV, TOPHOLD5G= TOPHOLD5\* TOPGOV. Robust standard errors in brackets, \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

**Table 2.5.2: Market Leverage Regressions: Expropriation Hypothesis**

Variables	(1)	(2)	(3)	(4)	(5)	(6)
<b>TOPGOV</b>	<b>-0.0100***</b>	<b>-0.0089**</b>	<b>-0.0107***</b>	<b>0.0294**</b>	<b>-0.0070</b>	<b>0.0201</b>
	[0.0036]	[0.0036]	[0.0036]	[0.0137]	[0.0074]	[0.0123]
<b>HHI3</b>	<b>-0.0285*</b>	<b>-0.0693***</b>		<b>-0.0813**</b>	<b>-0.0712***</b>	
	[0.0163]	[0.0119]		[0.0390]	[0.0275]	
<b>TOPHOLD5</b>	<b>-0.0586***</b>		<b>-0.0782***</b>	<b>0.0068</b>		<b>-0.0382*</b>
	[0.0175]		[0.0127]	[0.0292]		[0.0208]
TGB	0.0079	0.0084	0.0072	0.0084	0.0083	0.0082
	[0.0070]	[0.0070]	[0.0070]	[0.0070]	[0.0070]	[0.0070]
LAT	0.0510***	0.0507***	0.0508***	0.0513***	0.0506***	0.0511***
	[0.0024]	[0.0024]	[0.0024]	[0.0024]	[0.0024]	[0.0024]
ROA	-0.5075***	-0.5112***	-0.5086***	-0.5079***	-0.5110***	-0.5092***
	[0.0201]	[0.0201]	[0.0201]	[0.0202]	[0.0201]	[0.0202]
Q	-0.0233***	-0.0237***	-0.0232***	-0.0231***	-0.0232***	-0.0228***
	[0.0012]	[0.0012]	[0.0012]	[0.0017]	[0.0016]	[0.0016]
EMPAST	-0.5920***	-0.5947***	-0.5956***	-0.5948***	-0.5944***	-0.5932***
	[0.0573]	[0.0573]	[0.0573]	[0.0573]	[0.0573]	[0.0572]
LGDP	-0.0050	-0.0048	-0.0053	-0.0050	-0.0048	-0.0053
	[0.0043]	[0.0043]	[0.0043]	[0.0043]	[0.0043]	[0.0043]
CRDMK	-0.0065*	-0.0068*	-0.0065*	-0.0066*	-0.0068*	-0.0066*
	[0.0035]	[0.0035]	[0.0035]	[0.0035]	[0.0035]	[0.0035]
CST	0.0030	0.0033	0.0031	0.0026	0.0033	0.0029
	[0.0059]	[0.0059]	[0.0059]	[0.0059]	[0.0059]	[0.0059]
SPE	-0.0174**	-0.0174**	-0.0172**	-0.0171**	-0.0174**	-0.0174**
	[0.0077]	[0.0077]	[0.0077]	[0.0077]	[0.0077]	[0.0077]
QG				-0.0003	-0.0009	-0.0006
				[0.0018]	[0.0018]	[0.0018]
<b>HHI3G</b>				<b>0.0747*</b>	<b>0.0025</b>	
				[0.0411]	[0.0280]	
<b>TOPHOLD5G</b>				<b>-0.0946***</b>		<b>-0.0559***</b>
				[0.0315]		[0.0213]
Year Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Industry Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Observations	7877	7877	7877	7877	7877	7877
R2	0.5232	0.5229	0.5222	0.5228	0.5229	0.5228

This table reports panel regressions for market leverage. Dependent variable: LEVMA=total debt/ (total debt + market value of equity). TOPGOV=1 if largest shareholder is government related, HHI3 is Herfindahl-Hirschman Index of 3 largest shareholders, TOPHOLD5 is shares of top 5 largest shareholders. TGB= Fixed asset/total assets, LAT= Log(total assets), ROA=net profit before tax/ total asset, Q= (market value of equity + total debt) / (total equity + total debt), LGDP=Log(GDP per capita), Cash paid to and for employees / total assets, CRDMK= Total loans of financial institutions/GDP at the provincial level, CST=1 if coastal provinces/cities, SPE=1 if special economic region. QG=Q\* TOPGOV, HHI3G= HHI3\* TOPGOV, TOPHOLD5G= TOPHOLD5\* TOPGOV. Robust standard errors in brackets, \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

**Table 2.5.3: Long -Term Book Leverage Regressions**

Variables	(1)	(2)	(3)	(4)	(5)	(6)
<b>TOPGOV</b>	<b>-0.0005</b> [0.0038]	<b>-0.0012</b> [0.0037]	<b>-0.0011</b> [0.0037]	<b>0.0271*</b> [0.0139]	<b>0.0121*</b> [0.0069]	<b>0.0284**</b> [0.0123]
<b>HHI3</b>	<b>-0.0186</b> [0.0172]	<b>0.0047</b> [0.0128]		<b>-0.0105</b> [0.0385]	<b>0.0435</b> [0.0276]	
<b>TOPHOLD5</b>	<b>0.0329*</b> [0.0171]		<b>0.0201</b> [0.0127]	<b>0.0583**</b> [0.0279]		<b>0.0528***</b> [0.0201]
TGB	0.0527*** [0.0084]	0.0525*** [0.0084]	0.0522*** [0.0084]	0.0533*** [0.0084]	0.0530*** [0.0084]	0.0530*** [0.0084]
LAT	0.0279*** [0.0022]	0.0281*** [0.0022]	0.0277*** [0.0022]	0.0280*** [0.0022]	0.0281*** [0.0022]	0.0279*** [0.0022]
ROA	-0.1083*** [0.0207]	-0.1062*** [0.0206]	-0.1090*** [0.0207]	-0.1089*** [0.0206]	-0.1070*** [0.0206]	-0.1094*** [0.0207]
Q	-0.0008 [0.0012]	-0.0005 [0.0012]	-0.0007 [0.0012]	0.0007 [0.0016]	0.0011 [0.0016]	0.0007 [0.0016]
EMPAST	-0.6615*** [0.0580]	-0.6597*** [0.0580]	-0.6637*** [0.0579]	-0.6598*** [0.0579]	-0.6561*** [0.0579]	-0.6611*** [0.0578]
LGDP	-0.0197*** [0.0045]	-0.0199*** [0.0045]	-0.0199*** [0.0045]	-0.0198*** [0.0045]	-0.0199*** [0.0045]	-0.0199*** [0.0045]
CRDMK	0.0007 [0.0037]	0.0009 [0.0037]	0.0007 [0.0037]	0.0007 [0.0037]	0.0009 [0.0037]	0.0007 [0.0037]
CST	-0.0007 [0.0057]	-0.0008 [0.0057]	-0.0006 [0.0057]	-0.0008 [0.0057]	-0.0007 [0.0057]	-0.0008 [0.0057]
SPE	0.0057 [0.0084]	0.0057 [0.0084]	0.0058 [0.0084]	0.0056 [0.0084]	0.0054 [0.0084]	0.0057 [0.0084]
QG				-0.0022 [0.0018]	-0.0025 [0.0017]	-0.0022 [0.0018]
<b>HHI3G</b>				<b>-0.0020</b> [0.0412]	<b>-0.0465*</b> [0.0282]	
<b>TOPHOLD5G</b>				<b>-0.0415</b> [0.0318]		<b>-0.0454**</b> [0.0217]
Year Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Industry Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Observations	7873	7873	7873	7873	7873	7873
R2	0.2212	0.2196	0.2200	0.2216	0.2205	0.2208

This table reports panel regressions for long -term book leverage. Dependent variable: LLEVBA=total long-term debt/ (total debt + equity). TOPGOV=1 if largest shareholder is government related, HHI5 is Herfindahl-Hirschman Index of 3 largest shareholders, TOPHOLD5 is shares of top 5 largest shareholders. TGB= Fixed asset/total assets, LAT= Log(total assets), ROA=net profit before tax/ total asset, Q= (market value of equity + total debt) / (total equity + total debt), LGDP=Log(GDP per capita), Cash paid to and for employees / total assets, CRDMK= Total loans of financial institutions/GDP at the provincial level, CST=1 if coastal provinces/cities, SPE=1 if special economic region. QG=Q\* TOPGOV, HHI5G= HHI5\* TOPGOV, TOPHOLD5G= TOPHOLD5\* TOPGOV.  
Robust standard errors in brackets, \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

**Table 2.5.4: Long -Term Market Leverage Regressions**

Variables	(1)	(2)	(3)	(4)	(5)	(6)
<b>TOPGOV</b>	<b>0.0004</b> [0.0022]	<b>0.0001</b> [0.0022]	<b>-0.0001</b> [0.0021]	<b>0.0238***</b> [0.0084]	<b>0.0135***</b> [0.0044]	<b>0.0244***</b> [0.0075]
<b>HHI3</b>	<b>-0.0143</b> [0.0104]	<b>-0.0057</b> [0.0078]		<b>-0.0108</b> [0.0252]	<b>0.0165</b> [0.0185]	
<b>TOPHOLD5</b>	<b>0.0121</b> [0.0109]		<b>0.0022</b> [0.0081]	<b>0.0293*</b> [0.0176]		<b>0.0235*</b> [0.0131]
TGB	0.0329*** [0.0051]	0.0328*** [0.0051]	0.0325*** [0.0051]	0.0331*** [0.0052]	0.0329*** [0.0052]	0.0329*** [0.0052]
LAT	0.0247*** [0.0015]	0.0247*** [0.0015]	0.0245*** [0.0015]	0.0247*** [0.0015]	0.0246*** [0.0015]	0.0246*** [0.0015]
ROA	-0.0914*** [0.0119]	-0.0906*** [0.0119]	-0.0919*** [0.0119]	-0.0916*** [0.0119]	-0.0909*** [0.0119]	-0.0920*** [0.0119]
Q	-0.0066*** [0.0006]	-0.0065*** [0.0006]	-0.0065*** [0.0006]	-0.0042*** [0.0009]	-0.0040*** [0.0009]	-0.0041*** [0.0009]
EMPAST	-0.4230*** [0.0351]	-0.4223*** [0.0351]	-0.4247*** [0.0351]	-0.4210*** [0.0350]	-0.4192*** [0.0350]	-0.4219*** [0.0350]
LGDP	-0.0101*** [0.0026]	-0.0101*** [0.0026]	-0.0102*** [0.0026]	-0.0100*** [0.0026]	-0.0101*** [0.0026]	-0.0101*** [0.0026]
CRDMK	-0.0038* [0.0022]	-0.0037* [0.0022]	-0.0038* [0.0022]	-0.0038* [0.0022]	-0.0037* [0.0022]	-0.0038* [0.0022]
CST	-0.0017 [0.0036]	-0.0018 [0.0037]	-0.0017 [0.0037]	-0.0018 [0.0036]	-0.0017 [0.0036]	-0.0018 [0.0037]
SPE	-0.0039 [0.0046]	-0.0039 [0.0046]	-0.0038 [0.0046]	-0.0039 [0.0046]	-0.0040 [0.0046]	-0.0039 [0.0046]
QG				-0.0037*** [0.0010]	-0.0039*** [0.0010]	-0.0037*** [0.0010]
<b>HHI3G</b>				<b>0.0016</b> [0.0267]	<b>-0.0261</b> [0.0188]	
<b>TOPHOLD5G</b>				<b>-0.0281</b> [0.0193]		<b>-0.0292**</b> [0.0135]
Year Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Industry Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Observations	7877	7877	7877	7877	7877	7877
R2	0.3381	0.3375	0.3370	0.3391	0.3389	0.3385

This table reports panel regressions for long –term market leverage. Dependent variable: LLEVBA=total long-term debt/ (total debt + equity). TOPGOV=1 if largest shareholder is government related, HHI5 is Herfindahl-Hirschman Index of 3 largest shareholders, TOPHOLD5 is shares of top 5 largest shareholders. TGB= Fixed asset/total assets, LAT= Log(total assets), ROA=net profit before tax/ total asset, Q= (market value of equity + total debt) / (total equity + total debt), LGDP=Log(GDP per capita), Cash paid to and for employees / total assets, CRDMK= Total loans of financial institutions/GDP at the provincial level, CST=1 if coastal provinces/cities, SPE=1 if special economic region. QG=Q\* TOPGOV, HHI5G= HHI5\* TOPGOV, TOPHOLD5G= TOPHOLD5\* TOPGOV. Robust standard errors in brackets, \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

**Table 2.5.5: Short Term Debt Regressions: Expropriation Hypothesis**

Variables	(1)	(2)	(3)	(4)	(5)	(6)
<b>TOPGOV</b>	<b>-0.0163*</b> [0.0086]	<b>-0.0139</b> [0.0086]	<b>-0.0166*</b> [0.0085]	<b>-0.0345</b> [0.0300]	<b>-0.0292*</b> [0.0155]	<b>-0.0382</b> [0.0272]
<b>HHI3</b>	<b>-0.0106</b> [0.0404]	<b>-0.0969***</b> [0.0296]		<b>-0.0444</b> [0.0867]	<b>-0.1631***</b> [0.0630]	
<b>TOPHOLD5</b>	<b>-0.1224***</b> [0.0383]		<b>-0.1297***</b> [0.0280]	<b>-0.1311**</b> [0.0603]		<b>-0.1556***</b> [0.0444]
TGB	-0.1379*** [0.0176]	-0.1369*** [0.0176]	-0.1382*** [0.0176]	-0.1387*** [0.0177]	-0.1381*** [0.0177]	-0.1389*** [0.0176]
LAT	-0.0281*** [0.0052]	-0.0288*** [0.0052]	-0.0282*** [0.0051]	-0.0283*** [0.0052]	-0.0289*** [0.0052]	-0.0284*** [0.0052]
ROA	-0.3779*** [0.0404]	-0.3854*** [0.0404]	-0.3783*** [0.0404]	-0.3771*** [0.0404]	-0.3838*** [0.0404]	-0.3780*** [0.0404]
Q	-0.0040 [0.0030]	-0.0050* [0.0029]	-0.0040 [0.0030]	-0.0048 [0.0041]	-0.0059 [0.0041]	-0.0047 [0.0041]
EMPAST	0.9263*** [0.1446]	0.9196*** [0.1446]	0.9250*** [0.1445]	0.9236*** [0.1446]	0.9148*** [0.1446]	0.9235*** [0.1445]
LGDP	0.0507*** [0.0104]	0.0512*** [0.0105]	0.0506*** [0.0104]	0.0508*** [0.0104]	0.0513*** [0.0105]	0.0506*** [0.0104]
CRDMK	-0.0007 [0.0086]	-0.0013 [0.0086]	-0.0007 [0.0086]	-0.0007 [0.0086]	-0.0014 [0.0086]	-0.0007 [0.0086]
CST	0.0023 [0.0134]	0.0029 [0.0134]	0.0023 [0.0134]	0.0023 [0.0134]	0.0027 [0.0134]	0.0025 [0.0134]
SPE	-0.0198 [0.0195]	-0.0198 [0.0195]	-0.0197 [0.0195]	-0.0195 [0.0195]	-0.0193 [0.0195]	-0.0196 [0.0195]
QG				0.0011 [0.0043]	0.0013 [0.0043]	0.0010 [0.0043]
<b>HHI3G</b>				<b>0.0345</b> [0.0939]	<b>0.0801</b> [0.0660]	
<b>TOPHOLD5G</b>				<b>0.0196</b> [0.0694]		<b>0.0361</b> [0.0484]
Year Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Industry Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Observations	7877	7877	7877	7877	7877	7877
R2	0.2093	0.2072	0.2094	0.2098	0.2078	0.2099

Dependent variable: SHORT TERM DEBT=short-term debt / total debt. TOPGOV=1 if largest shareholder is government related, HHI5 is Herfindahl-Hirschman Index of 3 largest shareholders, TOPHOLD5 is shares of top 5 largest shareholders. TGB= Fixed asset/total assets, LAT= Log(total assets), ROA=net profit before tax/ total asset, Q= (market value of equity + total debt) / (total equity + total debt), LGDP=Log(GDP per capita), Cash paid to and for employees / total assets, CRDMK= Total loans of financial institutions/GDP at the provincial level, CST=1 if coastal provinces/cities, SPE=1 if special economic region. QG=Q\* TOPGOV, HHI5G= HHI5\* TOPGOV, TOPHOLD5G= TOPHOLD5\* TOPGOV.

