The Effect of the China Connect*

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Abstract

We study the effect on Chinese firms of the Shanghai (Shenzhen)-Hong Kong Stock Connect. The Connect was an important capital account liberalization introduced in the mid-2010s. It created a channel for cross-border equity investments into a selected set of Chinese stocks while the overall capital controls policy remained in place. Using a difference-in-difference approach, we find that mainland Chinese firm-level investment is negatively affected by contractionary U.S. monetary policy shocks and that firms in the Connect are more adversely affected than those that remained outside of it. These effects are economically large, robust, and stronger for firms with a higher leverage, higher share of foreign sales, operating in the non-tradable sector. Because firms would try to stay out of the Connect if increased sensitivity to external shocks were the only effect, we broaden our analysis. We find that firms in the Connect hold more cash, enjoy lower financing costs, and earn higher profitability than unconnected firms. We discuss the implications of our results for the debate on capital controls.

Keywords: Capital Controls; Global Financial Cycle; Foreign Spillovers; FOMC Shocks; China Connect; Corporate Investment
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1 Introduction

The Shanghai-Hong Kong "Stock Connect" program allows investors in mainland China and Hong Kong residents and foreign investors to trade eligible stocks listed on the other market, through the exchange and clearing houses in their home markets. This program, announced in April 2014 and begun in November 2014, is regarded as a major step toward internationalizing China's security markets. The program was extended to the Shenzhen exchange in 2016. The Shanghai (Shenzhen)-Hong Kong Stock Connect ("Connect" henceforth) is a natural experiment in equity market liberalization that took place amid an overall capital controls policy in China that remained unchanged. Importantly, the program allows only a set of Chinese firms to be traded by foreign investors, while the remaining firms are left out.

In this paper, we study the effect of the Connect on Chinese firms. Since the policy shock created two natural groups of firms to investigate, we differentiate between the control group that has remained under the protection of capital controls policy and the treatment group that is included in the Connect and hence more open to foreign influences.[1]

The first hypothesis we investigate is that, if capital controls can curb the effect of external shocks, then Chinese corporate investment in the Connect—with less protection from inland capital controls—-will be more sensitive to external shocks than unconnected firms.[2] Our proxy for external shocks is the U.S. monetary policy shocks series used by Rogers et al. (2018). We use this along with quarterly firm-level investment of listed companies in China. Consistent with our first hy-

[1]The Connect is different from China's partial opening to foreign investment examined by Fernald and Rogers (2002): the A-share, B-share market, in which different classes of shares in the same firm were allowed to be held only by domestic and foreign investors, respectively.

[2]The highly influential literature on the Global Financial Cycle recommends the use of capital controls to create an effective wall against external shocks for emerging markets (see IMF (2012), Jeanne et al. (2012), Rey (2015) and Miranda-Agrippino and Rey (2019)). This recommendation emerges from three findings: (1) the global financial cycle is large, (2) the cycle is primarily caused by shocks to US monetary policy, and (3) capital controls effectively shield the real and financial sides of emerging market economies. The empirical evidence for the effectiveness of capital controls is mixed (see Magud et al. (2018), Rebucci and Ma (2019) and Erten et al. (forthcoming)). One difficulty in reaching more consensus is that the policy is usually endogenous and sticky: many countries put capital controls in place simultaneously with adverse events and do not change them frequently.

pothesis, we find that firms in the Connect are more sensitive to Fed monetary policy shocks than those not in the Connect, after inclusion. The investment rate by treated firms declines by a net average of 2.8% following an additional one unit increase in the shock, controlling for firm-level investment opportunity, cash flow, and local economic conditions. This result is robust to a battery of tests. We also provide cross-sectional evidence on which types of firms in the Connect are more affected by Fed shocks.[3]

