Can Government Purchase Resolve Systemic Risk? Evidence from China*

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We analyze the economic effects of the government bailout during the stock market crash in 2015 in China using a difference-in-differences approach. We find that government direct purchase can be value enhancing for the rescued stocks by reducing their risks and improving their market qualities. More importantly, government direct purchase has spill-over effects and can mitigate market level contagion. Specifically, we find that government direct purchase can reduce rescued firms' contribution to systemic risk and exert positive externality on non-rescued firms by reducing their risks and consequently decreasing their contributions to the systemic risk. We identify three possible mechanisms through which government direct purchase plays a significant and important role in alleviating financial turmoil: reducing noise trading impact, enhancing market level liquidity, and attracting more long-horizon investors.

JEL classification: G01, G11, G18, G23.

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"This time's response to the abnormal turbulence in the stock market in 2015 is essentially a crisis intervention, which focuses on solving market failures and has successfully prevented the potential systemic risk crisis with joint effort."

— Xiao Gang, CSRC Chairman (January, 2016)

Various types of government invention in the financial markets have been observed in almost all economies around the world. From an economic perspective, governments can play a significant role in ensuring the stability of financial markets, especially when there exists market failure and thus negative externality is prevalent (Rochet and Tirole (1996), Vinogradov (2004), Gorton and Huang (2004), and Diamond and Rajan (2005)). Despite its importance, there is no consensus regarding the performance or the efficiency of government intervention during financial turmoil. For instance, Duchin and Sosyura (2012) point out that bailed-out banks in the Troubled Asset Relief Program (TARP) initiate riskier loans and shift assets toward riskier securities after government support with increases in volatility and default risk. In contrast, Sheng (2016) finds that TARP exerts positive influence on firms' liquidity while its impact on firms' real activities is limited. During the subprime crisis in 2008, government intervention led to net welfare gains of 73bn-91bn USD by decreasing the probability of bankruptcy of rescued investment banks (Veronesi and Zingales (2010)) and induced a moral hazard problem by prompting investors' aggressive investment into more risky assets (Aizenman (2009)).[1]

Among various measures undertaken by governments, the direct purchase of equities is the least investigated. Direct purchase might mitigate contagion in the financial markets, especially those induced by a liquidity crisis. To evaluate the efficiency of direct purchase of equities, in addition to its direct impact on market qualities such as the volatility, default probability and illiquidity, quantifying and assessing its impact on financial contagion or systemic risk is not only interesting to finance scholars in its own right, but is also exceedingly important for other factors. First, contagion or systemic risk serves as a propagation mechanism which distorts the markets non-linearly (Liu, Xu, and Zhong (2017)). Second, the existence of contagion features market failure and provides the rationale for intervention of government. Intuitively, the direct purchase of equities could serve as an insurance mechanism (government purchase might act as a cushion to prevent equity prices from falling) or a signal mechanism (to signal that there is no fundamental problem in the economy) so that investors might be assured. Consequently, irrational contagion is mitigated and the market

[1]Many other papers evaluate the economic effects of government intervention, for instance, Amihud, Mendelson, and Lauterbach (1997), Boehmer, Jones, and Zhang (2013), Colliard and Hoffmann (2017), and Heimer and Simsek (2019).

stabilizes. While previous research has clearly answered the question of whether government direct purchase can improve the market quality of rescued stocks (Huang, Miao and Wang (2016)), it has been much less clear on *whether* and *how* government direct purchase can mitigate systemic risk. However, the "non-linear" impact of government direct purchase on contagion and systemic risk, which arguably affects the whole market, is a feature of spillovers cannot be neglected (Boehmer, Jones, and Zhang (2019)). Our paper fills this gap. The goal of this paper is to try to answer the question: Does government direct purchase of equities mitigate market level liquidity crises and facilitate the good functioning of the overall financial market or does it simply ease the liquidity risk of the purchased stock?

We utilize the stock market crash in China in the summer of 2015 as our laboratory to investigate the economic impact of government direct purchase. The Shanghai Stock Exchange Composite Index fell from a 5,178 peak to 4,192 from June 12 to June 26, plunging by nearly 20%. As a consequence, a market level contagion ensued (see Bian, He, Shue, and Zhou (2018)).[2] In response, government undertook a direct purchase program to save the financial market. Specifically, the so called national team, CSF and CCH, on behalf of the government, purchased 1,365 stocks, i.e., almost half of all listed stocks in China.[3] Immediately after the direct purchase, market liquidity improved and the plummeting of the stock market was suppressed. Therefore, we focus on the government purchase plan implemented by the national team between July 1 and September 30, 2015 (2015Q3 in hereafter). To cover the entire stock market crash in China in 2015, we choose the sample of all publicly listed firms in the A-share market for the study, from January 1, 2014 to September 30, 2016.

Noteworthy is that even with as-good-as-random shocks of government purchase to individual firms, an important identification challenge remains because of the existence of possible contagion, i.e., the potential spillover effects of government purchase on non-rescued firms due to pre-existing networks between firms. Consequently, the non-rescued but highly correlated firms are not a suitable control group since they might violate the stable unit treatment value assumption (SUTVA) defined in Rubin (1980). Therefore, finding "pure controls" which might be more likely to satisfy SUTVA is the most challenging issue in our paper. As is well known, the fundamental dilemma associated with SUTVA is that control units need to simultaneously (a) satisfy SUTVA, which is more likely if they are uncorre-

[2]An important feature of this meltdown is that the crash is leverage-induced while the economic fundamentals remain solid with China's 2015 GDP growth maintained at 6.9 percent.

[3]The purchased firms seem non-random as they were large in market capitalization and half of them were not profitable. We mitigate this concern by using the comparable "least correlated" stocks as the control group and verify that our results stay qualitatively with a propensity score matching procedure and without matching.

lated with the treatment units on the firm-level, and (b) serve as counterfactuals for the treatment units, which is more likely when they are highly correlated or similar. To this end, we rely on factor model residual correlations with the rescued stocks to divide the non-rescued stocks into two cohorts - the "least correlated" firms and "most correlated" firms.[4] To measure firm level correlations, we calculate the daily idiosyncratic return of stock as the residual of the Fama-French (1993) three-factor model in the period before the government purchase action (following Ang, Hodrick, Xing, and Zhang (2006)). Gabaix (2011) suggests that idiosyncratic shocks to individual firms in a network do not average out and aggregate into systemic shocks. Moreover, Herskovic, Kelly, Lustig, and Nieuwerburgh (2016) note that idiosyncratic volatility co-movement also features of firm firm-level cash flows driven by firm-level productivity and demand shocks. Accordingly, we find the "least correlated" firms, which are firms whose idiosyncratic returns are "least correlated" with the idiosyncratic returns of rescued firms, but in the same industry. Thus, a control group such as "least correlated" firms might satisfy SUTVA better thus could provide a better counterfactual for the rescued firms.[5] This arguably provides a framework to analyze from this perspective and demonstrate that examining (directly) ΔCoVaR and MES and (indirectly) spillovers could be helpful in assessing market contagion.

Methodologically, with "least correlated" firms as the control group, we are able to separate the performance enhancement from spill-over effects. In our first tests, we corroborate the value creation view in the literature (see, Veronesi and Zingales (2010) and Huang, Miao, and Wang (2016)) by documenting that government purchase increases the firm value of a rescued stock by 3.37%. Naturally, we set out to find the sources of value creation. Employing a set of standard market quality measures, such as the equity volatility, default probability and risk measures (Vassalou and Xing (2004), Veronesi and Zingales (2010), and Huang, Miao, and Wang (2016)), illiquidity (Roll (1984), Amihud (2002), and Brogaard, Li and Xia (2016)), consistent with previous literature, we find that government direct purchase of equities in financial markets significantly decreases the default probability, volatility, and illiquidity of the rescued firms.

Our study next extends earlier research by demonstrating that government direct purchases on systemic risk/contagion risk. As argued previously and supported by many anecdotal evidences, the main concern for the government intervention is to mitigate the contagion risk whose existence is identified by many researches. Complementary to our research, Bian, Da, Lou, and Zhou (2018) find that the market level contagion features of the common

[4]To facilitate interpreting the empirical results, we drop the stocks that do not belong to these two groups (i.e, the "somewhat correlated" stocks) in the base regressions.

[5]A detailed explanation of how to find "least correlated" firms is in the Section III.A.

ownership of investors via leverage network and the Chinese government did not purchase the stocks with higher leverage-network eigenvector centrality *on average*.[6] In contrast, we focus on whether and how the government direct government mitigates systemic risk. Thus, to evaluate the impact of government intervention, in addition to the direct impact on the rescued firms, the market level contagion is of equally significance.[7] First, we investigate whether the direct purchases reduces the contribution of the rescued firm to the systemic risk/contagion risk. Due to network effects, an individual firm contributes to the systemic risk/contagion risk of the financial markets as the individual shocks could be aggregated into a large shock at market level (Gabaix (2011), Acemoglu, Carvalho, Ozdaglar, and Tahbaz-Salehi (2012), Ahern (2013), and Giovanni and Mejean (2014)). The direct purchase of rescued firms could offset the individual shocks so that the magnitude of individual shocks could be greatly reduced, resulting in lower realized contribution to the systemic risk by the rescued firms. We employ CBeta (see Brownlees and Engle (2012) and Engle (2014)) and two other measures of firm level contribution to systemic risk (ΔCoVaR of Brunnermier and Todrian (2017) and MES of Brownlees and Engle (2012)) and contrast between the rescued firms and "least correlated" firms. We find that government direct purchase is associated with reduction in rescued firms' contribution to systemic risk/contagion risk (for instance, a 9.45% decrease in MES).

Noteworthy is that our framework on assessing contagion is purely built on publicly available data and can be applied in practice to study any policy's effect on contagion. First, it provides for a more natural treatment-control delineation relative to previous studies that investigate shocks by comparing to all "non-treated" firms. Second, the framework employs not only a *time-series perspective* (reducing the rescued stocks' contribution to systemic risk) but also a *cross-sectional perspective* (positive spill-over effects). The existence of spill-over effects resides on the economic link between firms and includes, but is not limited to, the common ownership of investors via leverage network (Bian, Da, Lou, and Zhou (2018)). Overall, we conclude that market contagion is calmed by the government purchase.

Our study next corroborates the existence of spill-over effects, which tend to be neglected in asset pricing studies (Boehmer, Jones, and Zhang (2013)). We find that government direct purchases (indirectly) mitigate the possible negative externality problem during a market crash. Intuitively, if the direct purchase could reduce the liquidity shocks for the rescued firms, the stocks which are closely connected to the rescued firms could also be affected

[6]See Table 10 of Bian, Da, Lou, and Zhou (2018) and an earlier version of the paper. In fact, the lack of network centrality differences on average for the stocks purchased in the 3 bailout waves in 2015Q3 also attenuates the sample selection concern.

[7]By *market*, we refer to the rescued stocks and "most correlated" stocks, since they constitute most of the list stocks.

positively, thus this propagation mechanism goes on until a market level liquidity crisis is mitigated or even stopped. We next compare the above-mentioned market quality measures and systemic risk measures between the "most correlated firms" and the "least correlated firms". Results suggest that "most correlated" firms not only increases firm value by 4.23%, but also improved various market quality measures and their systemic risk contributions. For instance, government direct purchase reduces systemic risk contributions (measured by MES) by 10.61%. Thus, besides its direct impacts on rescued firms, government direct purchase exerts positive externality on the other firms, thus the *market level* contagion could be mitigated.

We undertake various robustness checks. First, we examine common trends assumption to ensure the validity of our difference-in-difference strategy. We find no systematic difference in pre-trends between purchased and least correlated stocks. Second, we conduct a placebo test. Specifically, we use a hypothetical time period (2013Q4 instead of the true period 2015Q3) as the government purchase period and find statistically insignificant DID estimators, thus confirming that it is indeed the government purchase during 2015Q3 that improved the market qualities. We also use a broader definition of the national team by including both direct and indirect holdings and our results are consistent. Moreover, to avoid possible selection bias, we repeat the analyses with the control group constructed using propensity score matching method. Overall, our results are robust to all above-mentioned checks.

Finally, we provides three possible mechanisms though which government direct purchase in financial markets can help reduce systemic risk and thus create value not only for the rescued firms but also for the "most correlated" ones. First, as predicted by the model of Brunnermeier, Sockin and Xiong (2018), we find that government purchase improves market quality by reducing the noise trading impact.[8] Second, the forced liquidation of margin accounts during a market crash leads to a liquidity spiral as described in Brunnermeier and Pedersen (2009). Under the "insurance hypothesis" previously discussed, government direct purchase signals to the market that the risk of fire-sale is mitigated, thus investors can adjust their beliefs and coordinate accordingly. Consequently, fire sale of both rescued firms and correlated firms is reduced and the systemic liquidity crisis is mitigated. We find that the order flow of both rescued firms and most correlated firms are larger following government direct purchase, indicating fire sale is mitigated to some extent. Last but not least, we document that long-horizon investors (patient mutual fund investors) are attracted to the rescued stocks, helping stabilize the prices.

While our study falls short of a controlled experiment, we believe that it takes an impor-

[8]This also lends support to the validity of Brunnermeier, Sockin and Xiong's (2018) trading against noise traders policy function.

tant step forward relative to previous studies in terms of addressing the basic identification problem of disentangling direct effects and spill-overs. A large number of studies have shown that appropriate government policy in a financial crisis can ease liquidity risk and decrease market information asymmetry (Huang and Wang (2009), Allen, Carletti and Gale (2009), and Heider, Hoerova, and Holthausen (2015)). Kareken and Wallace (1978) and Dothan and Williams (1980) study the interbank market and found that deposit insurance is redundant and can provide no social improvement. Demirguc-Kunt and Detragiache (2002) suggest that government policy may weaken the competitiveness of banks and bring about moral hazard. Aizenman (2009) also suggests that government's rescuing action in a financial crisis will aggravate investors' moral hazard. Moreover, Angeletos, Hellwig and Pavan (2006) endogenized policy in a global coordination game and found that policy interventions can cause coordination failures as an equilibria outcome. Our work provides empirical evidence that government purchase measures during a market crash helps to stabilize the financial market. Our study investigates a local shareholding shock affecting not the market quality of the rescued firms and also that of the "most correlated" firms. We complement the literature by demonstrating that government purchase actions during China's stock market crash in 2015 improved market quality by greatly decreasing systemic risk, liquidity risk and default probability and stabilizes the financial market. Finally, we explicitly examine the effects on "most correlated" firms, and find that government purchase action not only improves the liquidity of the purchased stocks, but also has positive spill-over effects on "most correlated" firms.

The rest of the paper proceed as follows. A time line of the government intervention is provided in Section I. Section II describes the sample, measurement of variables, and descriptive statistics. Section III.C examines the impact of the government's direct purchase on rescued stocks in terms of various market quality measures. Section IV investigates the effect of direct purchase on the systemic contribution of rescued stocks. Moreover, Section IV presents the positive spill-over effects on the most correlated stocks. We then conduct various robustness checks in Section V. Section VI discusses channels through which government purchase stabilizes the market. Section VII concludes.

I. 2015 Stock Market Crash in China and Government Intervention

The Chinese A-share stock market was a bull market from July 1, 2014 to June 12, 2015, with China's benchmark Shanghai Composite Index (SSECI) sky-rocketing from 2,050

to 5,166. On June 12, 2015, the CSRC released a set of draft rules that would tighten regulations on shadow-financed margin trading, which triggered the market crash (Bian, He, Shue and Zhou (2018)). SSECI began its free-fall on the next trading day after a June 12 high of 5,178. The heavy presence of retail investors and trading restrictions contributed to the deterioration of the market (Liu, Xu, and Zhong (2017)). Within a month, the value of shares in China's A-share market plummeted by almost 40%, causing serious contagion among individual margin investors who rushed to sell stocks (Bian, Da, Lou and Zhou (2018)). Thus, the summer of 2015 is generally referred to as one of the biggest market crashes in China's history. Figure 1 summarizes the chronology. Regulators took a series of actions to intervene (market saving plan hereafter), with the hope of mitigating the meltdown, the contagious risk, i.e., negative externality of the stock market. The detailed plan consisted of various actions, as summarized in Table I.

[Place Figure 1 and Table I about here]

China's market saving plan, as shown in Table I, consisted of two major series of actions. First, on behalf of government, a set of institutional investors, the so-called the national team, purchased various stocks directly in the stock market. In fact, as revealed in Table II, the national team (at 2015Q3) consisted of China Securities Finance Corporation Limited (CSF), China Central Huijin Investment Limited (CCH), Asset Management Plans (AMPs, 10 accounts) and five "tailored" mutual funds (5 accounts).[9] CSF and CCH are the direct shareholding part while the accounts of AMPs and five mutual funds are the indirect part.[10] The five mutual funds comprise China Merchants Fengqin Mixed Fund, E-fund Ruihui Mixed Fund, China Southern Consumption Vitality Mixed Fund, Harvest New Opportunity Mixed Fund, and ChinaAMC New Economy Mixed Fund, each set up with a size of 40bn CNY. [11] With the help of the national team, the market stabilized in September of 2015 and thus we focus our analysis on the effects of the national team's market-saving action in 2015Q3 and subsequent fiscal quarters as the treatment period.

Since its implementation, this direct purchase action has received much attention from both academics and practitioners as it was controversial in nature. Some suggest that the funds were too large, while others doubt if there was indeed benefit to the market.[12] The estimated cost of the direct purchase plan is about 1,212bn CNY (Huang, Miao and Wang,

[9]AMPs are indirectly held by CSF, to diversify shareholdings and to avoid making announcements due to holding no less than 5% in a certain firm.

[10]The indirect part also comprises another small part of CSF as shown in Table II.

[11]Meanwhile, 21 brokers in China held a meeting on July 4 and agreed on jointly investing no less than 120bn CNY to buy the blue chip ETF. For more information, see https://wallstreetcn.com/articles/233995.

[12]See http://www.businessinsider.com, and http://news.hexun.com/2016-05-11/183805933.html.

2016). Taking into account other indirect purchase costs, the total cost is estimated at about 1,500bn CNY, accounting for about 8.5% of the total volume of the floating stock in the A-share market, which is also about 2.2% in terms of China's GDP in 2015.[13] However, not much evidence about the benefits of such a huge market-saving plan has been documented. [14]

For a snapshot of the government purchase plan implemented by the national team between July 1 and September 30, 2015, we present the shareholding ratios and computed market values in Table II. Industry distributions of the purchased stocks are shown in the Internet Appendix, where we use the one-digit SWS industry classification code, which is the commonly used industry classification for investors in China to divide the sample stocks into 28 industries. These results reveal that the national team invested heavily in the stock market and its investment was quite diversified. In terms of direct shareholding, CSF purchased 742 firms, while CCH purchased 1,117 firms. Note that both CSF and CCH invested in the same 494 stocks, which were mainly financial firms and large market capitalization firms. Among the 1,365 directly purchased stocks, 651 stocks experienced losses in 2015Q3, which amounts to 47.58% of total directly purchased stocks.

Overall, our results are not sensitive to the time period in which the net government purchase of an individual stock is measured. The main reason for this lack of sensitivity is that government shareholding ratios were quite stable both before and after the purchase action in 2015Q3. Figure 2 summarizes the holdings of CSF and CCH over time. This rationalizes our inferring about net government purchases from the balance sheets in the second and third quarters of 2015.

[Place Tables II about here]

In addition to direct purchase, the government implemented other complementary measures, including the suspension of IPOs and the redemption of the subscription funds of 28 newly listed firms to prevent the dilution of market funds. CSRC restricted large shareholders from shareholding lessening, which also helped curb market panic. To encourage investors to invest, the PBC cut the requirement reserve ratio (RRR) and lowered benchmark interest rates on June 28. The RRR for finance companies was lowered by 300 basis points (bps) and interest rates for one-year lending and deposits were cut by 25 basis points to 4.85 percent and 2 percent respectively. In addition, the transaction fee (on both sides of a transaction) was lowered by 30% by the two main stock exchanges, from 0.0696% to 0.0487%. All these complementary measures affected the market as a whole and would be less a concern after

[13] See http://uk.businessinsider.com/bank-of-america-merrill-lynch-says-chinese-stocks-to-fall-27-2016-1.

[14] See a technical report at http://www.thepaper.cn/newsDetail_forward_1391161.

controlling for both time and industry fixed effects, thus, we focus on the causal impact of the direct purchase in this paper.

II. Sample Selection, Variables Measurement, and Descriptive Statistics

A. Sample Selection

In order to study the causal impact of direct purchase by the government, we need to find the appropriate treatment group and control group. Acknowledging the spillover effects of government purchase among the non-rescued stocks because of firm level stock correlations in Section IV.B, we choose the proper matching stocks that are less affected by the spillovers as the control units in the main analysis. It seems that the saving plan started to be implemented in late June of 2015. Therefore, in the benchmark analysis in this paper, we consider all stocks listed on the main board stock market of China (including both the Shanghai and Shenzhen stock exchanges) during the period from January 1, 2014 to September 30, 2016. Since we can only construct the holdings of national team on a quarterly basis, the treatment, i.e., the market saving plan is assumed to be implemented at the beginning of the 3rd quarter of 2015.[15] To exclude outliers, we winsorize both the top and bottom 1% for our empirical analysis. Overall, we end up with around 26,000 firm-quarter observations for regression analysis.

B. Variables Measurement

All firm-level control variables are assembled and constructed using Wind and CSMAR quarterly financial statement data. The stock purchase information by CSF, CCH, AMPs, and five related mutual funds are inferred from the balance sheets in the second and third quarters of 2015. We further exclude firms that traded less than 5 days from July 1 to September 30, 2015 from the sample in our regression analysis.

B.1. Measuring Government Direct Purchase

Following Huang, Miao, and Wang (2016), we infer the net purchases by the national team in 2015Q3 from the listing companies' balance sheets in the second and third quarters of 2015, as we do not observe its daily trading behavior. We denote the dummy variable

[15] We conduct a rolling base analysis using daily trading data to confirm that choosing the 3rd quarter as the event period is not restrictive.

GOVD, which equals 1 if a stock was directly purchased by CCH or CSF between July 1 and September 30, 2015. The variable GOV is defined as the ratio of the number of a firm's shares purchased by CCH and CSF combined to the firm's total floating shares between July 1 and September 30, 2015, multiplied by 100. The holdings of CCH and CSF were quite stable both before and after 2015Q3, which rationalizes using the net government purchase as a shock to the treatment group (rescued stocks). Taking indirect holdings (by the AMPs and the five tailed mutual funds) into account, we classify broader government purchase by the dummy variable GOVTD, which takes 1 if a stock was either directly or indirectly purchased by the government. Similarly, we obtain GOVT, the floating share ratio purchased in 2015Q3 by the government (either directly or indirectly), multiplied by 100. Using this broader measure of government direct purchase, however, has no effect on our findings. For robustness, we report in the Internet Appendix that our regression results stay with these alternative definitions of the "national team".

B.2. Measuring Performance of Stocks

Although there is no official document specifying the exact targets of the government purchase action, we infer from the officials' statements that the national team aimed to stabilize the market and forestall systemic risk. Zhou Xiaochuan, the then governor of PBC, emphasized that the systemic risks must be anyhow forestalled at a conference on July 2, 2015, right before the market-saving action. According to Xiao Gang, the then CSRC chairman, the market-saving campaign "focused on solving market failures and has successfully prevented the potential systemic risk crisis". Brunnermeier, Sockin and Xiong (2018) argue that the government trades against noisy traders to reduce volatility and stabilize the market. Therefore, we are motivated to quantify the economic effects of government purchase by employing two sets of measures which focus on market quality and systemic risk, respectively. We start by discussing the first set of measures from standard market quality perspectives.

Idiosyncratic Risk. The idiosyncratic risk of an individual stock is calculated following Ang, Hodrick, Xing, and Zhang (2006). In every quarter, we calculate the daily idiosyncratic return of a stock as the residual of the Fama-French (1993) three-factor model on date τ,

$$R_{i\tau} - r_\tau = \alpha_i + b_{it}(R_{mt} - r_\tau) + s_{it}SMB_\tau + h_{it}HML_\tau + \varepsilon_{i\tau}, \tag{1}$$

where τ is the subscript for the day, while t is the subscript for the quarter, $R_{i\tau} - r_\tau$ is stock i's excess return over daily deposit rate on day τ, $(R_{m\tau} - r_\tau)$, SMB_τ, HML_τ are daily Fama-French (1993) three factors, and b_{it}, s_{it}, and h_{it} are factor sensitivities or loadings. We

calculate Fama-French (1993) three factors in the following way: $(R_{m\tau}-r_\tau)$ is the daily return of the entire A-share value-weighted portfolio minus the daily deposit rate compounded from one-year deposit rate; SMB_τ is the daily spread between small-firm portfolio and big-firm portfolio measured on date τ, HML_τ is the daily spread between value-firm portfolio and growth-firm portfolio measured on date τ. Then $(R_{m\tau}-r_\tau)$, SMB_τ and HML_τ are the daily factors at day τ. We perform a time-series regression for each stock in each quarter t. The idiosyncratic volatility of a stock is computed as the standard deviation of the regression residuals. We transform the standard deviation of daily return residuals to an annual return residual by multiplying 2 times the square root of the number of trading days in that quarter.