Robust standard errors in brackets, \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

**Table 2.6: IV Regressions: Non-Tradable Share Reform Index to adjust Ownership Concentration**

	LEVBA		LEBMA		LLEVBA		LLEVMA		SHORT TERM DEBT	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
<b>TOPHOLD5</b>	<b>-0.4843***</b> [0.1296]	<b>-0.3533***</b> [0.0786]	<b>-0.1523*</b> [0.0794]	<b>-0.1359***</b> [0.0497]	<b>-0.1170</b> [0.0862]	<b>-0.0695</b> [0.0537]	<b>-0.0755</b> [0.0518]	<b>-0.0514</b> [0.0326]	<b>-0.1712</b> [0.1927]	<b>-0.1571</b> [0.1204]
<b>TOPGOV</b>	<b>-0.0282***</b> [0.0058]	<b>-0.0225***</b> [0.0053]	<b>-0.0115***</b> [0.0038]	<b>-0.0105***</b> [0.0035]	<b>-0.0035</b> [0.0041]	<b>-0.0008</b> [0.0038]	<b>-0.0013</b> [0.0025]	<b>0.0001</b> [0.0023]	<b>-0.0176*</b> [0.0093]	<b>-0.0168**</b> [0.0084]
<b>HHI3</b>	<b>-0.2262**</b> [0.0902]		<b>0.0363</b> [0.0569]		<b>0.0880</b> [0.0621]		<b>0.0475</b> [0.0375]		<b>0.0262</b> [0.1394]	
TGB	0.0134 [0.0097]	0.0194** [0.0095]	0.0067 [0.0064]	0.0079 [0.0064]	0.0510*** [0.0070]	0.0532*** [0.0070]	0.0328*** [0.0043]	0.0338*** [0.0043]	-0.1428*** [0.0158]	-0.1420*** [0.0159]
LAT	0.0536*** [0.0033]	0.0562*** [0.0036]	0.0493*** [0.0020]	0.0505*** [0.0023]	0.0289*** [0.0022]	0.0301*** [0.0025]	0.0248*** [0.0013]	0.0257*** [0.0015]	-0.0281*** [0.0050]	-0.0278*** [0.0056]
ROA	-0.7915*** [0.0252]	-0.7784*** [0.0267]	-0.5049*** [0.0174]	-0.5010*** [0.0186]	-0.0986*** [0.0191]	-0.0927*** [0.0205]	-0.0857*** [0.0117]	-0.0823*** [0.0126]	-0.3820*** [0.0434]	-0.3801*** [0.0467]
Q	-0.0011 [0.0019]	-0.0016 [0.0017]	-0.0231*** [0.0013]	-0.0230*** [0.0012]	0.0004 [0.0014]	0.0002 [0.0013]	-0.0059*** [0.0008]	-0.0060*** [0.0008]	-0.0036 [0.0031]	-0.0037 [0.0030]
EMPAST	-0.7448*** [0.0849]	-0.7103*** [0.0861]	-0.5865*** [0.0555]	-0.5802*** [0.0570]	-0.6518*** [0.0606]	-0.6369*** [0.0620]	-0.4188*** [0.0367]	-0.4101*** [0.0378]	0.9467*** [0.1362]	0.9507*** [0.1396]
LGDP	0.0164** [0.0074]	0.0187** [0.0074]	-0.0057 [0.0043]	-0.0053 [0.0044]	-0.0202*** [0.0047]	-0.0194*** [0.0047]	-0.0105*** [0.0028]	-0.0100*** [0.0028]	0.0506*** [0.0103]	0.0508*** [0.0103]
CRDMK	-0.0065 [0.0058]	-0.0063 [0.0058]	-0.0057 [0.0036]	-0.0057 [0.0037]	0.0012 [0.0039]	0.0014 [0.0040]	-0.0030 [0.0024]	-0.0031 [0.0024]	-0.0011 [0.0088]	-0.0011 [0.0089]
CST	-0.0058 [0.0095]	-0.0077 [0.0095]	0.0031 [0.0054]	0.0026 [0.0055]	-0.0016 [0.0058]	-0.0022 [0.0058]	-0.0020 [0.0034]	-0.0024 [0.0035]	0.0018 [0.0127]	0.0016 [0.0128]
SPE	0.0083 [0.0127]	0.0069 [0.0127]	-0.0174** [0.0071]	-0.0177** [0.0073]	0.0058 [0.0077]	0.0049 [0.0077]	-0.0037 [0.0045]	-0.0043 [0.0046]	-0.0207 [0.0169]	-0.0210 [0.0170]
Observations	7873	7873	7877	7877	7873	7873	7877	7877	7877	7877

**Table 2.7: Alternative Leverage Regression (GMM)**

Variables	LEVBA		LEVMA		LLEVBA		LLEVMA		SHORT TERM DEBT	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
<b>TOPGOV</b>	<b>-0.0195***</b>	<b>0.0327</b>	<b>0.0114***</b>	<b>0.0338**</b>	<b>0.0016</b>	<b>0.0377**</b>	<b>0.0014</b>	<b>0.0302***</b>	<b>-0.0236**</b>	<b>-0.0479</b>
	[0.0064]	[0.0216]	[0.0040]	[0.0157]	[0.0040]	[0.0153]	[0.0025]	[0.0097]	[0.0092]	[0.0333]
<b>HHI3</b>	<b>-0.0727***</b>	<b>-0.0987</b>	<b>-0.0277</b>	<b>-0.0637</b>	<b>-0.0306</b>	<b>-0.0498</b>	<b>-0.0216*</b>	<b>-0.0262</b>	<b>0.0138</b>	<b>0.0552</b>
	[0.0272]	[0.0641]	[0.0190]	[0.0447]	[0.0187]	[0.0428]	[0.0119]	[0.0297]	[0.0440]	[0.0949]
<b>TOPHOLD5</b>	<b>-0.0325</b>	<b>0.0467</b>	<b>0.0557***</b>	<b>0.0154</b>	<b>0.0313*</b>	<b>0.0766**</b>	<b>0.0139</b>	<b>0.0413**</b>	<b>-0.1081**</b>	<b>-0.1537**</b>
	[0.0284]	[0.0464]	[0.0208]	[0.0338]	[0.0190]	[0.0312]	[0.0127]	[0.0207]	[0.0421]	[0.0673]
TGB	0.0714***	0.0726***	0.0417***	0.0426***	0.0603***	0.0608***	0.0402***	0.0405***	-0.1070***	-0.1074***
	[0.0121]	[0.0121]	[0.0080]	[0.0080]	[0.0091]	[0.0091]	[0.0059]	[0.0059]	[0.0189]	[0.0190]
LAT	0.0535***	0.0540***	0.0571***	0.0576***	0.0297***	0.0299***	0.0283***	0.0284***	0.0320***	0.0322***
	[0.0040]	[0.0040]	[0.0029]	[0.0029]	[0.0025]	[0.0025]	[0.0017]	[0.0018]	[0.0056]	[0.0056]
ROE	<b>-0.9022***</b>	<b>0.9042***</b>	<b>0.5807***</b>	<b>0.5821***</b>	<b>0.1280***</b>	<b>0.1287***</b>	<b>0.1148***</b>	<b>0.1150***</b>	<b>0.3915***</b>	<b>0.3911***</b>
	[0.0361]	[0.0361]	[0.0256]	[0.0257]	[0.0232]	[0.0232]	[0.0141]	[0.0142]	[0.0500]	[0.0500]
Q	-0.0048**	-0.0059**	0.0223***	0.0228***	-0.0003	0.0013	0.0053***	0.0028***	-0.0062*	-0.0058
	[0.0020]	[0.0028]	[0.0014]	[0.0019]	[0.0013]	[0.0017]	[0.0007]	[0.0010]	[0.0033]	[0.0044]
EMPAST	0.1965*	0.1988*	0.0113	0.0120	0.4692***	0.4691***	0.3053***	0.3053***	1.2497***	1.2508***
	[0.1120]	[0.1121]	[0.0759]	[0.0760]	[0.0708]	[0.0707]	[0.0447]	[0.0446]	[0.1742]	[0.1740]
LGDP	0.0163**	0.0163**	-0.0079	-0.0079	0.0200***	0.0201***	0.0110***	0.0109***	0.0512***	0.0512***
	[0.0082]	[0.0082]	[0.0048]	[0.0048]	[0.0049]	[0.0049]	[0.0029]	[0.0029]	[0.0112]	[0.0112]
CRDMK	-0.0136**	-0.0137**	-0.0099**	-0.0101**	0.0007	0.0006	-0.0042*	-0.0043*	-0.0045	-0.0044
	[0.0061]	[0.0061]	[0.0040]	[0.0040]	[0.0040]	[0.0040]	[0.0025]	[0.0025]	[0.0093]	[0.0093]
<b>HHI3G</b>		<b>0.0486</b>		<b>0.0573</b>		<b>0.0326</b>		<b>0.0128</b>		<b>-0.0565</b>
		[0.0684]		[0.0472]		[0.0454]		[0.0311]		[0.1028]
<b>TOPHOLD5G</b>		<b>-0.1210**</b>		<b>0.1061***</b>		<b>-0.0677*</b>		<b>-0.0422*</b>		<b>0.0647</b>
		[0.0511]		[0.0363]		[0.0353]		[0.0224]		[0.0774]
Year Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	6487	6487	6490	6490	6487	6487	6490	6490	6490	6490

## CHAPTER 3

### FROM WORLD FACTORY TO WORLD CREDITOR:

### THE EXTERNAL WEALTH OF CHINA AND EXCESS RETURNS\*

#### Abstract

In the past decade, China has emerged as a global economic superpower. Does the world's manufacturing workshop play the leading role in assets trade as well as the goods trade? What is China's international investment position? What are the dynamics of the external wealth of China? Starting with the methodologies of Lane and Milesi-Ferretti (2007), I construct estimates of China's external assets and liabilities at the market price for the period 1997-2009. In this paper, I study China's net foreign assets position with valuation adjustment and excess returns between gross assets and liabilities. Also, I decompose the returns differential into FDI, portfolio equity, debt and foreign reserves. I show that net foreign assets, which are mainly dominated by foreign reserve assets and FDI liabilities, have grown rapidly since 2001 and exceeded 35% of GDP in 2009. My most striking and strong finding is the considerable size of negative excess returns as much as 6.6% per year. This occurs mainly because of the asymmetric structure of the external balance sheet of China: short position in equity and long position in debt. Finally, I find a robust return effect: the outstanding performance of inward FDI compared to outward FDI and portfolio equity and debt investment by foreign reserves. This finding indicates that China has not yet transformed from a successful world factory into a profitable world creditor. My findings might facilitate understanding of the external balance of Chinese and foreign reserves with capital account regulation policy under state controlled foreign asset investment.

JEL Classification Numbers: F21, F31, F32, F36

Keywords: Net Foreign Asset, Excess Returns, China

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*“Ici repose un géant endormi, laissez le dormir, car quand il s’éveillera, il étonnera le monde.”*  
“Here lies a sleeping giant, let him sleep, for when he wakes up, he will shock the world”

-----Napoléon Bonaparte, 1803

“How China shall rule the world: It has the world’s largest trade and current account surpluses and owns a third of world currency reserves. Its flow of savings is the world’s biggest...China’s influence is, in short, both pervasive and growing”

----Martin Wolf, 2011

### 3.1 Introduction

After three decades of spectacular growth, China has emerged as a global economic superpower and has increasing impact on the rest of the world. In 2008, China surpassed Japan and became the second-largest economy next to the US. Real GDP has grown by about 10% annually and China’s share of world trade has increased nearly tenfold over the past three decades, to about 9%, while its share of world GDP has risen to 13 % from less than 3 percent (IMF, 2010)<sup>1</sup>. Coping with a rapidly integrated into the global economy, China has accumulated more than 3 trillion dollars in foreign reserves as of the end of March 2011. On the other hand, the meltdown of the world economy and the substantial global imbalance have attracted a great deal of attention from academics and policy makers. However, the previous studies mainly focus on the goods trade perspective: how China’s exchange policy leads to the current account surplus (Dooley et al., 2003; Goldstein and Lardy, 2008; Cheung, Chinn and Fujii, 2009 and Corden, 2009).

Does the world’s biggest manufacturing factory play the leading role in assets trade as well as the goods trade? After we know how to survive a year without Chinese goods,<sup>2</sup> shall we start to figure out what will happen when China starts to buy up the gloomy world of the post-crisis era? In order to explore the position of cross border

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<sup>1</sup> Arora and Vamvakidis (2010) also find that China now accounts for nearly one-tenth of global demand for commodities and more than one-tenth of world exports of medium- and high-technology manufactured goods. China has become a major exporter of electronics and information technology products and is the largest supplier to the United States of consumer electronics products such as DVD players, notebook computers, and mobile phones.

<sup>2</sup> See “A Year without “Made in China: One Family’s True Life Adventure in the Global Economy,” by Sara Bongiorni (2008). Also, recent report “China buys up the world” at *Economist* (2010).

financial asset trade, its compositions and the returns, it is important to analyze the external balance sheet and international investment position. Most of the recent literature is dedicated to stylized facts from international evidence<sup>3</sup> (Lane and Milesi-Ferretti, 2001, 2007 and 2010) or “exorbitant privilege “of the US (Obstfeld and Rogoff, 2005; Gourinchas and Rey, 2007 and 2011; Forbes, 2010; Habib, 2010). However, there are few studies of the gross external assets and liabilities, the evolution of external wealth, and excess return on net foreign assets of China. My paper tries to provide empirical evidence to study the external wealth of China.

Some empirical research has been conducted by Lane and Milesi-Ferretti (2007) and Lane and Schmukler (2007). They document China’s net foreign asset<sup>5</sup> and gross positions and external structure and bilateral investment patterns and compare them with India from 1985 to 2004. Using Lane and Milesi-Ferretti’s (2007) EWN dataset, Sheng and Ng (2008) find that China has emerged as a more important global net creditor during the period between 1980 and 2004. As Ma and Zhou (2009) pointed out, Lane and Milesi-Ferretti’s (2007) historical IIP data were constructed prior to the first official publication of Chinese IIP data. Moreover, it is worthy of note that Lane and Milesi-Ferretti updated the IIP data of China (EWN II, 2009) mainly in book value. Also, Ma and Zhou (2009) argue that demographics, the sharp fall in youth dependency in particular, is the major determinant of China’s large net creditor position, which exceeded 30% of GDP in 2007. The roles of financial depth and the exchange rate in shaping China’s NFA positions appear mixed.

In contrast, Dollar and Kraay (2005) employ the calibrated theoretical model and non-structural cross-country analysis and predict that China will become a significant net debtor with NFAs of -17% of GDP in the middle of the 21st century. Also, due to the domestic distortions and institutional restrictions of external account regulation, China’s

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<sup>3</sup> See the recent surveys on the U.S. and many aspects of the return differentials, by Curcuru, Thomas and Warnock (2011).

<sup>5</sup> I will be exact in our use of these terms. International investment position refers to the net foreign assets, which is the measure of external wealth. Also, the position of external assets/liabilities refers to the gross assets/liabilities. By definition, the difference between gross assets and liabilities refers to the net foreign assets.

NFA will be a negative 9% of wealth in 20 years. Different than Dollar and Kraay's neoclassical approach, Jeanne (2011) presents a neat model of how a country can undervalue its real exchange rate through a combination of foreign asset purchase by the government and control on capital flows, especially severe financial inflow. He shows that this combination of policies allows the government to effectively control the level of net foreign assets for the country as a whole. The government controls the current account balance (since it is the change in net foreign assets) and therefore the trade balance. The real exchange rate, then, has to be consistent with the trade balance. Other things equal, accumulating more net foreign assets will depreciate the real exchange rate.

Regarding the return of holding foreign assets, Jeanne (2011) also argue that the welfare cost of an undervaluation policy comes from the fact that the country receives a low return on its foreign assets in terms of domestic consumption. The country depreciates its real exchange rate when it accumulates foreign assets and appreciates the real exchange rate when it reduces the pace of accumulation. In some sense, China follows the opposite of the classical investor's advice: it buys high and sells low.

The conflicting empirical results of Lane and Milesi-Ferretti (2007), and Ma and Zhou (2009) on the one hand, and Dollar and Kraay (2005), on the other, show that the existing empirical evidence on Chinese external wealth is far from conclusive. My aim in this paper is to fill this gap.

First, this paper empirically studies the external wealth of China using an extensive, hand-collected dataset of external balance sheet and international investment positions between 1997 and 2009 from numerous government agencies. The newly collected data from SAFE (State Administration of Foreign Exchange Rate of China), CSRC (China Securities Regulation Commission); CBRC (China Banking Regulation Commission) and MOC (Ministry of Commerce) have been provided to conduct a careful valuation adjustment to each component.

Second, starting with the methodology of Lane and Milesi-Ferretti (2007), I construct estimates of China's external assets and liabilities at the market price.

Consequently, I describe the positions of gross assets and liabilities and net foreign assets. As the result of the external balance sheet, I also study the historical evolution of financial integration and China's external capital structure. Moreover, I decompose gross assets and liabilities into four major categories: portfolio equity investment, foreign direct investment (FDI), portfolio debt and other investment, and foreign exchange reserves.

Third, following Habib (2010), I deal with the data limitations and explore implied rates of return on gross assets and liabilities, and the excess return of net foreign assets by investment income and capital gains. In addition, to address the return effect of excess returns of net foreign assets, I decompose the yield of investment income and rate of capital gains by asset categories: FDI, portfolio equity investment, portfolio debt, bank loan and other investment. Last, a comparison with excess returns of debt and equity sheds light on the structural features of the external balance of China.

To my knowledge, this is the first research to estimate the external wealth and excess return on net foreign assets of China in market price using the latest available data. The empirical evidence shows that net foreign assets, which are mainly dominated by foreign reserve assets and FDI liabilities, have grown rapidly since 2001 and exceeded 35% of GDP in 2009. The most striking and persistent finding is the considerable size of negative excess returns: on average, the excess return of net foreign assets attains -6.6% per year from 1997 to 2009. This occurs mainly because of the asymmetric structure of the external balance sheet of China: short in equity and long in debt. Finally, I find a robust return effect: the outstanding performance of inward FDI compared to outward FDI and portfolio equity and debt investment by foreign reserves.

The combination of the asymmetric structure of the external balance sheet, the outstanding performance by FDI liabilities, and the government dominated external asset investment leads a rising creditor like China to have a sizeable and persistent negative excess return. My empirical results also test the hypothesis about the relationship between real exchange rate and net foreign assets by Jeanne (2011), which is in line with his theoretical prediction about the negative excess return as well. To sum

up, the stylized facts about external wealth indicate that China has not yet transformed from a successful world factory into a profitable world creditor. In the last section, I will discuss my findings and policy implications.

This paper also contributes to a growing body of research and policy debate about exchange rate policy, capital inflow and economic growth. Due to the massive capital inflow to emerging markets during and after the current crisis, the IMF recommends capital control as a macro-prudential measure, as well other measures in the central bank's toolkit in emerging economies (Ostry et. al, 2011; Pradhan, 2011). Rodrik (2008, 2010) shows the benefit of currency undervaluation to stimulate economic growth for developing countries, in order to avoid government or market failures, which suggest the growth experience of China in particular. Prasad, Rajan and Subramanian (2007) find that there is no evidence that an increase in foreign capital inflows directly boosts growth, and emphasize the cost of overvaluation: the capital inflow appreciates the real exchange rate and hurts growth. They suggest reforming the limited absorptive capacity for foreign capital, such as financial market development. Therefore, a pragmatic approach to capital account liberalization has been proposed by Prasad and Rajan (2008), providing a modest proposal for controlled outflow in the case of China<sup>7</sup>.

On the other hand, Gregorio et al. (2000) and Warnock (2011) express doubts about capital control and provide evidence of the distortion of the economy and its ineffectiveness. As we discussed in the previous section about China<sup>8</sup>, in effect, the controls on capital inflows prevent the accumulation of foreign assets by the public sector from being offset by capital inflows to the private sector (Jeanne, 2011). My paper also contributes rich evidences of the benefits and costs of capital control from the perspective of net foreign assets: a rising creditor like China has a sizeable and persistent negative excess return.

