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# **In times of crisis does ownership matter?**

## **Liquidity extraction through dividends during the 2007–2009 financial crisis**

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Liquidity flow between regions with different levels of temporary financial constraints has received insufficient attention. This study takes advantage of a natural opportunity: Chinese capital markets clearly distinguish between foreign direct investment firms and firms with foreign institutional investment. Using the distinctive categorization of institutional holding structures in China, we find that foreign controlled enterprises were associated with an extraordinary increase in dividend payouts during the Global Financial Crisis, with concomitant underinvestment. Our results suggest that foreign-controlling shareholders extracted liquidity through dividends, highlighting a previously ignored channel for global transference of liquidity, with concomitant agency costs.

JEL classification: G15; G35

Keywords: Foreign equity ownership; foreign direct investment; dividends; financial liquidity; financial crises; Chinese capital markets

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## I. Introduction

We investigate the impact of foreign ownership on dividend payments of Chinese foreign-invested enterprises (FIEs) during the global financial crisis (GFC). It is well known that investors seek liquidity during crises by cutting dividends (Bliss, Cheng, and Denis, 2015). However, we document that, in China during the GFC, FIEs adjusted their dividends higher, in contrast to what occurred for both domestic firms and firms with passive institutional investor presence. Since liquidity was adversely impacted, particularly in Western economies by the GFC, we consider a liquidity-based explanation: FIEs engaged in investment-harming dividend increases to extract liquidity to the West.

While a number of studies consider the comparative advantage of possessing liquidity in times of financial crisis (Allen and Gale, 1994; Brown, 2000; Pulvino, 1998; Shleifer and Vishny, 1992),<sup>1</sup> these studies focus on firms with differences in liquidity levels within the same stressed environment. What has received less attention is how firm-level liquidity might be transferred across regions when a financial crisis manifests in one region of the world, leaving other regions comparatively less affected. And those studies that do examine global liquidity flows in this context mainly focus on liquidity shocks in one region of the globe causing selling pressure on stocks in another area (Antón and Polk, 2014; Jotikasthira, Lundblad, and Ramadorai, 2012). However, might adjusting dividend payouts be another way of filling liquidity voids?

Because of its distinctive taxonomy regarding institutional holding, China offers an ideal setting for examining the impact of foreign ownership on payout. Since 2001, a mechanism for foreign investors to acquire significant ownership in Chinese firms is through owning shares, as foreign direct investment (FDI), via FIEs (Cui and Jiang, 2009; Xu et al., 2006). FIEs require foreign ownership of at least 25%, leaving foreign investors with significant decision-making power. While, in China, foreign portfolio investors may also access the domestic stock market through the Qualified Foreign Institutional Investor (QFII) program or by holding B-shares,<sup>2</sup> Chen et al. (2013) estimate such foreign

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<sup>1</sup> For instance, Brown (2000) finds that equity real estate investment trusts (REITs) have an advantage over mortgage REITs in acquiring heavily discounted properties during real estate crashes. Similarly, Pulvino (1998) finds that less-indebted airlines are often able during economic downturns to purchase aircraft from more levered firms at “fire-sale” prices.

<sup>2</sup> Chinese firms issue multiple types of shares. A-shares and B-shares are tradable, and state shares and legal person shares are non-tradable. As of June 2018, there were 2,863 A-share listed firms and 101 B-share listed

portfolio investors hold only about 2% of the shares of these respective firms—significantly lower than the high levels of foreign holding in FIEs. Therefore, we opt to focus on FIEs to offer new information regarding the impact of foreign-controlling ownership on the payouts of respective domestic firms.

Our paper also connects to research on how foreign capital exposes domestic markets to international risks (Chen et al., 2013; Stiglitz, 1999). While much of this literature naturally focuses on volatility, the influence of corporate policies, like dividend payout, remains unclear. Our study also adds to studies on the influence of the 2007–2009 GFC on corporate policy and shareholder values. For instance, Bliss, Cheng, and Denis (2015) document a significant reduction in corporate payout in the U.S. during the GFC. Consistent with Shleifer and Vishny (1992), they report that payout reductions are more likely for firms susceptible to negative external financing shocks—those with higher leverage, more value-adding growth options, and lower cash balances.<sup>3</sup> Our study also connects to recent studies that examine how payouts vary with variations in equity stakeholders. For instance, Isakov and Weisskopf (2015) evidence that payouts are higher for family firms, as dominant shareholders of these firms are focused on maintaining control and wealth preservation but also have liquidity and income needs as they rely on investment income. Goyal, Jategaonkar, and Muckley (2020) find that recently privatized firms have higher payouts, attributing this to state’s enhancing reputational capital with minority shareholders. More generally, DeAngelo, DeAngelo, and Skinner (2009) discuss and amalgamate views of a number of scholars as to why controlling stockholders might prefer payout levels that are non-value-maximizing, with many of these reasonings based on shareholder concerns for maintaining control or concerns for idiosyncratic portfolio optimization or behavioral biases and bounded rationalities.

However, little attention has been given to payout policies and investment decisions of foreign-controlled, emerging-market firms during the GFC.<sup>4</sup> While identifying channels of global liquidity flow

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firms in China. Most B-share listed firms also issued A-shares. B-shares were originally reserved for foreign investors. From 2001, domestic investors could also trade B-shares. QFIIs were introduced in 2003 in China.

<sup>3</sup> See also Rudolph and Schwetzler (2013)

<sup>4</sup> Particularly with regard to equity markets, Glick and Hutchison (2013) find the correlation of equity price changes between Chinese markets and those of other Asian countries increased substantially during the GFC and remained high in post-crisis years. However, the correlation of U.S. market equity returns with those of Asian countries contrastingly decreased after the GFC.

during financial crises is important in general, because of China's significant role in the global economy, it is particularly valuable to understand how foreign ownership facilitates liquidity transference between Chinese and Western firms. Overall, foreign institutional and portfolio investors in emerging stock markets are known to prefer to invest in firms with stronger corporate governance (Jeon, Lee, and Moffett, 2011; Tong and Yu, 2012). While dividend payout may be used as a monitoring device to reduce free cash flow and mitigate the principal-agent conflict (Easterbrook, 1984; Jensen, 1986), high dividends constrain investment, especially during the onset of external financial shocks (Bliss, Cheng, and Denis, 2015; Ramalingegowda, Wang, and Yu, 2013). Consistent with this negative view of excess dividends, studies (Faccio, Lang, and Young, 2001; Huang, Shen, and Sun, 2011) document dividend tunneling by firm-controlling shareholders. Compared to asset selling that both depresses stock prices, and dilutes control of foreign investors, dividend increases are generally considered a positive sign by markets. This positive signal can mask dividend tunneling and concomitant underinvestment. There has been little investigation regarding changes in dividend payout by foreign-controlled emerging-market firms being used to move liquidity across the globe. Further, while the behavior of foreign investors in the QFII program or in B-shares has received attention, agency issues regarding FIEs has been little researched—despite FIE firms encompassing a much larger presence of foreign investor interest.

To test our predictions, we utilize a comprehensive sample of 2,423 Chinese firms, listed on the Shanghai and Shenzhen stock exchanges, spanning 2005–2014. Based on ownership data available from China Stock Market and Accounting Research (CSMAR), we identify 191 FIE firms. Conducting difference-in-differences (D-i-D) tests, we find that the FIEs, compared to non-FIEs, are associated with larger dividend payouts during the GFC. This relative dividend increase is economically meaningful, being almost 50% of the pre-crisis dividend payout level of FIEs.

For robustness, we consider, as per agency cost-based theory, that it is expected that managers will give preference to value-maximizing investment opportunities over dividend payout, especially during crises periods when opportunities for external financing are limited (Floyd, Li, and Skinner, 2015). However, using Tobin-Q as a proxy for firm-level growth opportunity (Hayashi, 1982), we find

that FIEs, irrespective of significant growth opportunities, paid higher dividends during the GFC. This clearly suggests payout increases were undertaken for reasons outside of concerns for the local FIEs.<sup>5</sup>

We particularly take effort to distinguish QFII firms from FIEs out of concern that some might interpret our results as showing that institutional shareholders increased dividends during the GFC to improve governance. Our arguments against this view are several fold: 1) FIE and QFII investors are entirely different classifications of investors, with institutional investors classified as QFII investors; 2) we particularly evidence that QFII firms did not increase dividends during the GFC; 3) whether the presence of institutional investors in a firm's investor base improves governance is contested in the literature, and furthermore there is no reason to expect during financial crises a greater need for improved governance;<sup>6</sup> and 4) during financial crises it is expected that there will be greater needs for liquidity. In summary, while we evidence that the presence of institutional investors conditions the effects we observe, our results are not driven by the small amount of institutional ownership in FIEs.

In additional robustness testing, to address concerns regarding sample-selection bias, we conduct two set of tests using propensity score matching (PSM) to identify counter-factual firms with comparable ex-ante propensities to increase dividend during the crisis years (Roberts and Whited, 2013). First, we use PSM to match each FIE firm-year observation with a unique non-FIE Chinese firm using an array of firm-level criterion. Second, instead of non-FIE Chinese firms, we consider QFII firms as counterfactuals. In both set of tests, we find a positive association between dividend payout and FIEs during the crisis years. Results also hold for FIEs with investment opportunity and high institutional holding—and are particularly strong when we use QFII-invested firms as a PSM control sample.

In the second part of our study, we document that, because of dividend increases, FIE investment decreased in the years after the GFC, leading to significant underinvestment. We verify our results using a propensity score-matched sample. These underinvestment findings closely align with our primary thesis: underinvestment by FIEs in the year's post-GFC are the result of dividend increases

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<sup>5</sup> While the use of Tobin's Q as a proxy for growth is disputed (Hayashi and Inoue, 1991; Wildasin, 1984), Andrei, Mann, and Moyen (2019) evidence recent tightening of this relationship.

<sup>6</sup> While some (Firth et al., 2012) find institutional investors, especially mutual funds, improves firm governance, others (Schmidt and Fahlenbrach, 2017) do not. In 2000, to strengthen corporate governance and reduce speculative behavior in the stock market, the Chinese government chose to develop mutual funds as institutional investors (Firth et al., 2016; Huang et al., 2019; Wang, Ye, and Goyal, 2019).

acting as a vehicle for the extraction of liquidity by foreign-controlling shareholders during the crisis. To further assess the importance of our findings, we examine the level of economic impact of FIE underinvestment, employing a propensity score-matched sample of FIEs with non-FIEs having similar propensities to increase dividend payout during the GFC. We correspondingly observe a negative effect of dividend increases by FIEs on post-crisis profitability and sales growth, with additional falsification tests further validating our findings.

In summary, while it is otherwise expected that investors will seek liquidity during crises by cutting dividends (Bliss, Cheng, and Denis, 2015), we find that, in China during the GFC, dividends were adjusted higher by FIE firms. Since liquidity was inversely impacted by the GFC, particularly in Western economies, a liquidity-based explanation for investment-harming dividend increases by foreign-controlled firms in China during the GFC is considered. We approach this question by empirically testing the feasibility of other explanations. The paper proceeds as follows: In Section II we discuss the theoretical background of the paper and develop our hypotheses. Section III describes our data and methodology used in this paper. Section IV provides empirical results including summary stats, regression analysis and robustness checks for potential endogeneity concern. Section V concludes the paper.

## **II. Theoretical background and hypotheses development**

Miller and Modigliani (1961) propose that, in a perfect market setting, firm valuation is independent of dividend policy. They also propose that with personal taxation investors will form clienteles with preferences for specific levels of dividends. As an extension of this, Allen, Bernardo, and Welch (2000) develop a dividend-signaling model based on a clientele hypothesis, proposing that firms might be able to signal their quality by initiating, then regularly paying, dividends. They conclude that as only high-quality firms are able to bear the tax-based burden of regular dividend payouts, higher dividends are a signal to attract better-informed investors. Therefore, a dividend-clientele hypotheses suggests that foreign investors in Chinese firms are relatively more likely to invest in high-dividend-paying firms. However, particular differences in payout-change behavior on the part of foreign-controlled firms in China during the GFC prompts further investigation. We document that foreign-controlled firms in China, in contrast to other firms, increased payouts during the financial crisis. This

behavior differed not only from that of other Chinese firms during the crisis but also from the behavior of these foreign-controlled firms during normal times. This remarkable behavior motivates investigations beyond clientele-based explanations.

Further, consistent with La Porta et al. (2000), agency-hypothesis proponents argue that paying higher dividends provides a cost-effective substitute for shareholder monitoring, leading to increases in firm-values and reductions in over-investment. Prior literature suggests that large shareholders play a vital role in firm-level corporate governance by monitoring firm activities. Such monitoring mitigates principal-agent costs (Shleifer and Vishny, 1986). Therefore, in emerging markets like China, foreign investors with a majority shareholding (in the form of FIEs) are more likely to apply global standards and practices by disbursing more cash through dividends, as a complement to the monitoring role of domestic firms.