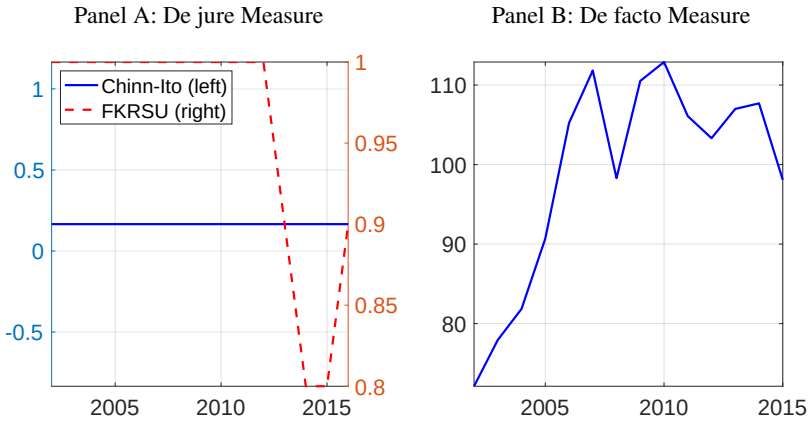
Our second hypothesis is that, if this increased sensitivity of Chinese corporate investment to external shocks was the only effect of the Connect, firms would lobby (or behave) to remain out of the Connect. Because we do not observe such behavior, we investigate additional effects of the Connect on Chinese firms. We establish that firms in the Connect raised more cash, enjoyed lower financing costs, and earned higher net income on equity (ROE) and assets (ROA), relative to firms outside of the Connect.

Policy Implications As is well known, China has imposed very strict capital controls (see Figure 1). Despite this, Chinese policymakers initiated the Connect. Trading under this program is subject to a maximum cross-border investment quota together with a daily quota. It has been argued that the Connect is a well-designed controlled capital account liberalization (Prasad (2017)), which presumably should minimize the impact of external shocks to domestic Chinese sectors. Our results indicate that even such a carefully designed policy experiment can expose domestic listed firms to external shocks. The findings in this sense thus support the use of capital controls in curbing external shocks. However, our results also point to many positive effects that firms enjoy from inclusion in the Connect. Overall, this suggests that firms are able to hedge the negative consequences from increased sensitivity to foreign shocks under this carefully calibrated liberalization.

Literature Review We contribute to three strands of literature. First, our paper

[3]Firms with a higher leverage ratio are more negatively affected after the connection. Moreover, firms operated in the non-tradable sector or with a higher proportion of foreign sales are more negatively affected after the connection.

Figure 1 Chinese Capital Account Restrictions



NOTE. The figure plots de jure and de facto measure for Chinese capital account policies. Panel A plots the de jure measure from Chinn and Ito (2006) and Fernández, Rebucci, and Uribe (2015). For Chinn-Ito indexes, a higher value means a higher level of capital account openness, where for Fernández et al. (2015) index a higher value means a lower level of capital account openness. Panel B plots the de facto measure, i.e. the sum of gross stocks of foreign assets and liabilities as a ratio to GDP. The source of data is from Lane and Milesi-Ferretti (2007).

is related to the literature on global financial cycles. For example, Rey (2015) and Miranda-Agrippino and Rey (2019) provide compelling evidence that a global financial cycle might lead asset prices and financial variables to co-move across the globe. Moreover, they argue that U.S. monetary policy is the driving force. Meanwhile, many papers have focused on the channel through which the global financial cycle can affect the local economy (see di Giovanni et al. (2017)). Cerutti et al. (2019) challenge the importance of the global financial cycle in explaining variations in capital flows, however. We also study the spillover effects of U.S. monetary policy shocks in the presence of capital controls, in our case using a firm-level, difference-in-difference approach.