Firm Value, Debt Value, and Default Probability. Following Vassalou and Xing (2004), Veronesi and Zingales (2010) and Huang, Miao, and Wang (2016), we adopt the Merton (1974) model to estimate firm values, debt values, and default probabilities. We compute the equity value using stock prices daily data between January 1, 2014 and September 30, 2016 and take the yield of a one-year treasury bond as the risk-free rate. To reflect timely change of equity volatility (VOL), we compute the annual standard deviation of equity returns using a rolling method with the 10-day window and thus update equity values (EV) accordingly. As we are considering a three-year period horizon, we use the total book liability on June 30, 2015 to represent the face value of debt for a firm. We then compute the variable FV to measure a firm's total value. We then compute debt value (DV) as firm value minus equity value.

Value-at-Risk. Furthermore, we calculate Value-at-Risk, denoted VaR(α), which is the maximum loss within the α%-confidence interval (Jorion (2007)). VaR captures the risk of loss of an institution and is widely adopted in practice. We set α to the 5% level and estimate VaR daily and then take the quarterly average.

Illiquidity. To estimate illiquidity for an individual stock, we adopt the effective spread estimator based on serial covariance of the change in daily equity returns proposed by Roll (1984). The serial covariance estimator of Roll (1984) or its extensions are frequently used in researches and are based on a simple insight: More negative serial covariance of daily equity returns reflects higher transaction costs and thus a larger bid-ask spread. For each stock each quarter, we calculate this spread estimator which is denoted as ROLL. Besides, following Amihud (2002) and Brogaard, Li and Xia (2016), we also use the Amihud method to measure illiquidity. The AMIHUD measure is defined as the absolute value of daily stock returns scaled by daily trading volume, multiplied by 10^9. We then average these daily AMIHUD measures over the quarter for each stock. This measure captures the idea that, for a given amount of trading, illiquid stocks should experience a larger price change. Note that both ROLL and AMIHUD are illiquidity measures: The wider the spread or the higher

the value of the AMIHUD measure, the less liquid the stock.

Systemic Risk. Finally, we consider another set of measures regarding possible systemic risk. We focus on three common methods which are designed to measure a firm's contribution to systemic risk. The first measure is CBeta, the dynamic conditional Beta of Brownlees and Engle (2012) and Engle (2014). CBeta is positively correlated with the individual stock's systemic risk. Following Brownlees and Engle (2012), we estimate CBeta daily using the GARCH-DCC model, which uses information prior to that day and eliminates the forward looking bias, before taking the quarterly average.

The second one is ΔCoVaR of Adrian and Brunnermeier (2011). Based on the concept of VaR, the CoVaR corresponds to the VaR of the market return obtained conditionally on some event $\mathbb{C}(r_{it})$ observed for firm i:

$$\Pr\Big(r_{mt} \leq CoVaR_t^{m|\mathbb{C}(r_{it})} \Big| \, \mathbb{C}(r_{it})\Big) = \alpha. \tag{2}$$

The ΔCoVaR of firm i is then defined as the difference between the VaR of the financial system conditional on this particular firm being in financial distress and the VaR of the financial system conditional on firm i being in its median state. To define the distress of an institution, various definitions of $\mathbb{C}(r_{it})$ can be considered. Because they use a quantile regression approach, Adrian and Brunnermeier (2011) consider a situation in which the loss is precisely equal to its VaR:

$$\Delta CoVaR_{it}(\alpha) = CoVaR_t^{m|r_{it}=VaR_{it}(\alpha)} - CoVaR_t^{m|r_{it}=Median(r_{it})}. \tag{3}$$

The third systemic risk measure is the MES, the marginal contribution of an institution i to systemic risk, as measured by the Expected Shortfall (ES) of the system. Originally proposed by Acharya et al. (2010), the MES was extended to a conditional version by Brownlees and Engle (2012). By definition, the ES at the $\alpha\%$ level is the expected return in the worst $\alpha\%$ of the cases, but it can be extended to the general case, in which the returns exceed a given threshold C. Formally, the conditional ES of the system is defined as

$$ES_{mt}(C) = \mathbb{E}_{t-1}(r_{mt}|r_{mt} < C) = \sum_{i=1}^{N} w_{it}\mathbb{E}_{t-1}(r_{it}|r_{mt} < C). \tag{4}$$

Then, the MES corresponds to the partial derivative of the system ES with respect to the weight of firm i in the economy (Scaillet, 2004).

$$MES_{it}(C) = \frac{\partial ES_{mt}(C)}{\partial w_{it}} = \mathbb{E}_{t-1}(r_{it}|r_{mt} < C). \tag{5}$$

The MES can be viewed as a natural extension of the concept of marginal VaR proposed by Jorion (2007) to the ES. It measures the increase in the risk of the system (measured by the ES) induced by a marginal increase in the weight of firm i in the system. The higher the firm MES, the higher the individual contribution of the firm to the risk of the financial system. Following the convention, we measure VaR, ΔCoVaR, and MES at the 5% level and estimate them daily before taking the quarterly average. As ΔCoVaR, and MES are typically negative, we follow the notations of Brownlees and Engle (2012) to take the negative of the original value as a substitute.

B.3. Measuring Control Variables

In sum, besides value variables, we end up with nine interested firm outcome variables constructed on the quarterly basis. We also use a set of control variables following the literature. Table III presents the main 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 each quarter in the sample period. We also include control variables such as EXPORT (which equals 1 if a company had foreign sales in the previous fiscal year, otherwise 0), SIZE (the logarithm of the company's asset book value), and SOE (which equals 1 if the company is either wholly or partially owned by the government, otherwise 0).

C. Descriptive Statistics

Table III reports the definitions of the variables and Table IV presents sample statistics of the main variables. Panel A of Table IV shows the dependent variables in our regressions. In the sample period, a listed firm on average has an equity volatility of 53.4%, an IVOL of 37.6%, a default probability of 2.7%, a VaR of 4.920%, a ΔCoVaR of 2.17% and a MES of 5.34%. Panel B of Table IV summarizes the firm-level variables and shows that a firm has an average ROA of 0.29% and a leverage ratio of 48.6%. In the sample, 36.7% of the listed companies are state-owned and more than half (52.9%) of the firms were directly purchased to some extent by the national team in 2015Q3.

[Place Tables III-IV about here]

III. Value Creation of Government Purchase

A. Identification strategy

In this section, we utilize a DID approach to identify the possible causal relationship between government direct purchase and the value creation for the rescued firms. The value creation might result from the relative improvement in market quality and reduction in risks. We compare various stock performance measures of the rescued firms with those of the comparable non-rescued firms before and after the government purchase in the market in 2015Q3.

The national team's purchase in 2015Q3 may serve as a quasi-experiment: It was sudden and unexpected by the market; its holdings were quite stable both before and after the purchase. However, two potential concerns about the validity of the DID approach emerges in our framework: First, the existence of selection issues might bias the DID estimators. For example, the government might invest in firms with better fundamentals so that their risks recover more rapidly.[16] Second, the potential positive spill-over effects of government purchase might understate the effects of government purchase. Positive spill-over effects occur when the government purchases a stock, which might help mitigate the panic selling on other non-rescued stocks. In fact, when panicked investors see the government directly purchase other stocks, they might be aware that the government will try to help the financial markets function well so that contagion risk is mitigated. Consequently, they don't need to rush to sell their stocks and could wait for the price of an asset to recover to the equilibrium price. Therefore, we should expect to see the panic selling of other stocks reducing as well. Consequently, the affected non-rescued firms won't satisfy the stable unit treatment value assumption (SUTVA) defined in Rubin (1980). Therefore, failing to disentangle the impacts on the affected non-rescued firms will cause downward bias on the estimate of the causal impact of the government direct purchases on the rescued firms.

We tackle these issues in a number of ways. First, we use a matching procedure to ensure that the treatment group (purchased stocks) and control group (matching peers) are observably similar. Second, we include firm fixed effects and year fixed effects to mitigate the heterogeneity not captured by firm characteristics. Third, we ensure that the interested outcomes of the treatment group (purchased stocks) and those of the control group (matching peers) are parallel, thus the deviation of which should be attributed to the effects of government purchase. Fourth, we report in the Internet Appendix that our findings stay

[16]Instead, we find the the purchased stocks are a little bit worse in fundamentals. Besides, Bian, He, Shue, and Zhou (2018) also find that the government did not disproportionately purchase stocks with high fire sale exposure (FSE), which is based on account level data calculation.

with alternative matching procedures and without matching. Fifth, we check with a placebo test and find that no differences between the treatment group (purchased stocks) and control group (matching peers) occur before the government purchase.

Last but not least, to address the spill-overs issue, we assume that the spill-over effect is not homogeneous among all non-rescued stocks; the stocks which are more closely connected with rescued stocks should be affected more compared with the stocks which are less connected with the rescued stocks. If this is the case, we can find a group of stocks which are least correlated with rescued stocks, but otherwise comparable, as the control group.

Borrowing the insights of Gabaix (2011), to empirically find the appropriate control group, we argue that the economic "correlation" between two listed firms can be measured using the correlations between their idiosyncratic returns. As indicated by Gabaix (2011), idiosyncratic shocks to individual firms in a network do not average out and aggregate into systemic shocks. Moreover, Herskovic, Kelly, Lustig, and Nieuwerburgh (2016) note that idiosyncratic volatility co-movement also features of firm firm-level cash flows driven by firm-level productivity and demand shocks. If there is no economic connection between two firms, the correlation between idiosyncratic returns of these two firms should be near zero. However, were there economic connection - a supplier-consumer relationship for instance - between two firms, the idiosyncratic shock to the supplier would also lead to a negative impact on the consumer firm.

Thus, the correlation between idiosyncratic shocks might be useful in measuring the economic connection between two firms. By excluding the possible common factor exposures, we are allowed to investigate whether the "idiosyncratic" benefit (surveyed in the mechanism section) due to government purchase propagates through the idiosyncratic shock connections and calm down the contagion in the network as a whole.

Therefore, in our paper, firm-level economic correlation is calculated based on the idiosyncratic returns of the Fama-French (1993) three-factor model in the period before the government purchase action.[17] We hereafter refer to these two groups as "most correlated" stocks and "least correlated" stocks, unless stated otherwise. In selecting the two groups of stocks, we require that this correlation be in place prior to the treatment, the government direct purchase, so as to avoid cases wherein the correlation was established coincident with or subsequent to the purchase. Specifically, we use the regression residual sequences of equation (1) from July 1, 2013 to June 30, 2015 - a two and a half year period preceding the government purchase. In the following, we index all the rescued stocks as set $A = \{a_1, a_2, ..., a_I\}$ for notational convenience, with subscript I being 1,365 in our main sample. We identify

[17]Our results remain valid when using the market model or the Fama-French (2015) five-factor model to pin down firm-level economic correlations.

the most and least correlated matching stocks for each of our rescued stocks as follows:

- For each rescued stock $a_i \in \{a_1, a_2, ..., a_I\}$, we find the set of potential matches by selecting the nearest 40% stocks in terms of market value on June 30, 2015 among the non-rescued stocks in the same industry (based on one-digit SWS industry classification code).[18]
- For each rescued stock $a_i \in \{a_1, a_2, ..., a_I\}$, in the set of potential matches, we select with replacement the non-rescued stock whose residual sequence has the highest correlation coefficient with a_i to be the "most correlated" stock b_i. After this step, each rescued stock is paired with a most correlated stock.
- For each rescued stock $a_i \in \{a_1, a_2, ..., a_I\}$, in its set of potential matches, we select with replacement the non-rescued stock whose residual sequence has the least correlation coefficient (in absolute terms) with a_i to be the proper "least correlated" stock c_i. Again, after this step, each rescued stock is paired with a least correlated stock.
- The group of most correlated stocks (group B) is constructed by the matching stocks b_i's and comprises 1,339 peer stocks as the firms in the banking industry were all purchased in our sample and do not have matching peers.
- The group of least correlated stocks is constructed by the c_i's that do not appear in group B. After this refinement, the group of least correlated stocks (group C) comprises 723 peer stocks.

[Place Table V about here]

Table V provides the descriptive statistics for the three groups of stocks before and after the purchase. For each group of stocks, we calculate a quarter-series average over the stated time interval and then calculate a cross-sectional mean. The selection criterion for the set of potential matches is identifying the non-rescued stocks in the same industry (based on one-digit SWS industry classification) with a market value (measured on June 30, 2015) in the nearest 40% to that of the rescued stock. From Table V, the rescued stock are similar to least correlated stocks in terms of various characteristics before and after the government direct purchase, such as return on asset (ROA), financial leverage (LEV), book to market ratio (M/B), net operating cash flow/total assets (CF), dividend yield (DIV), total assets (SIZE), and export (EXPORT). Similar patterns can be observed between the groups of most correlated stocks and least correlated stocks. Thus, the control group, i.e., the group of stocks which are least correlated with rescued stocks are otherwise comparable to the rescued stocks and the most correlated stocks, according to Table V. The matching procedure allows

[18]We verify in unreported tables that our results stay with other reasonable selection criterions.

us to minimize the spillover effects and the difference in observable characteristics between these firms and thereby disentangle the treatment effect of government direct purchase from a selection effect to some extent.

B. Value Creation

Veronesi and Zingales (2010) suggest the Revised Paulson Plan provided net benefit in the financial sector during the 2008 Columbus-day weekend. One may ask whether there was any value creation during the crisis for the rescued stocks and most correlated peers because of the national team's purchases. To address this question, we replicate the results of Huang, Miao, and Wang (2016) other than using the least correlated stocks as the control group, as follows:

$$\Delta Value_i = \alpha_0 + \alpha_1 TREAT + \gamma' X_i + \varepsilon, \tag{6}$$

where the dependent variable $\Delta Value_i$ represents the change of log firm value, log debt value or log equity value of each firm between June 30 and September 30, 2015. TREAT can take two forms. In terms of form, TREAT can be a qualitative dummy variable, GOVD, which equals 1 if the stock was purchased in 2015Q3 by the government and zero otherwise or qualitative, that is, GOV, which measures the share percentage purchased by the government in 2015Q3, ranging from 0 to 32.78 as shown in Table IV. X_i consists of a vector of firm-level control variables measured on June 30, 2015, which are specified in detail in Table III. The coefficient estimate on TREAT is the DID estimator that captures the effect of government purchase on the value change. If government purchase indeed leads to any value creation for the rescued stocks and most correlated peers, we expect the estimate of α_1 to be positive.

[Place Table VI and Figure 3 about here]

Table VI reports the results of value creation from government purchase. The DID estimators are generally positively significant across columns (1)-(6), indicating that the national team's purchases in 2015Q3 boosted a rescued stock' firm value, debt value, and equity value. For example, in column (2), the DID estimate for FV is 0.0337, which translates into a relative increase of 3.37%. Further investigation shows that the value creation mainly comes from the increases in debt value, while the value creation in equity value is insignificant. In fact, the average firm value of a rescued firm on June 30, 2015 was 57.68 billion CNY. Thus, the increases in firm values indicate an overall value gain of $3.37\% \times 57.68\text{billion} \times 1,365 = 2,708$ billion CNY. Given the estimated purchase cost is 1,212-1,500 billion CNY, the net welfare gain is 1,153-1,441 billion CNY.

Thus, government direct purchase indeed created huge values for the rescued firms. The value creation may result from the relative improvement in market quality and decrease in risk in a longer horizon, which we investigate next. It is notable, however, that we rule out the alternative hypothesis that the value creation stems from either government's picking stocks with superior fundamentals or providing real benefits. First, we have controlled for firm fundamentals in Table VI. Second, we verify in Table V that there is no systematic difference in fundamentals between purchased stocks and least correlated ones both before and after the purchase. Third, we find that the national team almost never enters the General Meeting of Shareholders (GMS) of purchased stocks and can't provide real benefits.

C. Effects of Government Purchase on Market Quality

Since we document a significant value creation effect of government direct purchase for the rescued firms, it is natural to ask where the value comes from. Following the literature, for instance, Veronesi and Zingales (2010), we investigate the possible impact of government direct purchase on the various measures of market quality for the rescued stocks.

With the "least correlated" firms as the control group, we employ a difference-in-differences specification to compare the changes between outcomes of rescued and non-rescued stocks in the main board stock market of China during the sample period of January 1, 2014 to September 30, 2016, based on the following model:

$$Y_{it} = \alpha_0 + \alpha_1 TREAT + \alpha_2 TREAT \times POST + \gamma' Z_{it-1} + \varphi_i + \eta_t + \varepsilon_{it}, \tag{7}$$

where the dependent variable Y_{it} is a measure of outcome of firm i in quarter t. Dummy variable POST equals 1 for every quarter after 2015Q3, and 0 otherwise.

TREAT is the treatment variable in our benchmark specification. TREAT here can take two forms in our analysis. In terms of form, TREAT can be a qualitative dummy variable GOVD, or qualitative variable GOV as in specification (6). Z_{it-1} consists of a vector of firm-level control variables, which are specified in detail in Table III. φ_i and η_t represent firm fixed effects (or industry fixed effects) and time fixed effects, respectively. The coefficient estimate on TREAT×POST is the DID estimator that captures the causal effect of government purchase on firm outcome Y. Our empirical strategy seeks to understand the effects of government purchase by ruling out confounding characteristics of the firms. If government purchase during a stock market crash imposes positive effects on market quality of the directly purchased stocks, we expect the α_2 to be negative across all interested firm outcomes specified in Section II.

In the following, we report the regression results of government direct purchase on the

rescued stocks in Tables VII-X, with columns (1)-(2) for the inclusion of industry fixed effects and columns (3)-(4) for the inclusion of firm fixed effects. Note that in columns (3)-(4) of Tables VII-X, the dummies TREAT and POST are both absorbed by firm fixed effects and quarter fixed effects, respectively.

[Place Tables VII-X about here]

Two observations are in order. First, government purchase stabilizes the stock prices and reduces risks including VOL, IVOL, and VaR. The regression results in Tables VII-X reveal a high and statistically significant causal relationship between government direct purchase and significant decline in these risks. As illustrated in column (3) of Table VII (Table VIII and Table X), the purchased stock would experience a 4.51pps reduction in equity volatility (2.4pps in IVOL and 0.406pps in VaR). These correspond to a decline of roughly 10% compared with the pre-event average. As indicated by Brunnermeier and Pedersen (2009), decreasing equity volatility mitigates liquidity spirals in the context of binding margin constraints. Thus, the timely purchase by the government in a margin-induced market crash may help restrain the initial negative shock, which is arguably as important as calming the leverage effect (namely, the contagion and systemic risk). The effect of government purchase may also help explain the decreasing equity volatility in the overall market since the equity bubble burst in 2015.[19] The reduction in IVOL might be at odds with the prior literature which establishes a positive link between growing institutional ownership and idiosyncratic volatility (Campbell, Lettau, Malkiel, and Xu (2001)). This might suggest that the government focuses on reducing risks and acts in a different way from common institutional investors. Moreover, according to Table IX, there is also decrease in default probability.

Second, we find that government direct purchase improves market liquidity. Relative to the control group, the ROLL index decreased by 4.86pps (column (3) of Table XI), and the AMIHUD index decreased by 0.686 (column (3) of Table XII). The magnitudes of the effects correspond to 20.00% and 77.25% of the pre-event average, which are economically sizeable. The liquidity provision is consistent with the findings of Huang, Miao, and Wang (2016) who focus on the short-run (2015Q3). A liquidity spiral (Brunnermeier and Pedersen (2009), Pedersen (2009), and Krishnamurthy (2010)) is a major catalyst of fire sale and contagion, because to the extent that the intervention improves liquidity, it reduces strategic complementarity among investors and thus mitigates the risks of the firms. All coefficients on the interaction between TREAT and the dummy POST are negatively statistically significant

[19]See, for instance, https://www.scmp.com/business/china-business/article/2083216/shanghais-low-stock-market-volatility-mystery.

across columns (1) to (4) in Tables XI and XII.

Overall, in this section, we utilize the DID approach to investigate the possible causal impact of government direct purchase on a standard set of market quality measures of rescued stocks. Consistent with previous literature, we find that government direct purchase indeed reduces equity volatility, idiosyncratic volatility, default probability, and VaR of the rescued stocks. We also find that government direct purchase enhances market liquidity for the rescued stocks.

IV. Impact of Government Purchase on Contagion

A. Government Purchase and Systemic Risk Reduction

In the previous section, we document that government direct purchase during the financial turmoil in 2015 in China created value for the rescued stocks and helped reduce risk and improve liquidity for them. The estimated overall net welfare gain was huge (1,100+ billion CNY), which is comparable to the estimated cost of the government purchase (1,500 billion CNY). However, this huge value creation for the rescued stocks might not justify the government rescuing action if there is no market level contagion involved. Therefore, in this section, we investigate the possible impact of the government purchase on contagion at market level. As previously argued, government should intervene when market failure exists, for instance, when market level contagion is prevalent, because in such cases, financial markets might not be able to work efficiently due to the possible various forms of negative externality. In such cases, it is legitimate for the government to intervene. The Internet Appendix shows that the performance measures soared to their peaks in 2015Q3 and the rescued stocks showed relative improvement after the purchase. Therefore, to evaluate the impacts of government intervention, in our case, direct purchase of stocks, we might also need to investigate whether such direct purchase could reduce the negative externality, i.e., prevent market level contagion, or reduce market level systemic risk.

To address this question, we argue from two perspectives. First, we argue that, if government direct purchase indeed reduces market level systemic risk, we should observe that the contribution of the rescued stocks to the systemic risk decreases. By definition, the contribution of one asset to systemic risk is a function of the magnitude of its negative shocks, and its position (influence) in financial networks. Intuitively, government direct purchase might provide an insurance/signal to the markets. This government bailing out action could have two consequences. First, stop the panic selling behavior of the market participants of rescued stocks. Thus, the negative shocks (if any) which occurred to the rescued stocks will

not be aggregated into a larger magnitude shock because the investors might not sell due to panic of contagion. Thus, the contribution to the systemic risk of rescued stocks decreases.

To test this conjecture, following the literature, we use CBeta and two measures of systemic risk contribution: ΔCoVaR and MES as the dependent variables. We follow the DID specification (7) by comparing the rescued stocks with the least correlated stocks. The results are reported in Tables XIII-XV. According to Tables XIV and XV, the estimated coefficients for TREAT×POST are all statistically significant at the 1% level in various specifications, indicating that government purchase somehow helps reduce systemic risk contribution of the rescued stocks. The economic magnitude of this impact is also sizeable. In column (3) of Table XV, the estimated coefficient is -0.3937, suggesting that were a non-rescued stock purchased, ceteris paribus it would experience a 0.3937pps decrease in contribution to systemic risk measured by MES. This result is both statistically and economically significant. Though a 0.3937pps reduction in MES is large by most standards, we also communicate the economic magnitudes of the government purchase's effect by examining simple risk statistics before and after the intervention. Prior to the purchase, the mean MES per firm-quarter for the rescued stocks was 4.164pps for our sample. This relative reduction thus accounts for a decline of 9.45%. Similarly, we document a 7.55% and a 4.47% decrease in CBeta and ΔCoVaR compared with the pre-event averages. Although we cannot completely rule out the selection effect, these differences are more likely to be attributable to a treatment effect; that is, government direct purchase has the ability to reduce systemic risk.

[Place Tables XIII-XV about here]

Another way of interpreting these results is that reducing the rescued stocks' contribution to systemic risk reflects a time-series reduction in contagion due to government purchase. The existence of positive spill-over effects demonstrates, from the cross-sectional perspective, the effect of government purchase on contagion, which we investigate next.

B. Positive Spill-Over of Government Purchase

This section examines the spill-over effects of government purchase. First, we document that there is value creation for the most correlated stocks by following the same methodology as that in Section III.B. The regression results are summarized in Table XVI and Figure 4 gives a graphical illustration. We can see that the government purchase also led to sizeable value creation in the most correlated stocks, which verifies the existence of spill-over effects. The average firm value of a most correlated firm on June 30, 2015 was 15.66bn CNY, implying a value gain of 887bn CNY ($4.23\% \times 15.66 \text{ billion} \times 1,339 = 887 \text{ billion CNY}$) due to the

spillover effects. Thus the direct increases in firm values and the spillovers indicate an overall value gain of $3.37\% \times 57.68\text{billion} \times 1,365 + 4.23\% \times 15.66$ billion $\times 1,339 = 3,540$ billion CNY. It is noteworthy that the spill-over effect may be underestimated as any non-rescued stock is to some extent correlated with the rescued stocks and we select only the most correlated peers. The spill-over effect is large in economic magnitude and should come from the relative improvement of the market qualities of the most correlated stocks, which we investigate next.