In China, foreign ownership of firms is typically much lower than that of the largest domestic ownership, which in most cases is state ownership (Firth et al., 2012). Due to regulatory constraints, foreign investors can rarely become controlling parties in listed firms in China (Chen et al., 2013). Therefore, large foreign investors tend to eschew long-term investment strategies within a Chinese speculative investment environment shaped by local retail investors. There is a large and growing body of literature testing whether foreign investors have informational advantages over their domestic peers. On one hand, foreign investors have a significant global investment exposure based on their technical skills. This is supplemented with an improved skill set to evaluate potential target firms in the form of manpower and technology. Therefore, it can be argued that foreign investors have an advantage over domestic investors. On the other hand, however, foreign investors may also have an inferior information set due to geological, cultural, and political differences (Choe, Kho, and Stulz, 2005). As a result, dividend payouts are perceived as a positive signal. Consequently, firms that regularly pay dividends become likely candidates for foreign investment (Jeon, Lee, and Moffett, 2011).

Based on the above discussion, it is highly likely that foreign investors prefer high-dividend-paying firms. Interestingly, approximately 75% of the total foreign ownership of domestic Chinese firms is held by entities based in North American and European markets (Chen et al., 2013). Literature highlights that there are both costs and benefits linked to cash retention. Cash reserve is commonly used



as a buffer against shocks to cash flows and investment opportunities. Thus, firms in crisis-hit markets are more likely to hold greater cash balances to offset substantially increased external-financing costs (Faulkender and Wang, 2006) and cash-flow volatility (Opler et al., 1999). They also are more likely to have an investment opportunity set that concomitantly becomes more valuable. This leads to an increased dependency on internal resources for investments (Almeida, Campello, and Weisbach, 2011). The credit crisis of 2007–09 manifested such an external shock (Bliss, Cheng, and Denis, 2015).

The onset of the credit crisis in mid-2007 was a negative shock to the supply of credit in the Western markets. The resulting squeeze in the supply of external capital for U.S. and European firms, as with episodes of credit contraction in general, impacted the availability of funds for corporate investment (Almeida, Campello, and Weisbach, 2011). Recent studies also evidence concomitant lacks of synchronization of business cycles (Fidrmuc and Korhonen, 2010) or finished-product export-orientations (Aloui, Aïssa, and Nguyen, 2011) between emerging economies and the U.S. and European markets during the 2007–2009 crisis period. Thus, there is ample reason to consider that foreign investors were motivated to export funds in the form of higher dividend payout during GFC. This rationale also is substantiated in prior studies such as Faccio, Lang, and Young (2001) on East Asian and Western European markets, and Huang, Shen, and Sun (2011) on Chinese markets. Consequently, Chinese-listed firms designated as FIEs are likely to pay higher dividends during the GFC in order to facilitate investment and cash-flow stability of foreign investors. Therefore, our primary hypothesis is:

*H1: Foreign-invested enterprises paid higher dividends during the period of global financial crisis than domestic firms and did not have relatively higher payouts at other times.*

Firms with better growth prospects have a stronger incentive to pay lower (or even omit) dividends in order to avoid tapping into costly external financing resources (La Porta et al., 2000). Recent studies establish a significant constraining effect of dividend policy on firm-level investment, leading to underinvestment problems (Brav et al., 2005; Ramalingegowda, Wang, and Yu, 2013). Managers are extremely reluctant to cut dividends, and view the objective to maintain the dividend level as a “nearly untouchable” (Brav et al., 2005; Lintner, 1956). Further, if managers increase dividend payout, they are more likely to continue this new payout level into the long run. Therefore, it is

reasonable to conclude that the primary rationale for sudden payout changes is unavailability of significant profit-yielding projects for the firm (Brav et al., 2005). More importantly, managers indicate that they are willing to forgo some valuable investment opportunities in order to maintain dividend levels, as opposed to declining investments only when they are likely to increase dividends (Brav et al., 2005). Overall, recent literature suggests a strong positive correlation between dividend payout and underinvestment.

Furthermore, there was a well-documented shock to the cost and supply of the credit in Western markets during the financial crisis (Bliss, Cheng, and Denis, 2015). Due to financial shock, firms faced significant decline in borrowing opportunities and increased uncertainty. This increased the cost of external funds for the firms across the U.S. and Europe. Further, consistent with this abrupt change in the supply of credit, and successive rise in the cost of external funding, firms shifted planning direction toward increased credit rationing to accommodate higher costs of borrowing and difficulties in initiating or renewing credit lines (Campello, Graham, and Harvey, 2010). Consequently, foreign investors from crisis regions had particular motivation to increase dividend payouts from Chinese firms in order to assuage shortages of liquidity or use as a buffer against anticipated shortages in their home markets during the GFC. Therefore, we hypothesize that the FIEs, being forced to increase their dividend payouts during the GFC, concomitantly suffered near-term underinvestment.

*H2 Dividend increases for foreign-invested firms during the GFC were negatively associated with future firm-level investments and positively associated with underinvestment.*

### **III. Data and model description**

#### *Sample Selection*

With the rapid integration of the Chinese financial markets in the global economy, especially in terms of FDI (Huang, Jin, and Qian, 2013), in 1990s and early 2000s, the Chinese stock market still remained effectively isolated to an extent that the foreign portfolio investors were legally prohibited from investing in domestic tradable A-shares until 2003, when China allowed QFIIs to invest in the domestic A-share market. This market ran under a government-allocated quota system, and was restricted to relatively large financial institutions in the initial phase (Huang and Zhu, 2015). Public

listings of FDI firms classified as FIEs was prohibited by The Ministry of Foreign Trade and Economic Cooperation in China until 2001. Effectively, foreign ownership of listed firms in China remained insignificant until around 2005. For these reasons, we begin our sample period in 2005. We study a sample of up to 2,423 industrial firms listed on the Shanghai Stock Exchanges and Shenzhen Stock Exchanges in China from 2005<sup>7</sup> to 2014.

Our data is collected from the CSMAR database (Firth et al., 2012; Firth et al., 2016). Following payout literature (Brockman and Unlu, 2009; Goyal et al., 2020), we remove regulated utilities, financial firms, and firms with negative book value. We also delete firms in financial distress<sup>8</sup> to ensure consistent comparison, since they are unlikely to pay any dividends or attract significant foreign investment. We also exclude firms with missing data and dual listings of H-shares due to different regulations. Further, we exclude firm-year observations for newly listed IPO firms (less than one year). Our final sample is an unbalanced panel that consists of up to 18,423 firm-year observations.

Since Lintner (1956), the literature on dividend policy has recognized that managers focus on DPS and dividend amount, rather than dividend payout ratios. Managers do this because dividends are sticky, and they are reluctant to upset investors by significantly changing the payout amount from year to year (Brav et al., 2005). Following recent literature on dividend payout (Ramalingegowda, Wang, and Yu, 2013; Bliss, Cheng, and Denis, 2015), we focus on cash dividend per share (DPS) as key payout parameters.<sup>9</sup> Next, following recent dividend literature we also employ dividend scaled by total assets (Flavin et al., 2021) and dividend scaled by sales (Goyal et al., 2020) as additional dividend payout parameters to test the viability of our hypothesis.

#### *Methodology and Model Description*

To test H1, we adopt a difference-in-differences (D-i-D) model, estimated using by both Tobit and OLS regressions, as follows<sup>10</sup>:

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<sup>7</sup> Besides, at the end of 2004, non-tradable shares in China accounted for more than 60% of the outstanding stocks, which seriously restricted the overall liquidity of the stock market. In 2005, the Chinese government initiated split-share structure resolution to resolve the issue of non-tradable shares to further improve the liquidity of the Chinese stock market; thus, our sample does not include the period prior to reform.

<sup>8</sup> Financially distressed firms are labelled as “ST” firms by Chinese stock exchanges.

<sup>9</sup> Among all A-share non-financial firms, less than 7% firm-years have paid stock dividend during 2005–2014 among which only 24 firm-year observations are classified as FIEs.

<sup>10</sup> According to Greene (2012) and Tobin (1958), OLS models are inconsistent when the dependent dividend

$$\text{DPS}_{it} \text{ or } \text{DIV\_TA}_{it} \text{ or } \text{DIV\_SALES}_{it} = \alpha + \beta_1 \text{FIE}_i \times \text{Crisis}_t + \beta_2 \text{FIE}_i \times \text{Postcrisis}_t + \beta_3 \text{FIE}_i + \beta_4 \text{Crisis}_t + \beta_5 \text{Postcrisis}_t + \gamma \text{Controls}_{it} + \varphi \text{IND}_i + \delta \text{YEAR}_t + \varepsilon_{it} \quad (1)$$

The dependent variable in EQ. (1) is the cash dividend per share ( $\text{DPS}_{it}$ ) in Chinese yuan. As alternative measures of dividend payout policy, we compute the cash disbursed as dividend scaled by the value of total assets for all firm-years ( $\text{DIV\_TA}_{it}$ ) and dividend scaled by the annual sales ( $\text{DIV\_SALES}_{it}$ ).  $\text{FIE}_i$  is a dummy which is assigned “1” if the firm’s controlling shareholder is a foreign investor (or firm) according to classifications of controlling shareholders types by CSMAR, and 0 otherwise.<sup>11</sup>  $\text{Crisis}_t$  is a dummy which is assigned “1” for years 2007 to 2009, and “0” otherwise.  $\text{Postcrisis}_t$  is a dummy assigned “1” for years 2010 to 2014, and “0” otherwise.  $\text{Controls}_{it}$  represents a number of control variables.  $\alpha$  is the intercept and  $\varepsilon_{it}$  is the regression error. Variable  $\text{IND}_i$  controls for industry fixed effects and  $\text{YEAR}_t$  controls for year fixed effects.

EQ. (1) allows us to account for potential payout adjustments among listed firms over three consecutive non-overlapping periods. In particular, dividend payout by FIEs can be computed as  $(\beta_1 \text{Crisis}_t + \beta_2 \text{Postcrisis}_t + \beta_3) * \text{FIE}_i$ . When  $\text{Crisis}_t$  and  $\text{Postcrisis}_t$  both are equal to 0 (hence, the baseline period in this model is the pre-crisis years 2005 and 2006),  $\beta_3$  shows dividend payout by FIEs in excess of Non-FIEs in 2005-2006 prior to the financial crisis. When  $\text{Crisis}_t = 1$  and  $\text{Postcrisis}_t = 0$  (years 2007-2009),  $\beta_1 + \beta_3$  shows dividend payout by FIEs in excess of Non-FIEs in 2007-2009.  $\beta_1$  represents the treatment effect (i.e., the difference in the changes of dividends) of  $\text{Crisis}_t$  on FIEs during the 2007–2009 financial crisis compared to the 2005-2006 pre-crisis period which tests hypothesis H1. When  $\text{Crisis}_t = 0$  and  $\text{Postcrisis}_t = 1$  (years 2010–2014),  $\beta_2 + \beta_3$  shows dividend payout by FIEs in excess of Non-FIEs in 2010-2014 and  $\beta_2$  represents the difference in dividend payout by FIEs during 2010-2014 post-crisis period compared to the baseline period 2005–2006 prior to the crisis.

Following extant payout literature on determinants of dividend policy in China, we include a number of control variables in our empirical analysis to test the validity and robustness of our key

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variables are left or right bounded, resulting in downwards-biased slope coefficients and upward-biased intercept. In our case, decreases in payout are bounded to a reduction to zero. Therefore, we also estimate Tobit models.

<sup>11</sup> CSMAR identifies the controlling shareholder using CSRC’s definition of the “ultimate owner” of a publicly listed company as: (1) the largest shareholder, or (2) the shareholder with more voting power than the largest shareholder, or (3) the shareholder with shareholding or voting rights above 30% of the total outstanding shares, or voting rights in the company, or (4) the shareholder who can determine over half of the board members.

hypothesis (Huang, Shen and Sun, 2011). We control for firm-level profitability by including return on assets as earnings before interest and tax scaled by total assets. We control for cash liquidity by including free cash flow of firm scaled by total assets. We control for other cash flow with sales and operations scaled by total assets, size by including natural logarithm of the market capitalization, leverage by scaling book value of total liabilities by total assets and investment opportunities by Tobin's Q. Further, we include a dummy variable equal to 1 if the firm had a seasoned equity offering (SEO) or rights issue in the year before ( $t-1$ ) or after ( $t+1$ ) the year of observation ( $t$ ) to account for capital market financing. To address the agency conflict between minority and majority shareholder, we control for the shareholding of the largest shareholder in the firm. Next, we consider the firm-level liquidity in the capital market by controlling for the proportion of tradable shares at the firm level. We also account for state-owned enterprises (i.e., SOEs) by including a firm-year-level dummy variable.