Second, our paper is related to the literature on the effectiveness of capital controls. A relatively new literature justifies the use of capital controls to address pecuniary externalities or aggregate demand externalities.[4] However, the empirical

[4]For papers that have pecuniary externalities, see Lorenzoni (2008), Jeanne and Korinek (2018, 2010a), Bianchi (2011), Korinek (2018), Benigno et al. (2013) and Ma (forthcoming). For papers with aggregate demand externalities, see Korinek and Simsek (2016) and Farhi and Werning (2016).

evidence on the effectiveness of capital controls policy is mixed (see Rebucci and Ma (2019) and Erten et al. (forthcoming)). For example, Forbes et al. (2015) find that most capital flows management measures do not significantly achieve their stated objectives of exchange rate management, capital flows management, monetary policy independence, and taming volatility. However, Miniane and Rogers (2007) do find evidence that capital controls buffer the spillover effects fron U.S. monetary policy to emerging market exchange rates and interest rates, while Ostry et al. (2012) and Bruno et al. (2017) find some supporting evidence for the effectiveness of capital controls in changing banking credit. One key difference in our paper lies in the identification of the policy shock. The natural experiment of the Connect made certain Chinese firms exposed to foreign investors while keeping other closed. Unlike nationwide capital control reforms documented in other papers (Henry (2000a,b, 2003) and Bekaert et al. (2005) for example), the Connect program in China provides a clean policy experiment to establish causal relationship.

Third, our paper is related to the literature on corporate investment and macro (global) uncertainty. For example, Ottonello and Winberry (2018) document an investment channel of U.S. monetary policy and find that firms with low default risk are the most responsive to monetary policy shocks. Husted et al. (forthcoming) find that monetary policy uncertainty significantly delays U.S. firm investment in ways that are in line with both the real options theory and the financial frictions channel. Consistently, we also find that (Chinese) corporate investment is negatively affected by the (US) monetary policy shock. Differently, we document a reduction in corporate investment for connected firms relative to unconnected ones following an FOMC shock. Our results provide additional evidence, derived from a clean identification, on the effects of capital account policies.

Finally, our paper is related to the literature establishing the positive effects of stock market liberalizations. For example, Henry (2000a,b, 2003), Chari and Henry (2004, 2008) and Bekaert et al. (2005) document positive growth effects in the long run for liberalizing countries. Consistently, we also find a positive effect of stock market liberalization on corporate investment. Differently, we provide a more comprehensive analysis of the liberalization on the corporate sector. Furthermore,

the Chinese stock connect provides a cleaner policy experiment.

The organization of the paper is as follows: Section 2 presents the institutional background of the Connect. Section 3 develops the main hypotheses of the paper. Section 4 describes our data and key variable construction. Sections 5, 6, and 7 present our empirical results, while Section 8 concludes the whole paper.

2 Institutional Background

China's two domestic stock exchanges, the Shanghai Stock Exchange (SHSE) and Shenzhen Stock Exchange (SZSE), were established in December 1990 and April 1991, respectively. Despite this relatively brief history, the A share market on these exchanges is the second largest in the world in terms of total market capitalization, trailing only the US. The number of listed firms has been growing since the market inception, with more than 3,500 firms listed and traded on the two exchanges at the end of 2018.

Foreign investors were restricted from trading in the A-share market. After the Asian financial crisis, the China Securities Regulatory Commission (CSRC) has taken a gradual and prudential approach to opening the financial markets (see Prasad and Wei (2005)). The CSRC first introduced a B-share market exclusively to foreign investors in 2001. One year later, the Qualified Foreign Institutional Investor (QFII) program was initiated to certain overseas institutional investors. This allowed limited access to A-share stocks. There are also restrictions on domestic residents purchasing overseas stocks. However, beginning in 2006, domestic institutional investors have been allowed to purchase foreign stocks under the Qualified Domestic Institutional Investor (QDII) program.

The Shanghai (Shenzhen)-Hong Kong Stock Connect was a pilot program established by the CSRC to connect the stock markets in Shanghai (Shenzhen) and Hong Kong. The idea was first proposed in 2007 by the Binhai New Area of Tianjin and the Bank of China. However, regulators postponed the program for nearly seven years. On April 10, 2014, the CSRC and Hong Kong Securities and Futures Commission (SFC) made a joint announcement to start the program. The plan was to

include any investors who have a stock account with balances no less than 500,000 RMB (approximately 72,000 USD), regarded as a relatively low barrier to enter both markets. The Connect was officially launched on November 17, 2014. With a key feature of the Connect being to allow both retail and institutional investors to participate in the stock market, it is different from the QFII and QDII programs.