[Place Table XVI and Figure 4 about here]

We also utilize the DID design to investigate spill-over effects by comparing the most correlated stocks with the least correlated stocks, which serve as a control group. Specifically, we employ the following regression which is similar to specification (7),

$$Y_{it} = \alpha_0 + \alpha_1 CORR + \alpha_2 CORR \times POST + \gamma' Z_{it-1} + \varphi_i + \eta_t + \varepsilon_{it}, \tag{8}$$

where dummy variable CORR takes 1 if the non-rescued stock is a most correlated stock and 0 if it is a least correlated stock. Other independent variables are the same as specification (7).

[Place Table XVII about here]

Table XVII reports the regression results with the above DID test. As shown, except for the case of DP, the interaction between CORR and the intervention-period dummy POST are all negative and statistically significant at the 1% level, which suggests that the most correlated stocks, on average, experience positive externality following the implementation of government purchase. This further validates our spill-over hypothesis. The economic magnitude of this spill-over effect is large. Compared with the least correlated stocks, equity volatility of the most correlated stocks declined by 8.12pps after government purchase, a 15.47% reduction relative to the pre-event average. Similarly, we find, due to spillovers, the idiosyncratic risk (VaR) decreased by 8.30% (15.38%). Further, illiquidity (ROLL) decreased by 0.1508, which corresponds to a decline of 44.35% compared with the pre-event average. Moreover, we document a sizeable and significant decrease in systemic risk: A coefficient estimate of -0.1692 (-0.4844) in column (8) (column (9)) of Table XVII suggests that, the most correlated group experiences a 8.35% (10.61%) decline in ΔCoVaR (MES).

Noteworthy is that we pick only the "most correlated" firms as the "treatment group" to disentangle the spillovers, so that coefficients in Table XVII may be stronger than the original direct treatment effect surveyed above, and arguably the spill-over effects would be emasculated as more firms that are to some extent "correlated" with the rescued firms are

clarified as "most correlated" firms. In sum, our estimates suggest that government purchase had an overall positive spill-over impact on market quality of most correlated stocks. The results are robust to various specifications of selection criteria for the group of the most/least correlated non-rescued stocks.

It is noteworthy that our main findings stay qualitatively stable when we do not refine the control group and use the rescued stocks and non-rescued stocks as the treatment and controls, respectively. The results are reported in detail in the Internet Appendix, with the DID estimators remaining significant but lower in magnitude as the most correlated stocks in the controls experience improvement due to the spill-over effects.

Thus, overall, we find that government direct purchase reduces the rescued stocks' contribution to systemic risk. In addition, positive spill-over effects of government direct purchase exist. In particular, we find that government direct purchase can improve most correlated stocks' market quality measures and mitigate their systemic risk contribution. These findings suggest that government direct purchase might be able to calm market level contagion.

V. Robustness Checks and Extensions

A. Dynamics of Government Purchase Effect

To allow for the time-varying impact of government purchase on outcome variables, i.e., dynamic effects of government purchase, we include a series of dummy variables in the standard regression to trace out the quarter-by-quarter effects of government purchase on the interested outcomes coefficient:

$$Y_{it} = \alpha + \lambda_1 D_{it}^{-5} + ... + \lambda_7 D_{it}^{0} + ... + \lambda_{11} D_{it}^{+4} + \gamma' Z_{it-1} + \varphi_i + \eta_t + \varepsilon_{it}, \tag{9}$$

where Y_{it} denotes the interested outcome of firm i in quarter t, φ_i and η_t are vectors of firm and quarter dummy variables that account for firm and quarter fixed effects, Z_{it-1} is the firm-level control variable vector, and ε_{it} is the error term. The government purchase dummy variables "D's", equal zero, except as follows: D^{-j} equals one for the rescued firms in the jth quarter before 2015Q3, D^0 equals one for the rescued firms in 2015Q3, while D^{+j} equals one for the rescued firms in the jth quarter after 2015Q3. Therefore, λ measures the outcome difference between the rescued stocks and the uncorrelated non-rescued stocks in the corresponding quarter. We exclude the government purchase dummy for 2014Q1, the 6th quarter before 2015Q3 in our sample, thus estimating the dynamic effect of government purchase on the interested firm outcomes relative to 2014Q1. Figure 5 plots the estimates for λ_t and the 95% confidence intervals, which are adjusted for firm-level clustering.

[Place Figure 5 about here]

The results in Figure 5 mirror the findings of the DID analysis in specification (7). The nine outcomes of interest display improvement after the government purchase. For instance, examining the top left panel (a) of Figure 5, we find that, relative to 2014Q1, the equity volatility of a rescued stock declines by 7.69pps in 2015Q4 compared with a least correlated stock. This DID estimate implies a decrease of 17.3% compared with the pre-event average and is significant at the 5% level. This is also economically sizeable. Besides, the effect persists at fairly similar magnitudes and is significant for subsequent quarters for equity volatility. The decrease in VOL is still 3.34pps in 2016Q3. That is, 43% of the initial decease effect remains 3 quarters later. Panels for the other outcomes exhibit similar patterns.

Our DID specification (7) relies on the standard common trends assumption that the variables of interest for both groups of stocks should co-move closely without any treatment. If there exist different pre-existing trends in the treatment group and control group, the estimated causal effect from the DID method might be biased. A common issue concerning the DID methodology is that this assumption cannot be tested formally. However, we take three measures to mitigate this concern. First, we investigate the dynamic effects of government purchase with specification (9). The the dynamics in Figure 5 reveal no systematic differences in pre-trends across purchased and non-rescued stocks regarding the interested firm outcomes. Although a few confounders appear in other outcomes, the differences are small and do not appear to be systematic decreasing trends. Second, we provide visual inspection of the data series reported in the Internet Appendix which validate the high correlations between the treated and the control groups in the pre-event window. Third, in the Internet Appendix we conduct "placebo" tests that have become customary in the literature on policy evaluation. All these tests combined confirm the validity of our control group.

B. Placebo Test

We conduct a placebo falsification test by pretending that the government purchase took place in 2013Q4 and perform a similar DID analysis. The results are tabulated in the Internet Appendix and we find that the DID estimators are statistically insignificant. The lack of placebo effect of government purchase and the observations of the above common trend tests indicate that our main DID test results are unlikely to be driven by chance.[20]

[20]We also use other quarter as "pseudo-purchase" and the results are similar.

C. *Inclusion of Indirect Shareholding*

Although our empirical design centers on direct purchase of the national team, a further concern is that direct government shareholdings may not completely reflect the efforts of the government purchase plan. Taking indirect holdings into account, we repeat our matching procedure and the regression in specification (7). Tables in the Internet Appendix report the results from these regressions and the main results stay essentially as before.

D. *Propensity Score Matching*

Bian, Da, Lou, and Zhou (2018) find that the rescued stocks differ from non-rescued ones in capitalization but not in leverage-network eigenvector centrality. To further alleviate the sample selection concern, we utilize a propensity score matching procedure to match the rescued firms with the comparable non-rescued stocks and repeat the DID analysis in specification (7). The results are reported in the Internet Appendix and the DID estimators are all negative and significant at the 1% level. Thus, we do not observe any significant change in our estimates.

In all our analyses, we also attempt to eliminate the sample selection issue using the full set of firm fixed effects (industry fixed effects) and time fixed effects to absorb any firm- (industry-) and time-specific heterogeneity not captured by firm characteristics. In summary, consistent with our hypothesis, our identification tests based on the main DID approach and its variations provide evidence that the effect of government purchase on market quality appears to be causal.

VI. Possible Mechanisms

In this section, we run several tests to examine if the hypothesized mechanisms through which government purchase may improve firm outcomes by stabilizing prices and mitigating contagion for not only the rescued firms but also the most correlated firms. Although we attempt to identify different economic mechanisms that underlie the positive effect of government direct purchase on firm outcomes, we acknowledge that there might exist other underlying mechanisms that are not necessarily mutually exclusive and, if anything, may jointly contribute to the positive effects of government direct purchase on firm outcomes. For instance, the liquidity provision mechanism lines up with the existence of margin investor network surveyed by Brunnermeier and Pedersen (2009) and Bian, Da, Lou, and Zhou (2018).

A. Noise Trading Risk Reduction

Largely populated by inexperienced retail investors, China's A share market is highly speculative and turbulent, which experiences high price volatility and the highest turnover rate among major stock markets in the world. Such "futile" trading buries the seed of the market crash in the summer of 2015 (see Liu, Xu, and Zhong (2017)). Brunnermeier, Sockin, and Xiong's (2018) theoretical model suggests that inexperienced retail investors in the Chinese markets contribute to price volatility and instability and the government stabilizes the market by directly trading against such noise traders. According to this view, market quality improves along with the reduction of the proportion of noise trading. We show in this section that government purchase indeed mitigates the noise trading risk, thereby improving the market quality of both rescued stocks and the most correlated stocks.

To measure noise trading risk on the firm level, we adopt the model of Easley, Kiefer, O'Hara, and Paperman (1996) and Easley, Hvidkjaer, and O'Hara (2002), who estimate the probability of information-based trading (PIN) specific to a given stock based on the number of buyer-initiated and seller-initiated trades in a certain period. As PIN not only depends on the arrival rate of informed traders, but also on the arrival of new information, we use the arrival rate of uninformed traders to proxy for the noise trading risk. Specifically, we obtain data on daily buyer-initiated and seller-initiated trades from CSMAR. Then in the same sample period (2014Q1 to 2016Q3), we calculate for each stock and quarter the quarterly arrival rate of uninformed traders (NOI) based on daily buyer-initiated and seller-initiated trades. Using NOI as the outcome (Y_{it}), we repeat the DID analysis in specifications (7) and (8). In Table XVIII, we report the results, where the DID estimators (both GOVD×POST and CORR×POST) are negative and statistically significant at the 1% level. The DID estimators translate to a 37.83% (0.0976/0.258) decrease and a 17.37% (0.0422/0.243) decrease in noise trading risk for the purchased stocks and most correlated stocks compared to their pre-event averages, respectively. This indicates that the national team significantly mitigated the noise trading risk of both rescued stocks and the most correlated stocks. To further support the channel of noise trading risk reduction, we add NOI and NOI's interaction with the corresponding DID estimators into specifications (7) and (8) to form heterogeneity tests. We expect stronger improvements for the stocks with higher noise trading risk whether it is a rescued stock or a most correlated one. Thereby, the coefficients of interest (GOVD×POST×NOI and CORR×POST×NOI) are expected to be negative. In Tables XIX and XX, we report the results. Two findings emerge. First, the estimated coefficients of GOVD×POST×NOI and CORR×POST×NOI are generally negative and statistically significant, implying that there is more reduction in risks for the stocks populated by more noisy traders. Second, the coefficients of NOI are all positively significant at the

1% level, supporting the view that noise traders contribute to price volatility and instability. These results demonstrate that reducing the noise trading impact could be an underlying mechanism through which government purchase improves market quality.

[Place Tables XVIII-XX about here]

B. Liquidity Provision and Fire Sale

Brunnermeier and Pedersen (2009), Krishnamurthy (2010), and Bian, He, Shue, and Zhou (2018) suggest that the liquidity spiral amplifies the impact of the fire sale, which exacerbates the market crash. To calm contagion, the government needs to improve market liquidity. As shown in previous sections, government direct purchase can enhance liquidity for both rescued firms and the most correlated firms. In this section, we further investigate whether fire sale is reduced. To this end, we investigate the changes in trading activities before and after the government direct purchase in 2015. We use order imbalances between 2014Q1 and 2016Q3 to proxy for fire sale and examine the association between trading activity and government purchase. For each trading day, we measure order imbalances in terms of the number and value of shares traded using data from CSMAR. Following Chordia and Subrahmanyam (2004), we measure the order imbalance in the number (OIBN) as the the difference between the number of buyer-initiated trades and the number of seller-initiated trades for each stock each day. In addition, the order imbalance in value (OIBV) is measured as the difference between the trading value of buyer-initiated trades and the trading value of seller-initiated trades for each stock each day. We further scale order imbalances by dividing OIBN (OIBV) by the daily total number of transactions (daily total CNY trading volume). We then average these daily OIBN (OIBV) over the fiscal quarter and multiply by 100.

Using the order imbalance ($OIBN_{it}$ or $OIBV_{it}$) as the regressand, we repeat the DID analysis in specifications (7) and (8) to investigate the impact of government purchase on order imbalance for the rescued stocks and the most correlated stocks, respectively. If the government purchase exerts a positive influence by calming contagion and thereby reducing sell orders, we expect the DID estimators to be positive.

[Place Tables XXI-XXII about here]

Government purchase attracts more buyer-initiated transactions according to Table XXI. The interaction term between GOVD and POST is positively significant, indicating that government purchase brings more investors in than out, although the national team itself did not increase its position significantly after 2015Q3, as shown in Figure 2. So long as order

imbalance (imperfectly) proxies for fire sale, this suggests that government direct purchase indeed leads to more buy orders and thus mitigates possible fire-sale, therefore restoring liquidity to both rescued firms and their closely connected firms.

To provide additional insights, we interact the DID estimators with illiquidity measures to form heterogeneity tests. Table XXII suggests two caveats. First, the negative coefficient estimates on ROLL and AMIHUD indicate that the less liquidity, the more fire sale there is. Second, positive coefficient estimates on the interaction terms (e.g., GOVD×POST×ROLL) imply that the government purchase's fire sale reduction effect is more pronounced if the stock has lower liquidity. Moreover, the reduction in fire sale because of liquidity provision lines up with the existence of margin investor network (Brunnermeier and Pedersen (2009) and Bian, Da, Lou, and Zhou (2018)).

C. Composition Effect

C.1. Fund-Specific Treatment Effects

In this section, we focus on a particular type of investor, mutual funds investors, as they are believed to be the main liquidity providers in the financial markets. Most mutual funds in China report quarterly, but the complete portfolio holding is reported only semi-annually. We gather data on the mutual fund holdings and characteristics from RESSET. We then restrict our sample to funds reporting at least once per quarter and with non-zero holdings of at least one purchased stock and one non-purchased stock throughout the period 2014Q1 to 2015Q2.[21] This leaves us with 1,367 funds. We calculate fund turnover rate as

$$TurnOver_{f,h} = \frac{\min(buys_{f,h}, sells_{f,h})}{Asset_{f,h-1}}, \tag{10}$$

where the numerator is the lesser of the fund's total purchases and sales over the half year h, and the denominator is the fund's equity asset value in the previous half year $h-1$. We then average the turnover rate through 2012 to 2014 for each fund.

Given our interest in the cross-sectional variation of the government purchase's impact, we need to measure the treatment effect at the fund level. Based on the hypothesis that government purchase attracts more long horizon investors, we focus on the government purchase's impact on portfolio holdings and trading volume. Following Grinblatt, Titman and Wermers (1995) and Colliard and Hoffmann (2017), we compute fund-specific treatment effects based on changes in portfolio holdings of treated and control stocks. Here, to avoid double counting, the set of treated and control stocks are the purchased and the

[21] The five tailored mutual funds of the national team are not included as they were set up in 2015Q3.

non-purchased stocks, respectively.

We use the following two measures of fund-specific treatment effects. First, did_f^H quantifies the government purchase's impact on security holdings. It is computed as the log change in funds' total holdings of treated stocks between June 30, 2015 and December 31, 2015, minus the contemporaneous log change in holdings of control stocks. To avoid picking up effects related to price changes, we value all holdings using the stock prices prevailing at June 30, 2015. The second variable, did_f^V, measures how funds' trading activity changes in response to government's purchase. We define fund-specific trading volume for half year h as the absolute value of the change in holdings between half year $h-1$ and half year h, again evaluated at the closing prices in $h-1$. Given that the computation of trading volume uses data from two adjacent half years, we compute did_f^V as the log change in trading volume of treated stocks between the first half year of 2016 and the second half year of 2014, minus the contemporaneous log change for control stocks. Mathematically, they are computed as

$$\begin{aligned} did_f^H &= [\log(p_{15H1}^T \cdot x_{f,15H2}^T) - \log(p_{15H1}^T \cdot x_{f,15H1}^T)] \\ &\quad -[\log(p_{15H1}^C \cdot x_{f,15H2}^C) - \log(p_{15H1}^C \cdot x_{f,15H1}^C)], \qquad (11) \\ did_f^V &= [\log(p_{15H2}^T \cdot |\Delta x_{f,16H1}^T|) - \log(p_{15H2}^T \cdot |\Delta x_{f,14H2}^T|)] \\ &\quad -[\log(p_{15H1}^C \cdot |\Delta x_{f,16H1}^C|) - \log(p_{15H1}^C \cdot |\Delta x_{f,14H2}^C|)], \qquad (12) \end{aligned}$$

where $x_{f,h}^T$ and $x_{f,h}^C$ denote the (column) vectors of holdings in treated and control stocks by fund f at half year $h \in \{15H1, 15H2\}$, and p_h^T and p_h^C denote the associated (row) price vectors. $\Delta x_{f,h}^T$ denotes $x_{f,h}^T - x_{f,h-1}^T$, with $\Delta x_{f,h}^C$ defined accordingly, and the notation $|\cdot|$ is used for the element-wise absolute value of a vector.

C.2. Explanatory Variables

We hypothesize that the government purchase attracted more long-run investors and reduced the impact of short-run investors, including retail investors. To test this prediction, we draw on a set of fund characteristics and construct the following explanatory variables. The main variable of interest is TurnOver. The variable GRatio is the log of a fund's f's total holdings of treated stocks minus its log holdings of control stocks in 15H1. The variable FundSize is defined as the average of the natural logarithm of a fund's total net asset value through 2012 to 2014. We use price-to-book ratio P/B as a proxy for the investment style of funds f. A high (low) value implies that a fund predominantly invests in growth (value) stocks. This measure is computed as the average price-to-book ratio across all portfolio constituents. Finally, IndexFund is a dummy variable that takes a value of one for index funds, and zero otherwise. The table in the Internet Appendix contains summary statistics

for these explanatory variables. The average fund has a price-to-book ratio of slightly above 8. Around 20% of the funds are index funds. The average fund is shown to have a high turnover (around 9), but there is considerable cross-sectional variation across funds with a standard deviation of 41.58.

C.3. Results

Table XXIII reports the coefficients from cross-sectional regressions of the fund-level treatment effects on our explanatory variables, separately for changes in portfolio holdings did_f^H and changes in trading volume (did_f^H). In all regressions, t-statistics are based on White standard errors robust to heteroskedasticity. We first discuss the impact on portfolio holdings. In line with our hypothesis, the coefficient on TurnOver is negative and strongly statistically significant, indicating that investors with longer(shorter) average holding periods increase (reduce) their holdings in the purchased stocks relative to non-purchased stocks. The coefficient estimate on TurnOver in column (3) is -0.25%, implying that investors with 1 deviation reduction in TurnOver increases their relative holdings by 10%.

[Place Table XXIII about here]

We now turn our attention to trading volume. The negative coefficient estimate on TurnOver in column (6) implies that funds with shorter average holding periods reduced their trading volumes in purchased stocks relative to the non-purchased stocks. Taken together, it seems that government purchase attracts more long horizon mutual investors and reduces the price impact of short horizon investors. According to Grossman and Stiglitz (1980) and Cremers and Pareek (2011), market quality improves along with the reduction of the proportion of short horizon investors.

In summary, our results suggest that government direct purchase indeed can reduce noise trader impact and attract liquidity provisions from market investors. Consequently, the overall market quality improves.

VII. Conclusion

In this paper, we analyze the economic effects of the government direct purchase during the stock market crash in 2015. Consistent with previous literature, we first document that government direct purchase could improve the market quality measures of rescued firms. In particular, the equity volatility, idiosyncratic volatility, default probability, VaR and iliquidity of the rescued firms could be reduced.

We further investigate the possible economic effects of government direct purchase on mitigation of market level contagion. We find that government direct purchase could reduce the rescued firms' systemic risk contribution and more importantly, government direct purchase exerts positive externality on non-rescued firms as well. In particular, we find that government direct purchase improves the market quality and contribution to systemic risk of non-rescued firms, who have economic link with the rescued firms. Thus, government direct purchase could prevent contagion at market level. We conduct various robustness checks, including various refinements of control groups. Our main findings stay qualitatively.

As far as we know, ours is among the first paper to attempt to analyze *whether* and *how* government intervention resolves systemic risk. Although well known in theory that it is legitimate for government to intervene in markets when there exists market failure, there are few empirical analyses of how government intervention could potentially help financial markets when there is a market level failure. Relying on factor model residuals, we provide a framework to analyze from this perspective and demonstrate that examining (directly) ΔCoVaR and MES and (indirectly) spillovers could be helpful in assessing market contagion. Our analysis also corroborates the economic links between firms could facilitate the efficiency of the government intervention.

Finally, we identify three possible mechanisms for how government direct purchase in financial markets could help reduce systemic risk thus creating value not only for the rescued firms but also for the whole market. First, as predicted by the model of Brunnermeier, Sockin, and Xiong (2018), we find that government purchase improves market quality by reducing noise trading impact. Second, government direct purchase helps mitigate the risk of fire-sale of both rescued firms and most correlated firms. Last but not least, we find that long horizon investors (patient mutual fund investors) are attracted to the rescued stocks, which could help stabilize prices.

There are many potentially fruitful avenues for future research. For instance, a structural model and detailed account level data could be used to understand exactly how government intervention helps during market level failure. We leave them for future research.

Table I
Main Information about China's Saving the Market Plan.

Panel A chronicles the actions of the national team during the summer of 2015. Panel B provides information of the measures of main regulators in response of the stock market crash in the summer of 2015. Column "Change" represents the change of the CSI 300 Index on the corresponding date. The information and calculations are based on Wind.

Date	Change	Actions	Comment
Panel A: National Team			
7/3/2015	-5.41%	CSF increased its capital from 24 billion CNY to 100 billion CNY.	Capital injection
7/4/2015		CCH announced increase in holdings of blue chips ETF in the secondary market.	
7/6/2015	2.90%	PBC announced officially that it would provide liquidity to the CSF and make sure no systemic risks. CCH pledged it would not sell shares.	
7/13/2015	2.56%	Two mutual funds set up with each size being 40 billion CNY.	
7/31/2015	0.03%	Three more mutual funds set up with a total size of 120 billion CNY. The five mutual funds began the purchase in the market in August.	Indirect shareholding
Panel B: Main Regulators			
6/28/2015		PBC cut the requirement reserve ratio (RRR) and lowered key interest rates.	
7/1/2015	-4.29%	Shanghai and Shenzhen Stock Exchanges announced the reduction of market transaction costs. CSRC relaxed financial restrictions of margin trading.	
7/4/2015		State Council announced the suspension of initial public offerings (IPO).	Rare intiative
7/8/2015	-6.75%	State-owned Assets Supervision and Administration Commission required SOEs not to sell stocks. CSRC banned large shareholders with 5% of holdings or above from selling stocks in the next 6 months.	Soothe investors
7/9/2015	6.40%	China Banking Regulatory Commission allowed more flexible mortgage terms of share-secured loans. China Insurance Regulatory Commission relaxed insurance funds invested in the blue chip stocks. China Financial Futures Exchanges increased the margin requirement of the CSI 500 index futures further from 20% to 30%.	Intensive boosting actions

Note: CSF is short for China Securities Finance Corporation Limited and CCH for China Central Huijin Investment Limited.

Table II
Main Information about Purchased Stocks.

Panel A reports the direct shareholding ratios of the national team. Panel B reports the direct shareholding ratios of the nation team. Panel C reports direct shareholdings of the nation team. The calculations are based on market prices on June 30, 2015. 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.

06/30/2015	No. of Stocks Purchased	Purchased/Total No. of Stocks	Market Cap of Purchased Stocks (Billion)	Purchased/Total Market Cap
Panel A: Direct Shareholdings				
CSF	742	26.22%	39,682	61.00%
CCH	1,117	39.51%	41,966	65.00%
Direct Shareholding	1,365	48.23%	47,917	74.00%
Panel B: Indirect Shareholdings				
CSF	2	0.07%	15	0.02%
AMPs	436	15.41%	12,003	18.56%
Funds	267	9.43%	18,877	29.18%
Indirect Shareholding	637	22.51%	27,521	42.55%
Panel C: Total Shareholdings and A-Share Market				
Total Shareholding	1,404	49.61%	49,463	76.47%
A-share	2,830	100%	64,685	100%

Note: CSF is short for China Securities Finance Corporation Limited, CCH for China Central Huijin Investment Limited, AMPs for Asset Management Plans, and Funds for Mutual Funds. The five mutual funds comprise China Merchants Fengqin Mixed Fund, E-fund Ruihui Mixed Fund, China Southern Consumption Vitality Mixed Fund, Harvest New Opportunity Mixed Fund, and ChinaAMC New Economy Mixed Fund.