In order to examine the effects of dividend changes on firm investment, we follow Chen et al (2011) on capital investment of Chinese firms and measured capital investment INV as cash payments for fixed assets, intangible assets and other long-term assets from the cash flow statement minus cash receipts from selling these assets, scaled by one-year lag total assets. We then follow Biddle, Hilary, and Verdi (2009) to estimate a measure of underinvestment,<sup>12</sup> denoted as follows:

$$UNINV = \text{Expected (INV)} - INV \quad (2)$$

here Expected (INV) is the expected investment calculated by employing a piecewise regression model:

$$INV_{it} = \alpha_0 + \alpha_1 NEG_{it-1} + \alpha_2 RevGrowth_{it-1} + \alpha_3 NEG_{it-1} * RevGrowth_{it-1} + \alpha_4 IND_i + \delta Year_t + \epsilon_{it} \quad (3)$$

In EQ. (3) above, the dependent variable is firm-level investment scaled by total assets. The independent variable  $NEG_{it-1}$  is a dummy variable, equal to 1 if the change in sales over two consecutive fiscal years is negative.  $RevGrowth_{it-1}$  is the change in sales over two consecutive fiscal years. We also control for industry fixed effects  $IND_i$  based on the CSRC tier-2 industry classifications, under which sample firms are assigned to 75 sub-industries, and year fixed effects  $Year_t$  in the

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<sup>12</sup> Expected investment is calculated based on sales growth which is certainly expected to be lower during the crisis. While this suggests that firms are likely to make lower investments, it does not mean they should make inefficient investment decisions. According to Biddle, Hilary, and Verdi (2009), underinvestment (overinvestment) means forgoing (accepting) positive (negative) NPV projects.

regression.

$$F\_INV_{it} \text{ or } F\_UNINV_{it} = \alpha + \beta_1 D\_DPS_{it} + \beta_2 D\_DPS_{it} \times Crisis_t + \beta_3 D\_DPS_{it} \times Crisis_t \times FIE_i + \beta_4 Crisis_t + \beta_5 FIE_i + \gamma Controls_{it-1} + \phi IND_i + \delta YEAR_t + \varepsilon_{it} \quad (4)$$

The dependent variable in the model is the one-year forward capital investment ( $F\_INV_{it}$ ) or underinvestment ( $F\_UNINV_{it}$ ) scaled by total assets. The independent variable  $D\_DPS_{it}$  is the change of dividend per share (DPS) compared to previous year. To ensure robustness of the findings, we also replace  $D\_DPS_{it}$  in the model with the change of total cash dispersed as dividend scaled by total assets ( $D\_DIV\_TA_{it}$ ). As we aim to test the influence of dividend changes by foreign-controlled firms on firm investment during the 2007-2009 financial crisis period, the dummy variable  $Crisis_t$  in EQ. (4) takes the value of 1 for years 2007–2009 and 0 for all other years. In light of Biddle, Hilary, and Verdi (2009), we control for firm investment opportunity using Tobin’s Q ratio and the percentage of tangible assets, profitability using return on assets, government control, board composition using the size of the board and board independence ratio, firm size, financial leverage and industry and year fixed effects in EQ. (4). To account for outliers, we winsorize all non-dummy variables with a zero lower bound at the upper 1% level, while remaining variables are winsorized at the upper and lower 1% levels. A detailed description of all the dependent, explanatory and control variable is included in Appendix A1.

#### IV. Empirical analysis and discussion of results

##### 4.1 Summary Statistics

Table 1 reports descriptive statistics for the variables used in this study. Panel A in particular shows the summary statistics for the FIE firm-years; along with their corresponding matched non-FIE firm-years and the full sample used in this study. We note that 4.4% of the firm-years are classified as FIEs under foreign control.<sup>13</sup> Although, slightly over 54 percent of the total firm-years are classified as SOEs i.e. controlled by the Chinese government, but we do not find any major holding of SOEs in our FIE sample. For the full sample, the average dividend per share (payout amount annually disbursed by payers) is Chinese Yuan ¥ 0.10, and the average total cash dividend paid accounts for 1.20% of asset

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<sup>13</sup> The average percentage shareholding by foreign controlling shareholders among FIEs is about 37.5% according to our statistics, and these FIEs are mostly private sector firms in which the Chinese government has zero or negligible shareholding.

value and 2.5% of sales among all firm-years. On average, 36.54% (and 37.52%) of the outstanding shares in Chinese firms (and in FIEs) are held by the largest shareholder (and foreign controlling shareholders). Another 31.4% on average among all firms are held by institutional investors.<sup>14</sup>

Basic statistics for FIEs for differing periods are reported in Table 1, Panel B. We observe a monotonic increase in dividend payout (for all the three parameters) and institutional shareholding from Pre-crisis to Post-crisis period. Next, similar statistics for the matched non-FIE firm-years are reported in Table 1, Panel C. Here we observe a drop in the dividend payout (for all the three parameters) during the crisis years.

(Please insert Table 1 about here)

Figures 1 and 2 illustrates the differences in dividends scaled by assets and sales respectively of FIEs versus domestic firms and QFII firms. For FIEs, there was a sharp increase in both dividends to total assets and sales at the start of the GFC, from 2007. In contrast, domestic firms and QFII firms do not display such an increase in dividends per assets or sales. Both domestic firms and QFII firms show a steady decline in dividends per assets and sales at the onset and into the GFC. Interestingly, payout premium of FIEs continue for the entire duration of the GFC both in terms of dividends to assets and sales.

(Please insert Figure 1 and Figure 2 about here)

#### *4.2 Dividend Premiums, Foreign Controlled Firms, and Financial Crisis: Baseline Regression Analysis*

Table 2 shows our baseline regression tests for Hypothesis H1 using a set of nested models, which posits a positive treatment effect of the crisis on FIEs' dividend payout compared with domestic enterprises. As indicated in the model description section, the coefficient on the interaction FIE\*Crisis captures the primary treatment effect. All six models show a consistent significant positive treatment effect in line with H1. These results are robust to alternative dividend payout measures.

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<sup>14</sup> In China, mutual funds are the most influential type of institutional investors (Firth et al., 2016). Other institutional investors include brokers, QFIIs, insurance companies, trusts, financial firms, banks, ordinary (non-government) legal persons and non-financial listed companies. Excluding ordinary legal persons in our tests does not alter our findings.

In sum, our empirical estimates are consistent with our expectation that foreign-controlled firms paid higher dividends during the period of the GFC. The baseline period in these regression models are the pre-crisis years (assuming both crisis and post-crisis takes the value of zero). The results for the dividend payout in the post-crisis period (2010–14) are in general positive and statistically significant (with an exception of dividends to total assets), suggesting payout by the domestic firms in China during the post-crisis period increased compared to that of the pre-crisis years of 2005–06. These findings clearly reconcile with the general increase in payout trend overtime in last four decades across the US (Fama and French, 2001) and the European Union (von Eije and Megginson, 2008). Next, besides the treatment effect, the in general insignificant coefficient for FIE\*Postcrisis across five models (with an exception of baseline model for dividend per share) indicates a dividend readjustment by the FIEs following the GFC to the level of the pre-crisis period. In an ideal scenario of no financial crisis, markets would expect that firms reduce their once-increased dividends only when their earnings deteriorate on a long-term basis (Brav et al., 2005). Hence, the post-crisis dividend readjustment indicated in these five models<sup>15</sup> supports our view that the FIEs increased their dividend initially to reduce their cash-flow vulnerability in their home country during the crisis period, and then subsequently reverted to optimal payouts post the GFC.

In addition to these interactions, significant negative (for Model 5) or insignificant (for Models 1 to 4 and 6) coefficients on the FIE dummy suggest that, in general, payout by FIEs is lower to that of domestically controlled firms in non-crisis period. This is contradictory to the well-established notion of higher dividend payout by foreign controlled firms in South Korea (Jeon, Lee, and Moffett, 2011; Goyal et al., 2020). However, the dummy variable controlling for the crisis years is negative and highly significant in all the three baseline models (Models 4 to 6). This suggests dividend cuts by domestically controlled firms, as opposed to increases, during the crisis. This is consistent with the findings of Bliss, Cheng, and Denis (2015) for the U.S. market, who suggest firms cut dividends during economic downturns as a precautionary tactic to reduce cash-flow variability and retain resources for future investments.

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<sup>15</sup> In model 4, negative and significant coefficient for FIE \* Postcrisis shows that in this case, FIEs paid less dividend per share in the Post-crisis compared to their Pre-crisis level.



In terms of the size and the economic significance of the dividend changes, for instance, if looking at Model 5 in Table 2, the coefficient on FIE\*Crisis is 0.454 and significant, suggesting that the dependent variable Div/Assets (in percentages) is 0.454% higher for FIEs than non-FIEs in crisis. In summary, the size of this treatment effect accounts for around 50% of Div/Assets value in the pre-crisis period (0.885% as reported in Panel B of Table 1). Compared to the average Div/Assets of the full sample and for FIEs (1.197% and 1.452%, respectively, as reported in Panel A of Table 1), the relative scale of increase of dividend payout by FIEs during crisis years is large.<sup>16</sup>

Regarding the other control variables, the coefficients on firm size and profitability (ROA) are positive and significant, indicating that large, profitable firms are more likely to pay dividends. The coefficients on investment opportunity, leverage, and capital raised through SEO are negative and significant. Overall, results for the firm-level controls hold to predictable relations with dividend payout proxies as documented in recent literature on payout in the Chinese setting (e.g., Huang et al., 2011; Firth et al., 2016; etc.). Thus, it is clear that foreign-controlled firms in China are likely to pay higher dividends, both in terms of dollar amount and scaled payout, during the period of financial crisis, but they also are likely to re-adjust their payout ratio backwards once the crisis is over.

(Please insert Table 2 about here)

#### *4.3 Growth opportunities, Institutional Investors and the Payout Pattern of Foreign-Controlled Firms*

In a setting of perfect capital markets, the Fisher separation theorem asserts that the primary objective of a corporation will be the maximization of its present value, irrespective of the income preferences of its shareholders (Miller and Modigliani, 1961; Fama and French, 2001). Therefore it will not be incorrect to believe that strong growth opportunities can mitigate dividend expropriation by large shareholders and reduce the possibility of principal-agent conflict (Fama and French, 2001; Denis and Osobov, 2008).

We conduct additional analysis, reported in Table 3 (Models 1, 3 and 5), to account for the effect of the growth prospects on FIEs' dividend payout during the crisis years. To do this, we control

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<sup>16</sup> The magnitude is comparable for dividend to sales too in Model 6.

for the firm-level growth opportunities (TobinQ) (DeAngelo, DeAngelo and Stulz, 2006; Fama and French, 2002). Consistent with theory (Fama and French, 2002), available growth opportunities (TobinQ) is negatively associated with dividend payout i.e. in general managers prefer to pursue growth prospects in lieu of high dividend payout. Interestingly, the triple interaction term (FIE\*Crisis\*TobinQ) is positive and significantly associated at 5 percent level or higher with all the three dividend payout proxies (DPS in Model 1, DIV\_TA in Model 3 and DIV\_SALES in Model 5). We note that the pecking order theory suggests that higher growth or abundant investment opportunities induce lower cash dividends, as earnings are retained to finance growth (Fama and French, 2002), especially during the periods of financial constraints (Bliss, Cheng, and Denis, 2015). Huang, Shen and Sun (2011) report that, in general, Chinese firms give preference to investing in profitable projects over dividend payout, and report no signs of expropriation by controlling shareholders, although the latter prefers higher dividends. Our results in Table 3 suggest that foreign controlling ownership can encourage high Tobin's Q firms to pay higher dividends during the periods of financial constraint.

After controlling for growth opportunities, the interaction FIE\*Crisis becomes insignificant across all the six models indicating that the positive treatment effect of the GFC on dividend payout by FIEs has mostly been captured by the triple interaction term as discussed above. Dividend readjustment (FIE\*Postcrisis) is consistent as evidenced in Table 2. This indicates that, for FIEs that exported liquidity through dividends, post-crisis downward dividend adjustment is significant after accounting for the available growth prospects that FIE invested Chinese firms sacrifice to pay higher dividends.

Next, analysis so far has focused on controlling ownership and minority shareholders holding tradable shares. Institutional investors may play a more influential role than individual investors given that individual ownership often is too diffuse to impact a firm's dividend policy. Additionally, since 2000, Chinese regulators have undertaken substantial efforts to develop financial institutions with the primary intention to improve the efficiency of the listed firms and help stabilize the stock market (Firth et al., 2016). Earlier studies on institutional investors in China generally indicate that they have preferential access to firm-level information (Firth, Lin, and Zou, 2016) and often engage in trading on insider information (Tong and Yu, 2012). Further, these institutional investors, through their voting

rights, can not only influence firm-level financial decisions but also other major policy decisions through cash dividend payout (Firth, Lin, and Zou, 2016).

