Saving China's Stock Market*

Yi Huang† Jianjun Miao‡ Pengfei Wang§

September 2016
First version: August 2016

Abstract

What are the economic benefits and costs of preventing a stock market meltdown during the summer of 2015 by the Chinese government intervention? We answer this question by estimating the value creation for the stocks purchased by the government between the period starting with the market crash in mid-June and the market recovery in September. We find that the government intervention increased the value of the rescued firms with a net benefit between RMB 2,464 and 3,402 billion, which is about 5% of the Chinese GDP in 2014. The value creation came from the increased stock demand by the government, the reduced default probabilities, and the increased liquidity.

JEL classification Numbers: G14, G15, G18

Keywords: China, Stock Market Crash, Government intervention, liquidity

*We have benefitted from comments by participants in Conferences held in Fudan University and Jinan University and in seminars at the China Securities Regulatory Commission and Zhejiang University. In particular, we would like to thank Harald Hau, Shang-Jin Wei, Bin Zhang, and Michael (Zheng) Song for their valuable comments. We gratefully acknowledge research assistance from Ye Zhang and Yadong Huang, and financial support from Sino-Swiss Science and Technology Cooperation.

†Graduate Institute, Geneva, Maison de la paix, Chemin Eugene-Rigot 2, 1202 Geneva, Switzerland. Tel: (+41) 22 908 59 40. E-mail: yi.huang@graduateinstitute.ch.

‡Department of Economics, Boston University, 270 Bay State Road, Boston MA 02215, USA. Email: miaoj@bu.edu. Tel: (+1) 617 353 6675.

§Department of Economics, The Hong Kong University of Science and Technology, Clear Water Bay, Hong Kong. Office: (+852) 2358 7612. Email: pfwang@ust.hk

1. Introduction

From mid-June to early July of 2015, the Chinese Shanghai Stock Exchange Composite Index (SSECI) plunged by 32%, wiping out more than RMB 18 trillion in share value from its June 12 peak.[1] The value lost was equivalent to about 30% of China's GDP in 2014 and about 20% of the US GDP in 2014. The Shenzhen market, which has more tech companies and is often compared to the US Nasdaq index, was down 41% over the same period.

This large stock market crash produced widespread panic and pushed the Chinese government to implement a range of rescue policies. In addition to halting IPOs, restricting short selling, and restricting share sales by large shareholders, the Chinese government directly or indirectly participated in stock market trading. In particular, the China Securities Finance Corporation Limited (CSF) lent money to 21 brokerages for them to buy stocks in the stock markets.[2] Moreover, the CSF and China Central Huijin Investment Limited (CCH),[3] the so called national team, also directly purchased stocks of more than 1,000 firms starting from July 6, 2015.

In this paper we study the following questions: Did the government intervention create value or was it simply a redistribution of value from taxpayers to the rescued firms? If it created value, where did the value added come from? These questions are important for policymakers and investors, but have not been studied in the academic literature.

To answer these questions, we estimate the costs and benefits of the government's purchases of stocks during the period from July 1 to September 30, 2015. We focus on the national team instead of the brokerages due to data availability. The national team continually purchased stocks starting from July 6, but we do not observe its daily trading behavior. We can only observe the national team's share holdings of the rescued firms from their quarterly balance sheets. From the balance sheets in the second and third quarters of 2015, we can infer the net purchases by the government in that period.

Given the global turbulence in financial markets during the period from July 1 to September 30, it is impossible to estimate the systemic effects of the government intervention. However, it is possible to estimate its effects on the rescued firms. To compute the intervention's effects

[1] Based on the exchange rate on June 30, 2015 (RMB 6.11 per US dollar), the loss is roughly 3 trillion US dollars.

[2] The CSF was established in 2011 to lend to securities brokerages to support margin lending to stock investors.

[3] The CCH is a wholly owned subsidiary of China Investment Corporation, with its own board of directors and board of supervisors. It is an organization by which the Chinese government can act as a shareholder for the big four state-owned banks and some other banks.

on the value of these firms, we do not limit ourselves to the changes in the value of common stocks, but we study the changes in the entire enterprise value by also studying changes in the value of existing debt.

We use the capital asset pricing model (CAPM) of Sharpe (1964) to compute the effects on equity value and use the Merton (1974) model to compute debt value. We find that the abnormal variation in the market value of common equity is RMB 113 billion. To separate the effect of the government purchase from that of other events occurring at the same time, we control for the change in debt value of non-rescued firms. This difference-in-difference approach gives the estimate of the total increase in debt value due to the government purchase. We find that the increase is RMB 3,169 billion. Adding up the increase in equity value and debt value, we obtain that the enterprise value of the rescued firms increased by RMB 3,282 billion.

This increase might come at a cost to the taxpayers. To estimate this cost, we compute the difference between the purchasing value and the holding value on September 30, 2015. Since the government continually purchased stocks during the period between July 6 and September 30 and since we do not observe its daily trading behavior in the data, we estimate its purchasing cost by computing the product of the government's net share holdings of the rescued firms and the estimated purchase price. We consider three estimates of the purchase price using the average price, the highest price, and the lowest price between July 6 and September 30. We find that the corresponding actual costs are 321.9 billion, 818.6 billion, and -119.8 billion, respectively. Subtracting these costs, we obtain that the value created by the government purchases is RMB 2,960, 2,464, and 3,402 billion, respectively. This value is between 4% and 6% of the market capitalization of the China's stock market on June 30, 2015, and is about 5% of China's GDP in 2014.

Where did this created value come from? What issues did the government purchase help to resolve? To answer these questions, we study the cross section of more than 1,000 rescued firms. We find that the value creation came from three major sources. First, the government purchase increased the demand for shares and raised equity value (or reduced the loss of equity value), thereby raising investors' confidence. Second, the government purchase reduced default probabilities of the rescued firms and hence raised their debt value. Third, the government purchase raised liquidity of the rescued firms. We compute default probabilities using the Merton model and measure illiquidity using the Amihud index (Amihud (2002)). We regress changes in firm value, changes in default probabilities, and changes in illiquidity between June

30 and September 30, 2015 on the shares purchased by the government after including a number of control variables. We find that the coefficients are significant and have the right signs.

Our paper contributes to the literature by providing the first analysis of the costs and benefits of the government purchase during the China's stock market crash in the summer of 2015. Our paper is related to Veronesi and Zingales (2010) who analyze the costs and benefits of the US government intervention (Paulson's plan) during the financial crisis of 2008. Our analysis is different from theirs in that the nature of the intervention in the two countries is different. The Chinese government directly purchased shares of more than 1000 firms, while the US government provided $125 billion preferred equity infusion in the nine largest US commercial banks joined by a three-year government guarantee on new unsecured bank debt issues. Our methodology is similar to, but different from theirs. Veronesi and Zingales (2010) use the credit default swap rates to estimate debt value and default probabilities. But data of these rates are not available in China. Instead, we use the Merton model to estimate debt value and default probabilities. Importantly, since the Chinese government purchased shares of more than 1,000 firms, we can conduct cross-sectional regressions to analyze the effects of the government purchase. But Veronesi and Zingales (2010) do not conduct a cross-sectional regression analysis because they have a very small sample size.

The rest of the paper proceeds as follows. Section 2 describes the Chinese stock market crash in the summer of 2015 and the government intervention. Section 3 provides an estimate of the costs and benefits of the government intervention. Section 4 studies the heterogeneous effects of the government intervention by conducting a cross-sectional regression analysis. Section 5 provides a robustness analysis. Section 6 concludes.

2. The Chinese Stock Market Crash and Government Intervention

2.1. A Chronology: 07/01/2014-9/30/2015

In this section we briefly describe the chronology of the Chinese stock market from July 1, 2014 to September 30, 2015. Since our study focuses on the short-run effects of the government rescue plan implemented in July 2015, we will not discuss the events happened after September 30, 2015. Figure 1 summarizes the chronology.

Insert Figure 1 Here.

Since the global financial crisis in 2008, the Chinese stock market was in the bear market until July 2014.[4] Starting from July 1, 2014 to June 12, 2015, the Chinese stock market skyrocketed and the SSECI rose from 2,050.38 to 5,166.35, a 152% increase. This bull market was due to four factors. First, the third Plenum of the 18th Communist Party of China Conference declared that China would continue to reform. In particular, China would promote a mixed-ownership economy by diversifying the shareholding structure of the state-owned enterprises (SOEs). Since many listed firms are state owned, this policy boosted the stock market. Second, the Chinese central bank (People's Bank of China, PBC for short) conducted loose monetary policies. In particular, on November 22, 2014, the PBC cut the loan rate by 40 basis points and the deposit rate by 25 basis points for the first time since July 2012. On February 5, 2015, the PBC lowered the required reserve ratio by 50 basis points to 19.5% for the first time since May 2012. On March 1, 2015, the PBC cut the benchmark interest rate by another 25 basis points. Third, new investors kept flooding into the stock market. Many people with little financial knowledge entered the market with the false belief that they could easily make quick and big money. Optimistic beliefs were prevalent in the market. Even the most important official newspaper, *People's Daily*, declared on April 10, 2015 that 4,000 index points were merely the start of a bull. Fourth, margin financing rose rapidly. As the stock market kept rising, the demand for margin financing rose. Many brokerages violated the government regulation by loosening the lending standard. In a series of studies,[5] Miao, Wang, and their coauthors show that leveraged borrowing can generate a stock market bubble and the collapse of bubbles will cause a financial crisis and an economic recession. In fact, many market observers warned that a stock market bubble already formed in May 2016.

The China Securities Regulatory Committee (CSRC) became concerned about the rapid increase in margin financing and started investigating brokerages in December 2014. Three major brokerages were forbidden to open new margin accounts for three months. This caused many investors to turn to fund-matching companies, which provided unregulated margin loans to traders. These companies permitted much lower entry barrier and much higher leverage. Another form of unregulated leverage was through umbrella-trusts. An umbrella-trust investor effectively obtained financing from the retail savers who bought wealth management products

[4] See Allen, Shan, Qian, and Zhu (2015) for a study on the disconnection between China's economic growth and the stock market performance.

[5] See Miao and Wang (2011, 2012, 2014, 2015), Miao, Wang, and Xu (2015), and Miao, Wang, and Zhou (2015).

at banks.[6] Umbrella-trust companies acted as financing vehicles that charged high fees by offering larger leverage ratios than regulated brokerages.