Table III
Variable Descriptions

The table reports the summary statistics of variables. The firm characteristics are constructed from quarterly balance sheet information for the 2014Q1-2016Q3 period. VaR, ΔCoVaR, and MES are measured at the 5% level.

Name	Description	Source
GOV	Shares directly purchased by government / floating shares * 100	Wind
GOVD	Dummy variable takes 1 if government directly purchased the stock in 2015Q3, otherwise 0.	Wind
GOVT	Shares purchased by government / floating shares * 100	Wind
GOVTD	Dummy variable takes 1 if government purchased the stock in 2015Q3, otherwise 0.	Wind
CORR	Dummy variable takes 1 if the stock belongs to the most correlated stocks specified in Section IV, otherwise 0.	Author's calculation
FV	Logarithm of firm value.	Author's calculation
EV	Logarithm of equity value.	Author's calculation
DV	Logarithm of debt value.	Author's calculation
VOL	Quarterly average of equity volatility with a 10-days rolling frequency.	Author's calculation
IVOL	Idiosyncratic volatility of an individual stock.	Author's calculation
DP	Quarterly average of default probability * 100.	Author's calculation
VaR	Quarterly average of value-at-risk.	Author's calculation
ROLL	Quarterly bid-ask spread proxy calculated following Roll (1984).	Author's calculation
AMIHUD	Quarterly average of Amihud: Amihud = absolute stock returns / trading volume * 10^9	Author's calculation
CBeta	Quarterly average of conditional beta.	Author's calculation
ΔCoVaR	Quarterly average of change of CoVaR * 100	Author's calculation
MES	Quarterly average of marginal expected shortfall * 100	Author's calculation
NOI	Quarterly average of noise trader arrival rate calculated by the PIN model / 10,000.	Author's calculation
OBISH	Quarterly average of order imbalance (in numbers) * 100.	Author's calculation
OBIVOL	Quarterly average of order imbalance (in volume) * 100.	Author's calculation
ROA	Net Income / total assets	CSMAR
M/B	Market / book value of equity	CSMAR
LEV	Total liabilities / total assets	CSMAR
CF	Net Operating Cash Flow / total assets	CSMAR
DIV	Dividend / price * 100	CSMAR
EXPORT	Dummy variable takes 1 if a company has foreign sales in the last fiscal year, otherwise 0	Wind
SIZE	logarithm of book value of asset.	CSMAR
SOE	Dummy variable takes 1 if the firm is wholly or partially owned by the government, otherwise 0.	CSMAR

Table IV
Summary Statistics

The table reports the summary statistics of the main variables for the period from January 1, 2014 to September 30, 2016. The independent variables are constructed from quarterly balance sheet information for the previous fiscal quarter. VaR, ΔCoVaR, and MES are measured at the 5% level.

Variable	Obs	Mean	Std	Min	P25	Median	P75	Max
Panel A: Dependent Variables								
VOL	26,896	0.534	0.246	0.175	0.345	0.476	0.668	1.224
IVOL	26,857	0.376	0.370	0	0.250	0.345	0.460	39.03
DP	26,006	2.182	3.791	0	0.006	0.344	2.545	17.22
VaR	26,923	5.703	2.301	2.181	4.009	5.142	6.900	12.74
ROLL	25,897	0.357	0.570	0	0	0.097	0.451	2.579
AMIHUD	26,923	1.015	4.792	0.0150	0.115	0.222	0.438	43.02
CBeta	26,923	1.105	0.256	0.460	0.941	1.106	1.270	1.783
ΔCoVaR	26,923	2.171	0.780	0.871	1.570	2.016	2.675	3.916
MES	26,923	5.335	2.486	1.750	3.501	4.670	6.630	12.76
NOI	23,356	0.326	0.405	0	0	0.180	0.525	1.684
OIBN	23,324	0.354	7.810	-59.10	-3.185	0.142	3.642	58.18
OIBV	23,324	0.437	7.815	-59.02	-3.097	0.224	3.729	58.46
Panel B: Firm-level Variables								
ROA	26,923	0.285	7.064	-18.40	-0.986	1.398	3.271	13.11
CF	26,923	0.577	4.040	-9.812	-0.456	2.349	3.515	4.207
LEV	26,923	0.486	0.228	0.0146	0.316	0.463	0.698	1.719
M/B	26,923	3.938	3.215	0.393	1.616	2.733	5.795	272.2
DIV	26,878	0.319	0.533	-0.667	-0.198	0.345	0.707	5.871
SIZE	26,923	21.73	1.345	17.94	20.61	21.54	22.56	30.66
EXPORT	26,923	0.556	0.497	0	0	1	1	1
SOE	26,923	0.367	0.482	0	0	0	1	1
GOV	26,923	1.538	2.482	0	0	0.400	2.680	32.78
GOVD	26,923	0.529	0.499	0	0	1	1	1
GOVT	26,923	2.570	4.391	0	0	0.480	3.720	44.73
GOVTD	26,923	0.543	0.498	0	0	1	1	1

Table V
Summary Statistics for Treated and Control Stocks

Panel A compares the empirical averages of main variables for the rescued stocks with the least correlated stocks and Panel B compares the empirical averages of main variables for the most correlated stocks with the least correlated stocks. p-value of differences are displayed and none of the differences is significant at the 10% level or better. All variables are defined in Table III.

Panel A: Rescued Stocks versus Least Correlated Stocks

	Before Purchase			After Purchase		
Variable	Rescued Stocks	Least Correlated Stocks	p-Value	Rescued Stocks	Least Correlated Stocks	p-Value
ROA	3.101	3.023	0.37	-2.883	-2.863	0.91
LEV	0.408	0.406	0.60	0.574	0.577	0.51
M/B	3.360	3.349	0.77	4.512	4.555	0.51
CF	-0.684	-0.563	0.16	1.980	1.914	0.28
DIV	0.546	0.544	0.74	0.060	0.069	0.48
SIZE	21.123	21.149	0.28	22.402	22.415	0.57
EXPORT	0.564	0.546	0.11	0.571	0.558	0.20

Panel B: Most Correlated Stocks versus Least Correlated Stocks

	Before Purchase			After Purchase		
Variable	Most Correlated Stocks	Least Correlated Stocks	p-Value	Most Correlated Stocks	Least Correlated Stocks	p-Value
ROA	3.087	3.023	0.48	-2.984	-2.863	0.47
LEV	0.406	0.406	0.94	0.574	0.577	0.57
M/B	3.499	3.349	0.16	4.491	4.555	0.33
CF	-0.598	-0.563	0.15	2.008	1.914	0.12
DIV	0.554	0.544	0.17	0.062	0.069	0.58
SIZE	21.154	21.149	0.87	22.399	22.415	0.49
EXPORT	0.495	0.546	0.10	0.500	0.558	0.11

Table VI
Value Creation of Government Purchase

This table reports the results of the difference-in-differences (DID) tests on the value creation of the government direct purchase. ΔFV, ΔDV, and ΔEV are the differences of firm values, debt values, and equity values between June 30, 2015 and September 30, 2015. White standard errors robust to heteroskedasticity are given in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	ΔFV		ΔDV		ΔEV	
	(1)	(2)	(3)	(4)	(5)	(6)
GOV	0.0070***		0.0009**		0.0048***	
	(0.0015)		(0.0004)		(0.0016)	
GOVD		0.0337***		0.0069**		0.0075
		(0.0102)		(0.0031)		(0.0112)
ROA	1.3862	1.4465	0.0758	0.0788	0.2010	0.2683
	(1.7596)	(1.7263)	(0.2581)	(0.2572)	(1.4234)	(1.4280)
LEV	-0.2431	-0.2344	-0.0892*	-0.0926*	-0.3282	-0.2964
	(0.3116)	(0.3133)	(0.0520)	(0.0527)	(0.2495)	(0.2450)
M/B	-0.0074	-0.0094	-0.0074	-0.0079	0.0120	0.0122
	(0.0324)	(0.0326)	(0.0071)	(0.0070)	(0.0320)	(0.0319)
CF	1.8095	1.9053	0.6490	0.7016	1.6079	1.4401
	(3.3846)	(3.3761)	(0.7353)	(0.7531)	(3.0535)	(3.0384)
DIV	0.1801*	0.1753*	0.0134	0.0125	0.0868	0.0856
	(0.1076)	(0.1064)	(0.0213)	(0.0215)	(0.1064)	(0.1073)
SIZE	-0.0728	-0.0872	-0.0219	-0.0251	-0.0155	-0.0173
	(0.0648)	(0.0656)	(0.0183)	(0.0182)	(0.0637)	(0.0638)
EXPORT	-0.0038	-0.0031	0.0009	0.0010	0.0009	0.0014
	(0.0099)	(0.0099)	(0.0029)	(0.0029)	(0.0117)	(0.0116)
SOE	0.0339***	0.0357***	0.0031	0.0031	-0.0212**	-0.0183*
	(0.0089)	(0.0089)	(0.0026)	(0.0026)	(0.0103)	(0.0102)
Constant	1.1624	1.4753	0.5491	0.6204	-0.1319	-0.1043
	(1.4910)	(1.5100)	(0.4201)	(0.4174)	(1.4735)	(1.4754)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1634	1634	1634	1634	1634	1634
Adj.R^2	0.112	0.108	0.023	0.025	0.059	0.055

Table VII
Effects of Government Purchase on VOL

This table reports the results of the difference-in-differences (DID) tests on the impacts of the government direct purchase on equity volitility, by comparing the rescued stocks to the least correlated stocks. All variables are defined in Table III. VaR, ΔCoVaR, and MES are measured at the 5% level. Standard errors adjusted for firm-level clustering displayed in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)
GOVD×POST	-0.0344***		-0.0451***	
	(0.0042)		(0.0043)	
GOVD	-0.0024			
	(0.0037)			
GOV×POST		-0.0100***		-0.0112***
		(0.0009)		(0.0010)
GOV		0.0008		
		(0.0008)		
ROA	-0.0001	-0.0001	-0.0007	-0.0006
	(0.0009)	(0.0009)	(0.0007)	(0.0007)
LEV	0.0071	0.0051	0.0120	0.0111
	(0.0177)	(0.0180)	(0.0172)	(0.0172)
M/B	-0.0009	-0.0006	-0.0012	-0.0012
	(0.0021)	(0.0021)	(0.0019)	(0.0019)
CF	-0.0007	-0.0008	0.0008	0.0007
	(0.0011)	(0.0011)	(0.0011)	(0.0011)
DIV	-0.0067	-0.0063	0.0019	0.0019
	(0.0135)	(0.0139)	(0.0126)	(0.0129)
SIZE	-0.0005	-0.0005	-0.0025	-0.0025
	(0.0038)	(0.0038)	(0.0035)	(0.0035)
EXPORT	0.0030	0.0032	-0.0129*	-0.0108
	(0.0034)	(0.0034)	(0.0072)	(0.0071)
SOE	-0.0511***	-0.0504***		
	(0.0033)	(0.0033)		
Time FE	Yes	Yes	Yes	Yes
Firm FE	No	No	Yes	Yes
Industry FE	Yes	Yes	No	No
Observations	21911	21911	21911	21911
Adj.R^2	0.711	0.714	0.765	0.767

Table VIII
Effects of Government Purchase on IVOL

This table reports the results of the difference-in-differences (DID) tests on the impacts of the government direct purchase on idiosyncratic volitility, by comparing the rescued stocks to the least correlated stocks. All variables are defined in Table III. VaR, ΔCoVaR, and MES are measured at the 5% level. Standard errors adjusted for firm-level clustering displayed in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)
GOVD×POST	-0.0165***		-0.0237***	
	(0.0038)		(0.0039)	
GOVD	-0.0149***			
	(0.0031)			
GOV×POST		-0.0053***		-0.0062***
		(0.0007)		(0.0007)
GOV		-0.0007		
		(0.0006)		
ROA	-0.0009	-0.0009	-0.0015*	-0.0014
	(0.0009)	(0.0009)	(0.0009)	(0.0009)
LEV	0.0041	0.0028	0.0209	0.0203
	(0.0176)	(0.0179)	(0.0175)	(0.0174)
M/B	0.0025	0.0029	0.0024	0.0024
	(0.0021)	(0.0022)	(0.0022)	(0.0022)
CF	-0.0011	-0.0011	0.0003	0.0002
	(0.0011)	(0.0011)	(0.0011)	(0.0011)
DIV	-0.0143	-0.0133	-0.0092	-0.0092
	(0.0142)	(0.0145)	(0.0141)	(0.0142)
SIZE	-0.0020	-0.0018	-0.0044	-0.0043
	(0.0037)	(0.0037)	(0.0036)	(0.0036)
EXPORT	-0.0002	-0.0003	-0.0039	-0.0027
	(0.0028)	(0.0028)	(0.0060)	(0.0060)
SOE	-0.0336***	-0.0341***		
	(0.0027)	(0.0027)		
Time FE	Yes	Yes	Yes	Yes
Firm FE	No	No	Yes	Yes
Industry FE	Yes	Yes	No	No
Observations	20686	20686	20686	20686
Adj.R^2	0.359	0.359	0.387	0.389

Table IX
Effects of Government Purchase on DP

This table reports the results of the difference-in-differences (DID) tests on the impacts of the government direct purchase on default probalility, by comparing the rescued stocks to the least correlated stocks. All variables are defined in Table III. VaR, ΔCoVaR, and MES are measured at the 5% level. Standard errors adjusted for firm-level clustering displayed in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)
GOVD×POST	0.0142		0.0538	
	(0.0660)		(0.0661)	
GOVD	-0.1200			
	(0.0873)			
GOV×POST		-0.0648***		-0.0495***
		(0.0124)		(0.0116)
GOV		0.0213		
		(0.0160)		
ROA	0.0009	0.0003	-0.0027	-0.0036
	(0.0243)	(0.0242)	(0.0186)	(0.0186)
LEV	-0.1693	-0.2083	-0.3300	-0.3651
	(0.4735)	(0.4751)	(0.4132)	(0.4141)
M/B	-0.0336	-0.0304	-0.0256	-0.0239
	(0.0550)	(0.0550)	(0.0482)	(0.0481)
CF	0.0159	0.0170	0.0162	0.0178
	(0.0317)	(0.0317)	(0.0266)	(0.0266)
DIV	0.0041	0.0030	0.0541	0.0448
	(0.4031)	(0.4045)	(0.3562)	(0.3570)
SIZE	-0.0111	-0.0089	0.0452	0.0459
	(0.0985)	(0.0978)	(0.0793)	(0.0790)
EXPORT	0.1268	0.1238	-0.0414	-0.0394
	(0.0772)	(0.0777)	(0.1555)	(0.1565)
SOE	0.6809***	0.6692***		
	(0.0812)	(0.0807)		
Time FE	Yes	Yes	Yes	Yes
Firm FE	No	No	Yes	Yes
Industry FE	Yes	Yes	No	No
Observations	21407	21407	21407	21407
Adj.R^2	0.485	0.486	0.544	0.545

Table X
Effects of Government Purchase on VaR

This table reports the results of the difference-in-differences (DID) tests on the impacts of the government direct purchase on VaR, by comparing the rescued stocks to the least correlated stocks. All variables are defined in Table III. VaR, ΔCoVaR, and MES are measured at the 5% level. Standard errors adjusted for firm-level clustering displayed in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)
GOVD×POST	-0.2698***		-0.4056***	
	(0.0399)		(0.0418)	
GOVD	-0.0184			
	(0.0402)			
GOV×POST		-0.0867***		-0.1015***
		(0.0078)		(0.0102)
GOV		-0.0018		
		(0.0097)		
ROA	0.0023	0.0017	-0.0076	-0.0070
	(0.0089)	(0.0089)	(0.0063)	(0.0062)
LEV	0.0260	0.0043	0.0387	0.0310
	(0.1658)	(0.1671)	(0.1390)	(0.1388)
M/B	-0.0131	-0.0098	-0.0094	-0.0091
	(0.0205)	(0.0204)	(0.0163)	(0.0164)
CF	-0.0121	-0.0119	0.0041	0.0025
	(0.0106)	(0.0108)	(0.0093)	(0.0095)
DIV	-0.1721	-0.1736	-0.0831	-0.0830
	(0.1304)	(0.1328)	(0.1071)	(0.1091)
SIZE	-0.0070	-0.0076	-0.0404	-0.0406
	(0.0351)	(0.0351)	(0.0307)	(0.0306)
EXPORT	0.0097	0.0136	-0.1179*	-0.0996
	(0.0394)	(0.0394)	(0.0670)	(0.0663)
SOE	-0.5822***	-0.5669***		
	(0.0381)	(0.0378)		
Time FE	Yes	Yes	Yes	Yes
Firm FE	No	No	Yes	Yes
Industry FE	Yes	Yes	No	No
Observations	21926	21926	21926	21926
Adj.R^2	0.660	0.664	0.741	0.743

Table XI
Effects of Government Purchase on ROLL

This table reports the results of the difference-in-differences (DID) tests on the impacts of the government direct purchase on Roll, a proxy for liquidity, by comparing the rescued stocks to the least correlated stocks. All variables are defined in Table III. VaR, ΔCoVaR, and MES are measured at the 5% level. Standard errors adjusted for firm-level clustering displayed in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)
GOVD×POST	-0.0434***		-0.0486***	
	(0.0152)		(0.0155)	
GOVD	0.0015			
	(0.0076)			
GOV×POST		-0.0067***		-0.0085***
		(0.0020)		(0.0022)
GOV		0.0004		
		(0.0013)		
ROA	0.0036	0.0037	0.0039	0.0040
	(0.0039)	(0.0039)	(0.0039)	(0.0039)
LEV	-0.0589	-0.0574	-0.0525	-0.0511
	(0.0682)	(0.0680)	(0.0739)	(0.0739)
M/B	-0.0051	-0.0049	0.0001	0.0001
	(0.0085)	(0.0084)	(0.0093)	(0.0093)
CF	0.0093***	0.0090***	0.0090**	0.0087**
	(0.0035)	(0.0035)	(0.0039)	(0.0039)
DIV	-0.0214	-0.0195	-0.0037	-0.0028
	(0.0539)	(0.0537)	(0.0562)	(0.0560)
SIZE	0.0095	0.0094	0.0004	0.0002
	(0.0139)	(0.0138)	(0.0153)	(0.0152)
EXPORT	-0.0059	-0.0058	-0.0008	0.0010
	(0.0076)	(0.0076)	(0.0284)	(0.0285)
SOE	-0.0424***	-0.0427***		
	(0.0066)	(0.0066)		
Time FE	Yes	Yes	Yes	Yes
Firm FE	No	No	Yes	Yes
Industry FE	Yes	Yes	No	No
Observations	21176	21176	21176	21176
Adj.R^2	0.378	0.377	0.401	0.401

Table XII
Effects of Government Purchase on AMIHUD

This table reports the results of the difference-in-differences (DID) tests on the impacts of the government direct purchase on Amihud, a proxy for liquidity, by comparing the rescued stocks to the least correlated stocks. All variables are defined in Table III. VaR, ΔCoVaR, and MES are measured at the 5% level. Standard errors adjusted for firm-level clustering displayed in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)
GOVD×POST	-0.4387***		-0.6860***	
	(0.0704)		(0.0831)	
GOVD	0.1158*			
	(0.0615)			
GOV×POST		-0.0435***		-0.0569***
		(0.0154)		(0.0197)
GOV		0.0000		
		(0.0166)		
ROA	-0.0051	-0.0045	-0.0030	-0.0014
	(0.0082)	(0.0082)	(0.0121)	(0.0120)
LEV	-0.9271**	-0.9003**	-0.8376**	-0.7812*
	(0.4016)	(0.4009)	(0.4114)	(0.4087)
M/B	0.0758*	0.0758*	0.0676	0.0646
	(0.0418)	(0.0417)	(0.0443)	(0.0436)
CF	0.0044	0.0015	0.0225	0.0167
	(0.0199)	(0.0197)	(0.0213)	(0.0209)
DIV	-0.2715	-0.2574	-0.2149	-0.1911
	(0.3015)	(0.3003)	(0.2939)	(0.2906)
SIZE	-0.0925*	-0.0948*	-0.0648	-0.0684
	(0.0496)	(0.0496)	(0.0527)	(0.0525)
EXPORT	-0.0449	-0.0427	-0.0620	-0.0435
	(0.0464)	(0.0462)	(0.1288)	(0.1268)
SOE	-0.3732***	-0.3671***		
	(0.0390)	(0.0381)		
Time FE	Yes	Yes	Yes	Yes
Firm FE	No	No	Yes	Yes
Industry FE	Yes	Yes	No	No
Observations	21926	21926	21926	21926
Adj.R^2	0.032	0.031	0.030	0.026

Table XIII
Effects of Government Purchase on CBeta

This table reports the results of the difference-in-differences (DID) tests on the impacts of the government direct purchase on CBeta, by comparing the rescued stocks to the least correlated stocks. All variables are defined in Table III. VaR, ΔCoVaR, and MES are measured at the 5% level. Standard errors adjusted for firm-level clustering displayed in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)
GOVD×POST	-0.0769***		-0.0822***	
	(0.0090)		(0.0090)	
GOVD	0.1047***			
	(0.0091)			
GOV×POST		-0.0101***		-0.0100***
		(0.0020)		(0.0020)
GOV		0.0079***		
		(0.0021)		
ROA	-0.0014	-0.0013	0.0002	0.0004
	(0.0020)	(0.0020)	(0.0016)	(0.0016)
LEV	0.0512	0.0561	0.0247	0.0295
	(0.0468)	(0.0472)	(0.0373)	(0.0379)
M/B	-0.0020	-0.0031	0.0000	-0.0002
	(0.0050)	(0.0052)	(0.0043)	(0.0043)
CF	0.0025	0.0022	0.0044**	0.0038*
	(0.0025)	(0.0025)	(0.0022)	(0.0022)
DIV	0.0328	0.0300	0.0351	0.0373
	(0.0294)	(0.0298)	(0.0251)	(0.0255)
SIZE	-0.0079	-0.0092	-0.0125*	-0.0129*
	(0.0092)	(0.0093)	(0.0075)	(0.0076)
EXPORT	0.0060	0.0078	-0.0480***	-0.0454***
	(0.0078)	(0.0080)	(0.0135)	(0.0135)
SOE	-0.0334***	-0.0254***		
	(0.0076)	(0.0077)		
Time FE	Yes	Yes	Yes	Yes
Firm FE	No	No	Yes	Yes
Industry FE	Yes	Yes	No	No
Observations	21926	21926	21926	21926
Adj.R^2	0.091	0.074	0.072	0.067

Table XIV
Effects of Government Purchase on ΔCoVaR

This table reports the results of the difference-in-differences (DID) tests on the impacts of the government direct purchase on ΔCoVaR, by comparing the rescued stocks to the least correlated stocks. All variables are defined in Table III. VaR, ΔCoVaR, and MES are measured at the 5% level. Standard errors adjusted for firm-level clustering displayed in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)
GOVD×POST	-0.1011***		-0.0886***	
	(0.0151)		(0.0140)	
GOVD	0.1693***			
	(0.0131)			
GOV×POST		-0.0284***		-0.0268***
		(0.0033)		(0.0029)
GOV		0.0226***		
		(0.0037)		
ROA	-0.0042	-0.0042	-0.0027	-0.0026
	(0.0036)	(0.0036)	(0.0024)	(0.0024)
LEV	0.1030	0.1012	-0.0067	-0.0112
	(0.0741)	(0.0737)	(0.0517)	(0.0516)
M/B	-0.0099	-0.0114	-0.0043	-0.0041
	(0.0084)	(0.0085)	(0.0061)	(0.0061)
CF	0.0023	0.0023	0.0013	0.0010
	(0.0040)	(0.0041)	(0.0033)	(0.0034)
DIV	-0.0102	-0.0174	-0.0404	-0.0413
	(0.0517)	(0.0527)	(0.0394)	(0.0398)
SIZE	-0.0020	-0.0031	-0.0079	-0.0078
	(0.0146)	(0.0149)	(0.0116)	(0.0115)
EXPORT	0.0456***	0.0482***	-0.0334	-0.0289
	(0.0137)	(0.0140)	(0.0250)	(0.0250)
SOE	0.0208*	0.0315**		
	(0.0125)	(0.0126)		
Time FE	Yes	Yes	Yes	Yes
Firm FE	No	No	Yes	Yes
Industry FE	Yes	Yes	No	No
Observations	21926	21926	21926	21926
Adj.R^2	0.661	0.658	0.743	0.744