Although the Connect is appropriately viewed as a loosening of capital account restrictions, trading through the program is nevertheless subject to aggregate quotas. The daily quota of trading capitalization is 13 billion RMB for the Shanghai Exchange and 10.5 billion RMB for the Hong Kong Exchange. On April 11, 2018, the daily quota increased four-fold to 42 billion and 52 billion, respectively. Moreover, short selling through the Connect is banned.

In December 2016, the Shenzhen Stock Exchange was also opened to the Hong Kong Stock Connect. Unlike the Shanghai Stock Exchange, the Shenzhen Exchange includes both growth and high-tech startup firms like ChiNext. Since then, more than one thousand stocks from the mainland have become connected to overseas investors, including both large-cap and mid-cap stocks.

Table 1 Shanghai (Shenzhen)-Hong Kong Stock Connect Program

Effective Date	Announcement Date	Number of stocks added	Number of stocks on list
Nov 17, 2014	Apr 10, 2014	416	416
Dec 5, 2016	Aug 16, 2016	676	1092

NOTE. This table summarizes the number of stocks that are included in the Shanghai (Shenzhen)-Hong Kong Stock Conncet program in our sample.

Table 1 shows the timeline of this influential reform. On November 17, 2014, the Shanghai (Shenzhen)-Hong Kong Stock Connect was made effective. On that day, 416 constituent stocks in the Shanghai Stock Exchange (SHSE) 180 index, SHSE 380 index, and A-H dual listed stocks became eligible for the Program.[5] The list was revised slightly due to the adjustment of the 180 and 380 index. On December 5, 2016, the pilot program was expanded to the Shenzhen Exchange. At

[5]Originally, there are 537 (856) stocks included in the stock connect on November 17, 2014 (December 5, 2016). However, we select our sample following the literature and drop some firms (see Section 4 for a detailed description). In our sample, 416 (676) firms from Shanghai (Shenzhen) Stock Exchange are included in the program.

that time, 676 stocks from the SZSE Component Index on a designated list were eligible for overseas investors through the Connect.

3 Hypothesis Development

Capital controls policy has been proposed as a way for emerging market economies to enhance financial stability and reduce the impact of external shocks on the domestic economy (see Korinek (2018) and Rey (2015), etc.). China has very strict capital account restrictions, as manifest in the Chinn-Ito index, for example, which measures countries capital account restrictions (see Figure 1). The recent capital controls data set from Fernández et al. (2015) also confirms this characterization of China's policy tightness, albeit while featuring a small change favoring more relaxed capital controls after 2014. In terms of de facto capital account policies, as measured by the sum of gross stocks of foreign assets and liabilities as a ratio of GDP, China has an upward trend starting from the early 2000s, with fluctuations around 100 after 2010. We conclude that China's overall capital controls policy is very persistent and has not changed significantly in recent decades.

Against that backdrop, the introduction of the Shanghai (Shenzhen)-Hong Kong Stock Connect was an important relaxation of capital controls policy in China. The absence of a sharp change in the de facto measure for capital controls, despite the Connect, is consistent with the initial intention of the policy. The Connect was a carefully-calibrated policy experiment designed to reduce excessive capital flows and feature an opening of only part of the stock market to foreign investors. It thus provides an ideal laboratory for testing hypotheses concerning spillovers from external shocks in the presence of capital controls. To the extent that controls are effective, there should be smaller spillover effects on firms that are not in the Connect and hence function more completely under the protection of capital controls. If they are not effective, there should not be significant differences between connected (treatment group) and unconnected firms (control group) in their investment responses to external shocks after the connection. Thus, our first hypothesis:

Hypothesis 1. *Firms included in the Connect program become more sensitive to*

external shocks than unconnected firms, after the Connect.