As the banking sector was channeling money into the stock market by unregulated umbrella-trust companies, the CSRC was worried about the risk involved. In particular, the collapse of a stock market bubble could create massive margin liquidation, which would damage banks' balance sheets, leading to a financial crisis. To avoid this risk, the CSRC issued a very strong regulation order on June 13, 2015 that banned all security companies from providing facility for off-market or shadow margin lending, which was estimated to be in the range of RMB 500 to 1,600 billion. To the surprise of the government, the SSECI lost 13.1% between June 15 and June 19, the largest weekly loss since 2008. Investors panicked and the market continued to drop. On June 26, the SSECI plummeted by 7.3% and 2,312 among the 2,763 total publicly listed stocks fell by 10%, hitting the lower limit.[7] Investors with a leverage ratio of 10 at fund-matching companies first went bust. Their portfolios were liquidated, expediting the fall of stock prices. The forced liquidation spread to umbrella-trusts, which allowed a leverage ratio of 3, and then to the margin accounts in regulated brokerages, which allowed a maximal leverage ratio of 2. This generated a liquidity spiral as described in Brunnermeier and Pedersen (2009).

On June 26 the PBC cut the interest rate for the fourth time by 25 basis points and the required reserve ratio by 50 basis points. The stock market briefly rebounded a little. But between June 29 and July 3, 2015, the SSECI lost another 12.27% in five trading days. Within just three weeks, the SSECI lost 28.6%. On July 4 (Saturday), Premier Li Keqiang held a State Council Meeting by convening 21 major brokerages, 25 mutual fund companies, and major regulators. Right after the meeting, 21 brokerages announced a joint RMB 120 billion purchase plan to purchase blue-chip ETFs and alleged not to sell them when the SSECI was below 4500 points. On July 5, the CSRC announced that IPOs of 28 companies would be suspended and the PBC would provide financing for the CSF. On the night of July 5, the CCH announced that it had purchased ETFs in the past few days and would continue to purchase in the stock market.

On Monday, July 6, the SSECI opened up 7.8% higher than the previous close, but then declined again with only 2.41% up at the close. More than 900 stocks, which accounted for

[6] See Acharya, Qian, and Yang (2016) for a study on the wealth managent products in China.

[7] Under the CSRC regulations, any listed stock must be traded at prices within a lower limit and an uper limit in any trading day. The lower (upper) limit is the price level 10% below (above) the close price in the previous trading day.

42% of total stocks, dropped by 10%, closed at the daily lower limit. The CSF was reported to start buying big blue-chips in the afternoon session.

On July 7, the SSECI lost 1.3% and on July 8, the SSECI lost another 5.9%, with about one third of all listed companies suspended trading and 915 of remaining stocks closed at the daily lower limit. From June 15 to July 8, the SSECI lost 32.1%. Retail investors lost a lot of money and the balance sheets of the brokerages and state-owned banks were in danger. Investors were in panic and a financial crisis might be imminent.

At this critical moment, the Chinese government reached a consensus on rescuing the stock market. A number of measures were taken:

- The PBC announced officially that it would provide liquidity to the CSF and make sure no systematic risks.
- The State-owned Assets Supervision and Administration Commission required SOEs not to sell stocks.
- The CCH pledged it would not sell shares.
- The CSF announced it would provide RMB 260 billion margin loans to finance stock purchases by the 21 brokerages.
- The CSRC banned large shareholders with 5% of holdings or above from selling stocks in the next 6 months.
- China Banking Regulatory Commission allowed more flexible mortgage terms of share-secured loans.
- The China Insurance Regulatory Commission relaxed insurance companies' restriction in holding stocks.
- The China Financial Futures Exchanges increased the margin requirement of the CSI 500 index futures further from 20% to 30%.
- The CSRC and the Ministry of Public Security initiated joint investigation on rules-breaking short-sellers and rumor makers.

On July 9 the market rebounded and the SSECI gained 5.8%. The market temporarily stabilized until August 11 when the PBC unexpectedly weakened the RMB, lowering its official

exchange rate by almost 2%. Although the PBC stated that it was a move toward the market determination of the exchange rate, many interpreted that the devaluation was the PBC's increasing concern of the weak economy. The stock market responded by losing 28.33% from August 12 to August 26. On August 25 the PBC cut the interest rate by 0.25%. There were no other measures announced to further stabilize the stock market by the Chinese government. It was widely believed that this might be due to the fact that the Chinese government was tied by intervening in the foreign exchange market. It is possible that the national team purchased stocks during this period, but this information is not available in the public data.

2.2. Summary Information about Purchased Stocks

After a dramatic drop in the stock market in mid-June 2015, the Chinese government started purchasing stocks from the first week of July. The purchases were conducted primarily through two state-owned investment companies, the CSF and the CCH.[8] In our sample, we first collect all the information about the top ten largest shareholders of all Chinese stocks, and then manually match the names of the CSF and the CCH with the list of shareholders from companies' quarterly reports between Q2 and Q3 of 2015. We define our sample to include the stocks which were purchased by the government, and match them with their balance sheets, market prices, market returns, and fundamental performance information.

We find that, by the end of September 2015, the CSF and the CCH together invested in 1,365 stocks in the Chinese stock market, which accounted for about 50% of the total number of stocks in the stock market. There were 494 stocks purchased by both the CSF and the CCH. Out of the total number of invested stocks, 41% were in the Shanghai main board, 18% were in the Shenzhen market, 26% were in the small and medium board (SMB), and 15% were in the growth enterprise board (GEB). Only the CCH purchased stocks from the GEB and SMB, in a total of 544 firms. Based on the market prices on September 30, 2015, the CCH and the CSF invested in more than 77% in the Shanghai main board, 14% in the Shenzhen market, 6% in the SMB, and 3% in the GEB. More than 60% of the purchased stocks were concentrated on the stocks that accounted for more than RMB 50 billion in market capitalization. The CSF purchased more than 66% of stocks with the capitalization over RMB 50 billion, while the CCH

[8] There are other investment vehicles funded by the China Securities Finance Corporation, a stock market stabilization fund, as well as the Wutongshu investment platform, the equity fund owned by the central bank of China. We did not include stocks purchased by those investment vehicles and shadow funds due to data limitations. Therefore, the purchased stocks included in our sample might underestimate the total amount of the rescue plan.

held only 43% stocks with a similar size.

Insert Table 1A, B, C Here.

Panel A of Table 1 shows that the market capitalization of the stocks purchased by the CSF accounted for 61% of the total market capitalization on June 30, 2015. The corresponding share for the CCH is 65% and the market capitalization of all stocks purchased by both the CSF and CCH accounted for 74% of the total market capitalization.

Panel B of Table 1 reports the balance sheet information about the purchased stocks. After the government intervention, the balance sheets of the purchased stocks improved with an increasing return to assets (ROA), return to equity (ROE), and a slightly decreasing leverage (debt/assets) ratio. Specifically, the average ROA and ROE increased from 3.01% to 4.39% and from 2.87% to 4.93% respectively, while the leverage ratio remained almost unchanged at 45%. In contrast, the average market to book (M/B) ratio declined from 5.32 to 3.55.

Panel C of Table 1 presents the industry-wise allocation at the end of September 2015. The CSF and the CCH invested more than 30% and 25% respectively in banking and non-banking stocks. The remaining investments were distributed among various industries ranging from 7% to less than 1%. In terms of the market capitalization on September 30, banking and non-banking financial stocks contributed to about 25% of the total invested stocks by the SCF and the CCH. This indicates that the government purchased mainly stocks in the financial sector.

3. Gains/Costs of the Government Intervention

In this section we estimate the gains or costs of the government intervention by an event study analysis. An event study cannot measure the systemic effect of the government intervention because such an effect is affected by many other market events taking place at the same time. Thus we can estimate only the differential impact of the government intervention on the rescued stocks compared to the rest of the market. Following Veronesi and Zingales (2010), we calculate the change in the entire firm value between 2015Q2 and 2015Q3 by considering both equity and debt and then estimate the net gains after deducting the actual cost of the intervention.

3.1. The Merton Model

Veronesi and Zingales (2010) use the credit default swap (CDS) rates data to estimate debt value and default probabilities. Since these data for Chinese stocks are not available, we have

to use a different approach. As a starting point, we adopt the Merton (1974) model to estimate firm value and default probabilities. We then compute debt value as firm value minus equity value.

Now we briefly introduce the Merton (1974) model. Suppose that firm value V follows a geometric Brownian motion process

$$dV/V = \mu dt + \sigma_V dW, \tag{1}$$

where μ is the expected continuously compounded return on V, σ_V is the volatility of firm value and W is a Wiener process. Suppose that debt is a discount bond with face value F and maturity T. If firm value is lower than F at the maturity date, then the firm defaults and debt holders get V, but equity holders get nothing. Thus equity can be viewed as a call option on the underlying firm value with the strike price F and the time-to-maturity T. Its value can be derived by the Black-Scholes formula:

$$\begin{aligned} E &= V\mathcal{N}(d_1) - e^{-rT}F\mathcal{N}(d_2), \\ d_1 &= \frac{\ln(V/F) + \left(r + 0.5\sigma_V^2\right)T}{\sigma_V\sqrt{T}}, \\ d_2 &= d_1 - \sigma_V\sqrt{T}, \end{aligned} \tag{2}$$

where E is equity value, r is the risk-free rate, and $\mathcal{N}$ denotes the standard cumulative normal distribution function.

By Ito's Lemma, equity volatility satisfies

$$\sigma_E = \frac{V}{E}\mathcal{N}(d_1)\sigma_V. \tag{3}$$

We then use the values of r, T, E, and σ_E as input to solve for two variables V and σ_V using two equations (2) and (3). After obtaining this solution, we can compute expected default probability under the risk-neutral measure as

$$EDP = \mathcal{N}(-DD), \tag{4}$$

$$DD = \frac{\ln(V/F) + \left(r - 0.5\sigma_V^2\right)T}{\sigma_V\sqrt{T}}, \tag{5}$$

where DD is often called the (risk-neutral) distance to default. Under the physical measure, we replace r with μ in equation (5) to derive the (physical) expected default probability. We choose to compute the risk-neutral default probability instead of the physical default probability for

simplicity because we do not need to estimate the unknown parameter μ. Crosbie and Bhon (2003) and Vassalou and Xing (2004) propose a complicated iterative procedure to compute daily V and then estimate μ as the mean of the daily growth of V. Bharath and Shumway (2008) propose a simpler approach.

In our application we observe stock prices data and can compute equity value E on June 30 and September 30, 2015. We then take a rolling 250 day standard deviation of equity returns to estimate the volatility of equity σ_E. We take the one-year government bond yield as the risk-free rate r. Following Vassalou and Xing (2004) and Bharath and Shumway (2008), we use the short-term plus one half of the long-term liability of June 30 to represent the face value of debt for non-financial firms. Due to the special liability structure of the financial firms (banks, insurance and security firms), we use the total book liability on June 30 as the face value of debt. Suppose that the debt has one year maturity and set $T = 1$ on June 30. On September 30, T becomes 3/4. Once the values for r, T, E, and σ_E are obtained, we can compute firm value V on June 30 and September 30 as well as the default probabilities on those dates.