Table XV
Effects of Government Purchase on MES

This table reports the results of the difference-in-differences (DID) tests on the impacts of the government direct purchase on MES, by comparing the rescued stocks to the least correlated stocks. All variables are defined in Table III. VaR, ΔCoVaR, and MES are measured at the 5% level. Standard errors adjusted for firm-level clustering displayed in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)
GOVD×POST	-0.3795***		-0.3937***	
	(0.0404)		(0.0411)	
GOVD	0.2353***			
	(0.0338)			
GOV×POST		-0.0810***		-0.0873***
		(0.0092)		(0.0100)
GOV		0.0244***		
		(0.0071)		
ROA	-0.0011	-0.0011	0.0011	0.0017
	(0.0104)	(0.0105)	(0.0081)	(0.0082)
LEV	0.2983	0.2982	0.0330	0.0323
	(0.1985)	(0.2004)	(0.1569)	(0.1587)
M/B	-0.0300	-0.0305	-0.0286	-0.0286
	(0.0231)	(0.0232)	(0.0183)	(0.0183)
CF	0.0122	0.0112	0.0181*	0.0163
	(0.0117)	(0.0117)	(0.0103)	(0.0104)
DIV	-0.0901	-0.0942	-0.0042	-0.0018
	(0.1482)	(0.1509)	(0.1244)	(0.1269)
SIZE	-0.0116	-0.0142	-0.0018	-0.0023
	(0.0383)	(0.0387)	(0.0310)	(0.0312)
EXPORT	0.0030	0.0086	-0.1469**	-0.1304**
	(0.0372)	(0.0374)	(0.0602)	(0.0595)
SOE	-0.2245***	-0.2029***		
	(0.0363)	(0.0360)		
Time FE	Yes	Yes	Yes	Yes
Firm FE	No	No	Yes	Yes
Industry FE	Yes	Yes	No	No
Observations	21926	21926	21926	21926
Adj.R^2	0.756	0.757	0.829	0.830

Table XVI
Value Creation of Government Purchase

This table reports the results of the difference-in-differences (DID) tests on the value creation in the spill-over effects of the government purchase. ΔFV, ΔDV, and ΔEV are the differences of firm values, debt values, and equity values between June 30, 2015 and September 30, 2015. White standard errors robust to heteroskedasticity are given in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	ΔFV	ΔDV	ΔEV
	(1)	(2)	(3)
CORR	0.0423***	0.0104***	0.0174
	(0.0127)	(0.0037)	(0.0139)
ROA	6.0690*	0.4335**	6.4451*
	(3.6177)	(0.2158)	(3.5828)
LEV	0.3278	-0.0113	-0.7429
	(0.6937)	(0.0804)	(0.5821)
M/B	-0.8063	-0.1474**	0.1504
	(0.5924)	(0.0658)	(0.5052)
CF	2.8671	0.4614	28.4157**
	(14.5831)	(1.3549)	(11.9981)
DIV	1.0786	0.1631**	-0.1054
	(0.7509)	(0.0828)	(0.6362)
SIZE	-6.3318	-1.2125**	1.0548
	(4.4859)	(0.4996)	(3.8391)
EXPORT	0.0119	0.0044	0.0161
	(0.0140)	(0.0036)	(0.0162)
SOE	0.0676***	0.0031	0.0146
	(0.0130)	(0.0036)	(0.0148)
Constant	140.6825	27.0345**	-24.2827
	(100.1272)	(11.1499)	(85.6724)
Industry FE	Yes	Yes	Yes
Observations	1149	1149	1149
Adj.R^2	0.113	0.024	0.074

Table XVII
Spillover Effects of Government Purchase

This table reports the results of the difference-in-differences (DID) tests on the spillovers of the government direct purchase. All variables are defined in Table III. VaR, ΔCoVaR, and MES are measured at the 5% level. Standard errors adjusted for firm-level clustering displayed in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	VOL	IVOL	DP	VaR	ROLL	AMIHUD	CBeta	ΔCoVaR	MES
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
CORR×POST	-0.0812***	-0.0317***	0.0499	-0.8774***	-0.1508***	-19.7182***	-0.0717***	-0.1692***	-0.4844***
	(0.0056)	(0.0046)	(0.0695)	(0.0570)	(0.0187)	(1.1013)	(0.0096)	(0.0163)	(0.0454)
ROA	-0.0006	-0.0012	0.0409**	-0.0050	0.0103**	0.0803	-0.0006	-0.0021	0.0058
	(0.0010)	(0.0011)	(0.0178)	(0.0106)	(0.0051)	(0.3094)	(0.0020)	(0.0031)	(0.0099)
LEV	0.0147	0.0096	0.3834	0.0156	0.1123	2.5998	0.1160***	0.0825	0.0832
	(0.0242)	(0.0249)	(0.4112)	(0.2654)	(0.1089)	(8.7100)	(0.0391)	(0.0797)	(0.1932)
M/B	-0.0033	0.0003	0.0125	-0.0571*	-0.0065	-1.1255	-0.0031	-0.0080	-0.0365**
	(0.0027)	(0.0028)	(0.0433)	(0.0295)	(0.0111)	(0.8299)	(0.0037)	(0.0086)	(0.0185)
CF	0.0070***	0.0085***	0.0120	0.1309***	0.0217***	4.8778***	0.0096***	0.0275***	0.0492***
	(0.0012)	(0.0014)	(0.0246)	(0.0199)	(0.0061)	(0.8489)	(0.0018)	(0.0043)	(0.0081)
DIV	0.0036	-0.0476***	-0.3496	-0.1125	-0.2833***	-6.3935	0.0383*	-0.0572	0.0020
	(0.0146)	(0.0152)	(0.2925)	(0.1573)	(0.0628)	(5.1811)	(0.0225)	(0.0445)	(0.1381)
SIZE	0.0074*	0.0152***	0.1400**	0.2118***	0.0485***	11.2173***	-0.0023	0.0227*	0.0351
	(0.0039)	(0.0042)	(0.0659)	(0.0508)	(0.0152)	(1.8848)	(0.0064)	(0.0127)	(0.0271)
EXPORT	0.0056	0.0151**	0.3983***	0.1368*	0.0529**	4.3621***	-0.0579***	0.0319	-0.1790**
	(0.0068)	(0.0066)	(0.1484)	(0.0761)	(0.0265)	(1.3551)	(0.0140)	(0.0231)	(0.0717)
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	20122	18489	18407	20125	19160	20125	20125	20125	20125
Adj.R^2	0.692	0.399	0.542	0.651	0.305	0.160	0.073	0.710	0.793

Table XVIII
Mechanism: Less Noise Trading

This table reports the results of the difference-in-differences (DID) tests on the impacts of the government purchase on mitigating noise trader risk (NOI). Columns under "Rescued" and "Most Corr." use the rescued stocks and the most correlated stocks as the treatment group, respectively. All variables are defined in Table III. Standard errors adjusted for firm-level clustering displayed in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	Rescued	Most Corr.
	(1)	(2)
GOVD×POST	-0.0976***	
	(0.0113)	
CORR×POST		-0.0422***
		(0.0119)
ROA	-0.0026*	0.0012
	(0.0014)	(0.0017)
LEV	0.0669	0.1614***
	(0.0439)	(0.0503)
M/B	0.0121**	-0.0070
	(0.0048)	(0.0059)
CF	0.0027	-0.0063***
	(0.0029)	(0.0023)
DIV	-0.0489	-0.0607**
	(0.0306)	(0.0301)
SIZE	0.0026	0.0076
	(0.0066)	(0.0064)
EXPORT	0.0044	0.0216
	(0.0184)	(0.0152)
Time FE	Yes	Yes
Firm FE	Yes	Yes
Observations	19150	17315
Adj.R^2	0.238	0.247

Table XIX
Mechanism: Less Noise Trading

This table reports the results of the difference-in-differences (DID) tests on the government's mitigating noise trading risk (NOI). All variables are defined in Table III. VaR, ΔCoVaR, and MES are measured at the 5% level. Standard errors adjusted for firm-level clustering displayed in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	VOL	IVOL	DP	VaR	ROLL	AMIHUD	CBeta	ΔCoVaR	MES
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
GOVD×POST×NOI	-0.0275***	-0.0171***	-0.3989***	-0.2347***	-0.0303	-0.5572***	-0.0209*	-0.0584***	0.0367
	(0.0057)	(0.0054)	(0.1140)	(0.0547)	(0.0210)	(0.1194)	(0.0113)	(0.0195)	(0.0624)
GOVD×POST	-0.0158***	-0.0033	0.3659***	-0.1366***	-0.0265	-0.1769**	-0.0628***	-0.0051	-0.3285***
	(0.0051)	(0.0044)	(0.0914)	(0.0488)	(0.0183)	(0.0870)	(0.0106)	(0.0171)	(0.0527)
NOI	0.1447***	0.1101***	1.1451***	1.2742***	0.1531***	1.1890***	0.0952***	0.4133***	0.6652***
	(0.0056)	(0.0050)	(0.1298)	(0.0556)	(0.0221)	(0.1578)	(0.0103)	(0.0190)	(0.0555)
ROA	-0.0003	-0.0012	0.0102	-0.0040	0.0056	-0.0046	0.0009	-0.0018	0.0021
	(0.0008)	(0.0009)	(0.0205)	(0.0065)	(0.0042)	(0.0104)	(0.0018)	(0.0024)	(0.0096)
LEV	-0.0007	0.0187	-0.4460	0.0112	-0.0563	-0.7393**	0.0241	-0.0039	0.1022
	(0.0177)	(0.0181)	(0.4207)	(0.1508)	(0.0781)	(0.3081)	(0.0412)	(0.0547)	(0.1692)
M/B	-0.0047**	-0.0010	-0.0785	-0.0425**	-0.0017	0.0147	-0.0006	-0.0146**	-0.0360*
	(0.0022)	(0.0025)	(0.0575)	(0.0192)	(0.0104)	(0.0329)	(0.0049)	(0.0069)	(0.0209)
CF	0.0001	-0.0008	-0.0016	-0.0031	0.0083**	0.0038	0.0040*	-0.0013	0.0155
	(0.0010)	(0.0010)	(0.0273)	(0.0087)	(0.0041)	(0.0175)	(0.0023)	(0.0031)	(0.0104)
DIV	0.0095	0.0042	0.1329	0.0451	0.0360	0.0573	0.0416	-0.0052	0.0621
	(0.0128)	(0.0138)	(0.3663)	(0.1152)	(0.0627)	(0.1531)	(0.0286)	(0.0426)	(0.1413)
SIZE	-0.0017	-0.0037	0.0634	-0.0339	0.0011	-0.0357	-0.0115	-0.0054	-0.0087
	(0.0041)	(0.0040)	(0.0920)	(0.0365)	(0.0170)	(0.0563)	(0.0085)	(0.0134)	(0.0352)
EXPORT	-0.0070	-0.0019	-0.0302	-0.0772	0.0098	-0.0136	-0.0538***	-0.0167	-0.1470**
	(0.0073)	(0.0062)	(0.1680)	(0.0700)	(0.0313)	(0.1193)	(0.0151)	(0.0270)	(0.0658)
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	19150	18171	18817	19150	18599	19150	19150	19150	19150
Adj.R^2	0.796	0.411	0.562	0.773	0.423	0.035	0.078	0.768	0.842

Table XX
Mechanism: Less Noise Trading (Spill-Over)

This table reports the results of the difference-in-differences (DID) tests on the spillover effects of government's mitigating noise trading risk (NOI). All variables are defined in Table III. VaR, ΔCoVaR, and MES are measured at the 5% level. Standard errors adjusted for firm-level clustering displayed in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	VOL	IVOL	DP	VaR	ROLL	AMIHUD	CBeta	ΔCoVaR	MES
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
CORR×POST×NOI	-0.0140	-0.0388***	-0.6775***	-0.0343	-0.1450	2.6148	-0.0595***	-0.0119	-0.4132***
	(0.0095)	(0.0076)	(0.1460)	(0.1013)	(0.2544)	(3.0153)	(0.0121)	(0.0257)	(0.0791)
CORR×POST	-0.0595***	-0.0070	0.4718***	-0.7159***	-0.0853	-18.7501***	-0.0466***	-0.1218***	-0.2673***
	(0.0076)	(0.0059)	(0.0996)	(0.0783)	(0.1159)	(1.7236)	(0.0112)	(0.0212)	(0.0572)
NOI	0.1633***	0.1262***	1.4000***	1.4501***	0.6433	11.3186***	0.1363***	0.4638***	0.9410***
	(0.0079)	(0.0065)	(0.1584)	(0.0829)	(0.4335)	(2.5301)	(0.0121)	(0.0219)	(0.0724)
ROA	-0.0013	-0.0019	0.0197	-0.0100	0.0066	0.0746	0.0005	-0.0031	0.0078
	(0.0012)	(0.0012)	(0.0160)	(0.0126)	(0.0058)	(0.3580)	(0.0022)	(0.0036)	(0.0112)
LEV	0.0011	0.0094	0.9372**	-0.0239	-0.1613	-1.2462	0.1030**	0.0351	0.0174
	(0.0265)	(0.0257)	(0.4296)	(0.2778)	(0.2020)	(8.1877)	(0.0458)	(0.0846)	(0.2139)
M/B	-0.0050*	-0.0028	-0.0282	-0.0794**	-0.0061	-2.2070**	-0.0065	-0.0152	-0.0470**
	(0.0030)	(0.0030)	(0.0496)	(0.0322)	(0.0059)	(0.9186)	(0.0041)	(0.0095)	(0.0208)
CF	0.0070***	0.0077***	-0.0089	0.1230***	0.0180***	5.2915***	0.0083***	0.0250***	0.0465***
	(0.0013)	(0.0015)	(0.0261)	(0.0208)	(0.0064)	(0.8959)	(0.0019)	(0.0045)	(0.0086)
DIV	0.0221	-0.0293*	-0.2196	0.0978	-0.2441***	-0.3823	0.0452*	0.0026	0.0626
	(0.0186)	(0.0156)	(0.3010)	(0.1977)	(0.0597)	(4.9993)	(0.0262)	(0.0557)	(0.1535)
SIZE	0.0071	0.0119***	0.0345	0.2108***	0.0533***	13.2017***	-0.0005	0.0267*	0.0436
	(0.0046)	(0.0046)	(0.0673)	(0.0582)	(0.0193)	(2.1537)	(0.0067)	(0.0151)	(0.0307)
EXPORT	0.0074	0.0108	0.4199***	0.1750**	0.0864***	6.8271***	-0.0623***	0.0384	-0.1333*
	(0.0076)	(0.0070)	(0.1597)	(0.0867)	(0.0323)	(1.5589)	(0.0146)	(0.0257)	(0.0705)
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	17315	15976	15964	17315	16598	17315	17315	17315	17315
Adj.R^2	0.723	0.404	0.561	0.679	0.288	0.176	0.084	0.737	0.806

Table XXI
Mechanism: More Buy Orders

This table reports the results of the difference-in-differences (DID) tests on the possible mechanism of the government direct purchase. All variables are defined in Table III. Standard errors adjusted for firm-level clustering displayed in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	Rescued Stocks		Most Correlated Stocks	
	OIBN	OIBV	OIBN	OIBV
	(1)	(2)	(3)	(4)
GOVD×POST	0.616**	0.623**		
	(0.253)	(0.254)		
CORR×POST			2.199***	2.206***
			(0.269)	(0.269)
ROA	-0.020	-0.022	-0.094	-0.096
	(0.055)	(0.055)	(0.071)	(0.072)
LEV	-2.616**	-2.641**	-5.652***	-5.716***
	(1.244)	(1.249)	(1.776)	(1.772)
M/B	0.075	0.080	0.039	0.046
	(0.148)	(0.148)	(0.144)	(0.144)
CF	0.058	0.058	0.033	0.038
	(0.076)	(0.076)	(0.067)	(0.067)
DIV	-0.367	-0.378	-1.671*	-1.682**
	(0.797)	(0.801)	(0.855)	(0.857)
SIZE	0.321	0.321	-0.017	-0.015
	(0.230)	(0.230)	(0.231)	(0.230)
EXPORT	0.168	0.165	0.523	0.528
	(0.390)	(0.390)	(0.393)	(0.393)
Time FE	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes
Observations	19124	19124	17299	17299
Adj.R^2	0.035	0.035	0.030	0.030

Table XXII
Mechanism: More Buy Orders

This table reports the results of the difference-in-differences (DID) tests on the possible mechanism of the government direct purchase. All variables are defined in Table III. Standard errors adjusted for firm-level clustering displayed in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	Rescued Stocks				Most Correlated Stocks			
	OIBN		OIBV		OIBN		OIBV	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
GOVD×POST×ROLL	0.340**		0.332**					
	(0.164)		(0.165)					
GOVD×POST×AMIHUD		0.162*		0.168*				
		(0.096)		(0.097)				
CORR×POST×ROLL					1.579***		1.579***	
					(0.181)		(0.181)	
CORR×POST×AMIHUD						0.123***		0.124***
						(0.017)		(0.017)
GOVD×POST	0.378	0.486*	0.389	0.492*				
	(0.276)	(0.254)	(0.277)	(0.254)				
CORR×POST					0.887***	1.260***	0.897***	1.266***
					(0.293)	(0.268)	(0.294)	(0.269)
ROLL	-0.591***		-0.586***		-1.949***		-1.949***	
	(0.138)		(0.139)		(0.141)		(0.141)	
AMIHUD		-0.158***		-0.157***		-0.046***		-0.046***
		(0.028)		(0.028)		(0.002)		(0.002)
ROA	-0.021	-0.021	-0.022	-0.022	-0.115	-0.126	-0.118	-0.128
	(0.058)	(0.055)	(0.058)	(0.055)	(0.075)	(0.078)	(0.075)	(0.078)
LEV	-3.006**	-2.717**	-3.029**	-2.742**	-6.142***	-6.081***	-6.210***	-6.146***
	(1.268)	(1.238)	(1.274)	(1.243)	(1.823)	(1.761)	(1.819)	(1.759)
M/B	0.087	0.078	0.092	0.083	0.074	0.006	0.081	0.013
	(0.151)	(0.147)	(0.152)	(0.148)	(0.151)	(0.147)	(0.151)	(0.148)
CF	0.069	0.059	0.070	0.059	0.094	0.281***	0.099	0.285***
	(0.077)	(0.076)	(0.078)	(0.076)	(0.065)	(0.069)	(0.065)	(0.069)
DIV	-0.348	-0.366	-0.357	-0.376	-1.640*	-1.831**	-1.648*	-1.843**
	(0.818)	(0.795)	(0.822)	(0.799)	(0.875)	(0.910)	(0.878)	(0.912)
SIZE	0.421*	0.317	0.421*	0.318	0.026	0.495**	0.031	0.498**
	(0.243)	(0.229)	(0.243)	(0.230)	(0.232)	(0.229)	(0.232)	(0.229)
EXPORT	0.192	0.170	0.189	0.166	0.959***	0.847**	0.963***	0.852**
	(0.401)	(0.389)	(0.402)	(0.390)	(0.357)	(0.393)	(0.357)	(0.393)
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	18573	19124	18573	19124	16582	17299	16582	17299
Adj.R^2	0.037	0.037	0.037	0.037	0.044	0.059	0.044	0.058

Table XXIII
Mechanism: More Long-Horizon Investors

This table presents coefficient estimates from a linear regression of fund-specific treatment effects in terms of portfolio holdings (columns (1)-(3)) and trading volume (columns (4)-(6)) on fund characteristics. All variables are defined in Table III. White standard errors robust to heteroskedasticity are given in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	Holdings			Trading Volume		
	(1)	(2)	(3)	(4)	(5)	(6)
TurnOver	-0.0020***	-0.0026***	-0.0025***	-0.0015*	-0.0020**	-0.0020**
	(0.0007)	(0.0007)	(0.0007)	(0.0009)	(0.0009)	(0.0009)
GRatio	-0.3602***	-0.5242***	-0.6094***	-0.0900***	-0.1443***	-0.1672***
	(0.0287)	(0.0354)	(0.0371)	(0.0221)	(0.0297)	(0.0338)
FundSize		-0.0003	0.0161		-0.0205	-0.0163
		(0.0164)	(0.0162)		(0.0175)	(0.0174)
IndexFund		1.0795***	1.0651***		0.3577***	0.3533***
		(0.1140)	(0.1092)		(0.0989)	(0.0992)
P/B			-0.0657***			-0.0177*
			(0.0100)			(0.0094)
Constant	0.0364	0.0181	0.3305	-0.8415***	-0.4436	-0.3553
	(0.0381)	(0.3376)	(0.3383)	(0.0342)	(0.3560)	(0.3677)
Observations	955	955	955	955	955	955
Adj.R^2	0.239	0.322	0.350	0.027	0.042	0.044

Figure 1. A chronology of China's stock market. This figure shows the CSI 300 Index along with the main events around China's stock market crash in the summer of 2015. The period between the two vertical dotted lines indicate the implement of the national team's stock purchase action.

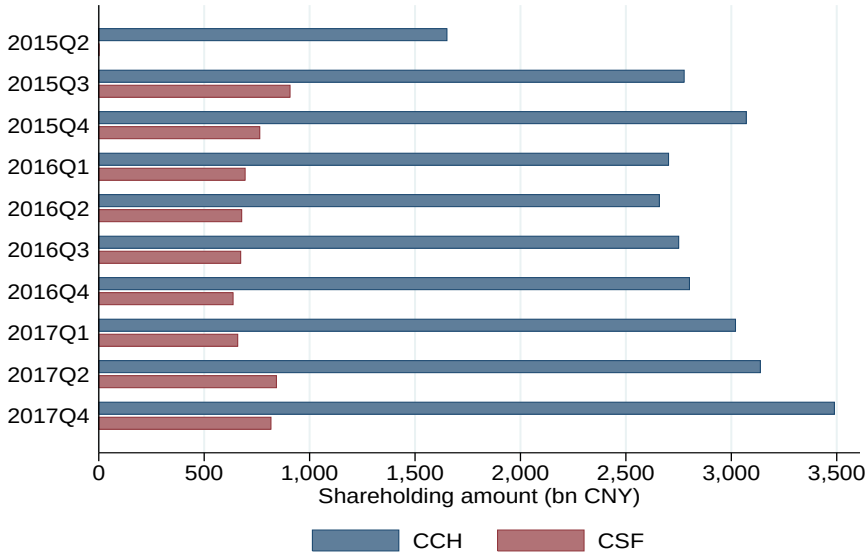


Figure 2. The holdings of CSF and CCH. This figure shows the holdings of CSF and CCH at the quarterly end. Data are obtained from Wind.

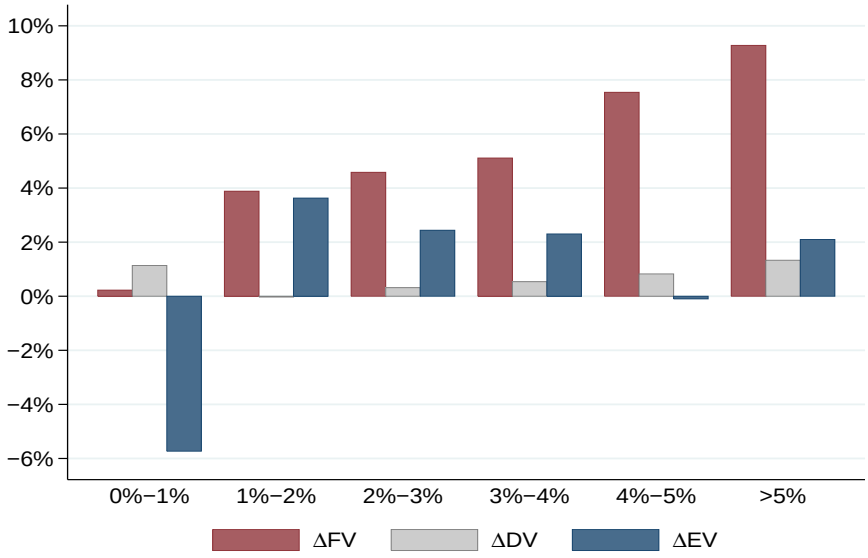


Figure 3. Value creation of government purchase. This figure shows the heterogenous value changes across different ratios of government share purchases between June 30 and September 30, 2015. All figures are relative to the control group, the least correlated peer stocks.