The remainder of the paper is structured as follows. Section II discusses the main empirical specification, data, and estimators. The empirical evidence of external wealth

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<sup>7</sup> The key difference between SAFE and securitizing foreign exchange reserves by Prasad and Rajan (2008) is the separation between closed-end mutual fund and government.

<sup>8</sup> The detailed empirical evidence, see Prasad and Wei (2008).

of China is presented in Section III. Section IV shows stylized facts of excess returns on net foreign assets. Section V concludes.

### 3.2 Data and Methodology

In this section, I will start with detailed and reliable measurements of the external wealth of China. Data from the balance of payments<sup>9</sup> on cross border flow data and international investment position<sup>10</sup> data have been officially reported by SAFE (State Administration of Foreign Exchange Rate of China). Alternatively, Lane and Milesi-Ferretti (2009) reported the gross external wealth data from 1982 to 2007, which have been complemented by cumulative capital flows with valuation adjustment. Their dataset divides gross assets and liabilities into four major categories: portfolio equity investment, foreign direct investment (FDI), portfolio debt and other investment, and foreign exchange reserves.

In addition, the newly collected data from SAFE, CSRC (China Securities Regulation Commission); CBRC (China Banking Regulation Commission) and MOC (Ministry of Commerce) have been provided to conduct a careful valuation adjustment to each component. Hence, I construct more structured estimates of the external wealth of China<sup>11</sup> at market prices from 1997 to 2009 by combining Lane and Milesi-Ferretti (2007) and SAFE's balance of payment and IIP data with valuation adjustment. A detailed description is provided in the appendix. Overall, the dataset of the external wealth of China at market value has been estimated on an annual basis from 1997 to 2009 by asset categories.

Secondly, following the common methodologies of Lane and Milesi-Ferretti (2007) and Habib (2010), I can calculate the implied rates of return on gross assets and liabilities and therefore the excess returns of external wealth by investment income and capital gains. In particular, the novel details of return indicators allow for replicating the

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<sup>9</sup> From 1996, SAFE began to report the balance of payment data following IMF's fifth edition of BOP (BOPM5). The detailed items and information are provided at table 3.1.

<sup>10</sup> China started to publish the official IIP data from 2004, updated in 2009.

<sup>11</sup> China started to open up the current account on December 1, 1996. Therefore, I adopt the consistent time series from 1997.

exercise of Habib (2010) and providing the composition of implied rate of return by asset class. Finally, I employ the Fisher equation to obtain the real returns of gross assets and liabilities. The detailed formulas/equations are described below.

$$NFA_t - NFA_{t-1} = CA_t + CG_t + KA_t + OC_t \quad (1)$$

In equation (1), NFA represents the net foreign assets at the end of year t; CA, CG, KA and OC are equal to the current account balance, capital gains, capital account balance and errors and omission respectively.

$$NFA_t - NFA_{t-1} = TB_t + TR_t + IIB_t + CG_t + KA_t + OC_t \quad (2)$$

In equation (2), NFA represents the net foreign assets at the end of year t; TB, TR, IIB, CG, KA and OC are equal to the trade balance, transfer (including remittances), investment income balance, capital gains, capital account balance and errors and omission respectively.

$$NFA_t = \sum_{i=0}^t TB_t + \sum_{i=0}^t TR_t + \sum_{i=0}^t IIB_t + \sum_{i=0}^t CG_t + \sum_{i=0}^t KA_t + \sum_{i=0}^t OC_t \quad (3)$$

In equation (3), following the backwards approach, we can obtain the value of net foreign assets by stock-flow dynamics equations.

The nominal returns by investment income and capital gains:

$$\begin{aligned} \text{Yield of Investment Income } y_t^A &= \frac{II_t^A}{A_{t-1}}; y_t^L = \frac{II_t^L}{L_{t-1}} \\ \text{Rate of Capital Gains } cg_t^A &= \frac{CG_t^A}{A_{t-1}}; cg_t^L = \frac{CG_t^L}{L_{t-1}} \\ \text{Total Returns } r_t^A &= \frac{II_t^A + CG_t^A}{A_{t-1}}; r_t^L = \frac{II_t^L + CG_t^L}{L_{t-1}} \quad (4) \end{aligned}$$

In equation (4), we can obtain the yield of investment income of gross assets and liabilities at year t,  $y_t^A$  and  $y_t^L$  from income of assets held abroad  $II_t^A$  and payments to foreigners holding domestic assets  $II_t^L$ .  $A_{t-1}$  and  $L_{t-1}$  are equal to gross asset and gross liabilities at year t-1 respectively. Also, we can calculate the rate of capital gains of gross assets and liabilities,  $cg_t^A$  and  $cg_t^L$  from capital gains of gross assets  $CG_t^A$  and capital gains of gross liabilities  $CG_t^L$ . Finally, we can obtain the total returns of assets  $r_t^A$

and  $r_t^L$  by the sum of yield of investment income and rate of capital gains of gross asset and liability.

Importantly, we shall combine stock and flow data to obtain the implied returns. Therefore, the following formulas will help us to obtain the return data.

$$CG_t^A = A_t - A_{t-1} - CO_t; \quad CG_t^L = L_t - L_{t-1} - CI_t \quad (5)$$

In equation (5),  $CO_t$  and  $CI_t$  represent capital outflow and capital inflow at year t respectively.

Employing Fisher equations, I can calculate the real rate of returns of gross assets and liabilities. Also, the differences will be the real excess returns.

$$\begin{aligned} \text{Real Yield of Investment Income} \quad ry_t^A &= \frac{1 + y_t^A}{1 + \pi_t} - 1; \quad ry_t^L = \frac{1 + y_t^L}{1 + \pi_t} - 1 \\ \text{Rate of Capital Gains} \quad rcg_t^A &= \frac{1 + cg_t^A}{1 + \pi_t} - 1; \quad rcg_t^L = \frac{1 + cg_t^L}{1 + \pi_t} - 1; \\ \text{Real Total Returns} \quad rr_t^A &= \frac{1 + y_t^A + cg_t^A}{1 + \pi_t} - 1; \quad rr_t^L = \frac{1 + y_t^L + cg_t^L}{1 + \pi_t} - 1 \quad (6) \end{aligned}$$

In equation (6),  $\pi_t$  equals the inflation rate at year t respectively.  $ry_t^A, ry_t^L, rcg_t^A, rcg_t^L, rr_t^A$  and  $rr_t^L$  represent the real yield of gross assets, real yield of gross liabilities, real returns of capital gains of gross assets, real returns of gross liabilities and real total returns at year t respectively.

$$\begin{aligned} \text{Nominal Excess Returns: } NER_t &= r_t^A - r_t^L; \\ \text{Real Excess Returns: } RER_t &= rr_t^A - rr_t^L \quad (7) \end{aligned}$$

In equation (7), NER and RER represent the nominal excess returns and real excess returns of external wealth of China at year t respectively.

The positions of gross assets and liabilities are reported in U.S. dollars. The capital flow data are reported in Yuan and have been converted into U.S. dollars as well. The position data displays from the end of 1997 to end of 2009. The returns data of external wealth covers the time series between the end of 1998 and end of 2009.

### 3.3 External Wealth of China

In this section, I will describe in novel detail the external wealth of China based on my newly constructed dataset from 1997 to 2009. Firstly, I will discuss the facts and

fictions about the measurement of external wealth. Secondly, I will report the gross assets and liabilities positions of China in market prices and the historical revolution of the international integration of the Chinese economy. Thirdly, I will characterize the net foreign asset positions, specifically the net equity and debt positions of China. Finally, I will decompose the external wealth by asset categories.

### 3.3.1. Facts and Fictions about External Wealth

How to measure the external wealth of China? There are various facts and fictions<sup>12</sup> to discuss. First fiction: the balance between national saving and investment cannot measure the external wealth of China. But, external wealth is the indicator of the stock of international investment position by resident status. Balance of payment data captures the flow of international transactions. As discussed in the previous section, the current account is part of the change in external wealth over time.

[Table 3.1 about here]

[Figure 3.1 about here]

Second fiction: the foreign exchange reserves of China are the same as gross asset positions. But, external wealth is the measurement of the net foreign assets position, which equals gross assets minus gross liabilities.

[Table 3.2 about here]

[Figure 3.2 about here]

In addition, there are three different approaches to estimate external wealth: historical price, current and market price. In this paper, I adopt the market price approach to measure the external wealth of China, in order to study the valuation effect. Also, I report the book value international investment positions<sup>13</sup> and the cumulative current accounts to compare with the market value of external wealth.

[Figure 3.3 about here]

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<sup>12</sup> Those fictions have been heavily discussed in China. Therefore, it is worthy to conduct careful studies to correct the misleading measures.

<sup>13</sup> SAFE only reported the IIP position from 2004 to 2009.

Figure 3.3 illustrates the different measures of the external wealth of China. The various measures are all fairly consistent in their time series variation and all document a strong trend toward increased net foreign assets. They show that China started to be in a creditor position in 2001 (7.2% of GDP), when China joined the World Trade Organization (WTO). Since 2001, the external wealth of China has grown rapidly, and exceeded 35% of GDP in 2009.

The general trends of different estimations are the same. On average, without the valuation effects, the historical estimates show a higher amount of external wealth and do not capture the dynamics of exchange rate and asset price movements. However, the market value of net foreign asset position only exceeds the book value NFA once and reaches the highest position in 2008<sup>14</sup>.

### 3.3.2. Gross Assets and Liabilities Positions

Figure 3.4 plots average trends for the gross assets and liabilities position of China. It shows a broad tendency of the changing positions of assets and liabilities in relation to each other. In particular, gross assets became larger than liabilities at 36% of GDP starting in 2001, with that trend accelerating through 2009. Specifically, in 2009, the gross assets and liabilities reached 71% of GDP and 37% of GDP respectively.

[Figure 3.4 about here]

Following Lane and Milesi-Ferretti (2001 and 2007), I also investigate the effects of trade integration and financial integration in China from 1997 to 2009. I define the sum of gross assets and liabilities as a share of GDP to be an indication of financial integration. Similarly, I define trade integration as the share of GDP of export plus imports of goods and services.

[Figure 3.5 about here]

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<sup>14</sup> The further investigation of NFA 2008 shall take into account the appreciation expectation before financial turmoil in 2009.

Figure 3.5 shows that both financial integration and trade integration<sup>15</sup> have been increasing rapidly. Although there is a short term decrease from 2008 to 2009 due to global financial turmoil, the surging trends indicate the effect of globalization taking place in China. In 2009, my measures of financial integration and trade integration reach 108% and 47% of GDP respectively. These findings instill confidence that the Chinese economy has been deeply integrated with the global economy.

### 3.3.3. Net Foreign Asset Positions

The dynamics of external wealth with valuation effects have been widely discussed in recent years. A key strength of the market value estimates of net foreign assets is their ability to reveal a recent development in the Chinese economy: from world factory to world creditor. The world's manufacturing workshop plays an important role in asset trade as well as goods trade.

[Table 3.3 about here]

[Table 3.4 about here]

Table 3.3 documents the size of net foreign assets position with absolute numbers. During the period of 1997-2009, the average size of NFA exceeds 431 billion USD, and is more than 10% of Chinese GDP. Before 2000, the market value of NFA is negative, -67 billion USD, and approximately 6.8% of Chinese GDP. From 2001 to 2005<sup>16</sup>, the average value of NFA reaches 203 billion USD, equivalent to 11% of GDP. Notably, the average size of NFA exceeds 1216 billion USD, equivalent to 30% of GDP between 2006 and 2009. This indicates the rising creditor position of China and the massive size of intentional investment position.

[Figure 3.6.1 about here]

Figure 3.6.1 illustrates the international comparisons of net foreign assets. In the line with US and UK<sup>17</sup>, the net foreign asset of China starts from more than negative 10

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<sup>15</sup> In fact, the financial integration is a stock measure and trade integration is a flow measure. In this paper, I just point out the time series trend instead of further analysis.

<sup>16</sup> In July 2005, the Chinese government announced the new, more flexible exchange rate policy. The new policy allowed gradual appreciation of RMB with a limited range of daily price movement.

<sup>17</sup> UK, US, Japan, India and Brazil NFA data are collected from Lane and Milesi-Ferretti's EWN project.

percent in 1997. The evolution of China's net foreign assets position from a net debtor to net creditor starts in 2001. By 2007, China's net foreign asset had reached 900 billion USD, which was roughly 26% of GDP. However, UK, US, India and Brazil held significant massive amount negative external wealth. In contrast, Japan's net foreign assets are higher than China, which remains 20% of GDP in 1997 and exceeds around 50% in 2007.

[Figure 3.6.2 about here]

Figure 3.6.2 shows net exports growth over time. Even before 2001, the average ratio of net exports was roughly 2% of GDP. There is a rapid increase from 2003 to 2007, reaching almost 9% of GDP in 2007. In contrast, net export slows down fairly quickly after 2008.

[Figure 3.6.3 about here]

In figure 3.6.3, I illustrate the evolution of net foreign assets from 1997 to 2009. The relationship of NFA to GDP clearly shows the rising position of China's external wealth. It has grown rapidly, exceeding 35% of GDP in 2009. During the financial turmoil period<sup>18</sup>, net foreign position has slightly declined, which falls from 37% of GDP in 2008 to 35% of GDP in 2009. But, overall the evolution of China's external wealth positions demonstrates the transformation from a major good trader to an active asset trader: from the world's manufacturing workshops to a foremost global investor.

As I discussed in a previous section, the relationship between real exchange rate policy and external balance sheet is still debatable. Chinn and Wei (2008) find no robust evidence linking current account adjustment and the degree of flexibility of an exchange rate regime. On the other hand, Jeanne (2011) shows the negative correlation between net foreign asset and the real exchange rate of China: accumulating more net foreign assets is associated with the real exchange rate depreciation.

[Figure 3.6.4 about here]

Figure 3.6.4 shows the correlation between net foreign assets and the real exchange rate. Before 2005, the accumulation of net foreign assets is broadly associated

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<sup>18</sup> Capital outflow from China has declined dramatically between 2008 and 2009.

with real exchange rate depreciations. Between the periods of 2005 to 2006, the real exchange rate appreciation is linked with the decrease of net foreign assets. But, I don't find the monotonic relationship between the real exchange rate and net foreign assets after 2006, which mainly due to the increasing net capital outflow. In fact, the appreciation of real exchange rate slows down following the increase of net foreign assets in 2005.

Gourinchas and Rey (2007) find both the trade channel and valuation channel affect the change of net foreign assets. In the US, valuation effects contribute 27 percent of the cyclical external adjustment. They provide evidence that the evolution of valuation effects is consistent with the broad evolution of the US dollar<sup>19</sup>.

According to the flow and stock dynamics identity and Gourinchas and Rey (2007), I define the valuation effect as the difference between the net foreign assets in market price and the cumulated current account series. The valuation effect results from the changes of the asset prices and exchange rate movement, which are missing from the cumulated current account balance.

[Figure 3.6.5 about here]

Figure 3.6.5 shows substantial change of the valuation component with real exchange rate movements. The dynamics of the valuation component are consistent with the real exchange rate movements. In fact, the valuation effect is negatively associated with the real exchange rate because China is a massive net creditor in foreign currency (primarily dollar) denominated assets. The real exchange rate depreciation is followed by an increase in the valuation component with negative value. During the period between 2005 and 2007, however, the sizable appreciation of the real exchange rate in China led to a fairly flat decline of the valuation component<sup>20</sup>. Strikingly, the valuation component captures the exchange rate policy change when the financial crisis hit in 2008, slowing the pace of appreciation of the nominal exchange rate. Between 2008

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<sup>19</sup> In the case of China, the real exchange rate movements have mixed impacts on the stock and flows of foreign assets: valuation effects on the stock and depreciation effects on the flows.

<sup>20</sup> Unfortunately, the official IIP data at SAFE does not provide detailed information of the currency decomposition. The assets and liabilities have been reported in dollar term. For further research, I will investigate the valuation effect with currency structure.

and 2009, the valuation effect points toward a significant decrease due to the effects of capital loss and exchange rate movements.

### 3.3.4. Compositions of External Wealth

The structure of the external balance sheet of China documents several important features of external balance of China. I decompose the gross external assets and liabilities by asset class. The external assets have been divided into FX reserves assets, portfolio debt assets, portfolio equity assets, FDI assets and other assets<sup>22</sup>. The external liabilities have been divided into portfolio equity liabilities, FDI liabilities, portfolio debt liabilities and other liabilities.

[Figure 3.7.1 about here]

Figure 3.7 series describe the composition of gross assets and liabilities. In figure 3.7.1, the share of FX reserves assets exceeds roughly 58% of total external assets on average. The second largest share comes from other debt investment<sup>24</sup>, which reach approximately 16% of total assets. The third largest share comes from portfolio debt assets<sup>25</sup>, which reach approximately 11% of total assets. The share of FDI assets<sup>26</sup> only attains 8% of total assets. The share comes from bank loan, which reach approximately 5% of total assets. The rest of the share belongs to the portfolio equity investment<sup>27</sup>.

In figure 3.7.2, the share of FDI liabilities exceeds nearly 48% of total liabilities on average. The second largest share comes from other debt liabilities<sup>28</sup>, which are almost 25% of total liabilities. The third largest share comes from bank loan, which reach

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<sup>22</sup> In this paper, I also take into account the bank loan as well, which is different with others.

<sup>24</sup> The other debt assets are held by SAFE, Ministry of Finance, China Development Bank, China Export Bank, and other state owned banks including trade credit, gold and other reserve claims.

<sup>25</sup> The portfolio debt assets are held by SAFE, Ministry of Finance, China Development Bank, China Export Bank, and other state owned banks as well.

<sup>26</sup> The FDI assets are mainly held by state owned giant companies. i.e., Petro China and China Petroleum & Chemical Corporation.

<sup>27</sup> The portfolio equity assets are almost all held by SAFE and CIC. After 2006, Qualified Domestic Institutional Investors could invest through international equity markets. However, the amount is fairly small and has declined dramatically, even before the financial turmoil.

<sup>28</sup> It mainly comes from the Ministry of Finance's external debt and the China Development Bank's bond issuing.

approximately 12% of total liabilities. Interestingly, the portfolio equity liabilities<sup>29</sup> has been rising since 2006 and exceeds 11% of total liabilities, when China opened up the domestic equity market through the Qualified Foreign Institutional Investor in 2006 and China Investment Corporation, which launched in 2007.