To apply the preceding Merton method, we need to know the previous year's information about equity value to estimate equity volatility. Some stocks lack this information due to either new listings or mergers and acquisitions. For this reason, we exclude those stocks from our sample. We then have a smaller sample of 2,650 stocks, among which 1,316 stocks were purchased by the national team and the remaining stocks were not purchased.

Table 2 presents the computed market values of all financial and non-financial firms in our sample on June 30 and September 30. Note that the CSF and the CCH both invested in the same 483 stocks, which were mainly financial and large market capitalization firms. We have to be careful about double counting when computing values.

Insert Table 2 Here.

Panel A of Table 2 shows that the CSF purchased 680 non-financial firms. The value of these firms increased by 3.8% and the increase in value was RMB 1,086 billion. The CCH purchased 1,041 non-financial firms and these firms lost value of RMB 708 billion. The loss was 2.2% of June 30 value. The CSF and the CCH both purchased 449 non-financial firms. These firms gained value of RMB 1,282 billion and the gain is 5.3%. In aggregate, the total rescued stocks lost 2.4% of firm value worth RMB 904 billion. There were 1,329 non-financial stocks not purchased by either the CSF or the CCH. These firms lost 13.5% of value worth RMB 2,352 billion.

Panel B of Table 2 presents the corresponding numbers for financial stocks. the CSF and the CCH purchased 40 and 38 financial stocks, respectively. There were 34 financial stocks purchased by both the CSF and the CCH. There were 5 financial stocks not purchased by either the CSF or the CCH. These firms lost 19.6% of value worth RMB 246 billion.

3.2. Change in Debt Value

Next we estimate debt value by subtracting equity value from firm value. Equity value is computed as the market capitalization, i.e., the stock market price multiplied by the total outstanding shares. Table 3 presents computed equity value.

Insert Table 3 Here.

Panel A of Table 3 shows that the purchased non-financial stocks lost about 30.9% of their equity value worth RMB 9,495 billion. The non-purchased stocks lost a smaller percentage of 24.8% of equity value worth RMB 3,800 billion. Panel B shows the corresponding results for financial stocks. The total purchased financial stocks lost 26.1% of equity value worth RMB 2,586 billion. By contrast, the total non-purchased stocks lost a much larger percentage of 46.9% of equity value worth RMB 231 billion.

In summary, Table 3 shows that the rescued financial stocks lost a much smaller percentage of equity value compared to the non-rescued financial stocks, but the opposite is true for the non-financial stocks.

Insert Table 4 Here.

Table 4 presents the estimated debt value. Panel A shows that debt value of the rescued non-financial firms increased by about more than 100%, while debt value of the non-rescued non-financial firms also increased, but by a much smaller magnitude. Panel B shows that debt value of the rescued financial firms barely changed, but debt value of the non-rescued financial firms lost about 2%.

Since debt value changed for both rescued and non-rescued firms during the period from June 30 to September 30 and since there were many market events happened during this period, we isolate the effect of the government intervention by using non-rescued firms as a control. For each rescued stock, we use non-rescued stocks in the same industry as a control. The adjusted change in debt value of the rescued stock is computed as

$$adjusted\ \Delta\left(debt\right) = \Delta\left(debt\right) - debt_{06/30} * \frac{\Delta\left(debtn\right)}{debtn_{06/30}},$$

where *debtn* denotes debt value of all non-rescued firms in the same industry of the rescued firm. Since the government purchased many stocks in various industries, we have to take industry effects into account. We use the industry classification presented in Panel C of Table 1.

Panel A of Table 4 shows that the adjusted debt value change is about 40% of the raw change for all purchased non-financial stocks, which is RMB 3,252 billion. By contrast, Panel B shows that the adjusted debt value change decreases significantly from RMB -12 billion to RMB -83 billion for the rescued financial firms. This means that debt value of the rescued non-financial firms benefitted much more significantly than that of the rescued financial firms.

3.3. Change in Equity Value

Table 3 shows that the market value of equity plummeted from June 30 to September 30, 2015 for both rescued and non-rescued firms. This could be due to a number of market events happened in this period. To estimate the effects of the government intervention, we have to control for these market events. As is standard in the finance literature, we use the CAMP model summarized by the following equations:

$$\begin{aligned}
Equity\ Value\ Gain &= MKTCAP * Abnormal\ Return, \\
Abnormal\ Return &= Raw\ Return - \widehat{\beta} * R_m, \\
Raw\ Return &= \frac{Stock\ Price_{09/30} - Stock\ Price_{06/30}}{Stock\ Price_{06/30}}, \\
R_m &= \frac{Market\ Index_{09/30} - Market\ Index_{06/30}}{Market\ Index_{06/30}},
\end{aligned}$$

where $MKTCAP$ is the market capitalization on June 30, 2015, the betas are estimated from daily stock prices during the period from January 1, 2014 to June 29, 2015. We use the SSECI as the market index.

Panel A of Table 5 shows that even though the raw returns dropped much more for the rescued non-financial stocks than for the non-rescued non-financial stocks, the abnormal returns dropped much less. All abnormal returns are negative and range from -1% to -4%. By contrast, Panel B of Table 5 shows that the abnormal returns on purchased financial stocks are positive and are about 6% to 7%. The abnormal returns on non-rescued financial stocks are about -47%. This means that financial stocks benefitted from the government intervention much more than non-financial stocks.

Insert Table 5 Here.

Combining Panels A and B shows that there was more than RMB 113 billion gain in equity value of total purchased stocks during the period from June 30 to September 30, 2015. Equity value of the stocks purchased by the CSF and the CCH increased by RMB 475 and 275 billion, respectively.

3.4. Actual Cost of the Stock Purchases

Both CSF and CCH bought stocks in July and August of 2015. We compute the purchasing cost using the following equation:

$$Cost\ of\ Stock\ Purchase = Purchased\ Shares * Price\ Per\ Share.$$

The information about the exact purchasing dates and the purchasing prices is not available from public sources. We can find the information about large shareholders and their shareholdings from a firm's balance sheets in Q2 and Q3 of 2015. We can estimate the purchased shares of all rescued firms as the shareholdings of the CSF and the CCH in Q3 minus their shareholdings in Q2. We use three ways to estimate the price per share: the average price between June 30 and September 30, 2015, the highest price in this period, and the lowest price in this period.

The purchasing cost is not the actual cost because both the CSF and the CCH owned the purchased stocks. We have to subtract the market value of the purchased stocks on September 30 to obtain the actual cost incurred in the period from June 30 to September 30.

Insert Table 6 Here.

Table 6 shows that the total costs of stock purchases by the CSF and the CCH range from RMB 770.5 to 1,708.8 billion. The CSF purchased fewer stocks, but the purchasing costs were higher. The market value of purchased stocks by the CSF on September 30 was RMB 599.2 billion, compared to RMB 291 billion for the CCH. Subtracting the market value on September 30, we obtain the total actual costs of stock purchases by both the CSF and the CCH, RMB 321.9 (average price), 818.6 (highest price), and -119.8 (lowest price). Thus if the CSF and the CCH purchased stocks at the lowest prices, they made paper profits from capital gain in equity. But if they purchased stocks at the average or higher prices, they had a paper capital loss at the expense of taxpayers. Unfortunately the data on the precise purchasing prices and quantities are not available from public sources. We do not know whether the government received capital gains from equity between September 30 and June 30, 2015.

3.5. Net Gains of the Government Purchase Plan

We are ready to compute the net costs and benefits of the stock purchase plan using the following equation:

$$Net\ gains = Adjusted\ change\ in\ debt\ value + Change\ in\ equity\ value - Actual\ cost.$$

Using the estimates obtained in Tables 4, 5, and 6, we obtain the net gains for financial and non-financial firms in Table 7. From the two panels, we observe the following: (1) Based on the average price, the purchased financial and non-financial stocks benefitted by about RMB 740 billion and 2,221 billion, respectively. (2) The net gains came mostly from the adjusted increase in debt value for non-financial firms. (3) The net gains of both financial and non-financial stocks purchased by the CSF were larger than those purchased by the CCH.

Insert Tables 7 and 8 Here.

Table 8 presents the aggregate of Panels A and B of Table 7. This table shows that the net gains of all stocks purchased by the CSF are between RMB 3,664 and 4,143 billion. The net gains of all stocks purchased by the CCH are between RMB 2,900 and 3,360 billion. The net gains of all stocks purchased by both the CSF and the CCH are between RMB 3,584 and 4,194 billion. The total net gains of all purchased stocks are between RMB 2,464 and 3,402 billion and the net gains per stock are between RMB 1.9 and 2.6 billion. To have a sense of the magnitude of the net gains, we present the net gains relative to the market capitalization of the Chinese stock market and GDP in Figure 2. This figure shows that the net gains are between 4% to 6% of the market capitalization on June 30, 2015 and between 3.8% to 5.8% of GDP in 2014.

Insert Figure 2 Here.

4. Sources of Value Creation

In the previous section we have shown that the government purchase plan created a substantial amount of value. This section addresses the following questions: What kind of firms was more likely to be saved? Where did the value creation come from? Since the government purchased shares of more than 1000 firms, we have a fairly large sample for a cross-sectional regression analysis. We begin by describing the data.

4.1. Data Description

We consider all stocks listed in the Shanghai and Shenzhen stock exchanges using Wind and CSMAR financial statement data matched with the stock purchase information by the CSF and the CCH. We exclude financial firms and newly listed firms from the sample in our regression analysis.

Insert Table 9 Here.

Panel A of Table 9 presents the variables used in our regression analysis. Accounting variables such as return on assets (ROA), market-to-book ratio (M/B), leverage (LEV), cash flow (CF), and dividend yield (DIV) are taken from firms' balance sheets in 2015Q2. We also include dummy variables such as GOVD (which equals 1 if a stock was purchased by the government between July 6, 2015 and September 30, 2015), export (which equals 1 if a company had foreign sales in 2015Q1, otherwise 0), BC (which equals 1 if a company is a blue chip, otherwise 0), and SOE (which equals 1 if the actual controller of a company is a state-owned enterprise, otherwise 0). The variable GOV is defined as the ratio of the number of a firm's shares purchased by the government to the firm's total outstanding shares between July 6, 2015 and September 30, 2015, multiplied by 100.

The variable DLL is defined as the number of days when a firm's stock price hit the lower limit during the crash period from June 6 to July 5, 2015. More than 84% of all stocks listed in Shanghai and Shenzhen Exchanges hit the lower limit for at least one day during the crash period. By contrast, only 34% of all stocks hit the lower limit for at least one day during the period from January 1 to June 5, 2015.