We further investigate which types of firms are more sensitive to external shocks after the Connect. The literature has offered some channels (see di Giovanni et al. (2017) for example). Importantly, when the cycle creates negative balance sheet effects on domestic firms, one should expect firms with relatively weak financial positions to be more sensitive to external shocks. This leads to the corollary to our first hypothesis:

Hypothesis 2. *Firms with relatively weak financial positions in the Connect program are more sensitive to external shocks after the Connect.*

Finally, we hypothesize that if the only effect of the Connect were that Chinese firms' investment became more sensitive to external shocks, firms would behave in such a way as to remain out of the Connect. We are unaware of any such behavior, and thus conjecture that:

Hypothesis 3. *Firms included in the Connect experience benefits that do not accrue to unconnected firms, after the Connect.*

As noted above, we test these hypotheses with a detailed data set and difference-in-difference estimation. We find strong support for all three hypotheses.

4 Data

We combine data from two main sources. The first is the U.S. monetary policy shock constructed by Rogers et al. (2018). The second is firm-level data from the China Stock Market and Accounting Research (CSMAR) Database.

4.1 US Monetary Policy Shock

Rogers et al. (2018) construct a Fed monetary policy shock series (MPS^{US} for brevity henceforth) that is a combination of three surprises: First, Target Fed Funds

rate surprises, which were zero between December 2008 and December 2015; second, Forward Guidance surprises; and third, Large Scale Asset Purchase surprises (zero before the QE1 program). This is a high-frequency surprise series, measuring changes in yields from 15 minutes before the time of a Federal Open Market Committee (FOMC) announcement to 1 hour and 45 minutes afterward.[6] The series captures the unexpected component of U.S. monetary policy announcements.

The MPS^{US} series begins in January 1990 and ends in December 2017.[7] During this period, the 250 shocks have a mean of -0.022 and a standard deviation of 0.119. To match the US monetary policy shock with our quarter-level firm data, we aggregate the MPS^{US} within each quarter as in Ottonello and Winberry (2018). We adopt two ways of aggregation. One is a simple sum. The idea is to capture the cumulative amounts of the monetary policy shock in a given quarter. Recognizing the slow adjustment of corporate investment decisions, we also use a value weighted sum to construct the quarterly MPS^{US}, where the weight is given by the number of days remaining in the quarter after FOMC announcement day. We estimate all of our regressions using both shock series. Because results are highly robust to the alternative definitions, we feature simple aggregation of FOMC surprises in our empirical evidence.[8] The summary statistics of the monetary policy shock series are reported in Table 2.

4.2 Firm-level Variables

We collect firm-level data from the China Stock Market and Accounting Research (CSMAR) Database. Our sample starts at the time when all A-share stocks were traded on the Exchanges. B-share stocks are excluded because they can only be traded by foreign investors. As is conventional, we drop financial and utility firms since they share different disclosure regulations and their liquidity positions are special compared with firms in other sectors. Following the literature, we also

[6] The series also includes a handful of inter-meeting announcements. See the original paper for details on the construction of the surprises.

[7] We use the Eastern U.S. time zone here. But there is of course a half-day time lag between the Chinese and U.S. time zones. This is not crucial for our analysis at quarterly basis.

[8] The results on value weighted is upon request.

Table 2 US Monetary Policy Shock: Summary Statistics

	Daily	Quarterly Sum	Quarterly Value-weighted
Mean	-0.022	-0.049	-0.026
Median	-0.005	-0.018	-0.003
Std	0.119	0.164	0.105
Min	-0.582	-0.571	-0.555
Max	0.295	0.326	0.196
Num	250	112	112

NOTE. The original data source for US monetary policy shock series is daily frequency from Rogers et al. (2018). The quarterly sum column takes the simple sum within a quarter to construct quarterly frequency series during 1990 to 2017. The quarterly value-weighted column takes the value weighted sum within a quarter where the weight is given by the number of days left in the quarter.

require firms to have at least two years of historical data (Fama and French (1993)). We exclude firms listed after year 2014 to get rid of the effect of newly IPOs.