[Figure 3.7.2 about here]

Dooley et al. (2008) suggest that Chinese FX reserves, in the form of Chinese holding of US Treasuries, represent "collateral" on US FDI in China. But, the former are an order of magnitude greater than the latter, partly because most FDI in China does not come from the US<sup>30</sup>. Figure 3.7.3 shows the size of FX reserves assets and the size of FDI liabilities. The FX reserve assets have been rising rapidly from 2001. In contrast, the FDI liabilities are increasing fairly slowly. On average, the FX reserves assets of China are roughly 760 billion. In contrast, the total FDI liabilities are approximately 390 billion over the sample year. Of course, total FX reserve assets substantially exceed total FDI liabilities from 2001 to 2009.

[Figure 3.7.3 about here]

Finally, I examine the external capital structure of China. Unlike Lane and Milesi-Ferretti (2001 and 2007), I simply apply the definition of net equity holding as the assets of FDI and portfolio equity minus liabilities of FDI and portfolio equity. Also, the net debt is the assets of FX reserve and debt investment minus liabilities of debt investments.

[Figure 3.8 about here]

Figure 3.8 shows the dynamics of net equity and net debt position. The positive net debt to GDP rises rapidly and then slows down after 2008. By contrast, the negative net equity to GDP declines and then decreases significantly after 2008. On average, the net debt and net equity are 28% of GDP and -17% of GDP respectively. The gap between net debt and net equity increases rapidly after 2001 and becomes fairly flat in 2008. The net debt is 56% of GDP and the net equity remains -22% of GDP in 2009. This indicates a

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<sup>29</sup> H share and QFII are the main sources of portfolio equity liabilities. H share is the shares of the Chinese companies listed in Hong Kong held by non-Chinese residents.

<sup>30</sup> See "Facts and Fallacies about U.S. FDI in China," by Lee Branstetter and Fritz Foley (2007)

striking evolution of China's external capital structure: short in equity and long in debt, which is consistent with the evidence of developing and emerging countries (Lane and Milesi-Ferretti, 2007) and opposite to world banker (Gourinchas and Rey, 2007).

Summing up, over the past 10 years, the external wealth (NFA) of China has been rising rapidly, which exceeds 1.7 trillion USD (35% of GDP) in 2009. China swung from a debtor to a creditor in 2001, and the average value of market price NFA reached more than 11% of GDP over time. The FX reserves assets<sup>31</sup> and FDI liabilities account for roughly 50% of total positions and thus dominate the gross positions of assets and liabilities separately. Finally, the external capital structure shows the long position of net debt and short position of net equity. Overall, the estimates of China's NFA in market price demonstrate an intriguing feature of the revolution of external wealth and the transition of the Chinese economy.

### **3.4 Excess Returns on Net Foreign Assets**

Has China successfully transformed from a world manufacture center to a profitable global investor? What are the excess returns of net foreign assets of China? In this section, I will first conduct careful estimates of the returns between external assets and liabilities by yield of investment income and rate of capital gain. Next, I will focus on the size of returns differentials between gross assets and liabilities, and discuss the sources of excess returns. Finally, the composition of excess returns by asset categories allows me to exploit the structural feature of return differentials and to outline future research.

#### **3.4.1. Gross Returns: Yield and Rate of Capital Gain**

In the previous sections, I introduced a detailed method to estimate the returns of gross assets and liabilities. Next, in common with most of the existing literature on returns differentials, I analyze the yield of investment income and rate of capital gain to study the return of external wealth. Yield of gross assets equals the returns attributable

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<sup>31</sup> Rodrik (2006) argues that developing countries have over-invested in the costly strategy of reserve accumulation and under-invested in capital-account management policies to reduce their short-term foreign liabilities.

to investment income from assets held abroad, including the dividends, coupons, and earnings of FDI and other portfolio investment. Yield of gross liabilities is the investment income from assets held in China by foreigners. Rate of capital gain is based on the asset price and exchange rate movements. Total return is the sum of yield and rate of capital gains.

Table 3.5.1 reports the average nominal returns of gross assets and liabilities by different periods. Firstly, China has a substantial yield of gross liabilities. On average, the annual yield of gross liabilities exceeds 6.4% from 1998 to 2009. Meanwhile, there is a significant positive yield on gross assets, which reaches almost 3.2 % at the same period. Also, the yield of gross assets is consistently smaller than yield of gross liabilities over the sample years.

[Table 3.5.1 about here]

Secondly, the rate of capital gain of assets is fairly low, -3.5%, from 1998 to 2009, mainly due to the considerable losses after 2000. In contrast to the outstanding performance of yield of gross liabilities, the rate of capital gain of gross liabilities tends to attain a slightly smaller average return, -0.1%. Interestingly, during the period of 2006-2009, 4.7% of average return of capital gains of gross liabilities is really impressive. Overall, the nominal gross return of assets (-0.3%) is substantially smaller than the nominal gross return of liabilities (6.3%) from 1998-2009. An exception is that the gross return of assets is larger than the gross returns of liabilities from 1998 to 2000, due to corresponding losses of asset price and exchange rate movements of gross liabilities.

[Table 3.5.2 about here]

Table 3.5.2 reports the average real returns of gross assets and liabilities by different periods. As noted above, the real returns are adjusted from nominal returns by the domestic inflation rate. On average, gross return of total assets became -1.6% and gross return of total liabilities became 5.1% from 1998 to 2009. After 2005, the annual rates of capitals gain are persistently negative, which mainly due to the substantial capital loss of gross assets. The appreciation of the real exchange rate affects the dollar dominated foreign assets.

### 3.4.2. Excess Returns: Yield and Rate of Capital Gain

The series in Table 3.6 and Table 3.7 report the average excess returns of net foreign assets by different sample periods. The most striking finding is the absolute sizes of negative excess returns. On average, total excess returns of net foreign assets exceeded -6.6%, owing to the negative excess returns in yield (-3.3%) and capital gains (-3.4%). There are high negative excess returns from yield and capital gains from 1998 to 2009. In table 3.6, the nominal excess return and real excess return generate similar trends over the sample periods. Indeed, the excess returns of capital gains attain fairly large losses, which are due to the substantial negative rate of capital gain from the gross assets and the gross liabilities.

[Table 3.6 about here]

[Table 3.7 series about here]

Both the yield and rate of capital gain of China's gross assets are smaller than that paid to foreigners for the gross liabilities. In order to provide more precise evidence of the size and sources of excess returns, the series in table 3.7 presents the statistics summary for total returns of gross assets and liabilities and excess returns components. Different periods during the sample years display different patterns of excess return and its components.

As we mentioned already, there were fairly large losses on the external wealth of China from 1998 to 2009. The volatility of excess returns relative to yield is attributed to the highly volatile excess returns of capital gain. The volatility of excess capital gain reaches its largest spike before the periods of financial turmoil and declines significantly. Indeed, the largest negative excess returns on gross assets over liabilities take place during the period of 2008-2009, which tends to increased losses of external wealth (-29.4% in 2009).

[Figure 3.9.1 about here]

Figure 3.9.1 plots the revolution of excess yield from 1998 to 2009. Interestingly, there is increasing negative yield after 2001, and finally it is close to a positive rate in

2004<sup>32</sup>. From 2006 to 2008, there is only 2% lower than zero<sup>33</sup>. On average, investment income paid to foreigners is larger than the earnings by foreign assets held in China. These results are consistent with the findings of emerging markets by Habib (2010), the so-called “risk premium” for foreign liabilities. In the case of China, it might happen because of the ownership of external asset investments, which are mostly held by the central bank or by state-owned companies or financial institutes.

[Figure 3.9.2 about here]

Figure 3.9.2 illustrates the declining trends of excess return of capital gains, which are mainly driven by asset price and currency movements. Excess return of capital gain swings from a positive rate to negative, exceeding the lowest rate (-24%) in 2009. Nevertheless, the highly volatile excess return of capital gains has an impact on total excess return.

[Figure 3.9.3 about here]

Figure 3.9.3 plots the total excess return of China. It shows the volatile negative return differentials of gross assets over liabilities. The total excess returns are substantially negative in all years except 2008, which also highlight the similar patterns of excess returns of capital gain due to the real exchange rate appreciations. In 2008, the total excess return reaches the highest rate (6%) over our sample period and is consistent with the highest excess return of capital gain (7%) in 2000. The lowest total excess return exceeds -29% in 2009 and reflects the excess return of capital gain (-24%) and excess yield (-5%) in the same year. Indeed, the revolution and patterns of excess return are in line with the fluctuations of excess returns of capital gain<sup>34</sup>.

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<sup>32</sup> My ongoing research on the allocation of cross-border asset investment finds that the diversification of asset allocation of government dominated investment has a fairly profitable return in 2004. The China Securities Journal revealed the following breakdown for the \$2,450 billion reserves of the People’s Bank of China (PBC): 65% in dollars, 26% in euros, 5% in sterling, and 4% in other currency in Oct. 2010.

<sup>33</sup> The reform of liberalizing capital accounts is also taking place, although slowly, private outflow from China has been increasing dramatically since 2005. There might be more profitable investments by the private sector compared with government investment. This is material for future research.

<sup>34</sup> Habib (2010) claims that over the long-run, relatively small but stable yields may have a stronger impact on foreign assets than large and volatile rates of capital gain. Over the short-run, rates of capital gain drive the behavior of total returns.

### 3.4.3. Decompositions of Excess Returns

The considerable size of negative returns of gross assets over liabilities is astonishing, which indicates that China has not yet transformed from a successful world manufacturing center into a profitable global investor. Decomposing the excess return will lead us to investigate the reasons for the sizeable and persistent loss of external wealth of China.

I decompose the gross external assets and liabilities by asset class. The external assets have been divided into FX reserves assets, portfolio debt assets, portfolio equity assets, FDI assets and other assets. The external liabilities have been divided into portfolio equity liabilities, FDI liabilities, portfolio debt liabilities and other liabilities. Habib (2010) claims that due to the paucity of detailed income balance data, there is no information of FX reserves asset investment<sup>35</sup>. As we discuss in the appendix, the major investment channels of FX reserves of China come through portfolio debt and portfolio equity investments. Table 3.8 also reports the total investment return of FX reserves of China in comparison with other asset classes.

[Table 3.8 about here]

Table 3.8 shows that the decomposition of returns for external assets and liabilities by asset class from 1998 to 2009. Focusing first on the FDI, the average returns of FDI liabilities are positive for external assets and liabilities and are substantially larger for liabilities (4.3%) than for assets (-0.2%). Consequently, the return differentials between FDI assets and liabilities become sizeable and negative (-4.5%), which makes them the largest part of the composition of excess returns. The increasing declining excess return of FDI finally exceeds -6.4% from 2006 to 2009.

Secondly, on average, the return of portfolio equity liabilities (1.02 %) surpasses the return of portfolio equity assets (0.01 %) significantly over our sample years. As a

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<sup>35</sup> Habib (2010) indicates that the breakdown of the income balance does not include a separate item for earnings stemming from the investment of official reserves. In theory, one should include those earnings in the appropriate category (e.g. dividend for equity, debt income or other income); however, in many cases, these earnings are reported by the authorities under "other income" to protect the confidentiality of these data. In my paper, I collected the available earnings information of FX reserve and compared with the returns of other asset class.

result, the average excess return of portfolio equity investment reaches -1.1%. During the periods of 2006 to 2009, the average excess returns of portfolio equity investment tend to decline sharply and lose 2.5% per year.

Thirdly, the average returns of portfolio debt assets (0.1%) exceed returns of debt liabilities (0.1%) from 1998 to 2009. After 2006, the gap between returns of assets over liability of portfolio debt investment rises significantly. Finally, the excess return reaches 0.9% per year from 2006 to 2009.

The last row compares the official total FX reserves investment with FDI liabilities. Interestingly, the average return of FX reserves of China achieves 3.21% per year from 1998 to 2009. Specifically, the return of FX reserves reaches 2.51% per year from 2001 to 2005. After 2006, it exceeds 4% per year. Therefore, the difference between the returns on FX reserve investment and FDI liabilities is significant (-1.1% per year) and finally surpass more than 2.7% per year from 2006 to 2009.

Overall, why does a rising creditor like China have a sizeable and persistent negative excess return? The combination of the asymmetric structure of the external balance sheet, the large portion of outperformance by FDI liabilities, and government dominated external asset investment might provide another angle to explain the current situation.

### **3.5 Concluding Remarks**

In this paper, from the valuation adjustment perspective, I take a careful look at the external wealth of China and excess returns on net foreign assets, using a newly constructed database of external balance in market price. I have shown a revolution in China's gross assets and liabilities and analyzed the composition of the positions of external assets and liabilities in a burgeoning literature on external adjustment and returns differentials on net foreign assets. Meanwhile, I have decomposed the external balance sheet into four asset classes and studied the exceptional features of external capital structure and return differentials.

My empirical studies on external balance sheet yield several important findings. First, I show that China started to be in a creditor position in 2001 (7.2% of GDP), which happens to when China joined the World Trade Organization<sup>36</sup> (WTO). Since 2001, the external wealth of China has grown rapidly, and exceeded 35% of GDP in 2009. Secondly, examining financial integration and trade integration, I find that the Chinese economy has been deeply integrated with the global economy. Third, the FX reserves assets and FDI liabilities account for more than 50% of total positions and thus dominate the gross positions of assets and liabilities separately. In addition, the dynamics of the valuation component are consistent with the real exchange rate movements. The real exchange rate depreciation is followed by an increase in the valuation component. Finally, the external capital structure shows the long position of net debt and short position of net equity. To sum up, the evolution of China's external wealth positions demonstrates the transformation from a major good trader to an active asset trader: from the world's manufacturing workshops to a foremost global investor.

My analysis on excess returns of external wealth of China sheds light on three important stylized facts. Firstly, on average, gross return of total assets became -1.6% and gross return of total liabilities became 5.1% from 1998 to 2009. Secondly, the most striking and persistent finding is the considerable size of negative excess returns: on average, the excess return of net foreign assets attains -6.6% per year from 1998 to 2009. Thirdly, I find a robust return effect: the outperformance of inward FDI (4.3%) compared to outward FDI (-0.2%) and portfolio equity liabilities (1.02 %) and portfolio debt asset (0.1%). In a word, the combination between asymmetric structure of the external balance sheet, the large portion of outperformance by FDI liabilities, and government dominated external asset investment leads to a rising creditor like China having a sizeable and persistent negative excess return. It indicates that China has not yet transformed from a successful world factory into a profitable world creditor.

My findings have several policy implications. Firstly, it is worth mentioning the

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<sup>36</sup> For detailed descriptions, see "China's Growing Role in World Trade" by Robert Feenstra and Shang-Jin Wei, (2007).

connection between the external wealth of China and international monetary system. Due to the fragile exorbitant privilege of international currency<sup>37</sup>, we should not underestimate the massive loss from the depreciation of the dollar. At the pace of RMB internationalization, can we expect the rising excess returns as well as the increasing external wealth? Secondly, the composition of external asset holdings really matters. Can we expect more outward FDI or portfolio equity investment? Indeed, it is a bilateral issue between Chinese and foreigners to build up business relationship based on mutual trust. Thirdly, the state controlled<sup>38</sup> ownership of foreign asset investment might lead to negative excess return. Can we expect more private sector involvement in cross border investment?

Last but not least, the accumulation of foreign reserve is partly due to capital controls policy in China. The importance and effectiveness of these capital controls deserve further study alongside with the roles of the exchange rate and internal macroeconomic imbalances.

What is the direct and indirect cost of running more than one third of the world reserve<sup>39</sup>? In this paper, I have provided empirical evidences of stylized facts of the external wealth and excess returns on NFA. Further research will include the composite effect in return differentials (Gourinchas and Rey, 2007 and 2011). It will guide us toward a better understanding of the determinants of excess returns. This is material for future research.

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<sup>37</sup> See the recent surveys "Reforming the International Monetary System" by Gourinchas, Pierre-Olivier, Emmanuel Farhi and H el ene Rey (2011).

<sup>38</sup> See the latest ECB report "The Sustainability of China's Exchange Rate Policy and Capital Account Liberalization" by Cappiello, L and G Ferrucci (2008)

<sup>39</sup> In the case of China, the concerns about costs of foreign reserves are different with arguments of "Social Cost of Foreign Reserves" by Rodrik (2006). Indeed, the mixed considerations are link with the export-growth strategy and the concern of capital outflows after Asia financial crisis in 1997.

## APPENDIX

In this section, I introduce detailed methods of obtaining the position of gross assets and liabilities at market price. Lane and Milesi-Ferretti (2009) reported the gross external wealth data<sup>40</sup> from 1982 to 2007, which divide gross assets and liabilities into four major categories: foreign exchange reserves, portfolio equity investment, foreign direct investment (FDI), portfolio debt and other investment. Therefore, I estimate the stock and flow data based on valuation adjustments by asset class.

### 1. Foreign Exchange Reserve Assets

Foreign exchange reserve assets are held by SAFE<sup>41</sup> and CIC<sup>42</sup>, which mainly invest in US, Europe and Japan markets. The total amount of foreign exchange reserve reached 3,044 (billions USD) at Q1, 2011. CIC got 245 billion and the rest has been managed by SAFE. I use the official FX reserve data provided by SAFE from 1997 to 2009.

Portfolio allocation of SAFE and CIC: SAFE and CIC both hold portfolio equity investments abroad. SAFE mainly invests in US and UK markets. CIC launched in 2007 and mainly focuses on North America markets. For CIC, I checked all of the portfolio and transactions data from annual reports. For SAFE, I put 5% of weight on its equity portfolio and 95% of weight on its portfolio debt investment due to its investment allocation.

For SAFE's portfolio equity asset holds, I follow 40% and 60% weights between FTSE100 and S&P. For CIC, I calculate the position based on the deal disclosure and

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<sup>40</sup> Following with Lane and Milesi-Ferretti( 2007), I measure the net purchases of foreign assets by residents and of domestic assets by nonresidents with a positive sign.

<sup>41</sup> Administrator of the State Administration of Foreign Exchange (SAFE) is a deputy-ministerial-level state administration under the People Bank of China. SAFE Investment Company is responsible for China's foreign exchange reserve management. They mainly invest at FX market and fixed income. Also, they have an offshore investment vehicle at HK to do equity investment (M&A).