Firm value, debt value, and default probabilities are computed using the Merton model described in Section 3.1. We then define the variables, FVC (firm value change), DVC (debt value change), and DPC (default probability change), as the changes of those values between June 30, 2015 and September 30, 2015.

Following Amihud (2002) and Brogaard et al. (2016), we use the Amihud index to measure illiquidity. The Amihud index is defined as the absolute value of daily stock returns divided by daily trading volume, multiplied by 10^6. This index captures the idea that, for a given amount of trading, illiquid stocks should experience a larger price change. A higher value of the Amihud index corresponds to lower liquidity. We use the variable LIQ to measure a firm's average illiquidity between July 1, 2015 and September 30, 2015, defined as the average Amihud

index during that period.

Panel B of Table 9 reports summary statistics of the variables discussed above for the sample period between June 30 and September 2015. There are several extreme values among the observations in the sample. To exclude outliers, we winsorize both the top and bottom 1% for our empirical analysis. Overall, we have more than 2,500 observations in the regression analysis. The control variables used in our baseline regression analysis are based on the balance sheet information in 2015Q2. As a robustness check in Section 5, we will use the balance sheet information in 2015Q3.

4.2. What Kind of Firms was More Likely to Be Saved?

As Table 1 shows, the Chinese government purchased many firms with various characteristics in various industries. What kind of firms was more likely to be saved? To answer this question, we study a Probit model specified below:

$$\Pr\left(GOVD = 1\right) = b_0 + \sum_{n=1}^{k} b_n X_n + \varepsilon,$$

where the vector X includes variables related to firm characteristics, the number of days when the stock hit the lower limit during the crash period, the ownership dummy, and the export dummy. It is natural that the government is more likely to save a firm with better fundamentals. Since many firms hit the lower limit during the crash period, the market liquidity dried up. A simple way to raise liquidity is to purchase stocks on the lower limits so that their prices move out of the lower limits. Thus we should expect that the government is more likely to purchase a stock if it stayed at the lower limit more often. Finally, the reason why we add the export dummy is that during the period under consideration, China experienced a devaluation of its currency, the RMB. This may affect the market value of exporting firms significantly.

Insert Table 10 Here.

We present the regression results in Table 10. As seen in columns 1 to 4, there is a very strong and significant positive correlation between the probability of being purchased by the government and firm characteristics including ROA, market-to-book ratio, dividend yield, SOE dummy, and blue-chip dummy. These results hold true both with and without industry fixed effects specifications. In particular, the higher the ROA or the higher the dividend yield, the more likely a firm is included in the government purchase plan. Being a SOE or a blue-chip firm

also increases the likelihood of being included in the government purchase plan. A firm with a larger market-to-book ratio is less likely to be included in the government purchase plan. These regression results indicate that the government is more likely to purchase value stocks, blue-chip stocks, high-dividend-yield stocks, and stocks of profitable firms or SOEs. Moreover, we find that government is more likely to buy stocks that stay at the lower limits. Interestingly, there is no statistical relationship between the export status and the probability of being purchased by the government. This result is consistent with the official announcements that the government did not intervene in the stock market in response to the currency devaluation in August 2015.

4.3. Did Purchasing More Shares Create More Values?

Intuitively, if the government purchases more stocks, it will raise more demand for stocks and hence raise more equity value and more liquidity. Tables 3 and 5 show that although equity value fell significantly during the period from June 30 to September 30, 2015, the fall would be more significant without the government purchase. To examine whether value creation would be higher if the government purchased more stocks, we run the following cross-sectional regression:

$$Value\ Creation = b_0 + \sum_{n=1}^{k} b_n X_n + \varepsilon.$$

Table 11 summarizes the results. The dependent variable, value creation, represents either the change in log firm value or in log debt value between June 30 and September 30, 2015. The key explanatory variable is GOV, the ratio of the shares purchased by the government to the total outstanding shares. For the various specifications considered, the control variables include industry fixed effects, export status, SOE dummy, blue-chip dummy, and other variables commonly used in the literature such as ROA, M/B, leverage, cash flow, and dividend yield.

We find a significant positive relationship between the number of shares purchased by the government and the value creation, after including many control variables. This result holds true for various specifications considered in columns 1 through 5 and in columns 6 through 10. Moreover, ROA, dividend yield, and leverage as well as the blue-chip, and export dummies have a positive correlation with the value creation. But M/B is negatively related to the value creation. This indicates that fundamentals matter for value creation.

When we gradually add more control variables from columns 1 to 5 for the regressions on the change in firm value, the slope of GOV gradually decreases, but is still significant, and R-squared gradually increases. A similar result holds true for the regressions on the change in

debt value. In columns 5 and 10 we find that the slope of GOV is 0.009 and 0.155, respectively, when we include all control variables. The interpretation based on our definition of GOV in Table 9 is that a one percentage point increase in the ratio of the number of shares purchased by the government to the total outstanding shares will raise firm value by 0.9% and debt value by 15.5%.

Insert Table 11 Here.

The positive and significant relationship between the government purchase and the value creation documented above is consistent with the aggregate evidence of the government purchase plan reported in Section 3.

4.4. The Impact on Default Probabilities and Liquidity

In the previous subsection we have shown that if the government purchased more shares, it would create more value. This could be due to the abnormal returns of equity generated by the increased demand for stocks. In this section we examine two additional channels: reduced default probabilities and increased liquidity.

As shown in Section 3, we can compute the expected default probabilities using the Merton (1974) model. We then compute the change in default probabilities between June 30 and September 30, 2015 for each stock. We use the Amihud index to describe illiquidity for each stock. We then run the following cross-sectional regressions:

$$\begin{aligned} DPC &= a_0 + a_1 GOV + \sum_{n=1}^{k} a_n X_n + \varepsilon, \\ LIQ &= a_0 + a_1 GOV + \sum_{n=1}^{k} a_n X_n + \varepsilon. \end{aligned}$$

Table 12 reports the regression results. Columns 1 to 5 of Table 12 show that there is a significant negative relationship between the change in default probabilities and the number of shares purchased by the government across various specifications. This implies that an increase in the number of shares purchased by the government tends to reduce the stock's default probability. The slope of GOV varies from -0.004 to -0.007 with different control variables. In column 5 the slope of GOV is -0.006 when we include all control variables. The interpretation is that a one percentage increase in the ratio of the number of shares purchased by the government to the total outstanding shares will reduce the default probabilities by 0.6%.

Insert Table 12 Here.

In columns 6 through 10, we find that there is a significant negative relationship between the Amihud index, our proxy for illiquidity, and GOV across various specifications. This implies that an increase in the number of shares purchased by the government relative to total outstanding shares tends to increase the liquidity of stocks.

5. Robustness

5.1. Alternative Control Variables

In the regressions reported in Tables 10 to 12, we use firm characteristics collected from the balance sheets in 2015Q2 as the control variables. As a robustness check, we now consider the balance sheet variables in 2015Q3 as the new control variables.

Tables 13 and 14 report the results. We find that our result, that value creation is positively related to GOV, is robust to using alternative measures of control variables. The magnitudes of the slope of GOV are similar, except that the slope of GOV is 0.018 in column 5 of Table 13, while it is 0.009 in column 5 of Table 11. This difference might be due to the relatively small sample in our cross-sectional regressions.

Insert Table 13 Here.

Table 14 shows that the negative relationship between GOV and default probabilities and the positive relationship between GOV and liquidity are robust to alternative measures of control variables. Moreover the slope of GOV is significant across various specifications and the magnitudes of the slope are quite similar in Tables 12 and 14.

Insert Table 14 Here

5.2. The Government Purchase Dummy

In the previous section we have studied the impact of the number of shares purchased by the government on value creation, default probabilities, and liquidity. We find that if the government purchases more shares, then the value creation will be higher, the default probabilities will be lower, and the liquidity will be higher. Now we ask whether the government purchase plan indeed raised liquidity and reduced default probabilities relative to the stocks not purchased

by the government. We use the government purchase dummy (GOVD) as a regressor to study this question. Table 15 reports the results.

Insert Table 15 Here.

Table 15 shows that the slopes of GOVD are negative and significant for both regressions on default probabilities and illiquidity across various specifications. Overall, we conclude that there is a positive effect of the government intervention plan on the liquidity and default probabilities of the stock.

6. Conclusions

In this paper we have estimated the benefits and costs of the government purchase plan. We find that the plan increased the value of the rescued firms with a total net benefit between RMB 2,464 and 3,402 billion**,** which is about 5% of the Chinese GDP in 2014. The value creation came from the increased stock demand by the government, the reduced default probabilities, and the increased liquidity.

We have used the Merton (1974) model to estimate the benefits and costs, as a starting point. This model needs strong assumptions such as the geometric Brownian motion process for firm value, the constant interest rate, and the discount defaultable debt. Developing a more complicated model by relaxing some of these assumptions will change our estimates. We hope our analysis can be used as a benchmark to stimulate further research in this direction.

We should emphasize that our estimates are based on a short-run analysis. Many researchers are concerned about the long-run costs of the Chinese government intervention. First, the massive stock purchases by the government prevented the efficient discovery of the stock prices. The national team is a large player in the stock market, whose transactions can have a large impact on the price movements. As a result, the stock prices may not reflect fundamentals. This may plant the seeds of a future bubble.

Second, although the government intervention stabilized the stock market in the short run, its trial and error approach may create more uncertainty, which is also a cause of market volatility. Some researchers argued that the Chinese stock market is like a casino whose owner keeps changing the rules to favor the house. The Chinese government appears to be manipulating the rules to favor a bull market and has actually eroded the integrity of the system and cast doubt on the government's ability to manage its financial affairs.

Third, on July 8, 2015, the Chinese regulators imposed a lock-up on shareholders owning 5% or more of their companies, prohibiting them from selling for six months. This rule is intended to prevent massive selling in declining markets. With the first wave of locked-up shares coming due in January 2016, just three days after the massive plunge, the Chinese stock markets were fearing the worst, triggering another steep decline in February 2016. The Chinese government extended the lock-up until additional rules could be established. Nearly 4 billion shares are set to become tradable again when the lock-up expires. The effect of lockups is well understood in mature stock markets; they tend to create latent bearish pressures as the expiration approaches. With an immature market like the Chinese stock market, the effects are much more prominent.

Fourth, the Chinese regulators banned one-day short selling, which was blamed to be a primary cause of the stock market volatility by the Chinese government. Although this restriction stabilized stock prices for a while, it could lead to greater volatility, since short sellers are the only investors who are buying during a stock market rout. Without them, there is nothing to slow the decline. It is likely that the short sellers' absence exacerbated the stock market plunge in the summer of 2015 and early 2016. Note that the U.S. stock market's biggest collapse occurred after the Securities and Exchange Commission (SEC) banned short selling.