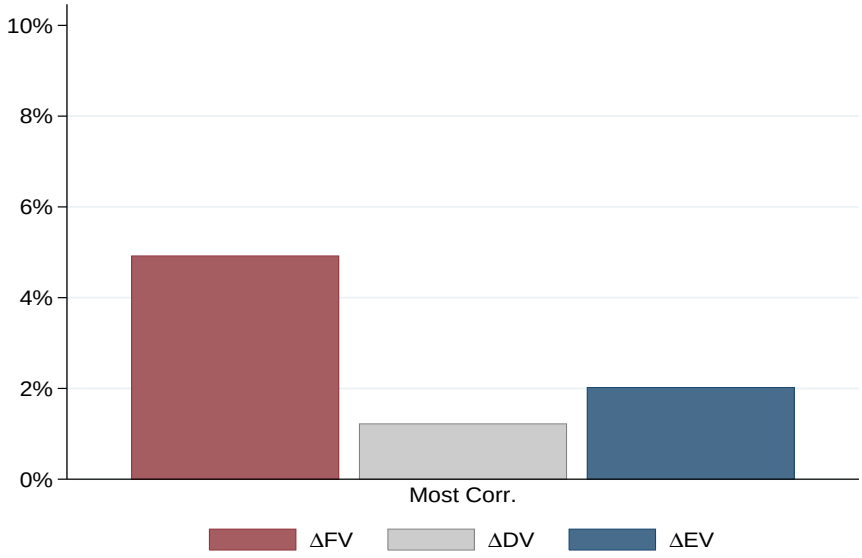
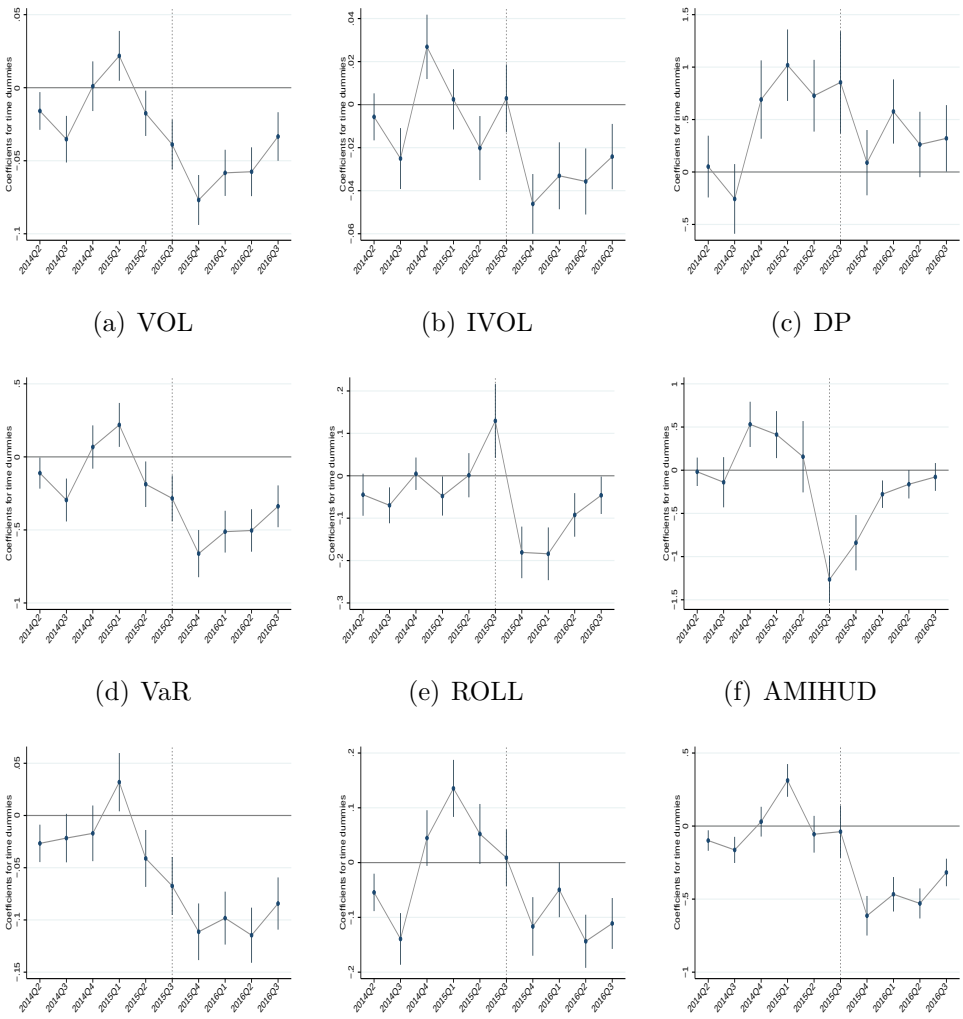


Figure 4. Value creation of government purchase (spill-over). This figure shows the value changes for the most correlated stocks between June 30 and September 30, 2015. All figures are relative to the control group, the least correlated stocks.



(a) VOL (b) IVOL (c) DP

(d) VaR (e) ROLL (f) AMIHUD

(g) CBeta (h) CoVaR (i) MES

Figure 5. Government purchase effect on market quality and systemic risk. In panels (a) to (i), this figure shows dynamic impact of government purchase on each of the nine main firm outcomes of interest for the rescued stocks and the least correlated stocks. All estimates are relative to 2014Q1, the first quarter in our sample. The government purchase on each outcome is represented by connected circles; "arms" around the circles represent 95% confidence intervals, adjusted for firm-level clustering. The vertical dotted line indicates the beginning of the government purchase.

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Internet Appendix to "Can Government Purchase Resolve Systemic Risk? Evidence from China"

This appendix presents a number of additional results and robustness checks. Section A shows the industry allocation of directly purchased stocks. Section B reports the correlations between the rescued stocks (treatment) and least correlated stocks (control) for the outcome variables studied in the main article. Section C provides empirical average graphs pertaining to the measures of market quality and systemic risk. Section D reports the regression results without matching. The results are significant but weaker in magnitude compared to our main results, which further supports the existence of spill-over effects. Section E checks that there was no sizeable anticipation of the government direct purchase, as we do not observe considerable improvement in the overall levels of market quality and systemic risk in the quarters prior to the purchase action. Section F offers a discussion of a broader definition of the national team and empirically estimates its impact. Moreover, Section G verifies the robustness with propensity score matching strategy. Finally, Section H reports the fund level explanatory variables of the composition effect in Section VI.C of the main paper.

Contents

A. *Industry Allocation of Directly Purchased Stocks*

Table IA.1 reports the industry allocation of directly purchased stocks, where we use the one-digit SWS industry classification code which is the commonly used industry classification for investors in China to divide the sample stocks into 28 industries. The results in Table IA.1 reveal that the national team's investment in the A share stock market of China is quite diversified, which might reflect the authorities' determination of forestalling systemic risk on the market wide.

B. *Correlations*

In Table IA.2, we report the correlations over the period 2014Q1 to 2015Q2 between the rescued stocks and the least correlated stocks that form our control group for the nine different variables studied in the main article. Intuitively, a high correlation means that variables strongly co-move before the purchase of the national team, strengthening the assumption that they would have continued to behave similarly without the government intervention (see, for instance, Colliard and Hoffmann (2017)). This is not a formal test, however, as even a low correlation coefficient is compatible with the common trends assumption.

C. *Additional Graphs*

Figure IA.1 illustrates our difference-in-difference estimates for the causal impact of the government purchase on the market quality and systemic risk variables defined in Section II.B. The solid lines and dashed lines indicate the treatment group and control group, respectively. Figure IA.1 below and the high correlations between the treated and the control groups in the pre-event window reported in the previous section, these tests confirm the validity of our control group.

D. Regression Results without Matching

This section reports the results when we do not refine the control group and use the rescued stocks and non-rescued stocks as the treatment and controls, respectively. Tables IA.3-IA.11 summarize the empirical results. Our main findings stay qualitatively, with the DID estimators remain significant but less in magnitude, which is because that the most correlated stocks in the controls experience improvement due to the spill-over effects. Failing to sperate them would understate our DID estimates in magnitude.

E. Placebo Tests

Our identification relies on the assumption that no difference occurs between the treatment group and the control group proceeding the national team's purchase. To rule out this possibility, we conduct a new diff-in-diff analysis similar to specification (7) with a sample period of 2013Q1 to 2014Q3 and postulating the quarters from 2013Q1 through 2013Q4 as the "pre-treatment" period, estimating the impact for this pseudo "pre-treatment" period. Table IA.12 reports our estimates. Across the nine variables we consider, we find all coefficients are statistically insignificant at 5% level. This analysis also serves as a placebo diff-in-diff and additionally supports the validity of our control group (see, for example, Autor (2003)).

F. Inclusion of Indirect Shareholding

Although our empirical design is centered on direct purchase of the national team, further concern is that direct government shareholdings may not completely reflect the efforts of the government purchase plan. The indirect shareholding part of the national team in 2015Q3, as described in Section I, comprises a small part of CSF, Asset Management Plans, and five "tailored" mutual funds, which combined purchased 637 stocks in the main board stock market of China. In the following, we account for the indirect shareholdings by the

government in the regressions. Specifically, we exploit the following setup

$$Y_{it} = \alpha_0 + \alpha_1 TREAT + \alpha_2 TREAT \times POST + \gamma' Z_{it-1} + \varphi_i + \eta_t + \varepsilon_{it}. \tag{IA.1}$$

This DID regression is identical to specification (7) and includes firm (industry) and time fixed effects. However, here the treatment variable TREAT also takes two forms for total shareholding: It can be qualitative, GOVTD, the dummy variable taking 1 if a stock was either directly or indirectly purchased by the government and quantitative GOVT, the total shareholding ratio purchased in 2015Q3 by the government (ranging from 0 to 44.73) as specified in Table III. In like manner, the coefficient estimate on TREAT×POST is the DID estimator of interest that captures the causal effect of total government purchase on the interested firm outcome Y.

Tables IA.13-IA.21 report the results from these regressions controlling for industry/firm and year fixed effects. The same as the results in Section IV, the coefficient estimates on dummy variable GOVTD×POST/GOVT×POST are generally negative and significant at the 1% level across all specifications, confirming the positive effect of government purchase on market quality and leaving the main results stay essentially as before.

G. Propensity Score Matching

One potential concern with our main results is the observation that the treatment group and control group may not be completely comparable. Bian, Da, Lou, and Zhou (2018) find that the rescued stocks differ from non-rescued ones in market capitalization but not in leverage-network eigenvector centrality. Although we have attempted to eliminate the sample selection issue by using the "least correlated" stocks as the control group, which does not differ from the rescued stocks in many dimensions. To further mitigate the sample selection concern, following Chemmanur, Loutskina, and Tian (2014), we utilize the propensity score matching strategy to identify the comparable non-rescued firms from the non-purchased stocks before repeating the DID analysis.

In Table IA.22, we match on pre-purchase control variable averages using a propensity

score matching procedure. The control peers are selected based on the time series mean of return on asset, leverage, market to book ratio, cash flow, dividend, firm size, as well as exportation indicator. To do so, we compute the probability that a firm is rescued by the national team in 2015Q3 and then match each rescued firm with 2 control firms using the nearest neighbor propensity score matching algorithm, with replacement. We can see from Table IA.22 that none of the differences is significant at the 10% level or better. The regression results are reported in Tables IA.23-IA.31. We incorporate firm fixed effects (industry fixed effects) and quarter fixed effects to absorb any firm- (industry-) and time-specific heterogeneity not captured by firm characteristics. As can be seen in Tables IA.23-IA.31, the DID coefficient estimates are all negative and significant at the 1% level across different outcomes. These results provide further evidence that our findings are more likely due to a treatment effect; that is, government direct purchase appears to exert positive impact on market quality and systemic risk.

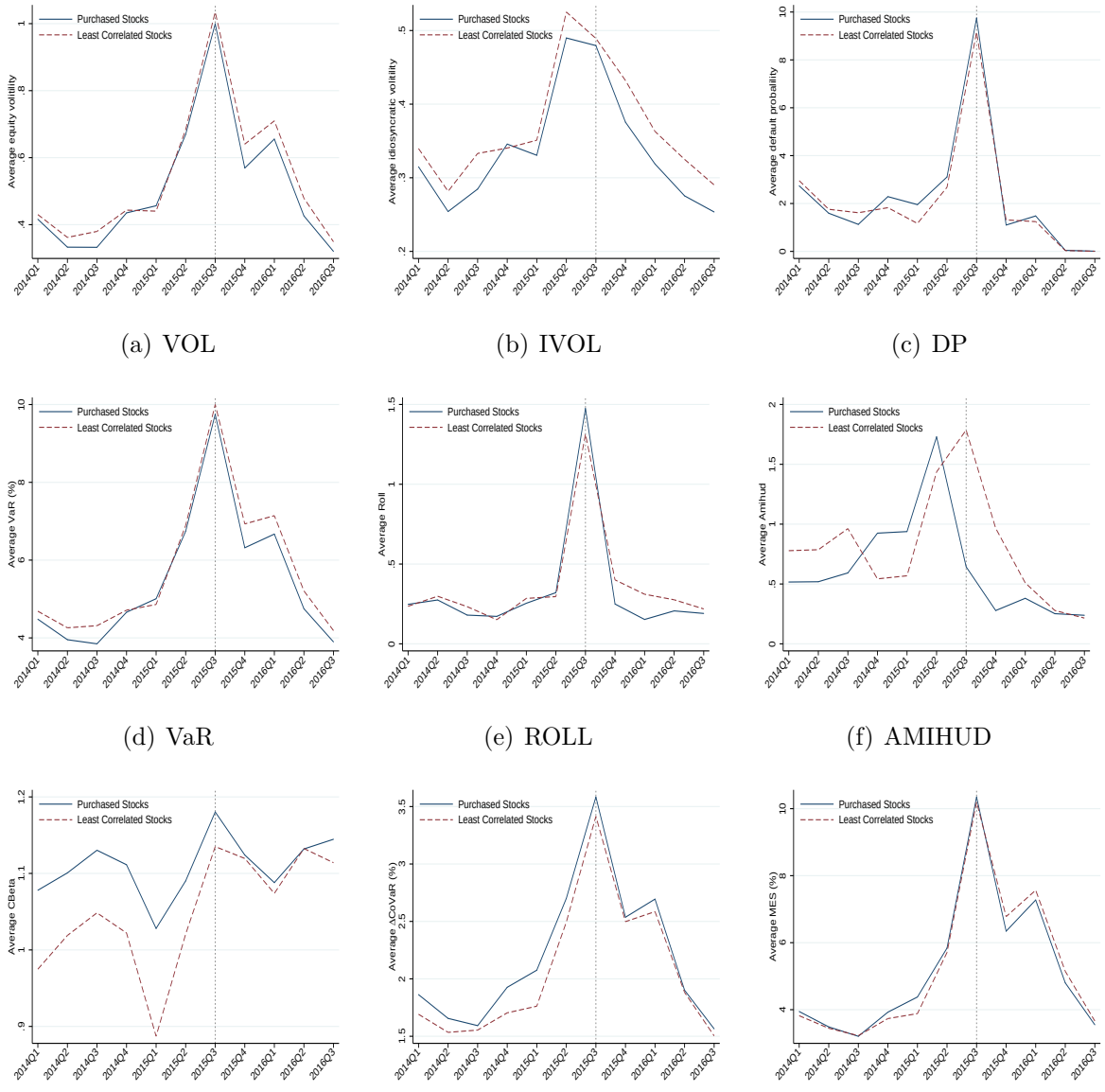
H. Fund Level Explanatory Variables

We describe the fund level explanatory variables of the composition effect in Section VI.C of the paper. Table IA.32 contains summary statistics for these explanatory variables. The average fund has a price-to-book ratio of slightly above 8. Around 20% of the funds are index funds. The average fund is shown to have a high turnover (around 9), but there is considerable cross-sectional variation across funds with a standard deviation of 41.58.

Table IA.1
Industry Allocation of Directly Purchased Stocks.

The table reports the industry allocation of the directly purchased stocks by CSF and CCH. 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. We use the one-digit SWS industry classification to divide the stocks into 28 categories.

06/30/2015	CSF	CCH	Total
	Market Cap Share (%)	Market Cap Share (%)	Market Cap Share (%)
Agriculture, forestry, animal husbandry & fisheries	0.5	1.5	0.8
Banking	22.5	10.5	18.5
Building Decoration	5.2	4.5	5
Building materials	0.8	1.5	1
Car	3	3.1	3
Chemical industry	3.4	4.6	3.8
Commercial trade	1.2	2.5	1.7
Communication	1.3	1.7	1.5
Computer	1.2	4.2	2.2
Defense industry	3	2.9	2.9
Electrical Equipment	1.8	3.5	2.4
Electronic	1.4	3.7	2.2
Equipment	3.5	5.1	4.1
Food & drink	3.2	2.7	3
Household appliances	2.1	2.4	2.2
Leisure services	0.3	0.5	0.3
Light manufacturing	0.3	0.6	0.4
Media	1.9	2.8	2.2
Mining	5.4	3.3	4.7
Non-Banking Financial	14.1	13.5	13.9
Non-ferrous metal	3	3	3
Others	0.3	0.6	0.4
Pharmaceutical Biotechnology	3.4	6.5	4.4
Real estate	4.6	4.9	4.7
Steel	2.1	1.5	1.9
Textile & Apparel	0.5	1.6	0.8
Transportation	5.3	4	4.8
Utilities	4.7	3.1	4.2
Total	100	100	100



(a) VOL (b) IVOL (c) DP

(d) VaR (e) ROLL (f) AMIHUD

(g) CBeta (h) CoVaR (i) MES

Figure IA.1. Graphical illustration of parallel pre-trends. In panels (a) to (i), we plot the cross-sectional average for rescued stocks and least correlated stocks for each outcome variable. The solid lines and dashed lines indicate the treatment group and control group, respectively. The vertical dotted line indicates the beginning of the government purchase.

Table IA.2
Correlations before Government Purchase

For each variable y, this table reports $corr(\overline{y}_t^{Rescued}, \overline{y}_t^{Least})$, where $\overline{y}_t^{Rescued}$ and $\overline{y}_t^{Least}$ are the cross-sectional averages of $y_{i,t}$ on date t for the treatment group (the rescued stocks) and the control group (the least correlated stocks), respectively, and t covers the 5 quarters before the purchase.

Variable	Corr.
VOL	0.994
IVOL	0.983
DP	0.855
VaR	0.993
ROLL	0.974
AMIHUD	0.945
CBeta	0.961
ΔCoVaR	0.988
MES	0.993

Table IA.3
Effects of Government Purchase on VOL

This table reports the results of the difference-in-differences (DID) tests on the impacts of the government direct purchase on equity volitility, by comparing the rescued stocks to all the non-rescued stocks. All variables are defined in Table III. VaR, ΔCoVaR, and MES are measured at the 5% level. Standard errors adjusted for firm-level clustering displayed in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)
GOVD×POST	-0.0294***		-0.0327***	
	(0.0037)		(0.0041)	
GOVD	-0.0090***			
	(0.0034)			
GOV×POST		-0.0095***		-0.0101***
		(0.0008)		(0.0009)
GOV		-0.0001		
		(0.0008)		
ROA	0.0003	0.0003	-0.0002	-0.0001
	(0.0009)	(0.0009)	(0.0008)	(0.0008)
LEV	0.0138	0.0117	0.0127	0.0110
	(0.0190)	(0.0192)	(0.0176)	(0.0176)
M/B	0.0001	0.0004	-0.0009	-0.0008
	(0.0024)	(0.0025)	(0.0023)	(0.0023)
CF	0.0003	0.0003	0.0020*	0.0019*
	(0.0012)	(0.0012)	(0.0011)	(0.0011)
DIV	0.0039	0.0032	0.0100	0.0097
	(0.0135)	(0.0138)	(0.0128)	(0.0129)
SIZE	0.0042	0.0043	0.0036	0.0036
	(0.0044)	(0.0044)	(0.0041)	(0.0040)
EXPORT	-0.0025	-0.0025	-0.0172***	-0.0160**
	(0.0031)	(0.0032)	(0.0063)	(0.0063)
SOE	-0.0490***	-0.0486***		
	(0.0029)	(0.0029)		
Time FE	Yes	Yes	Yes	Yes
Firm FE	No	No	Yes	Yes
Industry FE	Yes	Yes	No	No
Observations	26851	26851	26851	26851
Adj.R^2	0.706	0.708	0.754	0.756

Table IA.4
Effects of Government Purchase on IVOL

This table reports the results of the difference-in-differences (DID) tests on the impacts of the government direct purchase on idiosyncratic volitility, by comparing the rescued stocks to all the non-rescued stocks. All variables are defined in Table III. VaR, ΔCoVaR, and MES are measured at the 5% level. Standard errors adjusted for firm-level clustering displayed in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)
GOVD×POST	-0.0180***		-0.0202***	
	(0.0034)		(0.0034)	
GOVD	-0.0140***			
	(0.0029)			
GOV×POST		-0.0057***		-0.0060***
		(0.0007)		(0.0007)
GOV		-0.0009		
		(0.0006)		
ROA	-0.0006	-0.0006	-0.0011	-0.0011
	(0.0008)	(0.0008)	(0.0008)	(0.0008)
LEV	0.0070	0.0056	0.0115	0.0106
	(0.0180)	(0.0182)	(0.0170)	(0.0169)
M/B	0.0011	0.0013	0.0006	0.0007
	(0.0022)	(0.0022)	(0.0021)	(0.0021)
CF	-0.0001	0.0000	0.0014	0.0014
	(0.0011)	(0.0012)	(0.0010)	(0.0011)
DIV	-0.0057	-0.0063	-0.0080	-0.0081
	(0.0126)	(0.0127)	(0.0120)	(0.0121)
SIZE	0.0031	0.0032	0.0019	0.0020
	(0.0038)	(0.0038)	(0.0037)	(0.0036)
EXPORT	-0.0045*	-0.0047*	-0.0121**	-0.0113**
	(0.0026)	(0.0026)	(0.0056)	(0.0056)
SOE	-0.0334***	-0.0337***		
	(0.0025)	(0.0025)		
Time FE	Yes	Yes	Yes	Yes
Firm FE	No	No	Yes	Yes
Industry FE	Yes	Yes	No	No
Observations	25241	25241	25241	25241
Adj.R^2	0.365	0.364	0.388	0.390

Table IA.5
Effects of Government Purchase on DP

This table reports the results of the difference-in-differences (DID) tests on the impacts of the government direct purchase on default probalility, by comparing the rescued stocks to all the non-rescued stocks. All variables are defined in Table III. VaR, ΔCoVaR, and MES are measured at the 5% level. Standard errors adjusted for firm-level clustering displayed in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)
GOVD×POST	-0.0232		-0.0090	
	(0.0588)		(0.0586)	
GOVD	-0.0067			
	(0.0758)			
GOV×POST		-0.0643***		-0.0517***
		(0.0121)		(0.0114)
GOV		0.0274*		
		(0.0156)		
ROA	0.0040	0.0035	0.0114	0.0109
	(0.0200)	(0.0200)	(0.0164)	(0.0163)
LEV	0.3006	0.2782	-0.0199	-0.0384
	(0.4274)	(0.4272)	(0.3821)	(0.3823)
M/B	-0.0105	-0.0088	-0.0098	-0.0085
	(0.0533)	(0.0533)	(0.0458)	(0.0458)
CF	0.0212	0.0216	0.0296	0.0298
	(0.0301)	(0.0300)	(0.0253)	(0.0253)
DIV	0.1417	0.1360	0.1726	0.1674
	(0.3557)	(0.3558)	(0.2954)	(0.2960)
SIZE	0.0523	0.0502	0.0927	0.0906
	(0.0943)	(0.0939)	(0.0803)	(0.0801)
EXPORT	0.1841***	0.1832***	-0.0304	-0.0276
	(0.0688)	(0.0689)	(0.1392)	(0.1397)
SOE	0.8434***	0.8425***		
	(0.0720)	(0.0720)		
Time FE	Yes	Yes	Yes	Yes
Firm FE	No	No	Yes	Yes
Industry FE	Yes	Yes	No	No
Observations	25963	25963	25963	25963
Adj.R^2	0.485	0.486	0.539	0.539

Table IA.6
Effects of Government Purchase on VaR

This table reports the results of the difference-in-differences (DID) tests on the impacts of the government direct purchase on VaR, by comparing the rescued stocks to all the non-rescued stocks. All variables are defined in Table III. VaR, ΔCoVaR, and MES are measured at the 5% level. Standard errors adjusted for firm-level clustering displayed in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)
GOVD×POST	-0.2559***		-0.2942***	
	(0.0348)		(0.0399)	
GOVD	-0.0954**			
	(0.0374)			
GOV×POST		-0.0853***		-0.0914***
		(0.0073)		(0.0095)
GOV		-0.0112		
		(0.0097)		
ROA	0.0046	0.0044	-0.0032	-0.0030
	(0.0085)	(0.0085)	(0.0068)	(0.0067)
LEV	0.0632	0.0436	-0.0300	-0.0453
	(0.1823)	(0.1832)	(0.1515)	(0.1512)
M/B	0.0055	0.0089	-0.0077	-0.0068
	(0.0233)	(0.0233)	(0.0199)	(0.0199)
CF	-0.0044	-0.0035	0.0132	0.0127
	(0.0124)	(0.0126)	(0.0105)	(0.0107)
DIV	-0.1313	-0.1377	-0.0063	-0.0091
	(0.1292)	(0.1310)	(0.1087)	(0.1097)
SIZE	0.0376	0.0373	0.0316	0.0322
	(0.0431)	(0.0432)	(0.0360)	(0.0358)
EXPORT	-0.0486	-0.0471	-0.1323**	-0.1208**
	(0.0367)	(0.0367)	(0.0599)	(0.0597)
SOE	-0.5812***	-0.5719***		
	(0.0339)	(0.0340)		
Time FE	Yes	Yes	Yes	Yes
Firm FE	No	No	Yes	Yes
Industry FE	Yes	Yes	No	No
Observations	26878	26878	26878	26878
Adj.R^2	0.653	0.656	0.726	0.728