<sup>42</sup> CIC was established on September 29, 2007 with the issuance of special bonds worth RMB 1.55 trillion by the Ministry of Finance. These were, in turn, used to acquire approximately USD 200 billion of China's foreign exchange reserves and formed the foundation of its registered capital. In 2004, central Huijin got 45 billion USD foreign reserves to inject the Bank of China and China's Construction Bank's capital before IPO at Hong Kong. In 2008, the state-owned Central Huijin Investment Corporation was merged into CIC as a wholly-owned subsidiary company.

match with the equity market index. I.e., CIC invested Penn West Energy Trust and I adjust the position by S&P/TSX 60 Index.

According to fixed income asset allocation by SAFE, I follow 30%, 60%, 5% and 5% weights between yields of 8-15 year German government bond, yields of US government bonds<sup>44</sup>; yields on 10 year UK government bonds (gilts) and yields of 7 year Japanese government bond. Also, I adjust the value with yields of OECD 10 year government bond for robustness check purpose.

## 2. Portfolio Equity Investment

Liabilities:

1. Qualified Foreign Institutional Investor: Foreign institutional investors authorized under the (QFII) scheme, which was originally designed for foreign investors only.
2. B and H share: the shares of Chinese companies listed in Shanghai and Hong Kong by foreign currency<sup>45</sup>.

$$PEL_t = \frac{P_t}{P_{t-1}} PEL_{t-1} + \frac{P_t}{AP_t} Flow_t \quad (8)$$

$PEL_t$  represents the position of equity investment liabilities at year t.  $P_t$  is price index of year t.  $AP_t$  is the average price index from year t to the initial year.

For QFII and B share; I collect the Shanghai Composition Index and Hang Seng Index as price index for H share.

Asset<sup>46</sup>: Qualified Domestic Institutional Investor (QDII)

$$PEA_t = \frac{P_t}{P_{t-1}} PEA_{t-1} + \frac{P_t}{AP_t} Flow_t \quad (9)$$

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<sup>44</sup> The allocation between treasury debt, agency debt and corporate debt is following TIC data at U.S Department of Treasury. The foreign asset investment in Europe and Japan is assumed to be 5% of portfolio equity investment and 95% of portfolio debt investment.

<sup>45</sup> From 2001, Chinese residents were allowed to trade B share with foreign currency.

<sup>46</sup> As the previous section discussed, I will calculate portfolio equity and debt investment by FX reserves separately.

$PEA_t$  represents the position of equity investment assets at year t.  $P_t$  is price index of year t.  $AP_t$  is the average price index from year t to the initial year.

For Qualified Domestic Institutional Investor (QDII), I employ MSCI World Index of Morgan Stanley as the price index.

### 3. Foreign Direct Investment

Liabilities:

FID liabilities: Inward FDI

Assets:

FID Assets: Outward FDI

$$PIDL_t = \frac{P_t}{P_{t-1}}PIDL_{t-1} + \frac{P_t}{AP_t}Flow_t \quad (10)$$

$$PIDA_t = \frac{P_t}{P_{t-1}}PIDA_{t-1} + \frac{P_t}{AP_t}Flow_t \quad (11)$$

$PIDL_t$  represents the position of foreign direct investment liabilities at year t.  $P_t$  is price index of year t.  $AP_t$  is the average price index from year t to the initial year.

$PIDA_t$  represents the position of foreign direct investment assets at year t.  $P_t$  is price index of year t.  $AP_t$  is the average price index from year t to the initial year.

For Inward FDI, I collect the Shanghai Composition Index (SCI) as price index. For outward FDI, I employ MSCI World Index of Morgan Stanley as price index.

### 4. Portfolio Debt and Other Investment

Liabilities:

1. Foreign External Debt – Ministry of Finance issued government bond and external debt borrowing from international market.
2. Foreign Currency corporate bond: China Development Bank issued corporate bonds from International markets.
3. Bank Loan: Foreign banks lend to domestic market.

$$PDL_t = \frac{P_t}{P_{t-1}} PDL_{t-1} + \frac{P_t}{AP_t} Flow_t \quad (12)$$

$PDL_t$  represents the position of portfolio debt liabilities at year  $t$ .  $P_t$  is price index of year  $t$ .  $AP_t$  is the average price index from year  $t$  to the initial year. I employ EMBI China Government Bond Yields as the price index.

Asset:

1. Bank Loans: Bank of China and other State Owned Banks has the international lending business.
2. Portfolio Debt: Ministry of Finance and other state owned banks hold external debt assets.

$$PDA_t = \frac{P_t}{P_{t-1}} PDA_{t-1} + \frac{P_t}{AP_t} Flow_t \quad (13)$$

$PDA_t$  represents the position of debt and other assets at year  $t$ .  $P_t$  is price index of year  $t$ .  $AP_t$  is the average price index from year  $t$  to the initial year. For bank loan and portfolio debt, I collect 6 months LIBOR and OECD 10-year Bond Yield as the price index respectively.

The sources of the NFA data in this paper: SAFE, CSRC (China Securities Regulation Commission); CBRC (China Banking Regulation Commission) and MOC (Ministry of Commerce), CIC, BIS; WEO, IMF\_IFS, OECD, UNCTAD and Lane and Milesi-Ferretti's EWN project (2009).

The price information comes from [www.globalfinancialdata.com](http://www.globalfinancialdata.com)

The unit is reported in US dollars and the position is calculated at the end of year.

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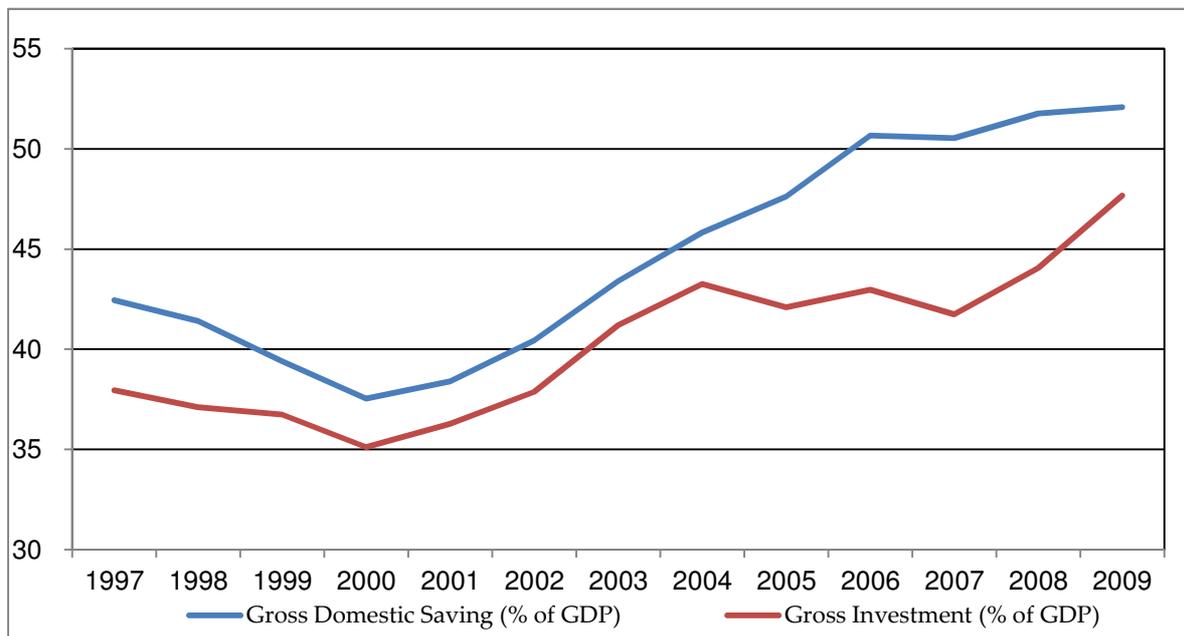
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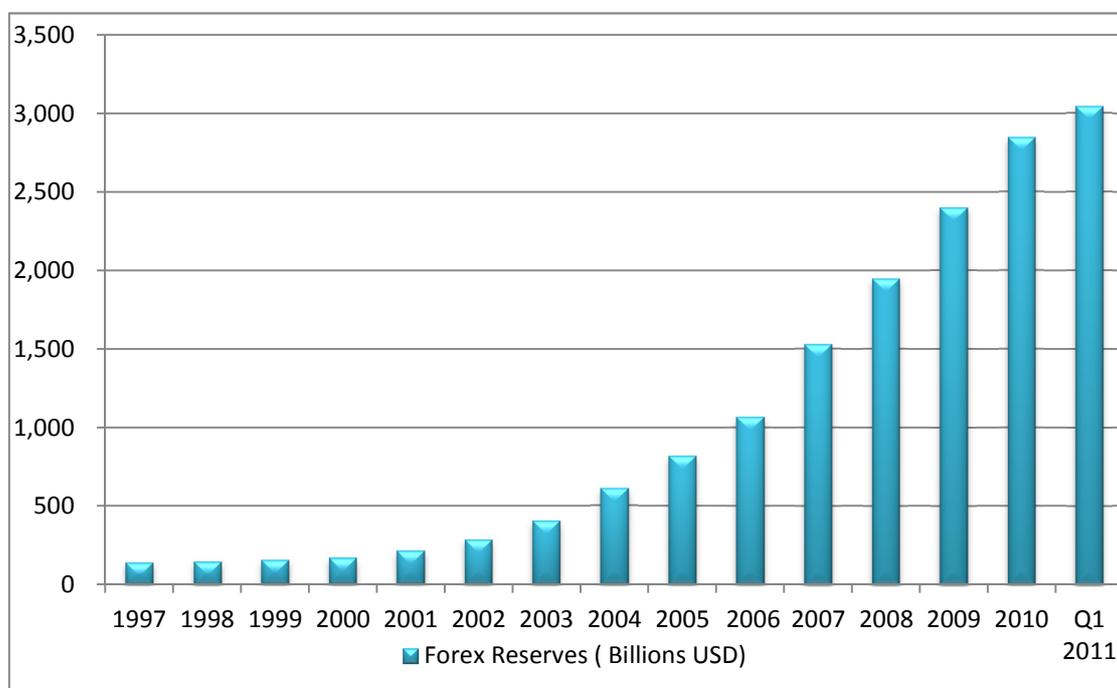
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**Figure 3.1: Saving and Investment Rates  
(% GDP, 1997-2009)**