Fifth, the Chinese government intervention can create a moral hazard problem. If firms believe that the government will rescue them if they default on the margin loans, then they may keep borrowing more without improving the loans' profitability.

Besides the possible long-run costs discussed above, there are many other questions worth further studying. For example, what are the problems of the Chinese trading system? How should one reform this system? Is there a better alternative intervention approach? We leave these questions for future research.

References

Acharya, Viral V., Qian Jun, and Zhishu Yang, 2016, In the Shadow of Banks: Wealth Management Products and Bank Risks, working paper, SAIF.

Allen, Franklin, Susan C. Shan, Jun Qian, Julie L. Zhu, 2015, Explaining the Disconnection between China's Economic Growth and Stock Market Performance, working paper, SAIF.

Amihud, Yakov, 2002, Illiquidity and Stock Returns: Cross-section and Time-series Effects. Journal of Financial Markets 5, 31-56.

Bharath, Sreedhar, and Tyler, Shumway, 2008, Forecasting Default with the Merton Distance to Default Model, *Review of Financial Studies* 21, 1339-1369.

Brogaard, Jonathan, Dan Li, and Ying Xia, 2016, The Effect of Stock Liquidity on Default Risk, *Journal of Financial Economics*, Forthcoming

Merton, Robert, 1974, On the Pricing of Corporate Debt: The Risk Structure of Interest Rates, *Journal of Finance* 29, 449-470.

Brunnermeier and Pedersen, 2009, Market Liquidity and Funding Liquidity, *Review of Financial Studies* 22, 2201-2238.

Miao, Jianjun and Pengfei Wang, 2011, Bubbles and Credit Constraints, working paper, Boston University.

Miao, Jianjun and Pengfei Wang, 2012, Bubbles and Total Factor Productivity, *American Economic Review* 102, 82-87.

Miao, Jianjun and Pengfei Wang, 2014, Sectoral Bubbles, Misallocation, and Endogenous Growth, *Journal of Mathematical Economics* 53, 153-163.

Miao, Jianjun and Pengfei Wang, 2015, Banking Bubbles and Financial Crises, *Journal of Economic Theory* 157, 763-792.

Miao, Jianjun, Pengfei Wang, and Zhiwei Xu, 2015, A Bayesian DSGE Model of Stock Market Bubbles and Business Cycles, *Quantitative Economics* 6, 599-635.

Miao, Jianjun, Pengfei Wang, and Jing Zhou, 2015, Asset Bubbles, Collateral, and Policy Analysis, *Journal of Monetary Economics* 76, S57-S70.

Sharpe, F. William, 1964, Capital Asset Prices: A Theory of Market Equilibrium under Conditions of Risk, Journal of Finance 19, 425-442.

Vassalou, Maria, and Yuhang Xing, 2004, Default Risk in Equity Returns, *Journal of Finance* 2, 831-868.

Veronesi, Pietro and Zingales, Luigi, 2010, Paulson's Gift, *Journal of Financial Economics* 3, 339-368.

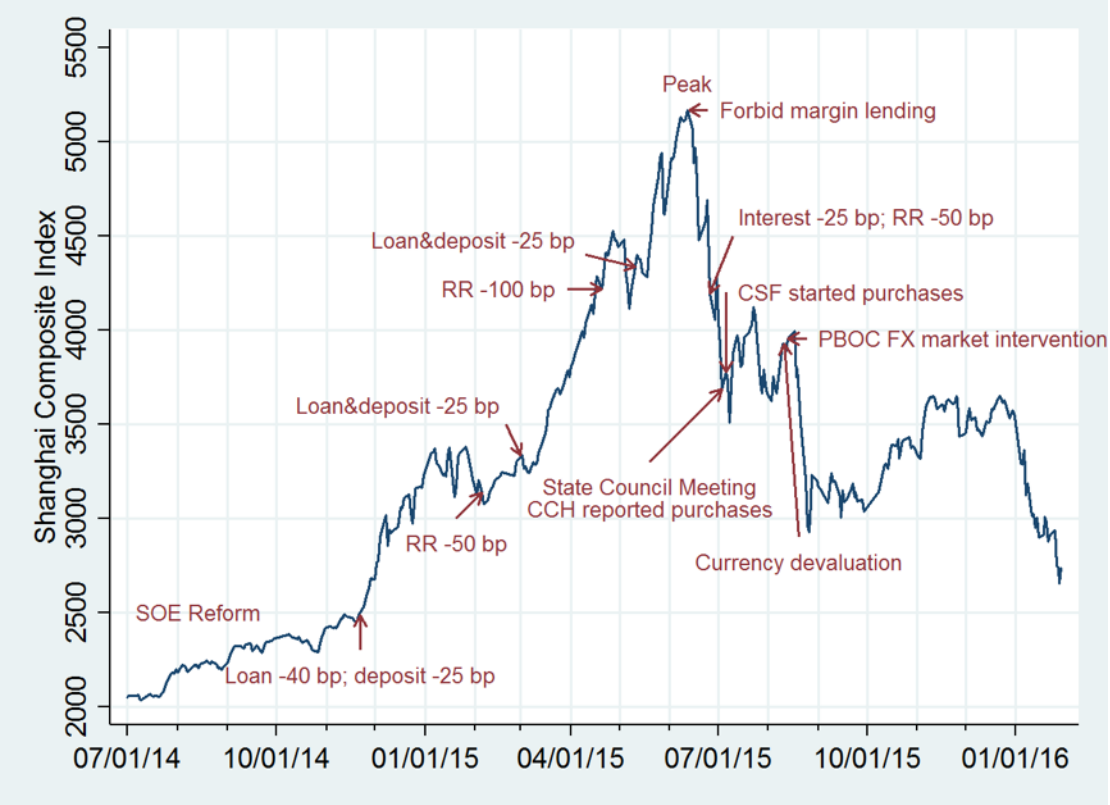
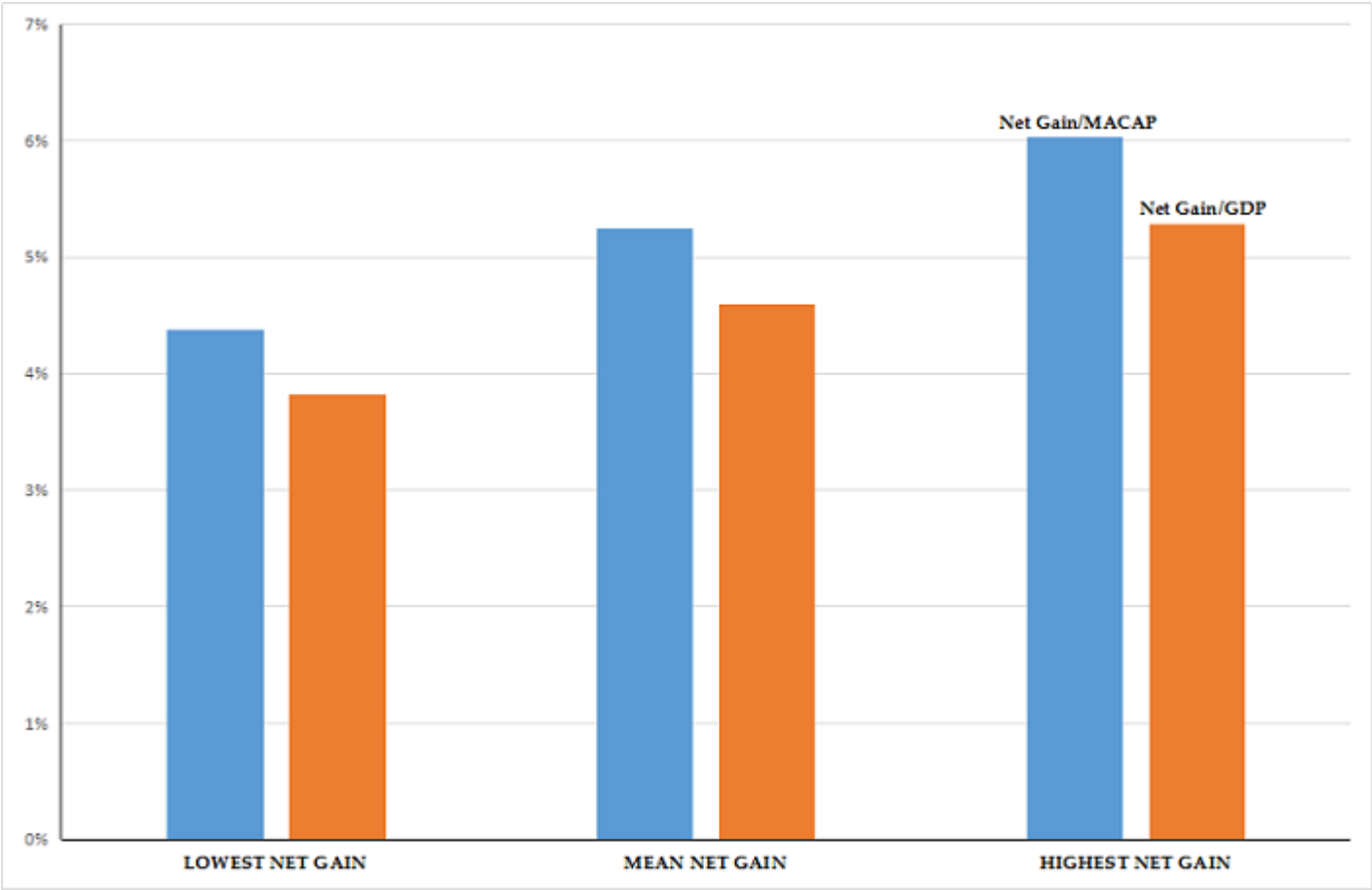


Figure 1: A Chronology of China's Stock Market

Figure 2: Net Gains of Government Intervention



Note: MACAP is the market capitalization on June 30, 2015 and GDP is 2014 value.

Table 1: Main information about Purchased Stocks

Panel A reports the number and market capitalization of purchased stocks in terms of market prices on June 30, 2015. Panel B reports the balance sheet information about the purchased stocks. Panel C reports the stock's industry allocation. The purchase information is collected from the ownership structure of all Chinese stocks on their quarterly financial statements on June 30 and September 30, 2015.