In Table 3 (Models 2, 4 and 6), we report the results of robustness tests, controlling for the percentage shareholding of institutional investors<sup>17</sup> on the foreign-controlled firm dividend payout during the period of financial crisis. In all the three regressions, the triple interaction (FIE\*Crisis\*InsSh) is positive and significant, suggesting that institutional shareholding facilitated dividend expropriations by foreign-controlling shareholders during the financial crisis. In contrast, consistent with the Models 1, 3 and 5, the FIE\*Crisis interaction term becomes insignificant, indicating no dividend expropriations in FIEs during the crisis without institutional shareholdings. Overall significant positive coefficient on our triple interaction (FIE\*Crisis\*InsSh) is consistent with Bushee (2001), who finds that an ownership base dominated by short-term-focused institutional investors can pressure managers into a short-term focus. Results are also consistent with the negative role of institutional investors in China documented by Tong and Yu (2012). The findings reported in Model 2, 4 and 6 of Table 3 are in line with recent literature on dividend payout premium exhibited by the institutional-investor-dominated firms (Firth et al., 2016; Goyal et al., 2020).

(Please insert Table 3 about here)

The analyses reported in Table 3 extend our results with regard to the mitigating impact of growth prospects and institutional shareholders on dividend payout by FIEs. Contrary to expectations, the results reported in these tables are consistent with managers of foreign-controlled firms abandoning investment opportunities in favor of dividend tunneling; with, interestingly, institutional investors facilitating such activities. Such exacerbating effects are not inconsistent with foreign-controlling firms increasing payouts more than other firms during the years of the GFC. Neither do these results suggest sacrificed investment prospects, or institutional shareholdings, are outcomes of principal-principal conflicts, which we evidence are unique to foreign-controlling ownership.

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<sup>17</sup> Results are similar when excluding ordinary (non-government) legal persons from institutional investors.

#### *4.4 Propensity-Score Matching and Payout Pattern of Foreign Controlled Firms*

A caveat in our analysis so far is the potential endogeneity of foreign control, which may lead to sample-selection bias. To address this concern, we follow Roberts and Whited (2013) and use PSM without replacement in conjunction with D-i-D estimation to conduct an additional robustness test of H1. A combination of PSM with a D-i-D estimator is likely to provide robust results as their properties are complementary (Blundell and Costa Dias, 2000). The first relaxes the common trend assumption of the latter, while the D-i-D estimator accounts for time-invariant unobservable firm heterogeneity which is neglected by PSM. We use PSM to identify among the domestically controlled (non-FIE) Chinese firms a subset of firms whose main characteristics are similar to those of the FIE firms. This procedure involves the estimation of an FIE firm's (propensity-score) ability to pay dividends over a set of firm-level characteristics. A non-FIE firm is then selected as a match to the FIE-firm on the following set of matching criteria: market capitalization, leverage, Tobin-Q, return on assets, industry of operation, and year of observation.

We apply PSM to identify comparable firms (Rosenbaum and Rubin, 1983). We also conduct nonparametric local linear regression matching to facilitate D-i-D tests (Heckman, Ichimura, and Todd, 1998). Contrary to extant literature, which matches the firms that change their payout policy on risk factors (Grullon and Michael, 2004), following von Eije, Goyal, and Muckley (2014), we utilize a matching procedure for the selection of the counterfactual firms (i.e., Chinese firms not controlled by foreigners) that is based on publicly available information in the market. Our counterfactual firms, thus, have a comparable, ex-ante propensity to increase their payout during the GFC as the FIE-controlled Chinese firms which actually increased their dividend payout between 2007 and 2009. For 776 FIE firm-years in our sample, we identify 776 unique matching non-FIEs.

We repeat our analysis of data in Tables 2–3 for the dividend payout premium by FIE-controlled Chinese firms during the GFC using this matching sample. Results are reported in Table 4.<sup>18</sup> As expected, with matching, although the number of observations is reduced, our results are consistent with H1. All the relevant results that document the evidence of expropriation by the FIEs are

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<sup>18</sup> Our results are qualitatively and quantitatively consistent for DIV\_SALES, but from hereon they are not reported for brevity purpose. They are available from the authors upon request.

theoretically consistent and significant at 5% or higher level. In summary, we witness the higher dividend payout by the FIE firms from 2007–2009 across Models 1 and 4. Furthermore, there is also a facilitation effect of institutional investors on dividend tunneling by FIEs during the financial crisis in Models 3 and 6. Likewise, we evidence results consistent with a dividend tunneling impact on growth prospects by FIEs during the financial crisis in Models 2 and 5. Finally, there is clear evidence of FIE firms either readjusting or significantly reducing their dividends once the crisis is over.

(Please insert Table 4 about here)

#### *4.5 Robustness Tests Using QFII-Invested Firms as a Control Sample*

In this section, we offer empirical evidence that the liquidity extraction effect dominates the clientele effect as an explanation for our results. This explanation relies on controlling-shareholders' influence over dividend payout during the crisis being different from that of foreign portfolio investors. As noted earlier in this study, in China, the percentage of foreign institutional shareholding is very low (around 2% among QFII-invested firms) and, thus, unlikely to exercise strong governance influence. Further, as others observe, QFII investors self-select into firms with better governance, characterized as being large, profitable, and dividend paying (Chen et al., 2013; Huang and Zhu, 2015). Consequently, high-dividend firms are likely to attract a QFII clientele.

During financial crises, however, FDI is far more difficult to reposition across borders compared to foreign portfolio investment. Therefore, during crises there is a strong motivation for foreign direct investors to exit through dividends. Furthermore, FDI, due to its substantial nature, exercises strong influence over corporate policies; and so, such investors are particularly able to affect changes in payout. Consequently, it is appropriate that we classify FIEs in accordance with the type of controlling shareholder, in this case whether the investor is foreign. A robustness test using QFII-invested (Non-FIE) firms as a control sample allows us to control for the clientele effect of foreigners and capture a less noisy liquidity expropriation (treatment) effect.<sup>19</sup> In Table 5, we report such tests.

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<sup>19</sup> The average percentage QFII shareholding among the control sample is 1.51%.

Across all models in Table 5, our results are consistent with that reported earlier and show strong support for Hypothesis H1 on dividend expropriation by foreign control shareholders during the GFC.

(Please insert Table 5 about here)

#### *4.6 Impact on Foreign Controlled Firm's Investment Policy: Basic Regression Analysis*

The evidence on dividend tunneling by FIEs we document so far naturally leads to the question of how such dividend changes affected FIEs' investment policy during and after the crisis years. While we have reported results consistent with managers of FIE firms deciding to abandon investment opportunities in favor of higher dividend payout during the crisis years, some may argue that dividend disbursement was a mean to mitigate potential agency costs of cash retention. While Miller and Modigliani (1961) note that in perfect capital markets investments are independent of dividend payout policy, markets were far from perfect during the GFC. In imperfect markets, dividend policy potentially affects investment decisions. Therefore, if the costs of holding cash are unchanged, we expect firms to respond to crises, and associated increases in external financing costs, by reducing corporate payouts and retaining aggregate portion of their operating cashflows. This substitution from external to internal capital would attenuate any adverse impacts of an external financing shock on investment and internal resources (cash balances), particularly for firms facing greater external financing frictions. But as per the results reported in Table 3 above, this does not seem to be the case with FIE firms in China. Thus, dividend expropriations by foreign-controlling shareholders during the crisis might have resulted in economically significant underinvestment (H2).

Subsequent empirical tests are reported in Table 6. With regard to testing our second hypothesis, the focus is how dividend increases by FIEs influence firm investment policy, rather than the impact of the level of dividend. Therefore, we exclude firm-years where there is no dividend change. The literature on dividends suggests investors and firms are reluctant to see dividend cuts (Brav et al., 2005; Lintner, 1956). Hence, following Benartzi, Michaely, and Thaler (1997), we analyze dividend cuts and dividend increases separately. The rationale behind splitting the sample is twofold. First, there is extensive literature that documents asymmetric investor behavior towards dividend changes. Brav et al. (2005) conduct in-depth interviews of financial executives, arguing that managers perceive a

substantial asymmetry between dividend increases and decreases. Second, many dividend theories imply that changes in dividends have information content about the future earnings of the firm trending in the same direction as the change in dividends (Benartzi, Michaely, and Thaler, 1997).

Panel A of Table 6 documents the regressions conducted using the subsample firm-years that increased DPS or, alternatively, total cash dispersed as dividend scaled by total assets compared to the previous fiscal year. We find that the triple interactions of change in payout in the crisis years by the foreign controlled firms ( $D\_DPS * Crisis * FIE$  and  $D\_DIV\_TA * Crisis * FIE$ ) are both negative and significantly associated with the one-period forward capital investment ratio ( $F\_INV$ ) in Models 1 and 3.<sup>20</sup> While, in models 2 and 4 dividend increase exhibits positive association with respect to one-period-ahead underinvestment ( $F\_UNINV$ ). Therefore, we conclude that dividend increase by foreign-controlled firms during crisis years had a detrimental outcome on the firm-level investment policy and likely led to economically significant underinvestment. These results support H2.<sup>21</sup>

In Table 6, Panel B, we repeat our analysis using the subsample firm-years that cut dividend compared to the previous financial year. Expectedly, although almost half of firm-years did cut dividend according to the number of observations reported, dividend cuts by FIEs do not appear to be used to support investment or to mitigate underinvestment problems during the crisis years. Both  $D\_DPS * Crisis * FIE$  and  $D\_DIV\_TA * Crisis * FIE$  are insignificant across Models 5–8 in Panel B.

(Please insert Table 6 about here)

In summary, the results from Table 6 support our hypothesis of the negative (positive) association of dividend increases on the firm-level (underinvestment) during the period of global

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<sup>20</sup> According to the descriptive statistics reported in Panel B of Table 1, among the FIEs, DPS on average increased from 0.06 Yuan pre-crisis to 0.10 Yuan during the crisis. In Table 6 Model 1, for instance, the significant coefficient on  $D\_DPS * Crisis * FIE$  is  $-9.084$ , indicating the corresponding drop in investment due to dividend cut is  $-9.084 * (0.10 - 0.06) = -0.36$  Yuan per share. Clearly this is economically meaningful considering stock prices in Chinese Yuan are mostly either in single- or double-digit numbers.

<sup>21</sup> The CSMAR database does not provide information on foreign controlling shareholders' business activities outside of China (for instance group headquarters located in the US). Therefore, we cannot empirically test the investment opportunity set of dividend-receiving firms. However, by employing the model of Biddle, Hilary, and Verdi (2009), we find strong evidence of underinvestment among FIE-controlled Chinese firms, concomitant with substantially increased dividends during the GFC. Therefore, assuming that respective foreign investors have reasonably good investment opportunities (as suggested by Shleifer and Vishny, 1992 and others who note the added utility of liquidity during downturns), minority Chinese domestic interests were deprecated.

financial turmoil. In the next subsection, to further explore the robustness of the impact of dividend premium on firm-level investments, we create a control-sample of domestic-controlled firms using the PSM technique that minimizes the difference between our sample FIE firms and control firms on multiple dimensions.

#### *4.7 Impact on Foreign-Controlled Firm's Investment Policy: Propensity-Score Matching*

This subsection describes tests and results that establish the robustness of our second hypothesis. In particular, following the PSM technique detailed in Table 4 above, in Table 7 we address the endogeneity concern regarding the investment/underinvestment problem caused among foreign-controlled firms due to the effect of dividend change during the crisis years. As described above, we match FIEs and non-FIEs based on market capitalization, leverage, return on assets, Tobin-Q, asset tangibility, industry classification, and year of observation without replacement. Since we omit the firm-years for no dividend change for both the treatment and control sample, we eventually retrieve up to 171 (133) unique FIE and non-FIE firms that increase (decrease) their dividends over two consecutive fiscal years. This time, with matching FIE and non-FIE samples, although the number of observations is reduced, results in Panel A of Table 7 appear to offer stronger support for H2. We observe signs of underinvestment problems caused by an increase in dividend payout during crisis years among FIE-controlled firms. The results not only are theoretically consistent, but also are statistically significant at almost 1% level across models 1 to 4. Next, in Panel B, consistent with theory, we do not find any support in favor of investments if FIE firms cut their dividends during crisis years ( $D\_DPS \times Crisis \times FIE$  and  $D\_DIV\_TA \times Crisis \times FIE$ ). However, in general, dividend cuts support (resolve) investment (underinvestment) problems. Briefly put, our results strongly support the underinvestment problem among FIEs caused by a sudden increase in dividend payout during GFC.