Table IA.7
Effects of Government Purchase on ROLL

This table reports the results of the difference-in-differences (DID) tests on the impacts of the government direct purchase on Roll, a proxy for liquidity, by comparing the rescued stocks to all the non-rescued stocks. All variables are defined in Table III. VaR, ΔCoVaR, and MES are measured at the 5% level. Standard errors adjusted for firm-level clustering displayed in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)
GOVD×POST	-0.0196*		-0.0225*	
	(0.0118)		(0.0126)	
GOVD	-0.0106			
	(0.0065)			
GOV×POST		-0.0047**		-0.0061***
		(0.0019)		(0.0021)
GOV		-0.0008		
		(0.0012)		
ROA	0.0057	0.0057	0.0052	0.0053
	(0.0037)	(0.0037)	(0.0040)	(0.0040)
LEV	-0.0373	-0.0381	-0.0193	-0.0200
	(0.0703)	(0.0702)	(0.0741)	(0.0740)
M/B	-0.0062	-0.0060	-0.0075	-0.0074
	(0.0092)	(0.0092)	(0.0095)	(0.0095)
CF	0.0061	0.0061	0.0067	0.0066
	(0.0041)	(0.0041)	(0.0044)	(0.0044)
DIV	-0.0440	-0.0444	-0.0405	-0.0405
	(0.0558)	(0.0558)	(0.0572)	(0.0572)
SIZE	0.0171	0.0171	0.0144	0.0144
	(0.0143)	(0.0142)	(0.0153)	(0.0152)
EXPORT	-0.0068	-0.0070	0.0246	0.0254
	(0.0068)	(0.0069)	(0.0236)	(0.0236)
SOE	-0.0353***	-0.0357***		
	(0.0060)	(0.0060)		
Time FE	Yes	Yes	Yes	Yes
Firm FE	No	No	Yes	Yes
Industry FE	Yes	Yes	No	No
Observations	25854	25854	25854	25854
Adj.R^2	0.366	0.366	0.390	0.390

Table IA.8
Effects of Government Purchase on AMIHUD

This table reports the results of the difference-in-differences (DID) tests on the impacts of the government direct purchase on Amihud, a proxy for liquidity, by comparing the rescued stocks to all the non-rescued stocks. All variables are defined in Table III. VaR, ΔCoVaR, and MES are measured at the 5% level. Standard errors adjusted for firm-level clustering displayed in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)
GOVD×POST	-0.1750		-0.1955	
	(0.1104)		(0.1546)	
GOVD	-0.1167			
	(0.1046)			
GOV×POST		-0.0173		0.0044
		(0.0239)		(0.0305)
GOV		-0.0263		
		(0.0256)		
ROA	0.0505	0.0507	0.0624*	0.0627*
	(0.0327)	(0.0328)	(0.0365)	(0.0365)
LEV	-0.6141	-0.6118	-0.6019	-0.5862
	(0.8618)	(0.8621)	(0.8704)	(0.8701)
M/B	0.0123	0.0141	-0.0468	-0.0482
	(0.1035)	(0.1036)	(0.1057)	(0.1057)
CF	0.0173	0.0175	0.0507	0.0494
	(0.0593)	(0.0594)	(0.0570)	(0.0569)
DIV	-0.2323	-0.2342	-0.0808	-0.0731
	(0.6280)	(0.6288)	(0.6391)	(0.6389)
SIZE	0.2339	0.2343	0.3294	0.3309
	(0.2232)	(0.2234)	(0.2206)	(0.2204)
EXPORT	-0.2163***	-0.2177***	-0.2883	-0.2860
	(0.0745)	(0.0745)	(0.2177)	(0.2175)
SOE	-0.7034***	-0.7049***		
	(0.0588)	(0.0584)		
Time FE	Yes	Yes	Yes	Yes
Firm FE	No	No	Yes	Yes
Industry FE	Yes	Yes	No	No
Observations	26878	26878	26878	26878
Adj.R^2	0.036	0.036	0.035	0.035

Table IA.9
Effects of Government Purchase on CBeta

This table reports the results of the difference-in-differences (DID) tests on the impacts of the government direct purchase on CBeta, by comparing the rescued stocks to all the non-rescued stocks. All variables are defined in Table III. VaR, ΔCoVaR, and MES are measured at the 5% level. Standard errors adjusted for firm-level clustering displayed in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)
GOVD×POST	-0.0450***		-0.0459***	
	(0.0076)		(0.0077)	
GOVD	0.0440***			
	(0.0079)			
GOV×POST		-0.0073***		-0.0073***
		(0.0017)		(0.0018)
GOV		0.0031*		
		(0.0017)		
ROA	-0.0014	-0.0015	-0.0002	-0.0002
	(0.0016)	(0.0016)	(0.0013)	(0.0014)
LEV	0.0105	0.0111	0.0104	0.0108
	(0.0440)	(0.0443)	(0.0331)	(0.0333)
M/B	0.0057	0.0054	0.0032	0.0031
	(0.0048)	(0.0048)	(0.0039)	(0.0039)
CF	-0.0006	-0.0008	0.0012	0.0010
	(0.0025)	(0.0025)	(0.0022)	(0.0022)
DIV	-0.0007	0.0010	0.0139	0.0145
	(0.0247)	(0.0248)	(0.0205)	(0.0206)
SIZE	-0.0075	-0.0073	-0.0059	-0.0057
	(0.0087)	(0.0087)	(0.0071)	(0.0071)
EXPORT	-0.0027	-0.0014	-0.0282**	-0.0270**
	(0.0072)	(0.0072)	(0.0122)	(0.0122)
SOE	-0.0252***	-0.0216***		
	(0.0067)	(0.0068)		
Time FE	Yes	Yes	Yes	Yes
Firm FE	No	No	Yes	Yes
Industry FE	Yes	Yes	No	No
Observations	26878	26878	26878	26878
Adj.R^2	0.070	0.067	0.056	0.055

Table IA.10
Effects of Government Purchase on ΔCoVaR

This table reports the results of the difference-in-differences (DID) tests on the impacts of the government direct purchase on ΔCoVaR, by comparing the rescued stocks to all the non-rescued stocks. All variables are defined in Table III. VaR, ΔCoVaR, and MES are measured at the 5% level. Standard errors adjusted for firm-level clustering displayed in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)
GOVD×POST	-0.0685***		-0.0647***	
	(0.0143)		(0.0131)	
GOVD	0.1186***			
	(0.0119)			
GOV×POST		-0.0246***		-0.0243***
		(0.0030)		(0.0027)
GOV		0.0202***		
		(0.0033)		
ROA	-0.0017	-0.0018	-0.0008	-0.0007
	(0.0034)	(0.0034)	(0.0024)	(0.0024)
LEV	0.0664	0.0628	0.0221	0.0171
	(0.0730)	(0.0727)	(0.0549)	(0.0548)
M/B	-0.0011	-0.0019	0.0000	0.0003
	(0.0082)	(0.0082)	(0.0069)	(0.0069)
CF	0.0072*	0.0068	0.0050	0.0049
	(0.0044)	(0.0044)	(0.0037)	(0.0037)
DIV	-0.0179	-0.0155	-0.0233	-0.0245
	(0.0455)	(0.0460)	(0.0379)	(0.0381)
SIZE	0.0110	0.0113	0.0083	0.0083
	(0.0156)	(0.0157)	(0.0127)	(0.0127)
EXPORT	0.0284**	0.0309**	-0.0362*	-0.0333
	(0.0127)	(0.0128)	(0.0214)	(0.0215)
SOE	0.0271**	0.0329***		
	(0.0117)	(0.0117)		
Time FE	Yes	Yes	Yes	Yes
Firm FE	No	No	Yes	Yes
Industry FE	Yes	Yes	No	No
Observations	26878	26878	26878	26878
Adj.R^2	0.651	0.649	0.737	0.738

Table IA.11
Effects of Government Purchase on MES

This table reports the results of the difference-in-differences (DID) tests on the impacts of the government direct purchase on MES, by comparing the rescued stocks to all the non-rescued stocks. All variables are defined in Table III. VaR, ΔCoVaR, and MES are measured at the 5% level. Standard errors adjusted for firm-level clustering displayed in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)
GOVD×POST	-0.2781***		-0.2756***	
	(0.0360)		(0.0377)	
GOVD	0.0609**			
	(0.0305)			
GOV×POST		-0.0723***		-0.0777***
		(0.0084)		(0.0091)
GOV		0.0087		
		(0.0069)		
ROA	-0.0015	-0.0016	-0.0029	-0.0028
	(0.0093)	(0.0094)	(0.0076)	(0.0076)
LEV	0.0024	-0.0080	-0.1319	-0.1430
	(0.1979)	(0.1995)	(0.1521)	(0.1524)
M/B	0.0009	0.0020	-0.0175	-0.0170
	(0.0244)	(0.0243)	(0.0193)	(0.0192)
CF	0.0048	0.0047	0.0137	0.0131
	(0.0108)	(0.0109)	(0.0096)	(0.0098)
DIV	-0.0871	-0.0872	-0.0020	-0.0035
	(0.1355)	(0.1372)	(0.1137)	(0.1147)
SIZE	0.0179	0.0184	0.0290	0.0297
	(0.0386)	(0.0387)	(0.0326)	(0.0325)
EXPORT	-0.0230	-0.0199	-0.0680	-0.0579
	(0.0344)	(0.0345)	(0.0576)	(0.0574)
SOE	-0.1673***	-0.1573***		
	(0.0326)	(0.0324)		
Time FE	Yes	Yes	Yes	Yes
Firm FE	No	No	Yes	Yes
Industry FE	Yes	Yes	No	No
Observations	26878	26878	26878	26878
Adj.R^2	0.747	0.748	0.818	0.819

Table IA.12
Extended Pre-Purchase Period - Placebo Analysis

This table reports the results of placebo analysis of the the government by extending pre-purchase period. All variables are defined in Table III. VaR, ΔCoVaR, and MES are measured at the 5% level. Standard errors adjusted for firm-level clustering displayed in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	VOL	IVOL	DP	VaR	ROLL	AMIHUD	CBeta	ΔCoVaR	MES
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
GOVD×POST	-0.0065	-0.0022	-0.5800	-0.0086	0.0426	-0.0687	0.0779	0.0333	-0.1878
	(0.0231)	(0.0245)	(0.4474)	(0.1774)	(0.0394)	(0.1201)	(0.0532)	(0.0797)	(0.1839)
GOVD	-0.0140	-0.0206	0.1133	-0.2063	-0.0533	-0.0106	0.0256	0.0768	0.2865
	(0.0233)	(0.0248)	(0.4578)	(0.1827)	(0.0405)	(0.2016)	(0.0542)	(0.0809)	(0.1860)
ROA	0.0027	0.0029	0.0047	0.0244	0.0002	0.0074	0.0060	0.0059	0.0269
	(0.0037)	(0.0037)	(0.1088)	(0.0358)	(0.0062)	(0.0257)	(0.0112)	(0.0168)	(0.0383)
LEV	0.0128	0.0055	0.1453	0.2702	-0.0109	-0.4351	0.0493	0.1930**	0.2883
	(0.0218)	(0.0211)	(0.7531)	(0.2180)	(0.0502)	(0.2702)	(0.0648)	(0.0968)	(0.2168)
M/B	0.0028	0.0073	0.1980	0.0091	0.0058	-0.0639*	-0.0221**	-0.0007	-0.0602
	(0.0057)	(0.0051)	(0.1953)	(0.0540)	(0.0096)	(0.0374)	(0.0112)	(0.0202)	(0.0482)
CF	0.0001	0.0002	0.0911	-0.0016	0.0009	0.0075	0.0008	0.0074	-0.0124
	(0.0026)	(0.0023)	(0.0814)	(0.0251)	(0.0043)	(0.0145)	(0.0054)	(0.0099)	(0.0224)
DIV	0.0079	-0.0110	-0.9110	0.1360	-0.0269	0.4699**	0.0773	0.1286	0.2945
	(0.0226)	(0.0225)	(0.7690)	(0.2306)	(0.0394)	(0.1847)	(0.0483)	(0.0862)	(0.1973)
SIZE	-0.0005	-0.0009	-0.0237	-0.0279	0.0074	-0.1200***	-0.0004	-0.0230	-0.0254
	(0.0060)	(0.0063)	(0.1940)	(0.0532)	(0.0127)	(0.0378)	(0.0155)	(0.0208)	(0.0555)
EXPORT	0.0024	0.0007	0.1360	0.0107	0.0257***	-0.0374	-0.0022	0.0236	-0.0579
	(0.0039)	(0.0036)	(0.1212)	(0.0422)	(0.0067)	(0.1251)	(0.0108)	(0.0169)	(0.0391)
SOE	-0.0428***	-0.0326***	0.1424	-0.4577***	-0.0346***	-0.3305***	-0.0408***	-0.0310*	-0.2117***
	(0.0038)	(0.0034)	(0.1227)	(0.0405)	(0.0061)	(0.1162)	(0.0103)	(0.0162)	(0.0370)
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	10495	10153	10375	10498	10294	10498	10498	10498	10498
Adj.R^2	0.204	0.151	0.190	0.219	0.073	0.003	0.079	0.239	0.258

Table IA.13
Inclusion of Indirect Shareholding: VOL

This table reports the results of the difference-in-differences (DID) tests on the impacts of the total government purchase on equity volitility, by comparing the rescued stocks to the least correlated stocks. All variables are defined in Table III. VaR, ΔCoVaR, and MES are measured at the 5% level. Standard errors adjusted for firm-level clustering displayed in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)
GOVTD×POST	-0.0460***		-0.0521***	
	(0.0063)		(0.0067)	
GOVTD	0.0001			
	(0.0034)			
GOVT×POST		-0.0056***		-0.0067***
		(0.0007)		(0.0009)
GOVT		0.0013**		
		(0.0006)		
ROA	0.0000***	0.0000***	0.0000***	0.0000***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
LEV	0.0177**	0.0183**	0.0082	0.0081
	(0.0079)	(0.0080)	(0.0099)	(0.0099)
M/B	-0.0009***	-0.0009***	-0.0007***	-0.0007***
	(0.0003)	(0.0003)	(0.0002)	(0.0002)
CF	-0.0001	-0.0000	0.0009	0.0008
	(0.0007)	(0.0007)	(0.0007)	(0.0007)
DIV	0.0117*	0.0122*	0.0121*	0.0122*
	(0.0068)	(0.0071)	(0.0064)	(0.0066)
SIZE	0.0057	0.0060*	0.0063*	0.0064*
	(0.0035)	(0.0036)	(0.0034)	(0.0034)
EXPORT	-0.0038	-0.0042	-0.0190**	-0.0185**
	(0.0034)	(0.0034)	(0.0079)	(0.0079)
SOE	-0.0485***	-0.0500***		
	(0.0030)	(0.0030)		
Time FE	Yes	Yes	Yes	Yes
Firm FE	No	No	Yes	Yes
Industry FE	Yes	Yes	No	No
Observations	35913	35913	35913	35913
Adj.R^2	0.419	0.419	0.424	0.425

Table IA.14
Inclusion of Indirect Shareholding: IVOL

This table reports the results of the difference-in-differences (DID) tests on the impacts of the total government purchase on idiosyncratic volitility, by comparing the rescued stocks to the least correlated stocks. All variables are defined in Table III. VaR, ΔCoVaR, and MES are measured at the 5% level. Standard errors adjusted for firm-level clustering displayed in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)
GOVTD×POST	-0.0335***		-0.0348***	
	(0.0083)		(0.0071)	
GOVTD	-0.0084***			
	(0.0025)			
GOVT×POST		-0.0038***		-0.0045***
		(0.0006)		(0.0006)
GOVT		0.0001		
		(0.0004)		
ROA	0.0000***	0.0000***	0.0000***	0.0000***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
LEV	0.0065	0.0071	-0.0046	-0.0047
	(0.0053)	(0.0053)	(0.0100)	(0.0100)
M/B	-0.0005***	-0.0006***	-0.0006***	-0.0005***
	(0.0001)	(0.0001)	(0.0001)	(0.0001)
CF	0.0000	0.0000	0.0009	0.0009
	(0.0007)	(0.0007)	(0.0008)	(0.0007)
DIV	0.0056	0.0061	-0.0002	-0.0000
	(0.0066)	(0.0068)	(0.0065)	(0.0065)
SIZE	0.0078**	0.0081**	0.0084**	0.0084**
	(0.0032)	(0.0032)	(0.0034)	(0.0034)
EXPORT	-0.0024	-0.0029	-0.0110*	-0.0108*
	(0.0030)	(0.0029)	(0.0062)	(0.0063)
SOE	-0.0329***	-0.0341***		
	(0.0025)	(0.0025)		
Time FE	Yes	Yes	Yes	Yes
Firm FE	No	No	Yes	Yes
Industry FE	Yes	Yes	No	No
Observations	34115	34115	34115	34115
Adj.R^2	0.106	0.105	0.095	0.095

Table IA.15
Inclusion of Indirect Shareholding: DP

This table reports the results of the difference-in-differences (DID) tests on the impacts of the total government purchase on default probalility, by comparing the rescued stocks to the least correlated stocks. All variables are defined in Table III. VaR, ΔCoVaR, and MES are measured at the 5% level. Standard errors adjusted for firm-level clustering displayed in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)
GOVTD×POST	-0.0823		-0.0541	
	(0.0663)		(0.0656)	
GOVTD	0.0900			
	(0.0848)			
GOVT×POST		-0.0362***		-0.0270***
		(0.0079)		(0.0074)
GOVT		0.0165*		
		(0.0099)		
ROA	0.0000***	0.0000***	0.0001***	0.0001***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
LEV	0.7463**	0.7429**	0.4057**	0.4036*
	(0.2990)	(0.2992)	(0.2067)	(0.2074)
M/B	-0.0064	-0.0062	-0.0044	-0.0043
	(0.0043)	(0.0043)	(0.0041)	(0.0041)
CF	0.0244	0.0242	0.0170	0.0169
	(0.0181)	(0.0181)	(0.0165)	(0.0165)
DIV	0.1524	0.1519	0.2352	0.2353
	(0.2345)	(0.2342)	(0.1715)	(0.1718)
SIZE	0.1174	0.1156	0.1414**	0.1402**
	(0.0760)	(0.0757)	(0.0686)	(0.0683)
EXPORT	0.1824**	0.1835**	-0.2808**	-0.2799**
	(0.0765)	(0.0765)	(0.1298)	(0.1299)
SOE	0.7839***	0.7874***		
	(0.0806)	(0.0802)		
Time FE	Yes	Yes	Yes	Yes
Firm FE	No	No	Yes	Yes
Industry FE	Yes	Yes	No	No
Observations	34897	34897	34897	34897
Adj.R^2	0.402	0.402	0.449	0.449

Table IA.16
Inclusion of Indirect Shareholding: VaR

This table reports the results of the difference-in-differences (DID) tests on the impacts of the total government purchase on VaR, by comparing the rescued stocks to the least correlated stocks. All variables are defined in Table III. VaR, ΔCoVaR, and MES are measured at the 5% level. Standard errors adjusted for firm-level clustering displayed in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)
GOVTD×POST	-0.3382***		-0.4030***	
	(0.0325)		(0.0419)	
GOVTD	-0.0421			
	(0.0333)			
GOVT×POST		-0.0399***		-0.0509***
		(0.0042)		(0.0057)
GOVT		0.0026		
		(0.0047)		
ROA	0.0000***	0.0000***	0.0000***	0.0000***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
LEV	0.0876	0.0931*	0.0748	0.0743
	(0.0546)	(0.0555)	(0.0564)	(0.0561)
M/B	-0.0064***	-0.0066***	-0.0041***	-0.0040***
	(0.0024)	(0.0025)	(0.0013)	(0.0014)
CF	-0.0029	-0.0026	0.0062	0.0055
	(0.0078)	(0.0079)	(0.0066)	(0.0067)
DIV	-0.0197	-0.0162	0.0199	0.0211
	(0.0618)	(0.0637)	(0.0543)	(0.0550)
SIZE	0.0600*	0.0626*	0.0490*	0.0497*
	(0.0349)	(0.0351)	(0.0297)	(0.0296)
EXPORT	-0.0575*	-0.0609*	-0.0943	-0.0901
	(0.0346)	(0.0348)	(0.0587)	(0.0592)
SOE	-0.5400***	-0.5495***		
	(0.0326)	(0.0328)		
Time FE	Yes	Yes	Yes	Yes
Firm FE	No	No	Yes	Yes
Industry FE	Yes	Yes	No	No
Observations	35940	35940	35940	35940
Adj.R^2	0.592	0.592	0.643	0.643

Table IA.17
Inclusion of Indirect Shareholding: ROLL

This table reports the results of the difference-in-differences (DID) tests on the impacts of the total government purchase on Roll, a proxy for liquidity, by comparing the rescued stocks to the least correlated stocks. All variables are defined in Table III. VaR, ΔCoVaR, and MES are measured at the 5% level. Standard errors adjusted for firm-level clustering displayed in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)
GOVTD×POST	-0.0417***		-0.0449***	
	(0.0138)		(0.0140)	
GOVTD	-0.0099**			
	(0.0049)			
GOVT×POST		-0.0036***		-0.0048***
		(0.0012)		(0.0014)
GOVT		-0.0004		
		(0.0006)		
ROA	0.0000***	0.0000***	0.0000***	0.0000***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
LEV	-0.0217	-0.0208	-0.0349	-0.0349
	(0.0174)	(0.0172)	(0.0213)	(0.0213)
M/B	-0.0012***	-0.0012***	-0.0011***	-0.0011***
	(0.0004)	(0.0004)	(0.0004)	(0.0004)
CF	0.0035*	0.0035*	0.0037	0.0036
	(0.0021)	(0.0021)	(0.0023)	(0.0023)
DIV	-0.0145	-0.0139	-0.0223	-0.0221
	(0.0260)	(0.0259)	(0.0270)	(0.0270)
SIZE	0.0092	0.0096	0.0074	0.0075
	(0.0097)	(0.0097)	(0.0101)	(0.0101)
EXPORT	-0.0013	-0.0018	0.0269	0.0272
	(0.0060)	(0.0061)	(0.0179)	(0.0179)
SOE	-0.0352***	-0.0367***		
	(0.0051)	(0.0051)		
Time FE	Yes	Yes	Yes	Yes
Firm FE	No	No	Yes	Yes
Industry FE	Yes	Yes	No	No
Observations	34811	34811	34811	34811
Adj.R^2	0.309	0.308	0.323	0.323

Table IA.18
Inclusion of Indirect Shareholding: AMIHUD

This table reports the results of the difference-in-differences (DID) tests on the impacts of the total government purchase on Amihud, a proxy for liquidity, by comparing the rescued stocks to the least correlated stocks. All variables are defined in Table III. VaR, ΔCoVaR, and MES are measured at the 5% level. Standard errors adjusted for firm-level clustering displayed in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)
GOVTD×POST	-0.0861		0.5103	
	(1.0304)		(2.4247)	
GOVTD	0.2873			
	(1.0660)			
GOVT×POST		-0.0878		-0.1034
		(0.1682)		(0.3599)
GOVT		0.1103		
		(0.1687)		
ROA	0.0001***	0.0001***	0.0000	0.0000
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
LEV	-1.0345	-1.0520	-1.3610	-1.3772
	(1.1217)	(1.1287)	(1.1473)	(1.1549)
M/B	-0.0295*	-0.0283	-0.0108	-0.0106
	(0.0179)	(0.0179)	(0.0213)	(0.0215)
CF	-0.1389	-0.1391	-0.1155	-0.1137
	(0.1648)	(0.1647)	(0.1576)	(0.1571)
DIV	0.6655	0.6734	0.0966	0.0899
	(1.2188)	(1.2200)	(1.5801)	(1.5808)
SIZE	0.7003	0.6920	0.6439	0.6361
	(0.9089)	(0.9096)	(0.9128)	(0.9129)
EXPORT	-1.0675	-1.0824	-1.6689	-1.6612
	(0.7749)	(0.7726)	(1.8315)	(1.8344)
SOE	-4.0798***	-4.1419***		
	(0.5207)	(0.5602)		
Time FE	Yes	Yes	Yes	Yes
Firm FE	No	No	Yes	Yes
Industry FE	Yes	Yes	No	No
Observations	35940	35940	35940	35940
Adj.R^2	0.017	0.017	0.017	0.017