Panel A: Purchased Stock Information

6/30/2015	No. of Stocks Purchased	No. of All Stocks	Purchased/Total No. of Stocks	Market Cap of Purchased Stocks (Billion)	Total Market Cap (Billion)	Purchased/Total Market Cap
CSF	742	2,830	26.22%	39,682	64,685	61.00%
CCH	1,117	2,830	39.51%	41,966	64,685	65.00%
Total	1,365	2,830	48.23%	47,917	64,685	74.00%

Panel B: Balance Sheet Data

6/30/2015	Total Asset (Billion)	Total Liabilities (Billion)	ROA (%)	ROE (%)	Leverage	M/B
CSF	155,316	135,602	2.79	3.57	0.52	3.76
CCH	138,118	119,398	3.15	3.14	0.43	5.89
Total	159,249	138,047	3.01	2.87	0.45	5.32
6/30/2015	Total Asset (Billion)	Total Liabilities (Billion)	ROA (%)	ROE (%)	Leverage	M/B
CSF	156,512	136,271	3.99	4.28	0.52	2.45
CCH	139,178	119,994	4.55	5.31	0.43	3.91
Total	160,486	138,705	4.39	4.93	0.45	3.55

Note:

a) CSF: China Securities Finance Corporation; CCH: China Central Huijin Investment Corporation

b) Both CSF and CCH invested in the same 494 stocks

c) Sources: Bloomberg, WIND and CSRC

Panel C: Industry Allocation

6/30/2015	CSF Market Cap Share (%)	CCH Market Cap Share (%)	Total Market Cap Share (%)
Banking	22.50	10.50	18.50
Non-Banking Financial	14.10	13.50	13.90
Mining	5.40	3.30	4.70
Chemical industry	3.40	4.60	3.80
Pharmaceutical Biotechnology	3.40	6.50	4.40
Transportation	5.30	4.00	4.80
Real estate	4.60	4.90	4.70
Building Decoration	5.20	4.50	5.00
Equipment	3.50	5.10	4.10
Utilities	4.70	3.10	4.20
Car	3.00	3.10	3.00
Computer	1.20	4.20	2.20
Food & drink	3.20	2.70	3.00
Non-ferrous metal	3.00	3.00	3.00
Electronic	1.40	3.70	2.20
Electrical Equipment	1.80	3.50	2.40
Media	1.90	2.80	2.20
Defense industry	3.00	2.90	2.90
Commercial trade	1.20	2.50	1.70
Household appliances	2.10	2.40	2.20
Steel	2.10	1.50	1.90
Communication	1.30	1.70	1.50
Building materials	0.80	1.50	1.00
Textile and Apparel	0.50	1.60	0.80
Agriculture, forestry, animal husbandry & fisheries	0.50	1.50	0.80
Light manufacturing	0.30	0.60	0.40
Others	0.30	0.60	0.40
Leisure services	0.30	0.50	0.30
Total	100.00	100.00	100.00

Table 2: Estimated Firm Value

Panel A and B report the market value of non-financial and financial firms, respectively, estimated using the Merton model.

Panel A: Non-Financial Stocks

Date	Number 06/30-09/30	Firm Value (Billion) 06/30	Firm Value (Billion) 09/30	Firm Value Change (Billion) 06/30-09/30	Firm Value Change per Stock (Billion) 06/30-09/30	Firm Value Change (%) 06/30-09/30
CSF	680	28,814	29,900	1,086	1.6	3.80
CCH	1,041	32,678	31,969	−708	−0.7	−2.20
Both CSF and CCH	449	24,177	25,459	1,282	2.9	5.30
Total Purchased Stocks	1,272	37,315	36,411	−904	−0.7	−2.40
Total Not Purchased Stocks	1,329	17,446	15,094	−2,352	−1.8	−13.50
Total Stocks	2,601	54,761	51,505	−3,256	−1.3	−5.90

Panel B: Financial Stocks Only

Date	Number 06/30-09/30	Firm Value (Billion) 06/30	Firm Value (Billion) 09/30	Firm Value Change (Billion) 06/30-09/30	Firm Value Change per Stock (Billion) 06/30-09/30	Firm Value Change (%) 06/30-09/30
CSF	40	124,229	121,797	−2,432	−60.8	−2.00
CCH	38	108,084	105,763	−2,321	−61.1	−2.10
Both CSF and CCH	34	106,665	104,512	−2,154	−63.3	−2.00
Total Purchased Stocks	44	125,648	123,049	−2,598	−59.1	−2.10
Total Not Purchased Stocks	5	1,257	1,011	−246	−49.2	−19.60
Total Stocks	49	126,904	124,060	−2,845	−58.1	−2.20

Table 3: Equity Value

Panels A and B report equity value for non-financial and financial stocks respectively. Equity value is equal to market capitalization computed as the market price multiplied by the number of outstanding shares.

Panel A: Non-Financial Stocks

Date	Number 06/30-09/30	Market Cap (Billion) 06/30	Market Cap (Billion) 09/30	Market Cap Change (Billion) 06/30-09/30	Market Cap Change per Stock (Billion) 06/30-09/30	Market Cap Change (%) 06/30-09/30
CSF	680	23,248	15,887	−7,362	−10.8	−31.70
CCH	1,041	26,983	18,776	−8,207	−7.9	−30.40
Both CSF and CCH	449	19,531	13,457	−6,073	−13.5	−31.10
Total Purchased Stocks	1,272	30,700	21,205	−9,495	−7.5	−30.90
Total Not Purchased Stocks	1,329	15,292	11,492	−3,800	−2.9	−24.80
Total Stocks	2,601	45,992	32,697	−13,295	−5.1	−28.90

Panel B: Financial Stocks

Date	Number 06/30-09/30	Market Cap (Billion) 06/30	Market Cap (Billion) 09/30	Market Cap Change (Billion) 06/30-09/30	Market Cap Change per Stock (Billion) 06/30-09/30	Market Cap Change (%) 06/30-09/30
CSF	40	9,493	7,067	−2,426	−60.7	−25.60
CCH	38	8,586	6,278	−2,308	−60.7	−26.90
Both CSF and CCH	34	8,187	6,038	−2,148	−63.2	−26.20
Total Purchased Stocks	44	9,892	7,306	−2,586	−58.8	−26.10
Total Not Purchased Stocks	5	493	262	−231	−46.3	−46.90
Total Stocks	49	10,385	7,568	−2,817	−57.5	−27.10

Table 4: Estimated Debt Value

Panels A and B report estimated debt value for non- financial and financial stocks respectively. Debt value is equal to firm value minus equity value from Tables 2 and 3. "Adjusted debt value change" is equal to the industry aggregate of the estimated debt value change of purchased stocks, adjusted for the debt value change of not purchased stocks in the same industry.

Panel A: Non-Financial Stocks

Date	Number 06/30-09/30	Debt Value (Billion) 06/30	Debt Value (Billion) 09/30	Debt Value Change (Billion) 06/30-09/30	Adjusted Debt Value Change (Billion) 06/30-09/30
CSF	680	5,566	14,014	8,448	3,659
CCH	1,041	5,695	13,194	7,499	3,114
Both CSF and CCH	449	4,646	12,002	7,356	3,521
Total Purchased Stocks	1,272	6,615	15,206	8,591	3,252
Total Not Purchased Stocks	1,329	2,154	3,602	1,448	1,448
Total Stocks	2,601	8,769	18,808	10,039	4,700

Panel B: Financial Stocks

Date	Number 06/30-09/30	Debt Value (Billion) 06/30	Debt Value (Billion) 09/30	Debt Value Change (Billion) 06/30-09/30	Adjusted Debt Value Change (Billion) 06/30-09/30
CSF	40	114,736	114,731	−5	−69
CCH	38	99,498	99,486	−12	−71
Both CSF and CCH	34	98,479	98,473	−5	−58
Total Purchased Stocks	44	115,755	115,743	−12	−83
Total Not Purchased Stocks	5	764	749	−15	−15
Total Stocks	49	116,519	116,492	−27	−98

Table 5: Value Gain of Common Equity of Purchased Stocks

Panel A reports the non- financial stocks' information, while Panel B reports the financial stocks' information. The market capitalization is the price per share on 06/30/2015 multiplied by the number of shares outstanding. The estimated beta is based on the average daily return between 01/01/2014 and 06/29/2015. The abnormal return equals raw return – estimated beta multiplied by the market return. "Equity value gain" is the product of the market capitalization (June 30) multiplied by the abnormal return.

Panel A: Non-Financial Stocks

Date	Number 06/30-09/30	Market Cap (Billion) 06/30	Estimated Beta 09/30	Raw Return (%) 06/30-09/30	Abnormal Return (%) 06/30-09/30	Equity Value Gain (Billion) 06/30-09/30	Equity Value Gain Per Stock (Billion) 06/30-09/30
CSF	680	23,248	1.03	−31.7	−2.1	−480	−0.7
CCH	1,041	26,983	1	−30.4	−1.9	−479	−0.5
Both CSF and CCH	449	19,531	1.06	−31.1	−0.8	−132	−0.3
Total Purchased Stocks	1,272	30,700	0.99	−30.9	−2.7	−827	−0.7
Total Not Purchased Stocks	1,329	15,292	0.73	−24.8	−3.9	−603	−0.5
Total Stocks	2,601	45,992	0.9	−28.9	−3.1	−1,430	−0.5

Panel B: Financial Stocks Only

Date	Number 06/30-09/30	Market Cap (Billion) 06/30	Estimated Beta 09/30	Raw Return (%) 06/30-09/30	Abnormal Return (%) 06/30-09/30	Equity Value Gain (Billion) 06/30-09/30	Equity Value Gain Per Stock (Billion) 06/30-09/30
CSF	40	9,493	1.14	−25.6	7.1	955	23.9
CCH	38	8,586	1.15	−26.9	6	754	19.8
Both CSF and CCH	34	8,187	1.14	−26.2	6.4	769	22.6
Total Purchased Stocks	44	9,892	1.14	−26.1	6.6	940	21.4
Total Not Purchased Stocks	5	493	0.58	−46.9	−30.5	−150	−30
Total Stocks	49	10,385	1.12	−27.1	4.9	790	16.1

Table 6: Actual Cost of Government Purchase Plan

The cost of stock purchase is equal to the purchased shares multiplied by the estimated purchase prices. The average, highest, and lowest costs of stock purchase are based on the average, highest, lowest prices of common equity between 06/30/2015 and 09/30/2015. Market value of shareholdings by government" is the value of the shareholdings of the government purchased stocks on 09/30/2015. The actual cost of stock purchase is the difference between the cost of stock purchase and the market value ofshareholdings by the government.