(Please insert Table 7 about here)

#### *4.8 Impact of Payout Change on Post-Crisis Revenue*

In the above sections, we establish the negative impact of dividend increment by FIE-controlled Chinese firms on their current and future investment policy. However, we still need to determine the level of economic significance of this underinvestment by these firms. Therefore, we empirically



investigate the detrimental impact of dividend increases on firms' revenue during the post-crisis period of 2010–2014. We begin by identifying a pool of FIE-controlled and non-FIE-controlled Chinese firms which, based on firm-level characteristics had similar propensities to increase dividend payout during the GFC.<sup>22</sup> We subsequently add a dummy variable assigned “1” for all firm-years that increased their payout (identified as an increase in DPS) for 2007–2009 to the set of independent variables.

As shown in Models 1 and 3 of Table 8, FIE-controlled firms that increased their dividend payout during the period of financial crisis ( $DPS\_inc\_crisis * FIE$ ) experienced subsequent declines in their post-crisis earnings (ROA) and sales growth. Interestingly, there also is a significant drop in their annual change in earnings ( $D\_ROA$ ) and sales growth. These results are robust to an array of annual firm-level financial and governance factors. These results are consistent with increases in dividend payouts during GFC causing subsequent underinvestment among FIEs as well as significant decline in revenue.<sup>23</sup>

(Please insert Table 8 about here)

#### 4.9 Falsification Tests

In light of Roberts and Whited (2013), falsification tests are designed to rule out alternative hypotheses and further examine the validity of the D-i-D models. We conduct D-i-D tests similar to those in Tables 4 and 7 over fictional financial crisis years of 2010 to 2012.<sup>24</sup> In these tests reported in Appendix A2 and A3, post-financial crisis years are 2013–2014. In Models 1–6 of Appendix A2, we present our findings of no significant payout premium by the foreign-controlled firms during artificial crisis years ( $FIE*SY\_2010-12$ ). In Models 1–8 of Appendix A3, we do not observe any significant association between dividend increases (decreases) and exacerbating (solving) investment/underinvestment by FIE-run Chinese firms during the artificial shock period of 2010–2012.

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<sup>22</sup> Please refer to the notes of Table 4 for the detailed discussion on the PSM methodology used in this study.

<sup>23</sup> We also test the models in Table 8 with an increase in  $DIV\_TA$  and  $DIV\_SALES$  by FIE-controlled Chinese firms during GFC. Results are qualitatively and quantitatively similar, and available from the authors upon request.

<sup>24</sup> The period 2010–2012 is the best candidate for fictional financial crisis years to test our hypothesis as 2005–2006 was a period of split-share structure reform in China (Huang and Zhu, 2015) and we also require at least two years of post-fictional crisis years for the proper interpretation of D-i-D results. However, we also run the tests for 2011–2012 as fictional financial crisis years. The results are qualitatively similar to those reported in Table 8, and available from the authors upon request.

These falsification tests lend support to the inference of causality, which arises from the D-i-D tests reported in Tables 2–8.

In reviewing the pathway of our analysis, we form our conclusions through a series of steps. First, we empirically determine that a change in the payout pattern of foreign-controlled firms in China occurred during the GFC and only during the GFC. FIEs increased payout during the years of the GFC and then returned to pre-crisis payout behavior post-crisis. Second, we note that other firms in China (i.e., those not foreign-controlled) did not increase payout or otherwise change payout behavior during the GFC. Third, we concomitantly observe that the GFC was a time and event predominantly characterized as a liquidity crisis and that this crisis was far more pronounced in North America and Europe than in China. And further, increases in payout act contra to the liquidity needs of firms. Lastly, we empirically determine that changes in payouts led to subsequent underinvestment of FIE firms, while such depreciation of value did not occur for other Chinese firms. Subsequently, we conclude that changes in payouts of FIEs were not done for a value-creating reason unique to FIEs. Related to this, in the sense of governance as value creating, we also control for cross-firm governance, finding that changes in payout were unrelated to differences in governance. The quantitative and qualitative processes used to form our conclusions are both reasonable and transparent. Overall, our results are strongly consistent with foreign-controlled firms in China increasing payout during the GFC in order to transfer liquidity from China to the West.

## **V. Conclusions**

Examining approximately 18,000 firm/years from China for the period 2005–2014, this study finds that Chinese firms that are particularly foreign-controlled increased dividend payouts during the GFC. Using propensity-score matching, falsification tests, and other procedures, we determine that such payout increases did not correspondingly occur among domestically controlled firms or among firms with foreign portfolio investment during the GFC. We also find that these payout increases among foreign-controlled firms led to subsequent underinvestment. Through testing for subsequent underinvestment and other factors, we conclude that Western-controlled firms in China increased payout during the 2007–2009 financial crisis to extract liquidity. Results reveal a principal-principal agency cost during the GFC.

Our results highlight an important difference in payout behavior of Chinese firms between Western-controlled FDI firms and, alternatively, firms with foreign institutional ownership; as well as Chinese firms in general. These results have important policy implications. While the various rules imposed by the Chinese government on foreign enterprises is reasonably seen as inconsistent with liberalized Western practice, our results suggest residual control rights matter (Hart, 2017). At least in the recent past, foreign-controlled enterprises in China have not behaved the same as domestic controlled enterprises. Ownership matters. These findings should be of great interest to researchers and practitioners interested in global financial stability, the role of China in the global financial system, and the agency cost of equity in determining dividend payout during financial cycles in emerging markets.

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**Table 1: Descriptive statistics**

This table shows the basic summary statistics, from 2005–2014, for the 2,423 listed firms in Chinese stock market. Panel A separates firm-years by firm type, while Panel B separates by period (pre-crisis, crisis, and post crisis). We report the number of firm-year observations, average, standard deviation of all the variables used in this study. Detailed definitions and descriptions of the variables are reported in Appendix A1

Panel A: Descriptive statistics by firm type										
		FIEs			Matched Non-FIEs			All Firms		
Variable	Unit	Obs	Mean	Std. Dev.	Obs	Mean	Std. Dev.	Obs	Mean	Std. Dev.
DPS	Yuan - ¥	801	0.110	0.177	789	0.094	0.146	18,423	0.099	0.144
DIV_TA	%	801	1.452	2.245	789	1.155	1.693	18,423	1.197	1.700
DIV_SALES	%	801	2.846	4.575	789	2.462	4.137	18,423	2.493	4.086
TradeSh	%	801	65.602	28.124	789	64.687	27.184	18,423	66.430	27.671
No1Sh	%	801	37.519	15.821	789	35.319	14.517	18,423	36.536	15.280
SOE	Dummy	801	0.000	0.000	789	0.506	0.500	18,423	0.543	0.500
ROA	%	801	6.090	8.628	789	5.684	7.701	18,423	6.012	7.168
FCF	%	801	-2.611	16.354	789	-3.025	16.965	18,423	-2.798	15.928
OCF	%	801	3.891	6.223	789	3.743	5.921	18,423	3.473	5.776
TobinQ	%	801	2.727	2.113	789	2.719	2.112	18,423	2.460	1.794
Ln_MV	Nat. Log.	801	21.863	0.944	789	21.838	0.940	18,423	22.019	1.020
Lev	%	801	25.627	19.596	789	26.459	19.676	18,423	27.938	20.314
InsSh	%	801	31.591	26.336	789	27.339	23.105	18,423	31.392	24.346
Lag_SEO	Dummy	801	0.046	0.210	789	0.061	0.239	18,423	0.065	0.246
Lead_SEO	Dummy	801	0.116	0.321	789	0.138	0.345	18,423	0.140	0.347
INV	%	708	6.913	8.805	668	6.481	7.721	16,274	7.105	8.245
UNINV	%	706	-0.286	7.901	668	0.611	7.522	16,266	0.013	7.758
D_DPS	Yuan - ¥	687	-0.005	0.095	663	0.000	0.113	15,870	-0.010	0.085
D_DIV_TA	%	687	0.068	1.431	663	0.190	1.284	15,870	0.048	0.991
Tang_Asset	%	801	44.095	23.895	789	43.946	23.212	18,423	44.087	22.794
Board_Size	Number	795	8.535	1.645	783	8.862	1.803	18,290	9.011	1.843
Board_Ind	%	795	36.888	5.194	783	36.523	4.922	18,290	36.575	5.092

**Panel B: Descriptive statistics on FIEs by differing periods**

Variable	Unit	Pre-crisis			Crisis			Post-crisis		
		Obs	Mean	Std. Dev.	Obs	Mean	Std. Dev.	Obs	Mean	Std. Dev.
DPS	Yuan - ¥	133	0.061	0.131	217	0.106	0.189	451	0.122	0.176
DIV_TA	%	133	0.885	1.770	217	1.468	2.398	451	1.612	2.252
DIV_SALES	%	133	1.673	3.426	217	2.672	5.086	451	3.276	4.555
TobinQ	%	133	1.786	1.643	217	3.165	2.357	451	2.793	2.031
InsSh	%	133	9.623	15.996	217	25.923	22.899	451	40.796	25.753
INV	%	113	6.571	9.545	192	6.272	7.702	403	7.314	9.077
UNINV	%	112	-0.449	8.117	192	0.305	7.036	402	-0.524	8.228

**Panel C: Descriptive statistics on matched non-FIEs by differing periods**

Variable	Unit	Pre-crisis			Crisis			Post-crisis		
		Obs	Mean	Std. Dev.	Obs	Mean	Std. Dev.	Obs	Mean	Std. Dev.



<b>Table 1: Descriptive statistics</b>										
DPS	Yuan - ¥	133	0.073	0.135	217	0.066	0.106	451	0.118	0.168
DIV_TA	%	133	0.996	1.774	217	0.903	1.489	451	1.373	1.813
DIV_SALES	%	133	1.974	4.097	217	1.601	2.805	451	3.055	4.610
TobinQ	%	133	1.768	1.618	217	3.048	2.269	451	2.838	2.074
InsSh	%	133	10.580	15.247	217	24.271	21.776	451	34.068	22.909
INV	%	113	5.300	7.212	192	7.030	8.618	403	6.600	7.337
UNINV	%	112	1.422	6.613	192	0.103	8.340	402	0.593	7.275

**Table 2: Dividend payout policy of foreign controlled Chinese firms (FIEs) during crisis years.**

The table reports the results for OLS regressions across various payout parameters for Chinese listed firms from 2005–2014. Crisis is a dummy which equals to 1 for years from 2007–2009, or otherwise 0 and Postcrisis is a dummy which equals to 1 for years 2010–2014, or otherwise 0. The dependent variable for Models 1&4 is dividend per share (DPS); for Models 2&5 is dividend scaled by total assets (DIV\_TA); for Models 3&6 is dividend scaled by sales (DIV\_SALES). The numbers in the parenthesis are the robust t-statistics for the regression coefficient with firm-level clustered standard errors. To reduce endogeneity, all the continuous independent variables are lagged by one year. The definition of the variables is in Appendix A1. \*\*\*, \*\*, \* represent significance at the 1%, 5% and 10% level respectively.

Model	1	2	3	4	5	6
Sample	All Firms	All Firms	All Firms	All Firms	All Firms	All Firms
VARIABLES	DPS	DIV TA	DIV SALES	DPS	DIV TA	DIV SALES
FIE * Crisis	0.035** (2.04)	0.542** (2.42)	0.925** (1.99)	0.029** (2.04)	0.454** (2.47)	0.821** (2.08)
FIE * Postcrisis	-0.012 (-0.80)	-0.012 (-0.06)	-0.174 (-0.43)	-0.026** (-2.09)	0.227 (1.43)	-0.559 (-1.60)
FIE	-0.009 (-0.77)	-0.097 (-0.61)	-0.037 (-0.12)	0.002 (0.17)	-0.547*** (-13.02)	0.106 (0.39)
Crisis	-0.015*** (-3.04)	-0.000 (-0.00)	0.237 (1.64)	-0.052*** (-10.40)	-0.348*** (-8.25)	-1.287*** (-8.30)
Postcrisis	0.008* (1.81)	-0.012 (-0.22)	0.100 (0.82)	0.018*** (4.56)	-0.000 (-0.00)	0.531*** (4.73)
TradeSh				-0.001*** (-13.30)	-0.006*** (-10.59)	-0.019*** (-14.45)
No1Sh				0.000*** (6.00)	0.006*** (7.44)	0.005** (2.17)
SOE				-0.009*** (-4.41)	-0.128*** (-5.12)	-0.227*** (-4.02)
ROA				0.006*** (35.26)	0.084*** (38.05)	0.117*** (26.74)
FCF				-0.001*** (-7.68)	0.003*** (2.98)	-0.009*** (-3.76)
OCF				-0.001*** (-5.97)	-0.016*** (-9.44)	-0.048*** (-13.48)
TobinQ				-0.005*** (-6.13)	-0.036*** (-3.82)	-0.081*** (-3.74)
Ln_MV				0.041*** (30.34)	0.236*** (17.98)	0.615*** (17.43)
Lev				-0.001*** (-12.06)	-0.020*** (-28.81)	-0.048*** (-27.00)
Lag_SEO				-0.030*** (-8.27)	-0.252*** (-6.84)	-0.687*** (-7.52)
Lead_SEO				-0.025*** (-9.61)	-0.301*** (-10.87)	-0.617*** (-9.07)
Constant	0.044*** (5.58)	0.911*** (8.74)	1.605*** (7.58)	-0.764*** (-27.00)	-3.323*** (-12.09)	-8.520*** (-11.75)
Industry effects	Yes	Yes	Yes	Yes	Yes	Yes
Year effects	No	No	No	Yes	Yes	Yes
Observations	17,653	17,653	17,636	17,653	17,653	17,636
No. of Firms	2,423	2,423	2,423	2,423	2,423	2,423
R-squared	0.055	0.078	0.112	0.331	0.364	0.305
F-test for FIE*Crisis + FIE	Prob.>F = 0.00	Prob.>F = 0.00	Prob.>F = 0.00	Prob.>F = 0.00	Prob.>F = 0.00	Prob.>F = 0.00

**Table 3: The moderating effects of Tobin's Q and Institutional investors on dividend payout policy of foreign controlled Chinese firms (FIEs) during crisis years.**

The table reports the results for OLS regressions across various payout parameters for Chinese listed firms from 2005–2014. Crisis is a dummy which equals to 1 for years from 2007–2009, or otherwise 0 and Postcrisis is a dummy which equals to 1 for years 2010–2014, or otherwise 0. The dependent variable for Models 1&2 is dividend per share (DPS); for Models 3&4 is dividend scaled by total assets (DIV\_TA); for Models 5&6 is dividend scaled by sales (DIV\_SALES). The numbers in the parenthesis are the robust t-statistics for the regression coefficient with firm-level clustered standard errors. To reduce endogeneity, all the continuous independent variables are lagged by one year. The definition of the variables is in Appendix A1. \*\*\*, \*\*, \* represent significance at the 1%, 5% and 10% level respectively. Results on control variables are omitted to conserve space.