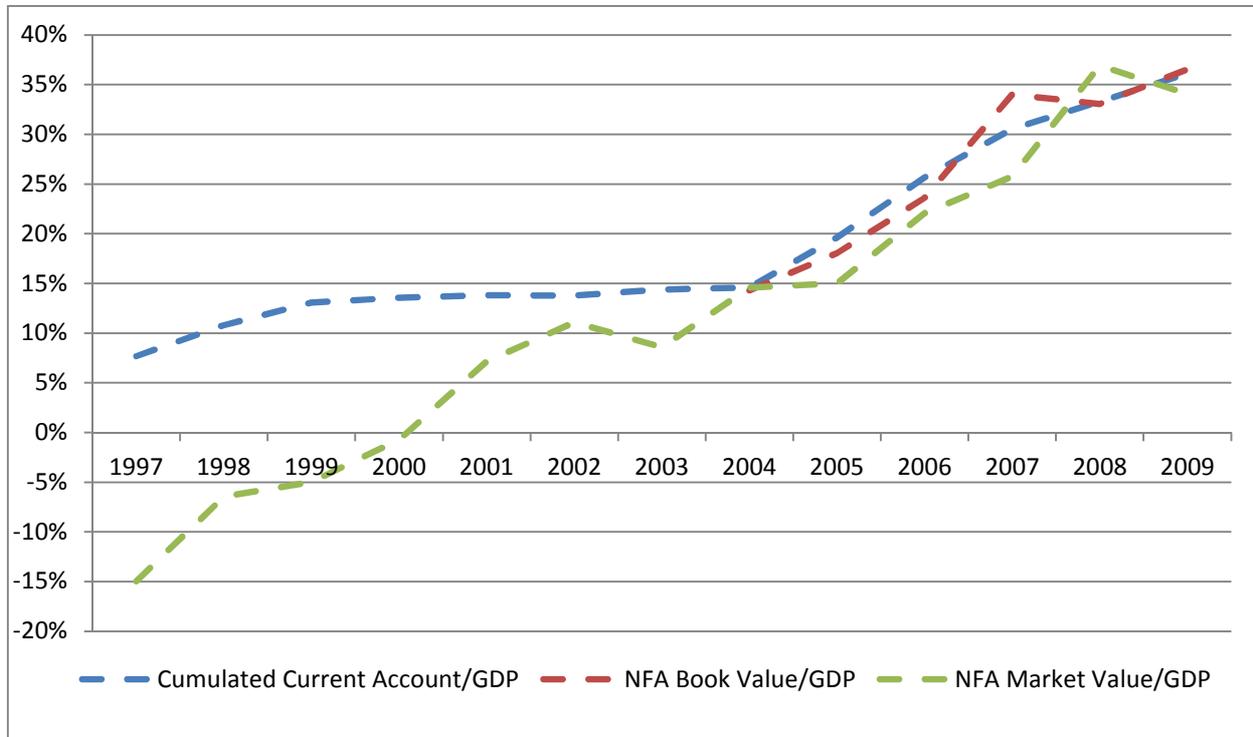


**Figure 3.2: Foreign Exchange Reserves  
(% GDP, 1997-2011)**

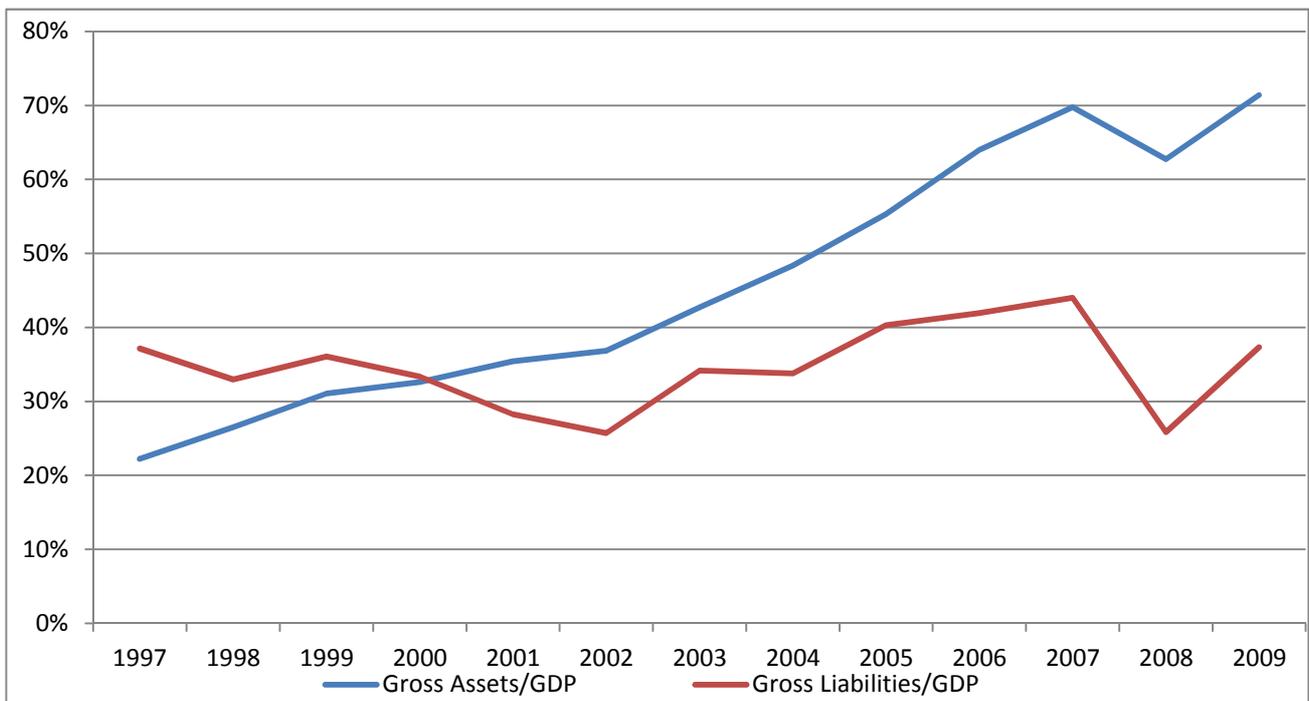


Source: SAFE, IMF and Author's Calculations, 2011

**Figure 3.3: Gross International Investment Position  
(% GDP, 1997-2009)**

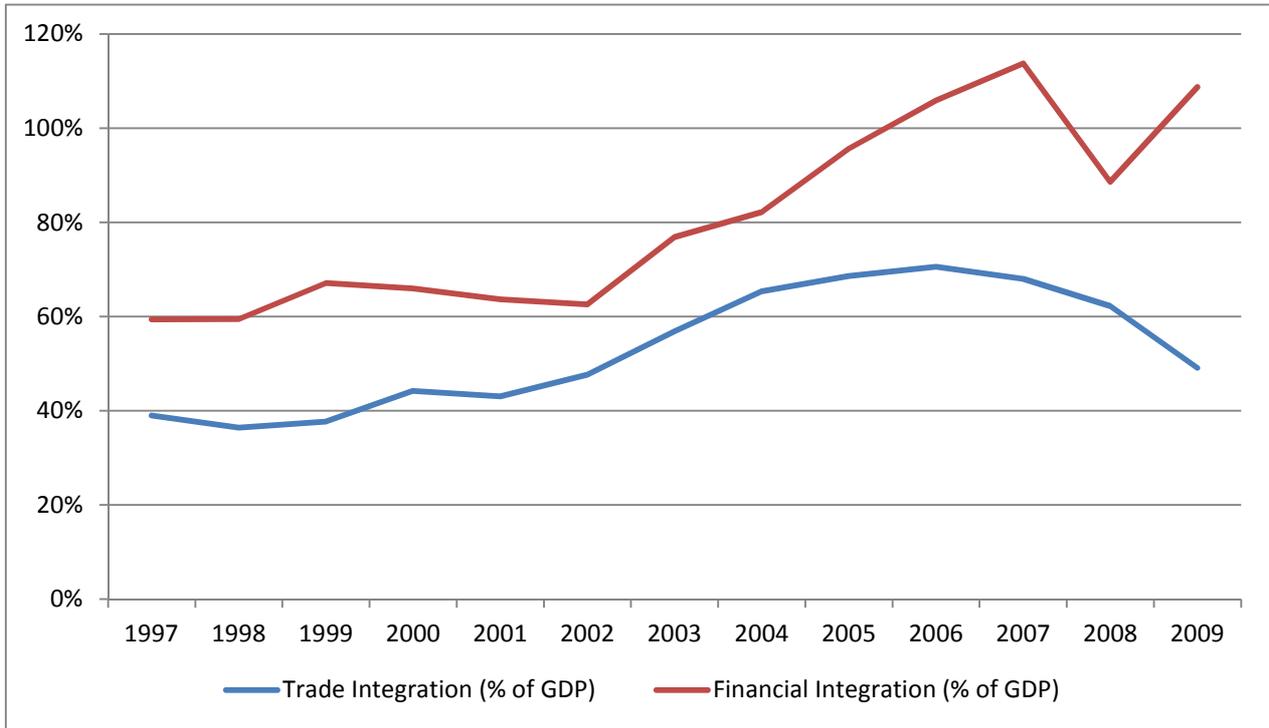


**Figure 3.4: Gross Assets and Liabilities Position  
(% GDP, 1997-2009)**

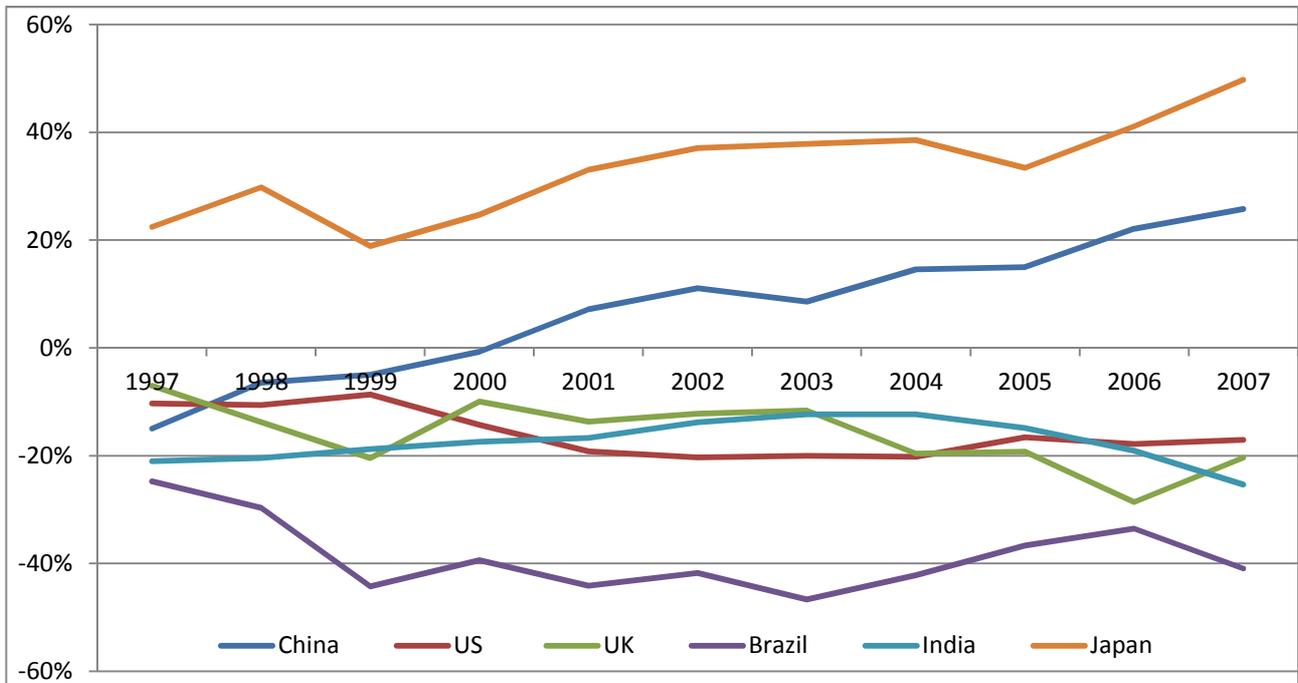


Source: SAFE, IMF and Author's Calculations, 2011.

**Figure 3.5: Trade Integration and Financial Integration  
(% GDP, 1997-2009)**

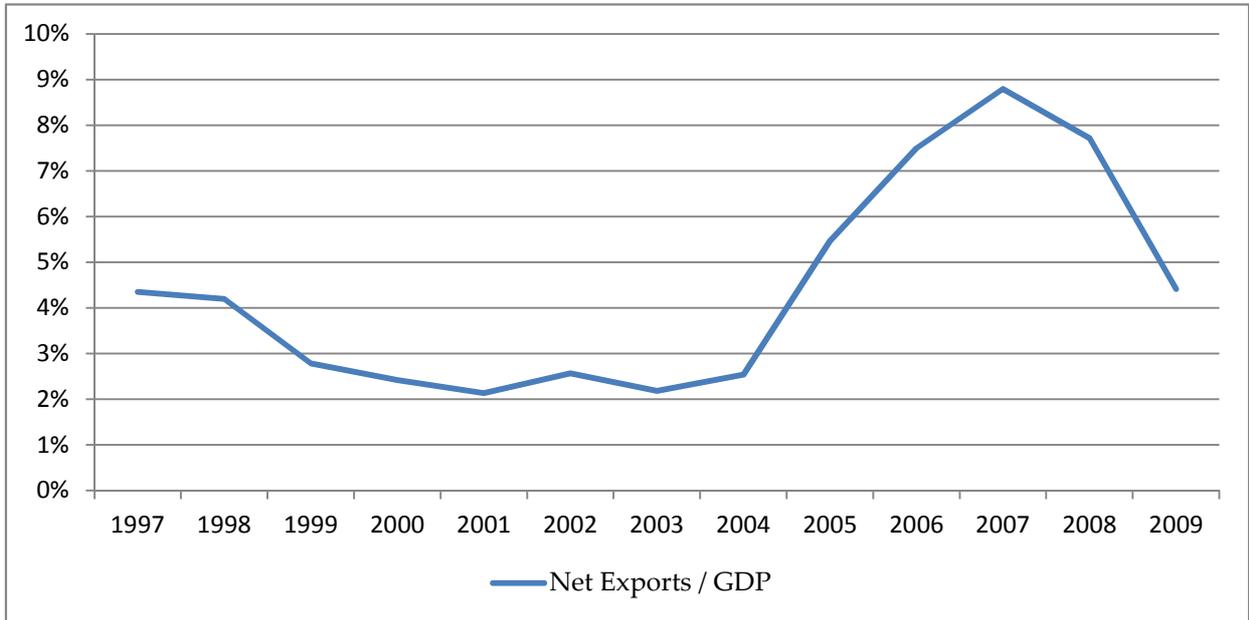


**Figure 3.6.1: International Comparisons of Net Foreign Assets  
(% GDP, 1997-2007)**

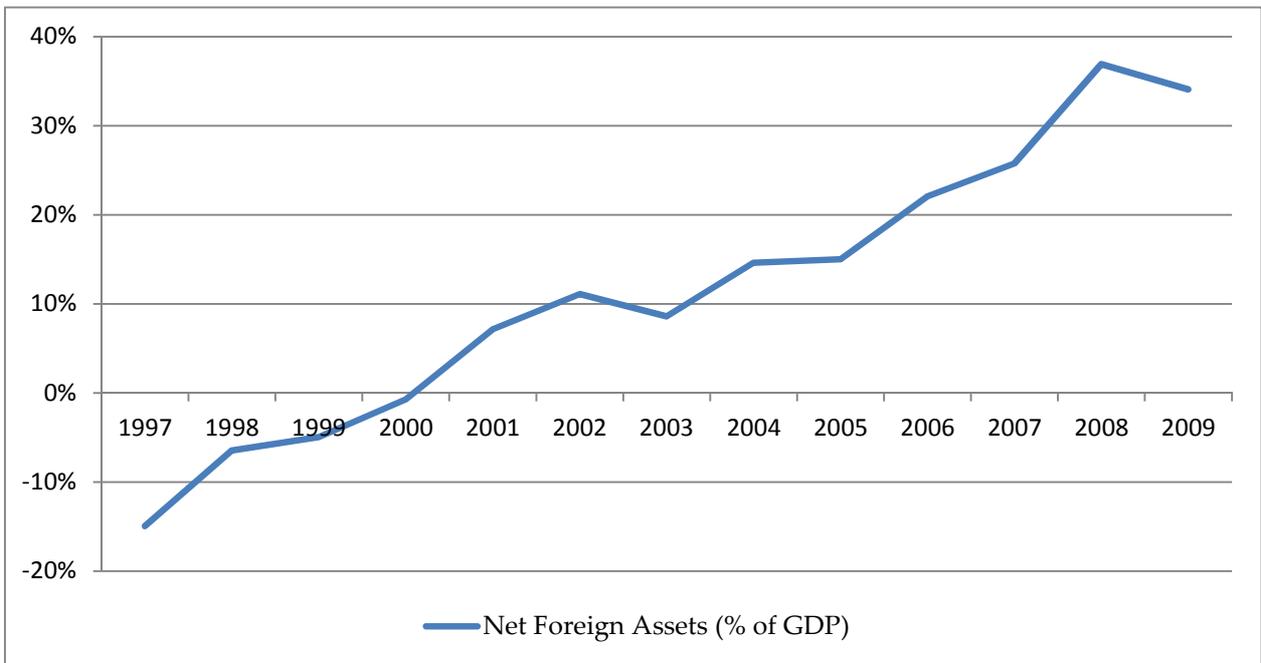


Source: SAFE, Lane and Milesi-Ferretti's EWN project (2009) and Author's Calculations, 2011.

**Figure 3.6.2: Net Exports**  
(% GDP, 1997-2009)

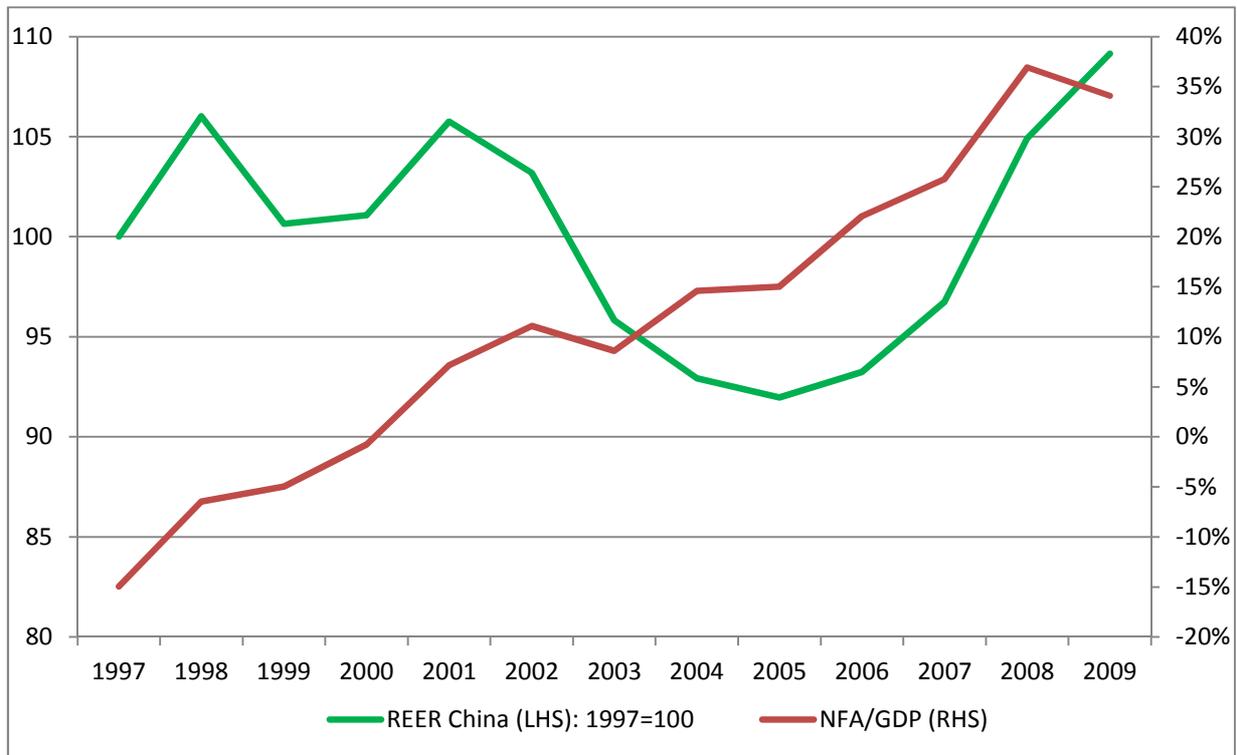


**Figure 3.6.3: Net Foreign Assets**  
(% GDP, 1997-2009)



Source: SAFE, IMF and Author's Calculations, 2011.