Date	Number of Purchased Stocks 06/30-09/30	Costs of Stock Purchase (Average) (Billion) 06/30-09/30	Costs of Stock Purchase (Highest) (Billion) 06/30-09/30	Costs of Stock Purchase (Lowest) (Billion) 06/30-09/30	Market Value of Shareholdings by Government (Billion) 09/30	Actual Cost of Stock Purchase (Average) (Billion) 06/30-09/30	Actual Cost of Stock Purchase (Highest) (Billion) 06/30-09/30	Actual Cost of Stock Purchase (Lowest) (Billion) 06/30-09/30
CSF	720	758.12	1,000.13	521.5	599.2	158.9	400.9	−77.8
CCH	1,079	454.08	708.67	249	291	163.1	417.7	−42.1
Total	1,316	1,212.2	1,708.8	770.5	890.2	321.9	818.6	−119.8

Note

a) China Securities Finance Corporation (CSF) and China Central Huijin Investment (CCH)

b) Both CSF and CCH invest in same 483 stocks

c) Purchase prices of market value are based on the average, highest and lowest prices between June 30 and Sep. 30, 2015

d) Sources: Bloomberg, WIND and CSRC

Table 7: Net Gains of the Government Purchase Plan

Panel A reports the non- financial stocks' net gains, while Panel B reports the financial stocks' net gains. The value gain of the debt equals to the adjusted debt value change, which comes from Table 4. The value gain of common equity comes from Table 5. The actual cost of the government purchase plan comes from Table 6. The net gain is the sum of the value gains from common equity and adjusted debt value minus actual costs.

Panel A: Non-Financial Stocks

	Number of Purchased Stocks	Debt Value Change (Billion)	Common Equity Gain (Billion)	Actual Cost (Average) (Billion)	Actual Cost (Highest) (Billion)	Actual Cost (Lowest) (Billion)	Net Gain (Average) (Billion)	Net Gain (Highest) (Billion)	Net Gain (Lowest) (Billion)
CSF	680	3,659	−480	97.2	254.3	−47.5	3,082	2,925	3,226
CCH	1,041	3,114	−479	107	286.2	−32.8	2,528	2,349	2,668
Both CSF and CCH	449	3,521	−132	125	327	−61.7	3,264	3,062	3,451
Total Purchased Stocks	1,272	3,252	−827	204.2	540.5	−80.3	2,221	1,884	2,505

Panel B: Financial Stocks Only

	Number of Purchased Stocks	Debt Value Change (Billion)	Common Equity Gain (Billion)	Actual Cost (Average) (Billion)	Actual Cost (Highest) (Billion)	Actual Cost (Lowest) (Billion)	Net Gain (Average) (Billion)	Net Gain (Highest) (Billion)	Net Gain (Lowest) (Billion)
CSF	40	−69	955	61.7	146.6	−30.3	824	739	916
CCH	38	−71	754	56	131.5	−9.3	627	551	692
Both CSF and CCH	34	−58	769	78.6	189.3	−31.8	633	522	743
Total Purchased Stocks	44	−83	940	117.7	278.1	−39.5	740	579	897

Note

a) China Securities Finance Corporation (CSF) and China Central Huijin Investment (CCH)

b) Both CSF and CCH invest in same 483 stocks

c) Purchase prices of market value are based on the average, highest and lowest prices between June 30 and Sep. 30, 2015

d) Sources: Bloomberg, WIND and CSRC

Table 8: Total Net Gain of Purchased Stocks

This table reports the aggregate of Panels A and B of Table 7.

	Number of Purchased Stocks	Debt Value Gain (Billion)	Common Equity Gain (Billion)	Actual Costs (Average) (Billion)	Actual Costs (Highest) (Billion)	Actual Costs (Lowest) (Billion)	Net Gain (Average) (Billion)	Net Gain (Highest) (Billion)	Net Gain (Lowest) (Billion)	Net Gain Per Stock (Average) (Billion)	Net Gain Per Stock (Highest) (Billion)	Net Gain Per Stock (Lowest) (Billion)
CSF	720	3,590	475	158.9	400.9	−77.8	3,906	3,664	4,143	5.4	5.1	5.8
CCH	1,079	3,043	275	163	417.7	−42.1	3,115	2,900	3,360	2.9	2.7	3.1
CSF and CCH	483	3,463	637	203.6	516.3	−93.5	3,897	3,584	4,194	8.1	7.4	8.7
Total Purchases	1,316	3,169	113	321.9	818.6	−119.8	2,960	2,464	3,402	2.2	1.9	2.6

Note

a) China Securities Finance Corporation (CSF) and China Central Huijin Investment (CCH)

b) Both CSF and CCH invest in same 483 stocks

c) Purchase prices of market value are based on the average, highest and lowest prices between June 30 and Sep. 30, 2015

d) Sources: Bloomberg, WIND and CSRC

Table 9: Variable Description, Sources and Summary Statistics

Panel A reports variable definition and sources and Panel B reports the summary statistics of variables from quarterly balance sheet information between June 30 and September 30, 2015.

Panel A: Variable Description, Sources

Name	Variable	Description	Source
GOV	Government Purchased Shares	Shares purchased by government / total outstanding shares * 100	Wind
GOVD	Government Purchase Dummy	Dummy variable equals 1 if government purchased the stock, otherwise 0.	Wind
FVC	Firm Value Change	Change of Log(Firm value)	Author's calculation
DVC	Debt Value Change	Change of Log(Debt value)	Author's calculation
DPC	Default Probability Change	Change of expected default probability	Author's calculation
LIQ	Amihud Index	Average of the Amihud index between 07/01/2015 and 09/30/2015, where Amihud index = Absolute value of stock returns / Trading volume*10^6	CSMAR
DLL	Days of Hitting Lower Limit	Number of trading days for a stock hitting the lower limit during 06/06/2015 and 07/05/2015.	Wind
ROA	Return on Assets	Net Income/Total assets *100	Wind
M/B	M/B ratio	Market /book value of equity	Wind
LEV	Leverage	Total liabilities/Total assets	Wind
CF	Cash Flow	Net Operating Cash Flow / Total assets	Wind
DIV	Dividend Yield	Dividend / Price*100	CSMAR
Export	Export Dummy	Dummy variable equals 1 if a company had foreign sales in 2015Q1, otherwise 0.	Wind
BC	Bluechip Dummy	Dummy variable equals 1 if a company is a bluechip share, otherwise 0.	Wind
SOE	State-owned Enterprise Dummy	Dummy variable equals 1 if the actual controller of a company is State-owned Enterprise, otherwise 0.	Wind

Panel B: Summary Statistics

Variables	Obs	Mean	Std	Min	P25	Median	P75	Max
GOV	2,583	0.96	1.41	0	0	0	1.37	6.89
GOVD	2,589	0.5	0.5	0	0	0	1	1
FVC	2,589	−0.27	0.31	−1.17	−0.48	−0.28	−0.06	1.08
DVC	2,299	−0.03	1.97	−4.7	−0.76	0.32	1.26	2.9
DPC	2,589	−0.005	0.067	−0.35	−0.049	−0.004	0.035	0.33
LIQ	2,104	1.21	2.36	0.033	0.17	0.37	0.87	10
DLL	2,584	3.32	2.18	0	2	3.5	5	14
ROA	2,587	2.73	2.61	−1.76	0.97	2.32	4.27	8.47
M/B	2,587	6.6	4.37	1.76	3.44	5.37	8.32	18.66
LEV	2,587	0.43	0.21	0.11	0.25	0.41	0.59	0.8
CF	2,587	0.0036	0.04	−0.09	−0.02	0.01	0.03	0.08
DIV	2,587	0.35	0.46	0	0	0.15	0.51	1.6
Export	2,589	0.5	0.5	0	0	0	1	1
BC	2,589	0.1	0.3	0	0	0	0	1
SOE	2,587	0.3	0.5	0	0	0	1	1

Table 10: Government Purchase Choice Model (Probit model =1, Government Purchase)

This table presents the linear Probit choice model to estimate the factors determining the government purchase plan, which includes firm and industry characteristics. All variables are defined in Table 9. All firm level variables are based on the balance sheet information at Q2 2015. * p < 0.1; ** p < 0.05; *** p < 0.01.

	(1)	(2)	(3)	(4)
DLL	0.031***	0.039***	0.042***	0.048***
	(0.012)	(0.011)	(0.012)	(0.012)
ROA	0.061***	0.053***	0.038***	0.046***
	(0.010)	(0.011)	(0.012)	(0.012)
Export	−0.000	0.022	0.025	−0.007
	(0.051)	(0.051)	(0.051)	(0.058)
M/B	−0.067***	−0.057***	−0.046***	−0.053***
	(0.006)	(0.006)	(0.007)	(0.007)
SOE		0.203***	0.186***	0.190***
		(0.060)	(0.060)	(0.063)
BC		0.873***	0.753***	0.780***
		(0.121)	(0.125)	(0.126)
LEV		−0.020	−0.001	0.120
		(0.136)	(0.136)	(0.148)
CF			−0.260	0.368
			(0.649)	(0.700)
DIV			0.332***	0.328***
			(0.066)	(0.067)
Constant	0.142**	−0.048	−0.196*	−0.248
	(0.071)	(0.100)	(0.104)	(0.183)
Pseudo- R2	0.04	0.06	0.07	0.09
N	2,582	2,582	2,582	2,582
Industry FE	No	No	No	YES

Table 11. The Impact on Value Creation

This table presents the regressions to estimate the correlation between the government purchase plan and value creation, which includes firm and industry characteristics. All variables are defined in Table 9. All firm level variables are based on the balance sheet information at Q2 2015. * p < 0.1; ** p < 0.05; *** p < 0.01

	FVC					**DVC**				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
GOV	0.044***	0.031***	0.017***	0.014***	0.009**	0.353***	0.294***	0.214***	0.195***	0.155***
	(0.004)	(0.004)	(0.003)	(0.003)	(0.004)	(0.021)	(0.022)	(0.021)	(0.022)	(0.022)
ROA		0.008***	0.020***	0.019***	0.020***		0.014	0.096***	0.095***	0.095***
		(0.002)	(0.003)	(0.003)	(0.003)		(0.016)	(0.018)	(0.018)	(0.019)
Export		0.013	0.01	0.012	0.028**		0.223***	0.234***	0.249***	0.316***
		(0.012)	(0.011)	(0.011)	(0.013)		(0.077)	(0.071)	(0.071)	(0.083)
M/B		−0.017***	−0.013***	−0.013***	−0.015***		−0.088***	−0.076***	−0.072***	−0.079***
		(0.002)	(0.002)	(0.002)	(0.002)		(0.011)	(0.011)	(0.011)	(0.011)
LEV			0.584***	0.566***	0.565***			3.741***	3.594***	3.836***
			(0.030)	(0.031)	(0.034)			(0.193)	(0.196)	(0.209)
CF			0.097	0.08	0.182			−0.171	−0.265	0.139
			(0.140)	(0.140)	(0.151)			(0.968)	(0.969)	(1.021)
DIV			0.034***	0.025**	0.027**			0.183**	0.146*	0.178**
			(0.012)	(0.012)	(0.012)			(0.079)	(0.081)	(0.081)
BC				0.076***	0.062***				0.268**	0.230*
				(0.018)	(0.019)				(0.122)	(0.123)
SOE				0.008	0				0.192***	0.122*
				(0.012)	(0.012)				(0.071)	(0.073)
Constant	−0.315***	−0.220***	−0.522***	−0.515***	−0.507***	−0.386***	0.071	−1.873***	−1.889***	−1.930***
	(0.007)	(0.015)	(0.022)	(0.023)	(0.023)	(0.052)	(0.092)	(0.149)	(0.152)	(0.150)
R2	0.04	0.1	0.24	0.24	0.27	0.07	0.11	0.25	0.25	0.29
N	2,583	2,582	2,582	2,582	2,582	2,293	2,292	2,292	2,292	2,292
Industry FE	No	No	No	No	YES	No	No	No	No	YES