Model	1	2	3	4	5	6
Sample	All Firms	All Firms	All Firms	All Firms	All Firms	All Firms
VARIABLES	DPS	DPS	DIV TA	DIV TA	DIV SALES	DIV SALES
FIE*Crisis*TobinQ	0.014** (2.32)		0.111*** (2.77)		0.209** (2.03)	
FIE * Crisis * InsSh		0.001*** (3.72)		0.019*** (3.31)		0.007* (1.73)
FIE * Crisis	-0.015 (-0.73)	0.002 (0.14)	0.105 (0.52)	-0.026 (-0.12)	0.165 (0.33)	0.633 (1.54)
FIE * Postcrisis	0.018 (0.91)	-0.042*** (-3.26)	0.142 (0.74)	0.223 (1.42)	-0.021 (-0.04)	-0.682** (-2.27)
TobinQ	-0.005*** (-6.51)		-0.010 (-1.41)		-0.087*** (-4.66)	-0.085*** (-4.65)
InsSh		0.001*** (15.02)		0.008*** (11.24)		0.009*** (5.37)
FIE	0.002 (0.17)	-0.001 (-0.06)	0.020 (0.16)	-0.539*** (-12.89)	0.107 (0.35)	0.093 (0.30)
Crisis	-0.052*** (-10.44)	-0.028*** (-8.84)	-0.932*** (-15.30)	-0.366*** (-8.65)	-1.287*** (-8.49)	-1.246*** (-8.22)
Postcrisis	0.018*** (4.59)	0.023*** (10.09)	0.150*** (3.22)	-0.012 (-0.09)	0.532*** (4.57)	0.538*** (4.63)
FIE*TobinQ	-0.014 (-0.38)		-0.036 (-0.47)		0.001** (2.33)	
TobinQ*Crisis	0.009 (1.32)		-0.144*** (-5.39)		-0.001 (-0.97)	
FIE*InsSh		0.001*** (3.87)		0.009** (2.57)		0.008* (1.76)
InsSh*Crisis		0.001*** (4.68)		0.003** (2.04)		0.001 (0.34)
Constant	-0.765*** (-27.02)	-0.482*** (-17.28)	-4.831*** (-16.69)	-1.856*** (-6.31)	-8.538*** (-11.85)	-6.688*** (-8.45)
Firm-level controls	Yes	Yes	Yes	Yes	Yes	Yes
Industry effects	Yes	Yes	Yes	Yes	Yes	Yes
Year effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	17,653	17,653	17,653	17,653	17,636	17,636
R-squared	0.331	0.335	0.378	0.370	0.305	0.307

**Table 4: Robustness check of the dividend payout policy by foreign controlled Chinese firms (FIEs) during crisis years using propensity-score matching.**

The table reports the results for OLS regressions across various payout parameters for Chinese listed firms from 2005–2014. We use PSM technique to match FIE and non-FIE firms based on market capitalization, leverage, return on assets, Tobin-Q, industry of operation and year of observation. All regressions are based on this matched sample. Crisis is a dummy which equals to 1 for years from 2007–2009, or otherwise 0 and Postcrisis is a dummy which equals to 1 for years 2010–2014, or otherwise 0. The dependent variable for Models 1-3 is dividend per share (DPS); for Models 4-6 is dividend scaled by total assets (DIV\_TA). The numbers in the parenthesis are the robust t-statistics for the regression coefficient with firm-level clustered standard errors. To reduce endogeneity, all the continuous independent variables are lagged by one year. The definition of the variables is in Appendix A1. \*\*\*, \*\*, \* represent significance at the 1%, 5% and 10% level respectively. Results on control variables are omitted to conserve space.

Model	1	2	3	4	5	6
Sample	PSM	PSM	PSM	PSM	PSM	PSM
VARIABLES	DPS	DPS	DPS	DIV_TA	DIV_TA	DIV_TA
FIE*Crisis*TobinQ		0.014** (2.34)			0.130** (2.39)	
FIE * Crisis * InsSh			0.001*** (3.16)			0.013** (2.26)
FIE * Crisis	0.038* (1.94)	-0.005 (-0.21)	0.010 (0.52)	0.438** (2.01)	0.079 (0.26)	0.158 (0.60)
FIE * Postcrisis	-0.032** (-2.08)	0.020 (0.89)	-0.048*** (-3.05)	0.167 (0.77)	0.172 (0.65)	0.187 (0.87)
TobinQ		-0.005* (-1.68)			-0.018 (-0.59)	
InsSh			0.001*** (3.44)			0.013*** (4.38)
FIE	-0.007 (-0.41)	-0.008 (-0.46)	-0.008 (-0.52)	-0.912*** (-4.82)	-0.019 (-0.09)	-0.902*** (-4.81)
Crisis	-0.105*** (-4.97)	-0.110*** (-5.17)	-0.055*** (-3.42)	-0.697*** (-3.83)	-1.550*** (-5.81)	-0.691*** (-3.76)
Postcrisis	0.034** (2.20)	0.035** (2.29)	0.034*** (3.45)	-0.016 (-0.08)	0.271 (1.34)	-0.048 (-0.25)
FIE*TobinQ		-0.001 (-0.03)			0.001** (2.23)	
TobinQ*Crisis		0.059*** (2.69)			-0.001 (-0.90)	
FIE*InsSh			0.041 (0.34)			0.008* (1.70)
InsSh*Crisis			-0.157* (-1.74)			0.001 (0.14)
Constant	-1.324*** (-11.20)	-1.330*** (-11.26)	-0.821*** (-7.50)	-9.460*** (-7.62)	-11.563*** (-9.03)	-6.503*** (-4.92)
Firm-level controls	Yes	Yes	Yes	Yes	Yes	Yes
Industry effects	Yes	Yes	Yes	Yes	Yes	Yes
Year effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,536	1,536	1,536	1,552	1,552	1,552
R-squared	0.407	0.412	0.442	0.436	0.444	0.452

**Table 5: Robustness check of the dividend payout policy by foreign controlled Chinese firms (FIEs) during crisis years compared to QFII-invested non-FIE firms.**

The table reports the results for OLS regressions across various payout parameters for Chinese listed firms from 2005–2014 based on the sample of FIEs and QFII-invested non-FIE firms. Crisis is a dummy which equals to 1 for years from 2007–2009, or otherwise 0 and Postcrisis is a dummy which equals to 1 for years 2010–2014, or otherwise 0. The dependent variable for Models 1–3 is dividend per share (DPS); for Models 4–6 is dividend scaled by total assets (DIV\_TA). The numbers in the parenthesis are the robust t-statistics for the regression coefficient with firm-level clustered standard errors. To reduce endogeneity, all the continuous independent variables are lagged by one year. The definition of the variables is in Appendix A1. \*\*\*, \*\*, \* represent significance at the 1%, 5% and 10% level respectively. Results on control variables are omitted to conserve space.

Model	1	2	3	4	5	6
VARIABLES	DPS	DPS	DPS	DIV_TA	DIV_TA	DIV_TA
FIE * Crisis * TobinQ		0.018*** (3.76)			0.112** (2.01)	
FIE * Crisis * InsSh			0.001** (1.98)			0.012** (2.18)
FIE * Crisis	0.025** (1.98)	0.012 (0.58)	-0.038 (-1.54)	0.623*** (2.74)	0.189 (0.66)	0.317 (1.25)
FIE * Postcrisis	-0.049*** (-3.25)	-0.061*** (-4.03)	-0.001 (-0.05)	0.107 (0.52)	-0.053 (-0.21)	0.089 (0.43)
TobinQ			-0.012*** (-4.34)		-0.025 (-0.79)	
InsSh			0.001*** (5.32)			0.008*** (3.62)
FIE	0.015 (0.98)	0.017 (1.01)	0.019 (1.11)	-0.019 (-0.10)	0.032 (0.16)	-0.013 (-0.06)
Crisis	-0.052*** (-4.49)	-0.048*** (-4.08)	-0.070*** (-4.04)	-1.066*** (-7.57)	-1.535*** (-7.70)	-1.045*** (-7.36)
Postcrisis	0.040*** (4.45)	0.042*** (4.62)	0.060*** (4.45)	-0.686*** (-4.89)	0.627*** (4.05)	-0.660*** (-4.65)
FIE*TobinQ		-0.010 (-0.30)			0.001*** (2.89)	
TobinQ*Crisis		0.028** (2.19)			0.001 (1.41)	
FIE*InsSh			0.312** (2.11)			0.007* (1.76)
InsSh*Crisis			0.089 (0.74)			0.003 (0.71)
Constant	-0.893*** (-10.17)	-0.699*** (-8.19)	-0.964*** (-11.52)	-5.389*** (-5.81)	-6.751*** (-6.97)	-3.945*** (-4.16)
Firm-level controls	Yes	Yes	Yes	Yes	Yes	Yes
Industry effects	Yes	Yes	Yes	Yes	Yes	Yes
Year effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,333	2,333	2,333	2,333	2,333	2,333
R-squared	0.365	0.379	0.382	0.424	0.445	0.431

**Table 6: Effect of change in dividend payout policy on future investments of FIEs during crisis years.**

This table reports the results for OLS pooled regression for the impact of change in dividend payout amount over two consecutive fiscal years on future firm-level investments for foreign invested Chinese listed firms from 2005–2014. The dependent variable is one-year ahead firm-level investments (Models 1, 3, 5, and 7) and under-investments (Models 2, 4, 6, and 8). The numbers in the parenthesis are the robust t-statistics for the regression coefficient with firm-level clustered standard errors. Panel A reports the results for the firm-years that increased their dividend payout amount from last fiscal year dividend payout and Panel B for the firm-years that decreased their dividend payout amount from last fiscal year. The definition of the variables is in Appendix A1. \*\*\*, \*\*, \* represent significance at the 1%, 5% and 10% level respectively.