Table IA.19
Inclusion of Indirect Shareholding: CBeta

This table reports the results of the difference-in-differences (DID) tests on the impacts of the total government purchase on CBeta, by comparing the rescued stocks to the least correlated stocks. All variables are defined in Table III. VaR, ΔCoVaR, and MES are measured at the 5% level. Standard errors adjusted for firm-level clustering displayed in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)
GOVTD×POST	-0.0491***		-0.0492***	
	(0.0074)		(0.0076)	
GOVTD	0.0510***			
	(0.0077)			
GOVT×POST		-0.0040***		-0.0038***
		(0.0009)		(0.0009)
GOVT		0.0045***		
		(0.0009)		
ROA	-0.0000***	-0.0000***	-0.0000***	-0.0000***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
LEV	0.0204	0.0193	0.0052	0.0054
	(0.0243)	(0.0237)	(0.0080)	(0.0081)
M/B	-0.0011*	-0.0010*	-0.0003	-0.0003
	(0.0006)	(0.0006)	(0.0003)	(0.0003)
CF	-0.0001	-0.0003	0.0015	0.0014
	(0.0015)	(0.0015)	(0.0012)	(0.0012)
DIV	0.0026	0.0027	0.0078	0.0080
	(0.0144)	(0.0145)	(0.0133)	(0.0134)
SIZE	-0.0017	-0.0019	-0.0017	-0.0015
	(0.0063)	(0.0063)	(0.0053)	(0.0053)
EXPORT	-0.0031	-0.0024	-0.0230**	-0.0227**
	(0.0073)	(0.0074)	(0.0105)	(0.0106)
SOE	-0.0214***	-0.0202***		
	(0.0069)	(0.0069)		
Time FE	Yes	Yes	Yes	Yes
Firm FE	No	No	Yes	Yes
Industry FE	Yes	Yes	No	No
Observations	35940	35940	35940	35940
Adj.R^2	0.083	0.081	0.071	0.069

Table IA.20
Inclusion of Indirect Shareholding: ΔCoVaR

This table reports the results of the difference-in-differences (DID) tests on the impacts of the total government purchase on ΔCoVaR, by comparing the rescued stocks to the least correlated stocks. All variables are defined in Table III. VaR, ΔCoVaR, and MES are measured at the 5% level. Standard errors adjusted for firm-level clustering displayed in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)
GOVTD×POST	-0.0996***		-0.0926***	
	(0.0136)		(0.0121)	
GOVTD	0.1396***			
	(0.0116)			
GOVT×POST		-0.0139***		-0.0125***
		(0.0018)		(0.0015)
GOVT		0.0137***		
		(0.0015)		
ROA	0.0000***	0.0000***	0.0000***	0.0000***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
LEV	0.0483	0.0445	0.0387**	0.0385**
	(0.0319)	(0.0304)	(0.0193)	(0.0192)
M/B	-0.0016***	-0.0014***	-0.0016***	-0.0015***
	(0.0005)	(0.0005)	(0.0005)	(0.0005)
CF	0.0024	0.0019	0.0026	0.0024
	(0.0027)	(0.0027)	(0.0022)	(0.0022)
DIV	-0.0130	-0.0132	-0.0085	-0.0082
	(0.0234)	(0.0235)	(0.0187)	(0.0189)
SIZE	0.0145	0.0136	0.0179*	0.0180*
	(0.0120)	(0.0121)	(0.0100)	(0.0100)
EXPORT	0.0274**	0.0294**	-0.0271	-0.0261
	(0.0123)	(0.0124)	(0.0177)	(0.0179)
SOE	0.0275**	0.0320***		
	(0.0117)	(0.0118)		
Time FE	Yes	Yes	Yes	Yes
Firm FE	No	No	Yes	Yes
Industry FE	Yes	Yes	No	No
Observations	35940	35940	35940	35940
Adj.R^2	0.621	0.619	0.707	0.707

Table IA.21
Inclusion of Indirect Shareholding: MES

This table reports the results of the difference-in-differences (DID) tests on the impacts of the total government purchase on MES, by comparing the rescued stocks to the least correlated stocks. All variables are defined in Table III. VaR, ΔCoVaR, and MES are measured at the 5% level. Standard errors adjusted for firm-level clustering displayed in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)
GOVTD×POST	-0.3122***		-0.3098***	
	(0.0358)		(0.0384)	
GOVTD	0.0651**			
	(0.0290)			
GOVT×POST		-0.0270***		-0.0319***
		(0.0044)		(0.0050)
GOVT		0.0082**		
		(0.0035)		
ROA	-0.0000	-0.0000	-0.0000***	-0.0000***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
LEV	0.1121	0.1143	0.0992	0.0996
	(0.0895)	(0.0888)	(0.0743)	(0.0737)
M/B	-0.0064	-0.0064	-0.0047*	-0.0047
	(0.0048)	(0.0049)	(0.0028)	(0.0029)
CF	-0.0056	-0.0059	0.0029	0.0023
	(0.0070)	(0.0070)	(0.0058)	(0.0058)
DIV	-0.0333	-0.0305	-0.0031	-0.0019
	(0.0754)	(0.0769)	(0.0609)	(0.0615)
SIZE	0.0226	0.0243	0.0189	0.0198
	(0.0290)	(0.0290)	(0.0252)	(0.0253)
EXPORT	-0.0241	-0.0253	-0.0660	-0.0633
	(0.0324)	(0.0325)	(0.0500)	(0.0506)
SOE	-0.1397***	-0.1444***		
	(0.0309)	(0.0309)		
Time FE	Yes	Yes	Yes	Yes
Firm FE	No	No	Yes	Yes
Industry FE	Yes	Yes	No	No
Observations	35940	35940	35940	35940
Adj.R^2	0.720	0.720	0.789	0.789

Table IA.22
Propensity Score Matching Estimator

This table reports the comparison results of the rescued stocks with the matching peers in terms of pre-purchase variable means. The control sample consists of stocks matched on pre-purchase control variable averages using a propensity score matching procedure. *p*-value of differences are displayed and none of the differences is significant at the 10% level or better. All variables are defined in Table III.

	Rescued Stocks	Matched Stocks	*p*-Value
ROA	3.101	3.117	0.81
LEV	0.408	0.407	0.77
M/B	3.360	3.358	0.94
CF	-0.684	-0.680	0.98
DIV	0.546	0.549	0.60
SIZE	21.123	21.111	0.50
EXPORT	0.564	0.559	0.47

Table IA.23
Effects of Government Purchase on VOL with PSM

This table reports the results of the difference-in-differences (DID) tests on the impacts of the government direct purchase on equity volitility, after the propensity score matching algorithm. We select control firms among all the non-rescued stocks. All variables are defined in Table III. VaR, ΔCoVaR, and MES are measured at the 5% level. Standard errors adjusted for firm-level clustering displayed in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)
GOVD×POST	-0.0737***		-0.0804***	
	(0.0028)		(0.0031)	
GOVD	-0.0073**			
	(0.0034)			
GOV×POST		-0.0159***		-0.0171***
		(0.0011)		(0.0013)
GOV		0.0017**		
		(0.0007)		
ROA	-0.0001	0.0004	-0.0005	-0.0002
	(0.0005)	(0.0005)	(0.0004)	(0.0004)
LEV	0.0213	0.0269	0.0189	0.0214
	(0.0162)	(0.0170)	(0.0163)	(0.0165)
M/B	-0.0035*	-0.0034*	-0.0025	-0.0028
	(0.0019)	(0.0020)	(0.0018)	(0.0018)
CF	-0.0004	-0.0000	0.0015	0.0015
	(0.0010)	(0.0010)	(0.0009)	(0.0010)
DIV	-0.0049	-0.0098	-0.0089	-0.0128
	(0.0118)	(0.0123)	(0.0109)	(0.0111)
SIZE	0.0019	0.0022	0.0035	0.0044
	(0.0039)	(0.0039)	(0.0036)	(0.0036)
EXPORT	-0.0169***	-0.0193***	-0.0568***	-0.0550***
	(0.0034)	(0.0035)	(0.0073)	(0.0073)
SOE	-0.0486***	-0.0468***		
	(0.0030)	(0.0031)		
Time FE	Yes	Yes	Yes	Yes
Firm FE	No	No	Yes	Yes
Industry FE	Yes	Yes	No	No
Observations	41847	41847	41847	41847
Adj.R^2	0.788	0.786	0.811	0.810

Table IA.24
Effects of Government Purchase on IVOL with PSM

This table reports the results of the difference-in-differences (DID) tests on the impacts of the government direct purchase on idiosyncratic volitility, after the propensity score matching algorithm. We select control firms among all the non-rescued stocks. All variables are defined in Table III. VaR, ΔCoVaR, and MES are measured at the 5% level. Standard errors adjusted for firm-level clustering displayed in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)
GOVD×POST	-0.0473***		-0.0532***	
	(0.0026)		(0.0026)	
GOVD	-0.0228***			
	(0.0028)			
GOV×POST		-0.0097***		-0.0108***
		(0.0008)		(0.0009)
GOV		-0.0006		
		(0.0006)		
ROA	-0.0030***	-0.0027***	-0.0036***	-0.0037***
	(0.0007)	(0.0007)	(0.0007)	(0.0007)
LEV	0.0011	0.0062	0.0117	0.0119
	(0.0162)	(0.0168)	(0.0158)	(0.0157)
M/B	-0.0010	-0.0004	0.0016	0.0018
	(0.0021)	(0.0022)	(0.0021)	(0.0021)
CF	-0.0015	-0.0013	0.0005	0.0005
	(0.0011)	(0.0011)	(0.0010)	(0.0010)
DIV	0.0164	0.0150	0.0003	-0.0001
	(0.0136)	(0.0139)	(0.0122)	(0.0124)
SIZE	0.0006	0.0004	0.0008	0.0013
	(0.0037)	(0.0037)	(0.0035)	(0.0035)
EXPORT	-0.0157***	-0.0186***	-0.0266***	-0.0253***
	(0.0029)	(0.0030)	(0.0066)	(0.0066)
SOE	-0.0282***	-0.0266***		
	(0.0025)	(0.0027)		
Time FE	Yes	Yes	Yes	Yes
Firm FE	No	No	Yes	Yes
Industry FE	Yes	Yes	No	No
Observations	39673	39673	39673	39673
Adj.R^2	0.494	0.484	0.502	0.500

Table IA.25
Effects of Government Purchase on DP with PSM

This table reports the results of the difference-in-differences (DID) tests on the impacts of the government direct purchase on default probalility, after the propensity score matching algorithm. We select control firms among all the non-rescued stocks. All variables are defined in Table III. VaR, ΔCoVaR, and MES are measured at the 5% level. Standard errors adjusted for firm-level clustering displayed in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)
GOVD×POST	-0.4996***		-0.5064***	
	(0.0482)		(0.0469)	
GOVD	0.2942***			
	(0.0962)			
GOV×POST		-0.1273***		-0.1181***
		(0.0138)		(0.0133)
GOV		0.0608***		
		(0.0184)		
ROA	0.0128	0.0129	0.0011	0.0016
	(0.0142)	(0.0141)	(0.0105)	(0.0105)
LEV	-0.4061	-0.4135	-0.7657**	-0.7524*
	(0.4706)	(0.4690)	(0.3830)	(0.3838)
M/B	-0.0683	-0.0706	-0.0696*	-0.0716*
	(0.0467)	(0.0469)	(0.0414)	(0.0417)
CF	0.0092	0.0083	-0.0038	-0.0040
	(0.0312)	(0.0312)	(0.0250)	(0.0252)
DIV	0.2733	0.2586	0.3653	0.3438
	(0.3220)	(0.3236)	(0.2670)	(0.2693)
SIZE	0.0576	0.0610	0.1177	0.1202
	(0.1152)	(0.1151)	(0.0856)	(0.0855)
EXPORT	0.3183***	0.3255***	-0.4504**	-0.4413**
	(0.0823)	(0.0815)	(0.1923)	(0.1920)
SOE	1.1337***	1.1334***		
	(0.0919)	(0.0933)		
Time FE	Yes	Yes	Yes	Yes
Firm FE	No	No	Yes	Yes
Industry FE	Yes	Yes	No	No
Observations	40580	40580	40580	40580
Adj.R^2	0.632	0.633	0.631	0.631

Table IA.26
Effects of Government Purchase on VaR with PSM

This table reports the results of the difference-in-differences (DID) tests on the impacts of the government direct purchase on VaR, after the propensity score matching algorithm. We select control firms among all the non-rescued stocks. All variables are defined in Table III. VaR, ΔCoVaR, and MES are measured at the 5% level. Standard errors adjusted for firm-level clustering displayed in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)
GOVD×POST	-0.7644***		-0.8448***	
	(0.0266)		(0.0302)	
GOVD	-0.1709***			
	(0.0388)			
GOV×POST		-0.1577***		-0.1715***
		(0.0108)		(0.0129)
GOV		-0.0004		
		(0.0100)		
ROA	0.0172***	0.0222***	0.0146***	0.0169***
	(0.0062)	(0.0062)	(0.0043)	(0.0043)
LEV	0.3760**	0.4494**	0.2168	0.2497*
	(0.1731)	(0.1792)	(0.1448)	(0.1459)
M/B	-0.0938***	-0.0924***	-0.0922***	-0.0964***
	(0.0204)	(0.0213)	(0.0181)	(0.0185)
CF	-0.0129	-0.0089	0.0120	0.0126
	(0.0109)	(0.0113)	(0.0094)	(0.0096)
DIV	-0.4301***	-0.4835***	-0.4479***	-0.4894***
	(0.1219)	(0.1272)	(0.1062)	(0.1086)
SIZE	0.0251	0.0275	0.0559	0.0651*
	(0.0412)	(0.0415)	(0.0350)	(0.0352)
EXPORT	-0.1764***	-0.2067***	-0.5825***	-0.5654***
	(0.0409)	(0.0416)	(0.0786)	(0.0776)
SOE	-0.6286***	-0.6061***		
	(0.0362)	(0.0374)		
Time FE	Yes	Yes	Yes	Yes
Firm FE	No	No	Yes	Yes
Industry FE	Yes	Yes	No	No
Observations	41899	41899	41899	41899
Adj.R^2	0.752	0.748	0.791	0.789

Table IA.27
Effects of Government Purchase on ROLL with PSM

This table reports the results of the difference-in-differences (DID) tests on the impacts of the government direct purchase on Roll, a proxy for liquidity, after the propensity score matching algorithm. We select control firms among all the non-rescued stocks. All variables are defined in Table III. VaR, ΔCoVaR, and MES are measured at the 5% level. Standard errors adjusted for firm-level clustering displayed in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)
GOVD×POST	-0.1662***		-0.1652***	
	(0.0081)		(0.0085)	
GOVD	0.0709***			
	(0.0066)			
GOV×POST		-0.0257***		-0.0265***
		(0.0026)		(0.0027)
GOV		0.0104***		
		(0.0017)		
ROA	-0.0021	-0.0021	-0.0057*	-0.0058*
	(0.0027)	(0.0026)	(0.0032)	(0.0031)
LEV	-0.0487	-0.0436	0.0381	0.0435
	(0.0664)	(0.0661)	(0.0698)	(0.0692)
M/B	0.0026	0.0032	0.0082	0.0088
	(0.0090)	(0.0089)	(0.0092)	(0.0092)
CF	0.0026	0.0027	0.0037	0.0037
	(0.0036)	(0.0036)	(0.0040)	(0.0040)
DIV	-0.0231	-0.0225	-0.0076	-0.0078
	(0.0554)	(0.0551)	(0.0559)	(0.0556)
SIZE	0.0196	0.0212	0.0163	0.0176
	(0.0146)	(0.0145)	(0.0154)	(0.0152)
EXPORT	0.0074	0.0086	-0.0543**	-0.0509**
	(0.0072)	(0.0072)	(0.0247)	(0.0248)
SOE	-0.0089	-0.0080		
	(0.0060)	(0.0061)		
Time FE	Yes	Yes	Yes	Yes
Firm FE	No	No	Yes	Yes
Industry FE	Yes	Yes	No	No
Observations	40036	40036	40036	40036
Adj.R^2	0.511	0.508	0.526	0.523

Table IA.28
Effects of Government Purchase on AMIHUD with PSM

This table reports the results of the difference-in-differences (DID) tests on the impacts of the government direct purchase on Amihud, a proxy for liquidity, after the propensity score matching algorithm. We select control firms among all the non-rescued stocks. All variables are defined in Table III. VaR, ΔCoVaR, and MES are measured at the 5% level. Standard errors adjusted for firm-level clustering displayed in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)
GOVD×POST	-0.2544***		-0.3419***	
	(0.0921)		(0.1209)	
GOVD	-0.7412***			
	(0.1130)			
GOV×POST		-0.0292		-0.0259
		(0.0215)		(0.0271)
GOV		-0.0691**		
		(0.0283)		
ROA	0.9719***	0.9794***	1.0006***	1.0022***
	(0.0840)	(0.0842)	(0.0891)	(0.0893)
LEV	8.7114***	8.8376***	9.3546***	9.3998***
	(2.3928)	(2.3969)	(2.4397)	(2.4416)
M/B	-3.0898***	-3.0831***	-3.1466***	-3.1507***
	(0.2857)	(0.2860)	(0.2915)	(0.2917)
CF	0.1323	0.1384	0.2002	0.2009
	(0.1380)	(0.1381)	(0.1394)	(0.1395)
DIV	-13.9298***	-13.9777***	-13.9919***	-14.0146***
	(1.8205)	(1.8208)	(1.8494)	(1.8506)
SIZE	1.1945**	1.1862**	1.3472**	1.3534**
	(0.5283)	(0.5275)	(0.5377)	(0.5381)
EXPORT	-0.1434	-0.2123**	-0.9901***	-0.9877***
	(0.0974)	(0.0969)	(0.2268)	(0.2265)
SOE	-0.7564***	-0.7385***		
	(0.0712)	(0.0718)		
Time FE	Yes	Yes	Yes	Yes
Firm FE	No	No	Yes	Yes
Industry FE	Yes	Yes	No	No
Observations	41899	41899	41899	41899
Adj.R^2	0.518	0.516	0.534	0.533

Table IA.29
Effects of Government Purchase on CBeta with PSM

This table reports the results of the difference-in-differences (DID) tests on the impacts of the government direct purchase on CBeta, after the propensity score matching algorithm. We select control firms among all the non-rescued stocks. All variables are defined in Table III. VaR, ΔCoVaR, and MES are measured at the 5% level. Standard errors adjusted for firm-level clustering displayed in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)
GOVD×POST	-0.1395***		-0.1393***	
	(0.0057)		(0.0057)	
GOVD	0.0923***			
	(0.0079)			
GOV×POST		-0.0219***		-0.0218***
		(0.0024)		(0.0024)
GOV		0.0101***		
		(0.0020)		
ROA	-0.0004	-0.0002	-0.0009	-0.0004
	(0.0011)	(0.0012)	(0.0008)	(0.0008)
LEV	0.0742*	0.0784*	0.0269	0.0370
	(0.0436)	(0.0446)	(0.0342)	(0.0350)
M/B	0.0042	0.0028	0.0021	0.0011
	(0.0040)	(0.0040)	(0.0032)	(0.0032)
CF	0.0010	0.0009	0.0028	0.0029
	(0.0025)	(0.0025)	(0.0020)	(0.0020)
DIV	-0.0226	-0.0287	-0.0173	-0.0250
	(0.0243)	(0.0247)	(0.0192)	(0.0196)
SIZE	-0.0034	-0.0009	-0.0005	0.0014
	(0.0089)	(0.0091)	(0.0069)	(0.0070)
EXPORT	-0.0060	-0.0018	-0.0658***	-0.0637***
	(0.0074)	(0.0075)	(0.0120)	(0.0118)
SOE	-0.0254***	-0.0246***		
	(0.0072)	(0.0072)		
Time FE	Yes	Yes	Yes	Yes
Firm FE	No	No	Yes	Yes
Industry FE	Yes	Yes	No	No
Observations	41899	41899	41899	41899
Adj.R^2	0.326	0.315	0.213	0.198

Table IA.30
Effects of Government Purchase on ΔCoVaR with PSM

This table reports the results of the difference-in-differences (DID) tests on the impacts of the government direct purchase on ΔCoVaR, after the propensity score matching algorithm. We select control firms among all the non-rescued stocks. All variables are defined in Table III. VaR, ΔCoVaR, and MES are measured at the 5% level. Standard errors adjusted for firm-level clustering displayed in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)
GOVD×POST	-0.2816***		-0.2754***	
	(0.0115)		(0.0106)	
GOVD	0.2119***			
	(0.0132)			
GOV×POST		-0.0552***		-0.0544***
		(0.0043)		(0.0041)
GOV		0.0322***		
		(0.0039)		
ROA	-0.0117***	-0.0114***	-0.0041***	-0.0033**
	(0.0022)	(0.0022)	(0.0015)	(0.0014)
LEV	0.1943***	0.1940***	-0.0124	-0.0005
	(0.0740)	(0.0742)	(0.0503)	(0.0500)
M/B	0.0114	0.0087	-0.0002	-0.0016
	(0.0070)	(0.0071)	(0.0058)	(0.0058)
CF	0.0058	0.0054	0.0040	0.0042
	(0.0043)	(0.0043)	(0.0031)	(0.0032)
DIV	-0.0569	-0.0664	-0.0423	-0.0560
	(0.0415)	(0.0425)	(0.0340)	(0.0344)
SIZE	-0.0028	0.0021	0.0085	0.0116
	(0.0151)	(0.0153)	(0.0117)	(0.0116)
EXPORT	0.0212	0.0298**	-0.1724***	-0.1669***
	(0.0141)	(0.0139)	(0.0267)	(0.0264)
SOE	-0.0249*	-0.0258*		
	(0.0135)	(0.0136)		
Time FE	Yes	Yes	Yes	Yes
Firm FE	No	No	Yes	Yes
Industry FE	Yes	Yes	No	No
Observations	41899	41899	41899	41899
Adj.R^2	0.762	0.760	0.787	0.786

Table IA.31
Effects of Government Purchase on MES with PSM

This table reports the results of the difference-in-differences (DID) tests on the impacts of the government direct purchase on MES, after the propensity score matching algorithm. We select control firms among all the non-rescued stocks. All variables are defined in Table III. VaR, ΔCoVaR, and MES are measured at the 5% level. Standard errors adjusted for firm-level clustering displayed in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)
GOVD×POST	-0.4419***		-0.4423***	
	(0.0265)		(0.0280)	
GOVD	-0.1392***			
	(0.0355)			
GOV×POST		-0.0978***		-0.1030***
		(0.0089)		(0.0094)
GOV		-0.0055		
		(0.0081)		
ROA	-0.0373***	-0.0344***	-0.0483***	-0.0473***
	(0.0074)	(0.0076)	(0.0062)	(0.0062)
LEV	-0.3103	-0.2700	-0.5041**	-0.4965**
	(0.2283)	(0.2315)	(0.2016)	(0.2019)
M/B	0.1569***	0.1586***	0.1474***	0.1459***
	(0.0235)	(0.0237)	(0.0200)	(0.0200)
CF	-0.0094	-0.0069	0.0120	0.0121
	(0.0125)	(0.0127)	(0.0112)	(0.0113)
DIV	0.6112***	0.5798***	0.6988***	0.6789***
	(0.1481)	(0.1513)	(0.1268)	(0.1274)
SIZE	-0.1081**	-0.1075**	-0.0762*	-0.0721*
	(0.0455)	(0.0456)	(0.0404)	(0.0401)
EXPORT	-0.1922***	-0.2114***	-0.3993***	-0.3889***
	(0.0362)	(0.0371)	(0.0513)	(0.0510)
SOE	-0.3284***	-0.3123***		
	(0.0345)	(0.0343)		
Time FE	Yes	Yes	Yes	Yes
Firm FE	No	No	Yes	Yes
Industry FE	Yes	Yes	No	No
Observations	41899	41899	41899	41899
Adj.R^2	0.824	0.823	0.861	0.861

Table IA.32
Summary Statistics of Fund Characteristics

This table presents summary statistics on fund characteristics for the 1,367 investment funds used in our analysis. We gather data on the mutual fund holdings and characteristics from RESSET. TurnOver is the average turnover rate through 2012 to 2014. GRatio is the log of the total holdings of treated stocks minus the log holdings of control stocks in 15H1. FundSize is defined as the average of the log of a fund's total net asset value through 2012 to 2014. P/B is the average price-to-book ratio across all portfolio constituents and IndexFund takes a value of one for index funds, and zero otherwise.

Variable	N	Mean	Std	Median
IndexFund	1,367	0.197	0.398	0
P/B	1,367	8.062	3.736	7.328
GRatio	1,309	1.031	1.581	0.680
TurnOver	1,027	9.384	41.58	1.646
FundSize	1,027	19.48	2.042	19.62

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