Table 12. The Impact on Default Probabilities and Liquidity

This table presents the regressions to estimate the impact of the government purchase plans on default probability change and liquidity separately, which includes firm and industry characteristics. All variables are defined in Table 9. All firm level variables are based on the balance sheet information at Q2 2015. * p < 0.1; ** p < 0.05; *** p < 0.01

	DPC					LIQ				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
GOV	−0.004***	−0.004***	−0.007***	−0.007***	−0.006***	−0.400***	−0.395***	−0.323***	−0.286***	−0.267***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.023)	(0.027)	(0.025)	(0.024)	(0.025)
ROA		−0.005***	−0.003***	−0.002***	−0.002***		0.074***	0.117***	0.108***	0.111***
		(0.000)	(0.001)	(0.001)	(0.001)		(0.021)	(0.025)	(0.025)	(0.026)
Export		−0.012***	−0.013***	−0.013***	−0.013***		−0.220**	−0.227**	−0.259***	−0.383***
		(0.003)	(0.002)	(0.003)	(0.003)		(0.097)	(0.097)	(0.096)	(0.119)
M/B		−0.002***	−0.001***	−0.001***	−0.001***		0.017	−0.09	−0.031	−0.026*
		(0.000)	(0.000)	(0.000)	(0.000)		(0.012)	(0.013)	(0.014)	(0.014)
LEV			0.097***	0.096***	0.092***			−0.602**	−0.246	−0.12
			(0.007)	(0.007)	(0.008)			(0.237)	(0.246)	(0.274)
CF			0.02	0.02	−0.007			−2.628**	−2.433*	−2.233*
			(0.031)	(0.031)	(0.033)			(1.315)	(1.304)	(1.335)
DIV			0.006	0.006*	0.006			−0.828***	−0.776***	−0.798***
			(0.004)	(0.004)	(0.004)			(0.111)	(0.111)	(0.114)
BC				−0.004	−0.004				−0.286***	−0.272**
				(0.006)	(0.006)				(0.096)	(0.108)
SOE				0.003	0.001				−0.565***	−0.499***
				(0.003)	(0.003)				(0.084)	(0.092)
Constant	−0.002	0.031***	−0.020***	−0.021***	−0.021***	1.665***	1.441***	2.050***	2.164***	2.091***
	(0.002)	(0.003)	(0.005)	(0.005)	(0.005)	(0.072)	(0.123)	(0.184)	(0.190)	(0.191)
R2	0.01	0.06	0.14	0.14	0.16	0.06	0.07	0.1	0.11	0.12
N	2,583	2,582	2,582	2,582	2,582	2,103	2,103	2,103	2,103	2,103
Industry FE	No	No	No	No	YES	No	No	No	No	YES

Table 13. Robustness Check: Value Creation

This table presents the regressions to estimate the impact of the government purchase plan on value creation. All variables are defined in Table 9. All firm-level variables are based on the balance sheet information in 2015Q3. * p < 0.1; ** p < 0.05; *** p < 0.01

	FVC					DVC				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
GOV	0.044***	0.041***	0.027***	0.021***	0.018***	0.353***	0.282***	0.204***	0.185***	0.143***
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.021)	(0.022)	(0.021)	(0.022)	(0.023)
ROA		0.007***	0.016***	0.016***	0.016***		0.012	0.062***	0.061***	0.058***
		(0.002)	(0.002)	(0.002)	(0.002)		(0.011)	(0.013)	(0.013)	(0.013)
Export		0.027**	0.024**	0.027**	0.044***		0.217***	0.230***	0.245***	0.308***
		(0.012)	(0.011)	(0.011)	(0.012)		(0.076)	(0.071)	(0.071)	(0.083)
M/B		−0.004*	0	0.001	0.002		−0.134***	−0.115***	−0.110***	−0.120***
		(0.002)	(0.003)	(0.003)	(0.003)		(0.015)	(0.016)	(0.017)	(0.017)
LEV			0.617***	0.579***	0.543***			3.654***	3.509***	3.771***
			(0.030)	(0.031)	(0.033)			(0.195)	(0.198)	(0.212)
CF			0.097	0.072	0.067			0.079	−0.03	0.182
			(0.114)	(0.114)	(0.124)			(0.749)	(0.748)	(0.782)
DIV			0.019**	0.01	0.011			0.157***	0.129**	0.171***
			(0.009)	(0.009)	(0.009)			(0.060)	(0.061)	(0.063)
BC				0.083***	0.070***				0.288**	0.252**
				(0.020)	(0.020)				(0.125)	(0.125)
SOE				0.045***	0.034***				0.184**	0.104
				(0.013)	(0.013)				(0.072)	(0.073)
Constant	−0.315***	−0.335***	−0.649***	−0.648***	−0.640***	−0.386***	0.096	−1.813***	−1.822***	−1.871***
	(0.007)	(0.015)	(0.022)	(0.022)	(0.022)	(0.052)	(0.091)	(0.147)	(0.151)	(0.149)
R2	0.04	0.05	0.2	0.21	0.24	0.07	0.11	0.25	0.25	0.29
N	2,583	2,582	2,582	2,582	2,582	2,293	2,292	2,292	2,292	2,292
Industry FE	No	No	No	No	YES	No	No	No	No	YES

Table 14. Robustness Check: Default Probabilities and Liquidity

This table presents the regressions to estimate the impact of the government purchase plans on default probability change and liquidity separately, which includes firm and industry characteristics. All variables are defined in Table 9. All firm level variables are based on the balance sheet information at Q3 2015. * p < 0.1; ** p < 0.05; *** p < 0.01

	DPC					**LIQ**				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
GOV	−0.004***	−0.004***	−0.006***	−0.006***	−0.006***	−0.400***	−0.356***	−0.294***	−0.263***	−0.234***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.023)	(0.025)	(0.023)	(0.023)	(0.024)
ROA		−0.003***	−0.002***	−0.002***	−0.001***		0.045***	0.074***	0.070***	0.075***
		(0.000)	(0.000)	(0.000)	(0.000)		(0.014)	(0.017)	(0.017)	(0.018)
Export		−0.012***	−0.012***	−0.012***	−0.012***		−0.171*	−0.170*	−0.199**	−0.302**
		(0.003)	(0.003)	(0.003)	(0.003)		(0.096)	(0.095)	(0.095)	(0.118)
M/B		−0.002***	−0.001**	−0.001*	0		0.095***	0.046**	0.032	0.047**
		(0.000)	(0.000)	(0.000)	(0.000)		(0.019)	(0.020)	(0.020)	(0.021)
LEV			0.099***	0.096***	0.090***			−0.621***	−0.326	−0.335
			(0.007)	(0.007)	(0.007)			(0.239)	(0.248)	(0.280)
CF			0.057**	0.054**	0.034			−1.973*	−1.76	−1.915*
			(0.024)	(0.024)	(0.026)			(1.099)	(1.092)	(1.122)
DIV			−0.001	−0.001	−0.001			−0.500***	−0.472***	−0.517***
			(0.003)	(0.003)	(0.003)			(0.080)	(0.082)	(0.087)
BC				−0.001	−0.001				−0.260**	−0.252**
				(0.006)	(0.006)				(0.101)	(0.111)
SOE				0.006*	0.004				−0.458***	−0.400**
				(0.003)	(0.003)				(0.080)	(0.088)
Constant	−0.002	0.023***	−0.025***	−0.027***	−0.027***	1.665***	1.101***	1.681***	1.770***	1.711***
	(0.002)	(0.003)	(0.005)	(0.005)	(0.005)	(0.072)	(0.111)	(0.177)	(0.183)	(0.187)
R2	0.01	0.05	0.13	0.13	0.15	0.06	0.09	0.1	0.11	0.13
N	2,583	2,582	2,582	2,582	2,582	2,103	2,103	2,103	2,103	2,103
Industry FE	No	No	No	No	YES	No	No	No	No	YES

Table 15. Robustness Check: Government Purchase Dummy

This table presents the regressions to estimate the impact of the government purchase plans on default probability change and liquidity separately, which includes firm and industry characteristics. All variables are defined in Table 9. All firm level variables are based on the balance sheet information at Q2 2015. * p < 0.1; ** p < 0.05; *** p < 0.01

	DPC				**LIQ**			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
GOVD	−0.017***	−0.019***	−0.019***	−0.020***	−0.716***	−0.661***	−0.635***	−0.488***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.106)	(0.105)	(0.113)	(0.114)
SOE		0.021***	0.008***	0		−0.881***	−0.699***	−0.608***
		(0.003)	(0.003)	(0.003)		(0.086)	(0.091)	(0.093)
ROA			−0.004***	−0.002***			0.040*	0.107***
			(0.001)	(0.001)			(0.022)	(0.026)
Export			−0.011***	−0.014***			−0.443***	−0.418***
			(0.003)	(0.003)			(0.122)	(0.120)
M/B			−0.001***	−0.001***			0.011	−0.023
			(0.000)	(0.000)			(0.013)	(0.014)
LEV				0.089***				−0.273
				(0.007)				(0.273)
CF				−0.009				−2.390*
				(0.033)				(1.349)
DIV				0.004				−0.898***
				(0.003)				(0.118)
BC				−0.006				−0.462***
				(0.006)				(0.106)
Constant	0.003	−0.002	0.024***	−0.014***	1.619***	1.891***	1.836***	2.231***
	(0.002)	(0.002)	(0.004)	(0.005)	(0.087)	(0.097)	(0.165)	(0.202)
R2	0.02	0.04	0.11	0.17	0.02	0.05	0.08	0.11
N	2,589	2,587	2,587	2,587	2,104	2,103	2,103	2,103
Industry FE	No	No	YES	YES	No	No	YES	YES