	Panel A: Dividend Increase				Panel B: Dividend Decrease			
Model	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dep. Var.	F_INV	F_UNINV	F_INV	F_UNINV	F_INV	F_UNINV	F_INV	F_UNINV
D_DPS	-1.500 (-1.45)	1.460 (1.37)			-1.097 (-1.03)	1.520 (1.44)		
D_DPS * Crisis	1.432 (0.85)	-1.567 (-0.93)			-4.113* (-1.86)	4.268** (1.97)		
D_DPS * Crisis * FIE	-9.084** (-2.05)	9.065** (2.00)			5.162 (0.63)	-5.365 (-0.66)		
D_DIV_TA			-0.190 (-1.10)	0.146 (0.83)			0.012 (0.09)	0.068 (0.55)
D_DIV_TA * Crisis			0.058 (0.27)	-0.057 (-0.27)			-0.120 (-0.56)	0.127 (0.59)
D_DIV_TA * Crisis * FIE			-0.746** (-1.97)	0.748** (1.96)			0.147 (0.24)	-0.191 (-0.31)
Crisis	-0.826 (-1.23)	2.055*** (3.03)	-0.625 (-1.00)	1.798*** (2.86)	-1.110 (-1.57)	2.468*** (3.46)	-0.776 (-1.05)	2.161*** (2.89)
FIE	-0.665 (-1.13)	0.414 (0.70)	-0.447 (-0.69)	0.193 (0.30)	-0.486 (-0.66)	0.301 (0.41)	-0.799 (-1.18)	0.689 (1.01)
TobinQ	0.243 (1.59)	-0.253* (-1.69)	0.130 (1.02)	-0.137 (-1.09)	0.107 (0.74)	-0.116 (-0.81)	0.122 (0.77)	-0.128 (-0.82)
Tang_Asset	-0.016 (-1.22)	0.011 (0.87)	-0.024** (-1.98)	0.019 (1.61)	-0.018 (-1.40)	0.011 (0.88)	-0.011 (-0.83)	0.005 (0.37)
ROA	0.099*** (2.91)	-0.062* (-1.84)	0.083*** (2.65)	-0.042 (-1.36)	0.135*** (4.33)	-0.069** (-2.25)	0.171*** (5.04)	-0.107*** (-3.18)
SOE	-1.315*** (-3.98)	1.266*** (3.83)	-1.255*** (-3.97)	1.153*** (3.67)	-1.025*** (-3.12)	0.931*** (2.86)	-0.921*** (-2.68)	0.889*** (2.61)
Board_Size	0.314*** (3.31)	-0.311*** (-3.31)	0.248*** (2.66)	-0.245*** (-2.67)	0.229** (1.98)	-0.228** (-1.99)	0.241** (1.97)	-0.236* (-1.94)
Board_Ind	0.072*** (2.68)	-0.071*** (-2.69)	0.064** (2.44)	-0.065** (-2.50)	0.049* (1.75)	-0.043 (-1.55)	0.048* (1.65)	-0.039 (-1.35)
Ln_MV	0.348* (1.87)	-0.295 (-1.58)	0.319* (1.79)	-0.268 (-1.51)	0.103 (0.55)	-0.095 (-0.51)	0.132 (0.70)	-0.156 (-0.83)
Lev	-0.028** (-1.97)	0.027* (1.92)	-0.047*** (-3.40)	0.045*** (3.33)	-0.049*** (-3.32)	0.045*** (3.08)	-0.044*** (-2.90)	0.040*** (2.60)
D_DPS * FIE	-2.637 (-0.33)	2.914 (0.36)			-2.717 (-0.38)	2.213 (0.31)		
Crisis * FIE	0.504 (0.34)	-0.474 (-0.33)			0.245 (0.16)	0.140 (0.09)		
D_DIV_TA * FIE			-0.575 (-1.16)	0.515 (1.06)			-0.767 (-1.15)	0.800 (1.21)
Crisis * FIE			0.536 (0.32)	-0.595 (-0.37)			-0.910 (-0.75)	1.080 (0.88)
Constant	-2.071 (-0.47)	9.681** (2.20)	0.465 (0.11)	7.238* (1.71)	4.599 (1.07)	3.426 (0.80)	3.634 (0.82)	4.952 (1.13)
Industry effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year effects	Yes	Yes	Yes	Yes	Yes	Yes	Year	Yes
Observations	3,168	3,168	4,090	4,090	3,480	3,480	3,042	3,042
R-squared	0.19	0.05	0.17	0.04	0.16	0.05	0.17	0.05

**Table 7: Robustness check for the effect of change in dividend payout policy on future investments of FIEs during crisis**

This table reports the results for OLS pooled regression for the impact of change in dividend payout amount over two consecutive fiscal years on future firm-level investments for Chinese listed firms from 2005–2014. The dependent variable is one-year-ahead firm-level investments (Models 1, 3, 5, and 7) and under-investments (Models 2, 4, 6, and 8). The numbers in the parenthesis are the robust t-statistics for the regression coefficient with firm-level clustered standard errors. Panel A reports the results for the firm-years that increased their dividend payout amount from last fiscal year dividend payout and Panel B for the firm-years that decrease their dividend payout amount from last fiscal year. We use PSM technique to match FIE and non-FIE firms based on market capitalization, leverage, return on assets, Tobin-Q, asset tangibility, industry of operation, and year of observation. The definition of the variables is in Appendix A1. \*\*\*, \*\*, \* represent significance at the 1%, 5%, and

	Panel A: Dividend Increase				Panel B: Dividend Decrease			
Model	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dep. Var.	F INV	F UNINV	F INV	F UNINV	F INV	F UNINV	F INV	F UNINV
D_DPS	3.851 (0.49)	−4.544 (−0.63)			−4.403 (−0.76)	6.587 (1.13)		
D_DPS * Crisis	2.222 (0.32)	−2.157 (−0.35)			7.171* (1.82)	−8.998** (−2.24)		
D_DPS * Crisis * FIE	−19.091*** (−2.81)	18.395*** (2.70)			−2.753 (−0.37)	3.441 (0.45)		
D_DIV_TA			−0.305 (−0.55)	0.040 (0.08)			−0.735 (−1.18)	1.144* (1.88)
D_DIV_TA * Crisis			−0.002 (−0.01)	0.031 (0.09)			0.398 (0.47)	−0.682 (−0.82)
D_DIV_TA * Crisis * FIE			−1.175** (−2.33)	1.233*** (2.55)			−0.434 (−0.49)	0.371 (0.42)
Crisis	2.186 (1.58)	−0.978 (−0.77)	1.989 (1.57)	−0.877 (−0.77)	−0.516 (−0.54)	0.804 (0.85)	−1.005 (−0.96)	0.948 (0.90)
FIE	−1.618* (−1.75)	0.754 (0.83)	−1.202 (−1.22)	0.482 (0.52)	−0.829 (−0.77)	0.188 (0.17)	−1.374 (−1.24)	0.672 (0.58)
TobinQ	−0.406 (−1.30)	0.028 (0.10)	−0.471 (−1.49)	0.088 (0.31)	0.815 (1.59)	−0.784 (−1.53)	0.673 (1.31)	−0.584 (−1.12)
Tang_Asset	−0.029 (−0.97)	−0.004 (−0.12)	−0.020 (−0.72)	−0.011 (−0.41)	−0.068* (−1.94)	0.050 (1.32)	−0.063 (−1.62)	0.045 (1.04)
ROA	0.230** (2.28)	−0.136 (−1.39)	0.271*** (2.87)	−0.165* (−1.82)	0.165* (1.92)	−0.100 (−1.20)	0.144 (1.49)	−0.089 (−0.93)
SOE	−0.556 (−0.50)	0.547 (0.50)	−1.077 (−0.98)	0.960 (0.90)	0.303 (0.27)	−0.359 (−0.32)	0.297 (0.24)	−0.078 (−0.07)
Board_Size	−0.244 (−0.81)	−0.011 (−0.04)	0.130 (0.39)	−0.322 (−0.99)	0.334 (0.97)	−0.183 (−0.54)	0.165 (0.59)	−0.005 (−0.02)
Board_Ind	−0.091 (−0.96)	0.028 (0.33)	−0.001 (−0.01)	−0.055 (−0.63)	0.102 (1.08)	−0.083 (−0.90)	0.079 (0.90)	−0.051 (−0.57)
Ln_MV	0.632 (0.90)	−0.505 (−0.76)	0.420 (0.68)	−0.346 (−0.60)	−0.991 (−1.57)	0.895 (1.43)	−1.051* (−1.74)	0.831 (1.32)
Lev	−0.063 (−1.62)	−0.026 (−0.79)	−0.077** (−2.13)	−0.012 (−0.39)	−0.128*** (−3.09)	0.088* (1.94)	−0.114** (−2.55)	0.069 (1.37)
D_DPS * FIE	3.420 (0.24)	−2.175 (−0.16)			2.690 (0.18)	4.731 (0.33)		
Crisis * FIE	1.570 (0.70)	−1.378 (−0.68)			−0.380 (−0.16)	−0.725 (−0.32)		
D_DIV_TA * FIE			−0.680 (−0.86)	0.602 (0.84)			−1.036 (−0.83)	1.276 (1.00)
Crisis * FIE			0.712 (0.32)	−0.585 (−0.29)			0.684 (0.29)	−1.758 (−0.73)
Constant	0.076 (0.01)	12.182 (0.83)	−1.145 (−0.09)	13.833 (1.09)	26.009** (2.17)	−17.348 (−1.45)	29.203** (2.40)	−17.951 (−1.43)
Industry effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year effects	Yes	Yes	Yes	Yes	Yes	Yes	Year	Yes
Observations	266	266	342	342	266	266	238	238
R-squared	0.11	0.05	0.10	0.04	0.15	0.10	0.15	0.09

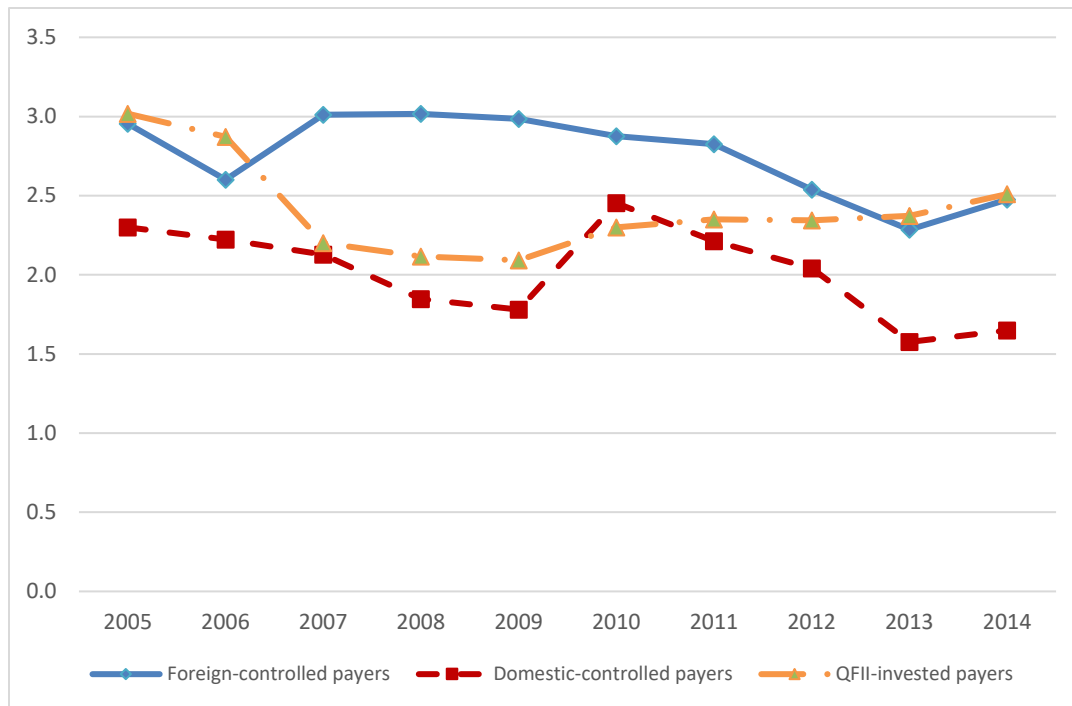
**Table 8: Dividend change during the financial crisis and post-crisis recovery in profitability and growth**

The table shows the level, as well as the change of profitability in Models 1 and 2 (ROA and D\_ROA); sales growth in Models 3 and 4 (Sales\_Growth and D\_Sales\_Growth), for sample firms during the post-crisis period of 2010–2014 due to increase of DPS during the crisis period from 2007–2009. DPS\_inc\_crisis is a dummy variable equal to 1 for the firms in the sample that increase their dividend payout during the crisis period. We use PSM technique to match FIE and non-FIE firms based on market capitalization, leverage, return on assets, Tobin-Q, industry of operation and year of observation. All regressions are OLS regressions conducted using this PSM-matched sample. The numbers in the parenthesis are the robust t-statistics for the regression coefficient with firm-level clustered standard errors. See Appendix A1 for variable definitions. \*\*\*, \*\*, \* represent significance at the 1%, 5%, and 10% level respectively.