**Figure 3.6.4: NFA and Real Effect Exchange Rate  
(% GDP, 1997-2009)**



**Figure 3.6.5: Valuation Component and Real Effect Exchange Rate  
(% GDP, 1997-2009)**

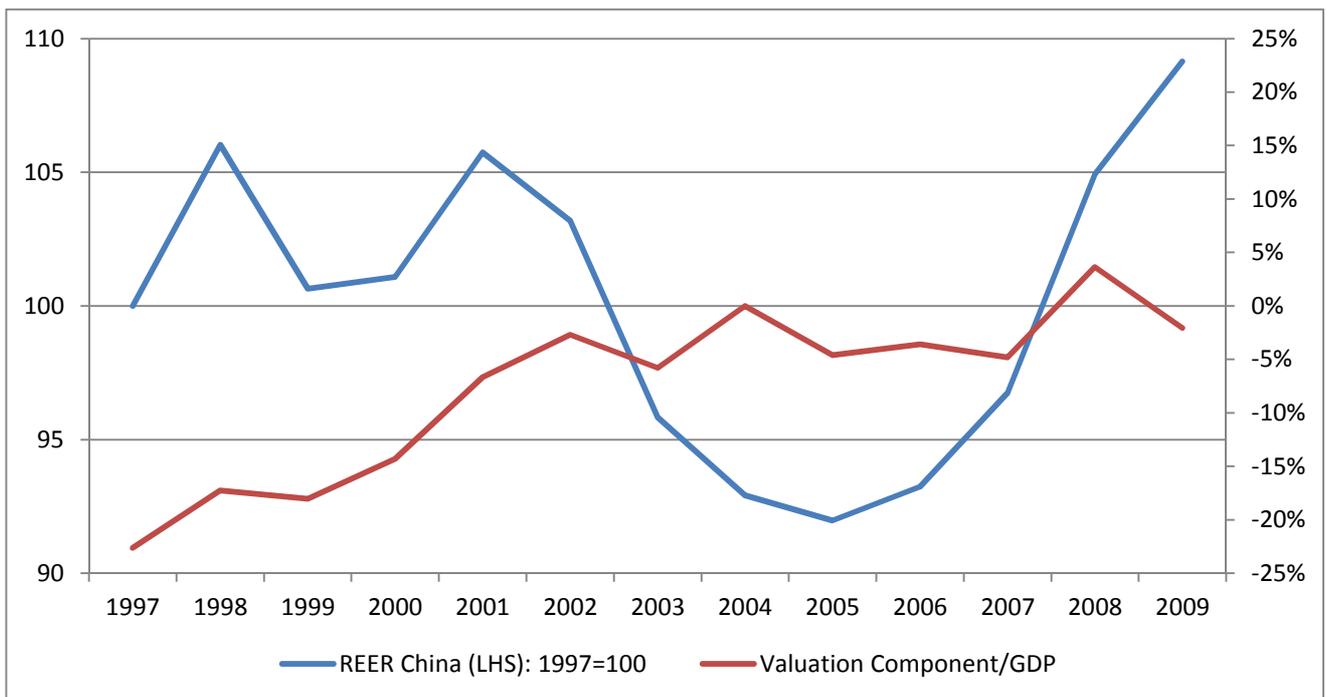


Figure 3.7.1: China External Assets

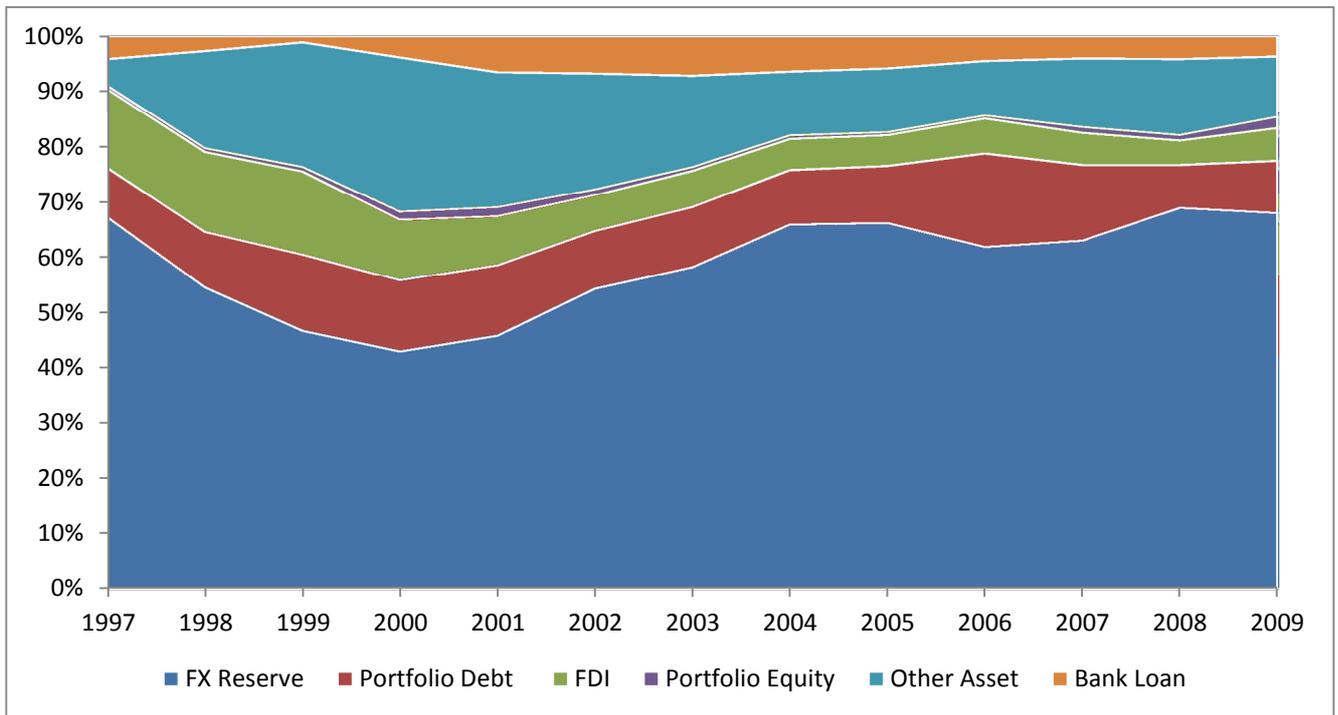
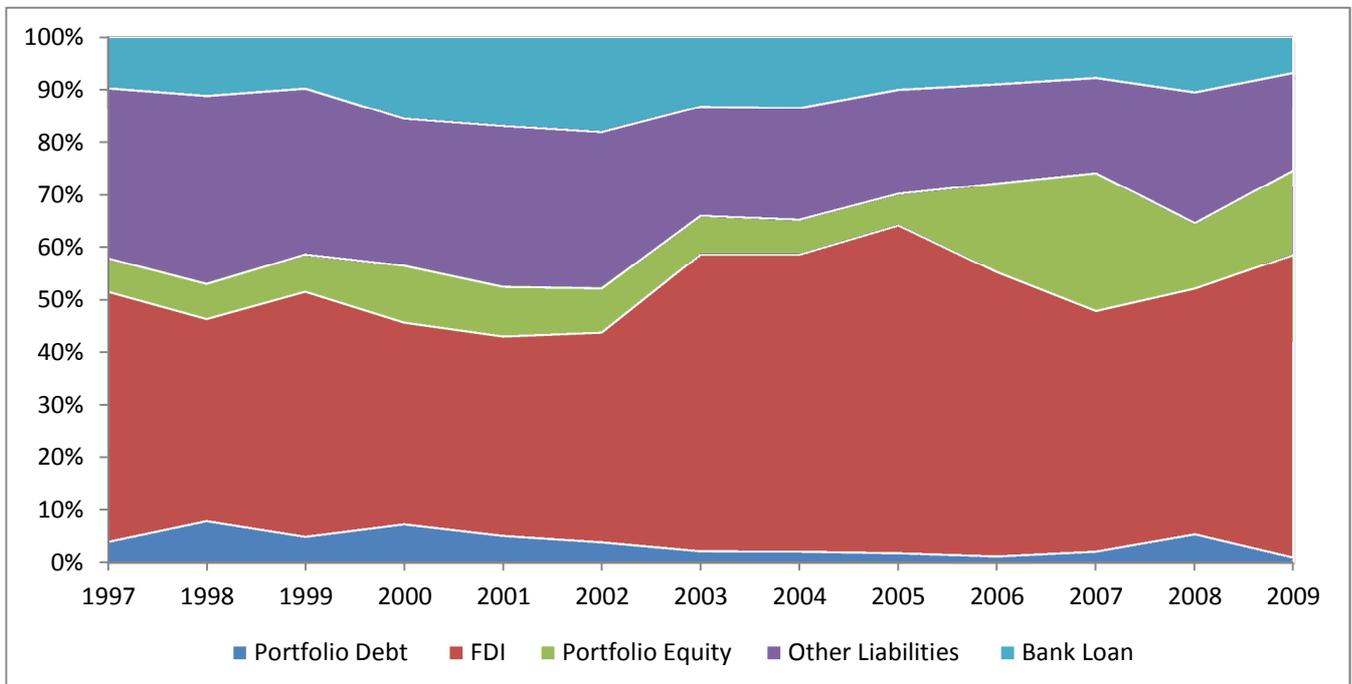
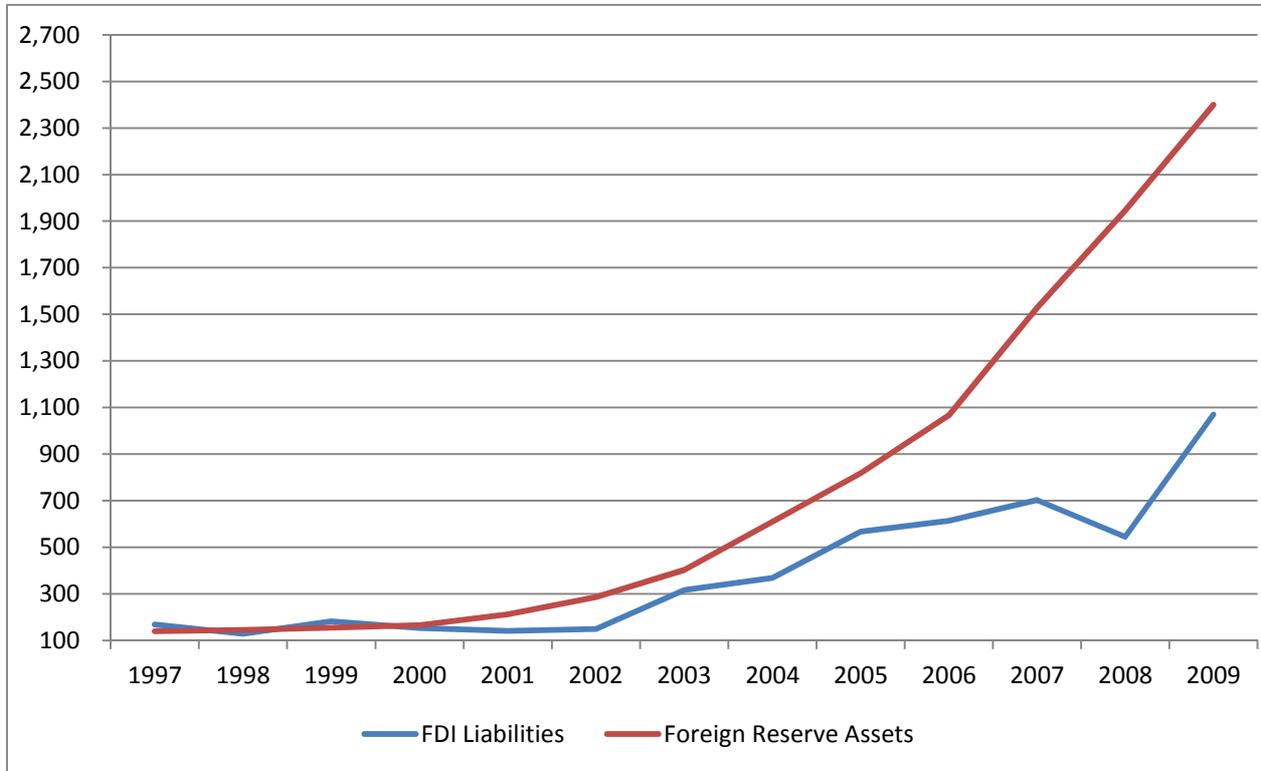


Figure 3.7.2: China External Liabilities

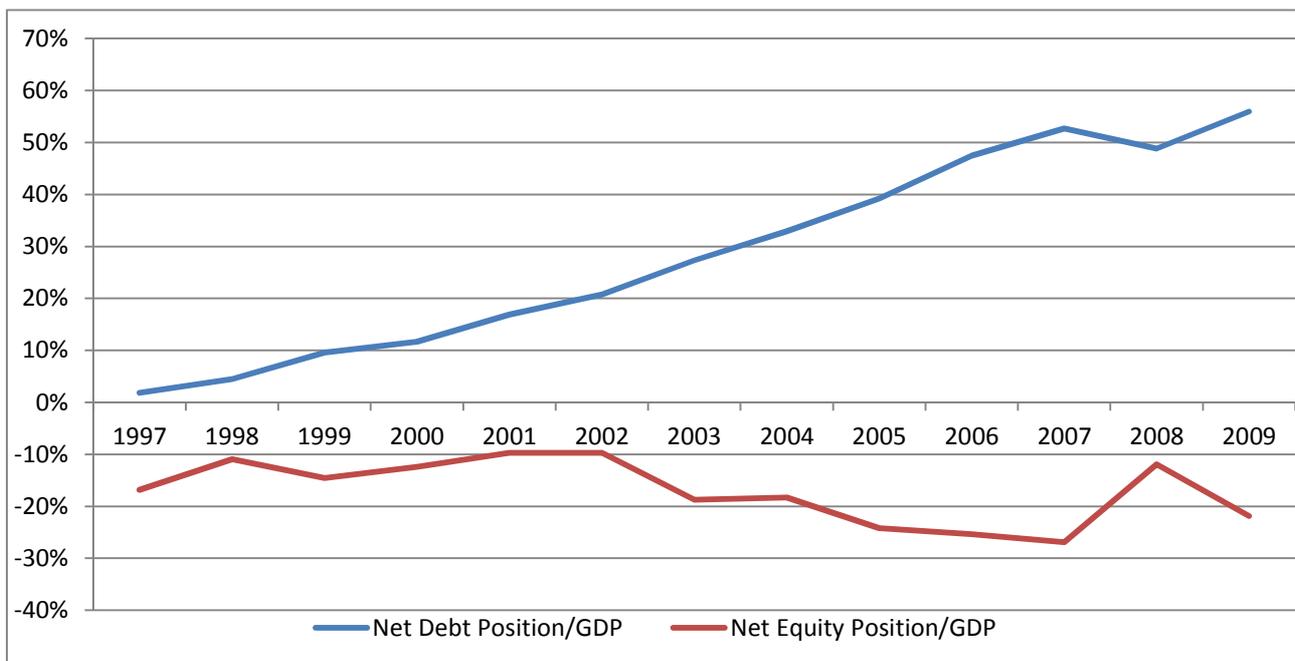


Source: SAFE, IMF and Author's Calculations, 2011.

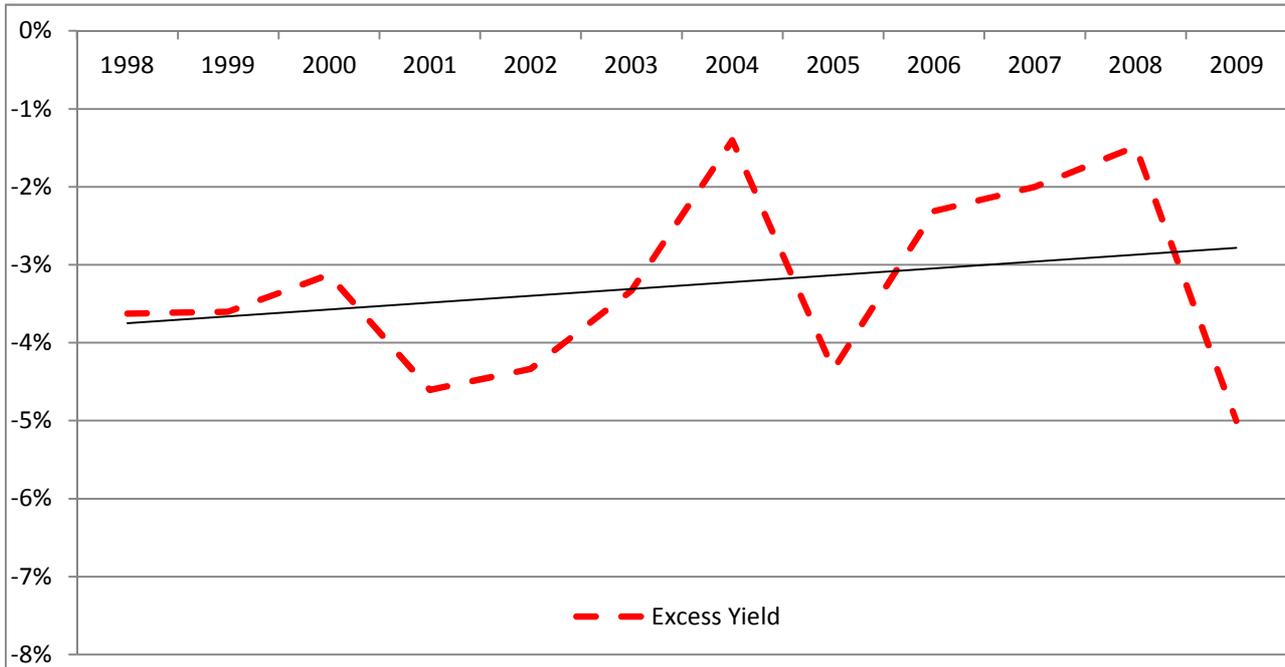
**Figure 3.7.3: Foreign Exchange Reserve VS. FDI Position  
(Billion USD, 1997-2009)**



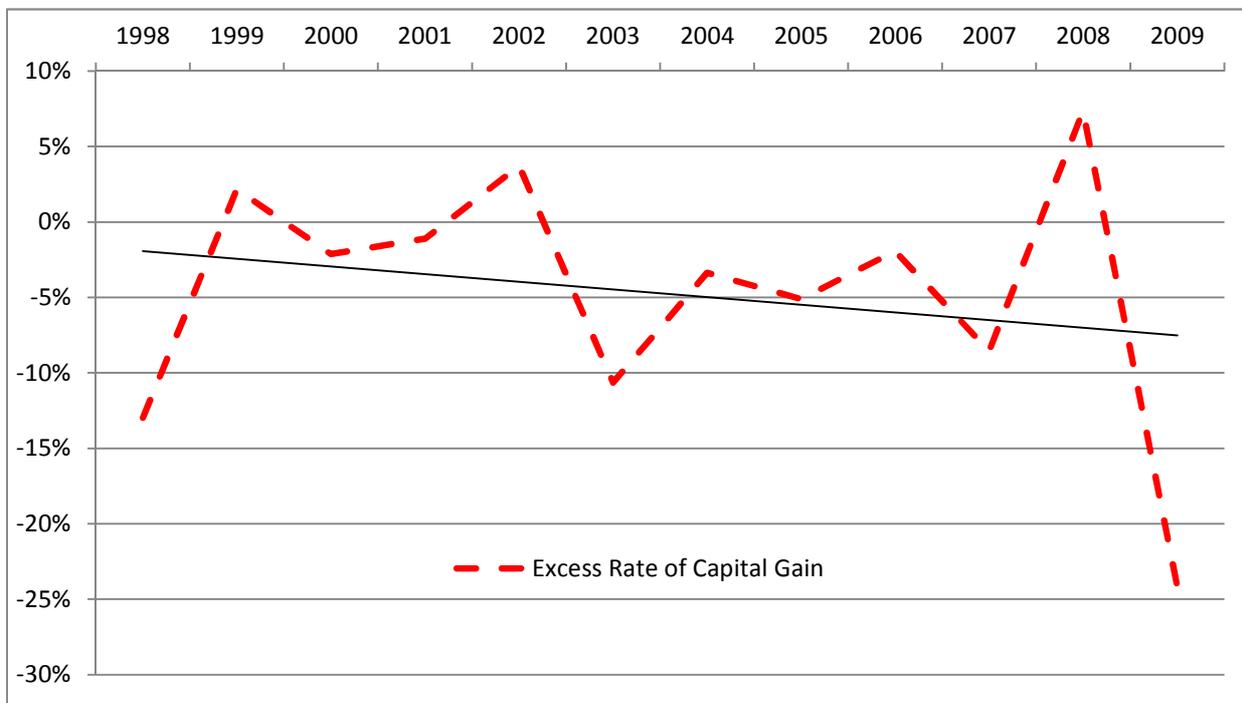
**Figure 3.8: Net Debt and Net Equity Positions  
(% GDP, 1997-2009)**



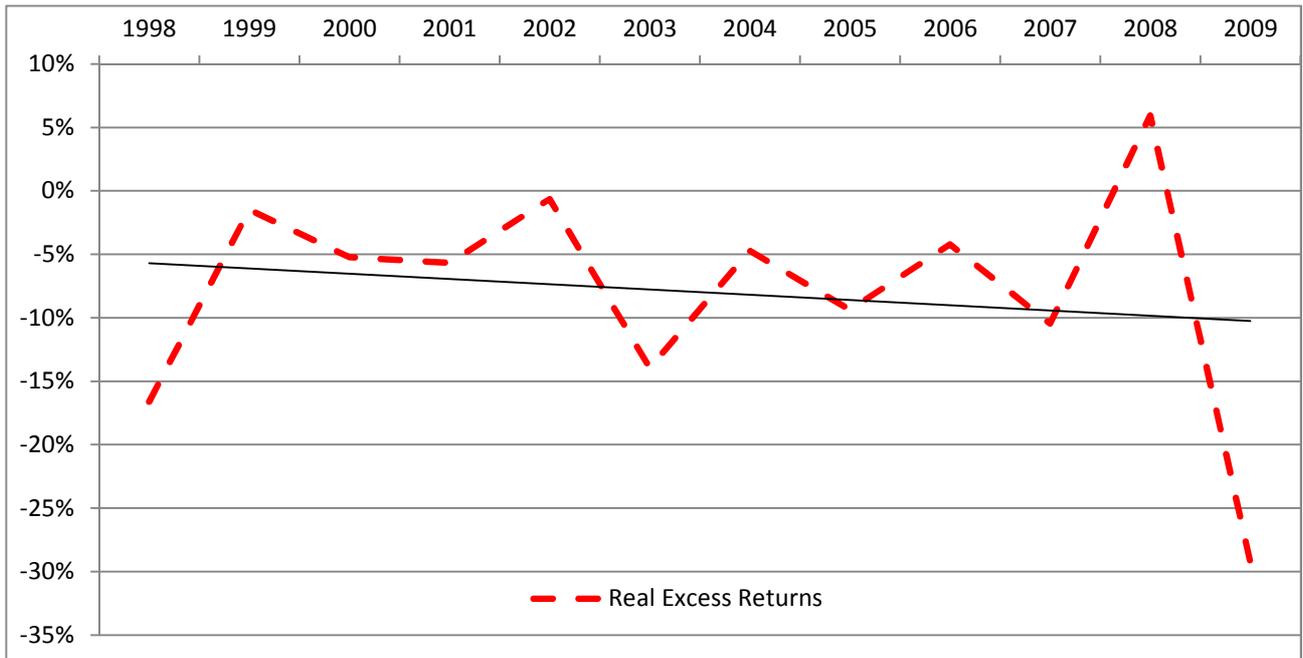
**Figure 3.9.1: Excess Yields of Net Foreign Assets**  
(%, 1998-2009)



**Figure 3.9.2: Excess Return of Capital Gain**  
(%, 1998-2009)



**Figure 3.9.3: Excess Return of Net Foreign Assets**  
(%, 1998-2009)



Source: SAFE, IMF and Author's Calculations, 2011.