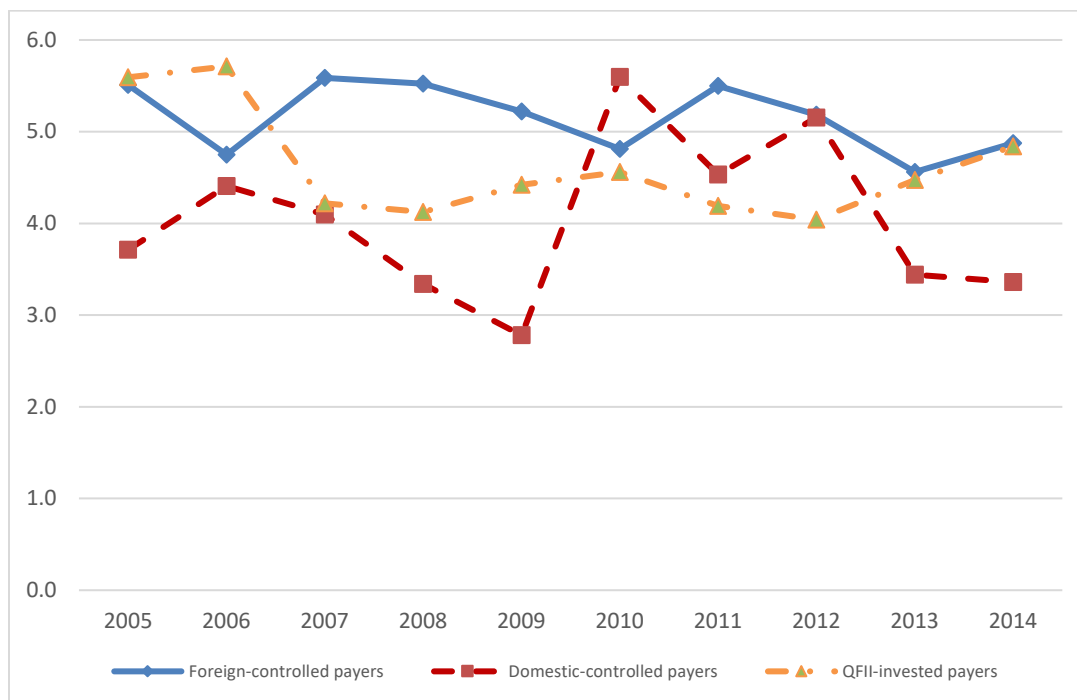
Model Dep. Var.	(1) ROA	(2) D ROA	(3) Sales Growth	(4) D Sales Growth
DPS_inc_crisis*FIE	−2.303*** (−2.62)	−1.902** (−2.34)	−8.916*** (−2.95)	−12.292*** (−2.75)
DPS_inc_crisis	0.730 (0.64)	0.883 (1.06)	−1.678 (−0.44)	10.189* (1.77)
FIE	0.862* (1.74)	0.743** (2.07)	−5.727 (−1.49)	2.118 (0.22)
DPS	1.212*** (17.40)	0.876*** (10.45)	−0.739 (−1.52)	2.942** (2.77)
TobinQ	0.557** (2.21)	0.355* (1.82)	10.868*** (3.37)	12.578** (2.52)
Tang_Asset	0.047 (1.47)	0.012 (0.31)	0.295 (1.28)	−0.465** (−2.46)
ROA		−0.712*** (−19.35)	−0.711 (−1.38)	−2.598*** (−3.74)
SOE	0.548 (1.75)	0.558** (2.42)	−5.876* (−1.89)	1.747 (0.14)
Board_Size	−0.302*** (−3.72)	−0.299*** (−3.95)	0.391 (0.31)	−0.749 (−0.50)
Board_Ind	−0.046 (−1.44)	−0.047* (−1.89)	0.071 (0.31)	−0.889* (−2.03)
Ln_MV	1.539*** (9.73)	0.878*** (3.71)	4.434 (1.49)	1.801 (0.56)
Lev	0.012 (1.15)	0.018* (2.08)	0.122 (0.67)	0.398 (1.46)
Constant	−28.778*** (−11.43)	−13.056*** (−3.02)	−104.331* (−2.03)	−35.407 (−0.56)
Industry effects	Yes	Yes	Yes	Yes
Year effects	Yes	Yes	Yes	Yes
Observations	620	620	620	620
R-squared	0.378	0.376	0.224	0.151



**Figure 1: Comparing dividends scaled by assets among different types of payers**



**Figure 2: Comparing dividends scaled by sales among different types of payers**



**Appendix A1: Detailed description of variables used in the analysis**

Variable name	Variable description
FIE	Foreign invested enterprise dummy variable. FIE dummy is equal to one if the firm controlling shareholder is foreign investor or firm, otherwise zero.
DPS	Dividend Per Share is the annual common cash dividend per share.
DIV_TA	DIV_TA is the annual common cash dividend distributed by the firm scaled by the total assets.
DIV_SALES	DIV_SALES is the annual common cash dividend distributed by the firm scaled by the sales.
Crisis	A dummy variable. It equals to one for years 2007–2009; otherwise zero.
Postcrisis	Postcrisis is the dummy, equal to one for years 2010–2014; otherwise zero.
TradeSh	Proportion of tradable shares listed on Shanghai and Shenzhen Stock Exchange scaled by the total number of outstanding shares.
No1Sh	Proportion of shares held by the largest shareholder in the firm scaled by the total number of outstanding shares.
SOE	A dummy variable equal to 1 if the firm controlling shareholder is government or its agency, otherwise 0.
ROA	Return on assets computed as earnings before interest and tax (EBIT) scaled by the total assets.
FCF	Firm free cash-flow (FCF) scaled by total assets.
OCF	Other cash flow in association with sales and operations scaled by total assets as in Huang, Shen, and Sun (2011).
Ln_MV	Natural logarithm of the year-end market capitalization of the firm.
TobinQ	Sum of market value of equity and book value of debt scaled by the book value of total assets of the firm.
Lev	Leverage is the book value of debt scaled by the total of firm market capitalization and debt value.
Tang_Asset	Ratio of tangible assets scaled by the total assets of the firm.
Lag/Lead_SEO	A dummy variable equal to 1 if the firm had a seasoned equity offering (SEO) or rights issue in the year before ( $t-1$ ) or after ( $t+1$ ) the year of observation ( $t$ ).
InsSh	Proportion of shares held by the institutional shareholders in the firm scaled by the total number of outstanding shares.
Board_Size	Board size is the total number of board-directors sitting on the company's board in a fiscal year.
Board_Ind	Board independence is the ratio of outside directors divided by the board size.
D_DPS	D_DPS is the change of cash dividend per share from last fiscal year.
D_DIV_TA	D_DIV_TA is the change of total cash dividend from last fiscal year scaled by total assets.
INV	The capital investment scaled by the lagged total assets.
UNINV	The predicted capital investment minus the actual capital investment defined as in Biddle, Hilary, and Verdi (2009).
Sales_Growth	Change in sales over two consecutive fiscal years, scaled by the total assets of year 1.
SY_2010-12	Dummy variable that takes the value of 1 for years 2010–2012, when there was effectively no financial crisis for the falsification test, and 0 otherwise.
Post_SY_2010-12	Dummy variable that takes the value of 1 for the years 2013–2014; and otherwise 0 for the falsification test.

**Appendix A2: A falsification test for fictional exogenous crisis years of 2010–12 using propensity-score matching on the dividend payout policy of foreign-controlled Chinese firms.**

The table reports the results for different regression techniques across various payout parameters for Chinese listed firms from 2005–2014, using 2010–2012 as the period of fictional exogenous financial crisis. The dependent variable for Models 1–3 is dividend per share (DPS) using Tobit regression; for Models 4–6 is dividend scaled by total assets (DIV\_TA) using pooled OLS regression. All regressions control for industry fixed-effects and firm level determinants consistent with regressions in Table 2. The numbers in the parenthesis are the robust t-statistics for the regression coefficient with firm-level clustered standard errors. To reduce endogeneity, all the continuous independent variables are lagged by one year. The definition of the variables is in Appendix A1. \*\*\*, \*\*, \* represent significance at the 1%, 5% and 10% level respectively. Results on control variables are omitted to conserve space.

Model	1	2	3	4	5	6
Sample	PSM	PSM	PSM	PSM	PSM	PSM
Method	Tobit	Tobit	Tobit	OLS	OLS	OLS
Dep. Var.	DPS	DPS	DPS	DIV_TA	DIV_TA	DIV_TA
FIE * SY_2010-12	-0.036* (-1.77)	-0.035 (-1.15)	-0.034 (-1.01)	-0.137 (-0.81)	-0.111 (-0.46)	-0.023 (-0.08)
FIE * SY_2010-12 * TobinQ		-0.004 (-0.53)			-0.032 (-0.58)	
FIE * SY_2010-12 * InsSh			-0.000 (-0.24)			-0.007 (-0.82)
FIE * Post_SY_2010-12	-0.023 (-1.17)	0.035 (0.90)	-0.041** (-2.05)	-0.007 (-0.04)	0.327 (1.09)	-0.201 (-1.06)
SY_2010-12	0.022 (1.50)	0.011 (0.34)	0.040* (1.74)	0.018 (0.17)	-0.727*** (-3.00)	-0.131 (-0.68)
Post_SY_2010-12	0.049*** (3.35)	-0.015 (-0.62)	0.052*** (3.70)	0.063 (0.55)	-0.462** (-2.22)	0.152 (1.32)
FIE	0.015 (0.95)	0.017 (1.02)	-0.026 (-1.31)	0.265* (1.90)	0.309** (2.26)	-0.026 (-0.16)
TobinQ		-0.038*** (-6.66)			0.017 (0.62)	
InsSh			0.001*** (3.21)			0.007* (1.77)
FIE*TobinQ		0.029*** (2.80)	0.180*** (3.62)			
TobinQ*Crisis		0.010 (1.02)	0.017 (0.29)			
FIE*InsSh			0.002*** (3.04)			0.013*** (2.91)
InsSh*Crisis			-0.001 (-0.88)			0.005 (0.86)
Constant	-1.552*** (-10.20)	-1.710*** (-10.14)	-1.123*** (-7.34)	-7.896*** (-6.68)	-11.679*** (-9.10)	-4.879*** (-3.83)
Firm-level controls	Yes	Yes	Yes	Yes	Yes	Yes
Industry effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,536	1,536	1,536	1,551	1,551	1,551
R-squared				0.426	0.441	0.443

**Appendix A3: A falsification test about a fictional exogenous crisis year of 2010-12 using propensity-score matching for the effect of change in dividend payout policy on future investments of FIEs.**

The table reports the results for OLS pooled regression for the effect of change in dividend payout amount over two consecutive fiscal years on future firm-level investments for Chinese listed firms from 2005–2014, using 2010–2012 as the period of fictional exogenous financial crisis. The dependent variable is the one-years ahead firm-level investments (Models 1, 3, 5, and 7) and under-investments (Models 2, 4, 6, and 8). The numbers in the parenthesis are the robust t-statistics for the regression coefficient with firm-level clustered standard errors. Panel A reports the results for the firm-years that increased their dividend payout amount from last fiscal year dividend payout and Panel B for the firm-years that decreased their dividend payout amount from last fiscal year. We use PSM technique to match FIE and non-FIE firms based on market capitalization, leverage, return on assets, Tobin-Q, asset tangibility, industry of operation and year of observation. The definition of the variables is in Appendix A1. \*\*\*, \*\*, \* represent significance at the 1%, 5%, and 10% level respectively.

	Panel A: Dividend increases				Panel B: Dividend decreases			
Model	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dep. Var.	F INV	F UNINV	F INV	F UNINV	F INV	F UNINV	F INV	F UNINV
D_DPS	4.581 (0.36)	-7.842 (-0.63)			-4.991 (-0.41)	0.320 (0.03)		
D_DPS * SY_2010-12	-4.959 (-0.34)	10.183 (0.76)			-25.768 (-1.59)	27.379 (1.64)		
D_DPS * SY_2010-12 * FIE	1.277 (0.08)	3.584 (0.23)			31.304* (1.81)	-32.819* (-1.79)		
D_DIV_TA			-0.422 (-0.64)	-0.168 (-0.28)			0.433 (0.42)	-0.804 (-0.77)
D_DIV_TA * SY_2010-12			0.152 (0.17)	0.617 (0.76)			-3.393* (-1.97)	3.978** (2.57)
D_DIV_TA * SY_2010-12 * FIE			-0.016 (-0.02)	-0.289 (-0.30)			3.872** (2.16)	-4.287*** (-2.65)
SY_2010-12	-0.721 (-0.37)	0.583 (0.30)	-0.354 (-0.26)	-0.054 (-0.04)	-2.865* (-1.69)	3.012* (1.74)	-4.043** (-2.02)	4.767** (2.49)
FIE	-1.560 (-0.81)	0.572 (0.30)	-0.108 (-0.07)	-0.984 (-0.69)	-0.388 (-0.23)	0.034 (0.02)	-3.267* (-1.69)	2.497 (1.23)
D_DPS * FIE	-11.014 (-0.65)	10.380 (0.68)			0.896 (0.06)	7.342 (0.48)		
SY_2010-12 * FIE	0.078 (0.03)	-0.617 (-0.27)			4.671** (2.27)	-3.396 (-1.57)		
D_DIV_TA * FIE			-1.219 (-1.25)	1.425* (1.76)			-1.785 (-1.37)	2.173 (1.63)
SY_2010-12 * FIE			-0.718 (-0.41)	1.030 (0.61)			6.044** (2.57)	-5.182** (-2.19)
Constant and Firm level controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	267	267	356	356	273	273	242	242
R-squared	0.082	0.047	0.097	0.055	0.218	0.143	0.227	0.167