**Table 1. China: Balance of Payments**

Item	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
<b>I. Current Account</b>	<b>370</b>	<b>315</b>	<b>211</b>	<b>205</b>	<b>174</b>	<b>354</b>	<b>459</b>	<b>687</b>	<b>1,341</b>	<b>2,327</b>	<b>3,540</b>	<b>4,124</b>	<b>2,611</b>
<b>A. Goods and Services</b>	<b>428</b>	<b>438</b>	<b>306</b>	<b>289</b>	<b>281</b>	<b>374</b>	<b>361</b>	<b>493</b>	<b>1,248</b>	<b>2,089</b>	<b>3,075</b>	<b>3,489</b>	<b>2,201</b>
a. Goods	462	466	360	345	340	442	447	590	1,342	2,177	3,154	3,607	2,495
b. Services	-34	-28	-53	-56	-59	-68	-86	-97	-94	-88	-79	-118	-294
<b>B. Income</b>	<b>-110</b>	<b>-166</b>	<b>-145</b>	<b>-147</b>	<b>-192</b>	<b>-149</b>	<b>-78</b>	<b>-35</b>	<b>-161</b>	<b>-54</b>	<b>79</b>	<b>177</b>	<b>73</b>
1. Compensation of Employees	2	-1	-4	-5	-6	-3	2	6	15	20	43	64	72
2. Investment Payments	-112	-165	-141	-142	-186	-147	-80	-42	-176	-74	35	113	1
<b>C. Current Transfers</b>	<b>51</b>	<b>43</b>	<b>49</b>	<b>63</b>	<b>85</b>	<b>130</b>	<b>176</b>	<b>229</b>	<b>254</b>	<b>292</b>	<b>387</b>	<b>458</b>	<b>337</b>
<b>II. Capital and Financial Account</b>	<b>210</b>	<b>-63</b>	<b>52</b>	<b>19</b>	<b>348</b>	<b>323</b>	<b>527</b>	<b>1,107</b>	<b>1,010</b>	<b>526</b>	<b>951</b>	<b>463</b>	<b>1,808</b>
<b>A. Capital Account</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>-1</b>	<b>0</b>	<b>0</b>	<b>-1</b>	<b>41</b>	<b>40</b>	<b>31</b>	<b>31</b>	<b>40</b>
<b>B. Financial Account</b>	<b>210</b>	<b>-63</b>	<b>52</b>	<b>20</b>	<b>348</b>	<b>323</b>	<b>528</b>	<b>1,107</b>	<b>969</b>	<b>486</b>	<b>920</b>	<b>433</b>	<b>1,769</b>
<b>1. Direct Investment</b>	<b>417</b>	<b>411</b>	<b>370</b>	<b>375</b>	<b>374</b>	<b>468</b>	<b>472</b>	<b>531</b>	<b>1,059</b>	<b>1,029</b>	<b>1,431</b>	<b>1,217</b>	<b>703</b>
1.1 Abroad	-26	-26	-18	-9	-69	-25	2	-18	-113	-212	-170	-535	-439
1.2 In China	442	438	388	384	442	493	471	549	1,172	1,241	1,601	1,751	1,142
<b>2. Portfolio Investment</b>	<b>69</b>	<b>-37</b>	<b>-112</b>	<b>-40</b>	<b>-194</b>	<b>-103</b>	<b>114</b>	<b>197</b>	<b>-49</b>	<b>-676</b>	<b>187</b>	<b>427</b>	<b>387</b>
<b>2.1 Assets</b>	<b>-9</b>	<b>-38</b>	<b>-105</b>	<b>-113</b>	<b>-207</b>	<b>-121</b>	<b>30</b>	<b>65</b>	<b>-262</b>	<b>-1,104</b>	<b>-23</b>	<b>327</b>	<b>99</b>
2.1.1. Equity Securities	0	0	0	N/A	0	0	0	0	0	-15	-152	-11	-338
2.1.2 Debt Securities	-9	-38	-105	N/A	-207	-121	30	65	-262	-1,090	129	339	437
<b>2.2 Liabilities</b>	<b>78</b>	<b>1</b>	<b>-7</b>	<b>73</b>	<b>12</b>	<b>18</b>	<b>84</b>	<b>132</b>	<b>212</b>	<b>429</b>	<b>210</b>	<b>99</b>	<b>288</b>
2.2.1. Equity Securities	57	8	6	N/A	8	22	77	109	203	429	185	87	282
2.2.2 Debt Securities	22	-7	-13	N/A	4	-5	7	23	9	0	25	12	6
<b>3. Other investment</b>	<b>-276</b>	<b>-437</b>	<b>-205</b>	<b>-315</b>	<b>169</b>	<b>-41</b>	<b>-59</b>	<b>379</b>	<b>-40</b>	<b>133</b>	<b>-697</b>	<b>-1,211</b>	<b>679</b>
<b>3.1 Assets</b>	<b>-396</b>	<b>-350</b>	<b>-244</b>	<b>-439</b>	<b>208</b>	<b>-31</b>	<b>-179</b>	<b>20</b>	<b>-489</b>	<b>-319</b>	<b>-1,515</b>	<b>-1,061</b>	<b>94</b>
<b>3.2 Liabilities</b>	<b>120</b>	<b>-86</b>	<b>39</b>	<b>123</b>	<b>-39</b>	<b>-10</b>	<b>120</b>	<b>359</b>	<b>449</b>	<b>451</b>	<b>818</b>	<b>-150</b>	<b>585</b>
<b>III. Reserve Assets</b>	<b>-357</b>	<b>-64</b>	<b>-85</b>	<b>-105</b>	<b>-473</b>	<b>-755</b>	<b>-1,170</b>	<b>-2,064</b>	<b>-2,506</b>	<b>-2,848</b>	<b>-4,607</b>	<b>-4,795</b>	<b>-3,984</b>
3.1 Foreign Currency and Gold	0	0	0	0	0	0	0	0	0	0	0	0	-49
3.2 SDR	0	-1	0	-1	-1	-1	-1	-2	0	2	-1	0	-111
3.3 Reserve Position in the IMF	-9	-13	13	4	-7	-11	-1	5	19	3	2	-12	-4
<b>3.4 Foreign Exchange</b>	<b>-349</b>	<b>-51</b>	<b>-97</b>	<b>-109</b>	<b>-466</b>	<b>-742</b>	<b>-1,168</b>	<b>-2,067</b>	<b>-2,526</b>	<b>-2,853</b>	<b>-4,609</b>	<b>-4,783</b>	<b>-3,821</b>
3.5 Other Claims	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>IV. Net errors and omissions</b>	<b>-223</b>	<b>-187</b>	<b>-178</b>	<b>-119</b>	<b>-49</b>	<b>78</b>	<b>184</b>	<b>270</b>	<b>155</b>	<b>-6</b>	<b>116</b>	<b>209</b>	<b>-435</b>

Sources: SAFE and PBOC, 2011; Notes: All data are annual averages. All data, except memo items, are in balance of payments; Units: \$ 100 Millions

**Table 2. China: Official International Investment Position**

	2004	2005	2006	2007	2008	2009
<b>Net Position</b>	<b>2,764</b>	<b>4,077</b>	<b>6,402</b>	<b>11,881</b>	<b>14,938</b>	<b>18,219</b>
<b>A. Assets</b>	<b>9,291</b>	<b>12,233</b>	<b>16,905</b>	<b>24,162</b>	<b>29,567</b>	<b>34,601</b>
<b>1. Direct Investment Abroad</b>	<b>527</b>	<b>645</b>	<b>906</b>	<b>1,160</b>	<b>1,857</b>	<b>2,296</b>
<b>2. Portfolio Investment</b>	<b>920</b>	<b>1,167</b>	<b>2,652</b>	<b>2,846</b>	<b>2,525</b>	<b>2,428</b>
2.1 Equity Securities	0	0	15	196	214	546
2.2 Debt Securities	920	1,167	2,637	2,650	2,311	1,882
<b>3. Other Investment</b>	<b>1,658</b>	<b>2,164</b>	<b>2,539</b>	<b>4,683</b>	<b>5,523</b>	<b>5,365</b>
3.1 Trade Credits	432	661	922	1,160	1,102	1,646
3.2 Loans	590	719	670	888	1,071	942
3.3 Currency and Deposits	553	675	736	1,380	1,529	1,409
<b>3.4 Other Assets</b>	<b>83</b>	<b>109</b>	<b>210</b>	<b>1,255</b>	<b>1,821</b>	<b>1,368</b>
<b>4. Reserve Assets</b>	<b>6,186</b>	<b>8,257</b>	<b>10,808</b>	<b>15,473</b>	<b>19,662</b>	<b>24,513</b>
4.1 Foreign Currency and Gold	41	42	123	170	169	371
4.2 SDR	12	12	11	12	12	125
4.3 Reserve Position in the IMF	33	14	11	8	20	25
<b>4.4 Foreign Exchange</b>	<b>6,099</b>	<b>8,189</b>	<b>10,663</b>	<b>15,282</b>	<b>19,460</b>	<b>23,992</b>
<b>B. Liabilities</b>	<b>6,527</b>	<b>8,156</b>	<b>10,503</b>	<b>12,281</b>	<b>14,629</b>	<b>16,381</b>
<b>1. Direct Investment in China</b>	<b>3,690</b>	<b>4,715</b>	<b>6,144</b>	<b>7,037</b>	<b>9,155</b>	<b>9,974</b>
<b>2. Portfolio Investment</b>	<b>566</b>	<b>766</b>	<b>1,207</b>	<b>1,466</b>	<b>1,677</b>	<b>1,900</b>
2.1 Equity Securities	433	636	1,065	1,290	1,505	1,748
2.2 Debt Securities	133	130	142	176	172	152
<b>3. Other Investment</b>	<b>2,271</b>	<b>2,675</b>	<b>3,152</b>	<b>3,778</b>	<b>3,796</b>	<b>4,508</b>
3.1 Trade Credits	809	1,063	1,196	1,487	1,296	1,617
3.2 Loans	880	870	985	1,033	1,030	1,114
3.3 Currency and Deposits	381	484	595	791	918	1,034
3.4 Other Liabilities	200	257	377	467	552	742

Sources: SAFE and PBOC, 2011; Units: 100 millions of USD

**Table 3. China: Size of Net Foreign Assets Position by Year**

Million USD	1997-2009	1997-2000	2001-2005	2006-2009
FX Reserves Assets	759,654	151,275	466,125	1,734,944
Portfolio Debt Assets	133,284	35,083	81,899	295,717
FDI Assets	76,006	39,980	48,508	146,404
Portfolio Equity Assets	13,353	2,858	5,987	33,057
Other Assets	212,935	68,154	166,608	415,625
Bank Loan Assets	50,850	-1,183	49,156	105,000
Portfolio Equity Liabilities	105,015	29,094	41,251	260,640
Portfolio Debt Liabilities	21,925	22,010	14,838	30,699
FDI Liabilities	393,112	158,197	308,678	733,568
Other Liabilities	253,320	160,839	209,501	400,575
Bank Loan Liabilities	78,968	42,979	76,855	117,600
Gross Assets	1,205,003	302,348	777,712	2,641,772
Gross Liabilities	773,371	370,140	574,268	1,425,482
Net Foreign Assets	431,632	-67,792	203,444	1,216,290

**Table 4. China: Net Foreign Assets Position by Year**

(% of GDP)	1997-2009	1997-2000	2001-2005	2006-2009
FX Reserves Assets	27.6	14.2	25.6	43.6
Portfolio Debt Assets	5.2	3.2	4.7	8.0
FDI Assets	3.4	3.7	2.8	3.8
Portfolio Equity Assets	0.5	0.3	0.4	0.8
Other Assets	8.9	6.2	9.8	10.5
Bank Loan Assets	1.8	-0.2	2.8	2.7
Portfolio Equity Liabilities	3.9	2.7	2.4	7.0
Portfolio Debt Liabilities	1.2	2.0	0.9	0.8
FDI Liabilities	17.0	15.0	16.9	19.1
Other Liabilities	12.6	15.2	12.2	10.4
Bank Loan Liabilities	3.9	4.0	4.5	3.1
Gross Assets	46.1	28.1	43.7	67.0
Gross Liabilities	34.7	34.9	32.4	37.3
Net Foreign Assets	11.4	-6.8	11.3	29.7

Sources: Lane and Milesi-Ferretti (2009), SAFE and CBRC, 2011; Note: China entry into WTO in year 2000; July 2005, the Chinese RMB switched to a managed float linked to a basket of currencies.

**Table 5.1. Nominal Returns: Yields, Capital Gain and Total Return by Year (%)**

Year	1998-2009	1998-2000	2001-2005	2006-2009
Assets Yield	3.2	3.1	2.6	3.9
Liabilities Yield	6.4	6.5	6.2	6.6
Assets Capital Gain	-3.5	-14.3	-0.4	0.8
Liabilities Capital Gain	-0.1	-9.4	1.6	4.7
<b>Total Assets Returns</b>	<b>-0.3</b>	<b>-11.2</b>	<b>2.2</b>	<b>4.7</b>
<b>Total Liabilities Returns</b>	<b>6.3</b>	<b>-2.8</b>	<b>7.8</b>	<b>11.3</b>

**Table 5.2. Real Returns: Yields, Capital Gain and Total Return by Year (%)**

Year	1998-2009	1998-2000	2001-2005	2006-2009
Assets Yield	1.8	3.7	1.3	1.1
Liabilities Yield	5.1	7.2	4.8	3.7
Assets Capital Gain	-4.7	-13.7	-1.8	-1.7
Liabilities Capital Gain	-1.3	-8.8	0.2	2.4
<b>Total Assets Returns</b>	<b>-1.6</b>	<b>-10.6</b>	<b>0.8</b>	<b>2.1</b>
<b>Total Liabilities Returns</b>	<b>5.1</b>	<b>-2.2</b>	<b>6.3</b>	<b>8.9</b>

**Table 6. Excess Returns: Yields, Capital Gain and Total Return by Year (%)**

Year	1998-2009	1998-2000	2001-2005	2006-2009
Excess Yield	-3.3	-3.5	-3.6	-2.7
Excess Return of Capital Gain	-3.4	-4.9	-2.0	-3.9
<b>Excess Total Return</b>	<b>-6.6</b>	<b>-8.3</b>	<b>-5.6</b>	<b>-6.6</b>

**Table 7.1. Summary Statistics: Excess Returns (1998-2009)**

(%)	Excess Yield	Excess Return of Capital Gain	Excess Returns	Total Assets Returns	Total Liabilities Returns
<b>Mean</b>	-3.3	-3.4	<b>-6.6</b>	-0.3	6.3
<b>St. Deviation</b>	1.2	9.5	<b>10.2</b>	17.2	23.0
<b>Median</b>	-3.5	-1.1	<b>-4.9</b>	3.1	5.0
<b>Min</b>	-5.0	-24.7	<b>-29.7</b>	-31.4	-31.8
<b>Max</b>	-1.4	-13.7	<b>-12.2</b>	-25.0	-50.6

**Table 7.2 Summary Statistics: Excess Returns (1998-2000)**

(%)	Excess Yield	Excess Return of Capital Gain	Excess Returns	Total Assets Returns	Total Liabilities Returns
<b>Mean</b>	-3.5	-4.9	<b>-8.3</b>	-11.2	-2.8
<b>St. Deviation</b>	0.3	7.7	<b>7.8</b>	19.2	11.9
<b>Min</b>	-3.6	-1.7	<b>-4.9</b>	-8.9	-4.0
<b>Max</b>	-3.6	-13.7	<b>-17.3</b>	-31.4	-14.1

**Table 7.3. Summary Statistics: Excess Returns (2001-2005)**

(%)	Excess Yield	Excess Return of Capital Gain	Excess Returns	Total Assets Returns	Total Liabilities Returns
<b>Mean</b>	-3.6	-2.0	<b>-5.6</b>	2.2	7.8
<b>St. Deviation</b>	1.3	4.8	<b>4.9</b>	16.7	20.7
<b>Min</b>	-4.3	-0.4	<b>-5.0</b>	1.0	1.9
<b>Max</b>	-4.6	-9.6	<b>-12.9</b>	-16.8	-11.8

**Table 7.4. Summary Statistics: Excess Returns (2006-2009)**

(%)	Excess Yield	Excess Return of Capital Gain	Excess Returns	Total Assets Returns	Total Liabilities Returns
<b>Mean</b>	-2.7	-3.9	<b>-6.6</b>	4.7	11.3
<b>St. Deviation</b>	1.6	15.9	<b>17.4</b>	17.4	34.0
<b>Min</b>	-2.2	-2.3	<b>-4.5</b>	8.8	13.3
<b>Max</b>	-5.0	-24.7	<b>-29.7</b>	-19.6	-31.8

**Table 8. Decompositions of Excess Returns by Year (%)**

Returns by Asset Class	1998-2009	1998-2000	2001-2005	2006-2009
FDI Assets Return	-0.2	-1.5	0.0	0.4
FDI Liabilities Return	4.3	-0.8	5.4	6.8
<b>FDI Excess Return</b>	<b>-4.5</b>	<b>-0.7</b>	<b>-5.3</b>	<b>-6.4</b>
Portfolio Equity Asset Return	0.01	-0.1	0.0	0.1
Portfolio Equity Liabilities Return	1.02	-0.2	0.5	2.6
<b>Portfolio Equity Excess Return</b>	<b>-1.1</b>	<b>0.1</b>	<b>-0.5</b>	<b>-2.5</b>
Portfolio Debt Asset Return	0.1	-1.1	0.2	0.8
Portfolio Debt Liability Return	-0.1	-0.3	0.1	-0.2
<b>Portfolio Debt Excess Return</b>	<b>0.2</b>	<b>-0.8</b>	<b>0.1</b>	<b>0.9</b>
Foreign Exchange Reserves Official Returns	3.21	N/A	2.51	4.09
<b>Returns Differentials: Reserves Official Returns- FDI Liabilities</b>	<b>-1.1</b>	<b>N/A</b>	<b>-2.9</b>	<b>-2.7</b>