Our sample period runs from 2002 to 2017, with the beginning date chosen to reflect when the CSRC required all listed firms to file quarterly financial reporting.[9] We drop observations with missing key values for investment, Tobin's Q or cash flow. The final sample comprises 87,740 firm-quarter observations, covering 2,174 unique firms. The detailed distribution of the sample by industry and year can be found in Table A.1 of the Appendix.

Our main measure of firm-level investment is defined as capital expenditures divided by beginning-of-quarter book value of total assets (lagged total assets), where the capital expenditures are calculated as cash payments for the acquisition of fixed assets, intangible assets and long-term assets, from the cash flow statement, minus cash receipts from selling those assets, plus cash paid for operating lease.[10]

We control for an array of firm-level characteristics that might affect corporate investment, according to the literature (see Julio and Yook (2012) and Cao et al. (2016) for example). The key control variables include the natural logarithm of total assets; Tobin's Q, calculated as the book value of total assets minus the book value

[9]The announcement date is April 6, 2001 and became effective in the year 2002. Detailed information can be found at: http://www.gov.cn/gongbao/content/2002/content_61983.htm.

[10]Our measure of investment to asset ratio is equivalent to capital expenditures (Compustat data item # 128 CAPX) which is commonly used in U.S. based studies.

of equity plus the total market value of equity scaled by book value of total assets; cash flow, measured by earnings before interest and taxes (EBIT) plus depreciation and amortization minus interest expenses and taxes scaled by lagged total assets; and sales growth, defined as the growth rate of revenue. We winsorize our sample at the top and bottom 1% of all continuous variables to guard against outliers. The details of variable construction are reported in Table A.2 of the Appendix.

Table 3 reports summary statistics for the firm characteristics used in our analysis.[11] The quarterly capital expenditure is 3.5% on average and has a standard deviation of 4.5%, slightly higher than U.S. listed firms (see Jens (2017)). The Tobin's Q is 2.624 on average with a standard deviation of 1.94. The mean of cash flow is 0.036 with a standard deviation of 0.046. Revenue growth is 0.413 on average with a standard deviation of 0.8. All statistics are consistent with the previous literature that studies China (Cao et al. (2016)).

5 Empirical Results

5.1 Baseline Results

To estimate the impact of U.S. monetary policy shocks on Chinese corporate investment before and after the Connect (Hypothesis 1), we utilize the following augmented version of the standard investment-Q specification.

$$Y_{it} = \alpha_i + \gamma_t + \beta_1 \text{MPS}_t^{\text{US}} + \beta_2 \text{Connect}_{it} + \beta_3 \text{MPS}_t^{\text{US}} \times \text{Connect}_{it} + \Gamma Z_{it} + \varepsilon_{it} \quad (1)$$

where i indexes the firm and t is a time index. The dependent variable is corporate investment Y_{it}, defined as quarterly capital expenditure scaled by book value of total assets at beginning of the quarter. The explanatory variables of interest are MPS_t^{US}, Connect_{it} and their interaction. We consider both equal weighted and value (date) weighted quarterly MPS_t^{US} as described above.

[11] Table A.3 in the Appendix presents the summary statistics for connected and unconnected firms in 2014 Q4.

Table 3 Firm-level Variables: Summary Statistics

	Obs	Mean	Std.Dev.	Min	Max
Capex	87740	0.035	0.045	-0.069	0.426
Size	87740	21.781	1.275	11.911	28.526
Tobin Q	87740	2.624	1.94	0.741	26.39
Cash Flow	87740	0.036	0.046	-0.331	0.315
Revenue Growth	87740	0.413	0.8	-0.978	6.173
Local GDP Growth	87740	0.101	0.029	-0.081	0.251

NOTE. This table reports descriptive statistics for key variables used in our sample from 2002 to 2017. Capex denotes the capital expenditure divided by the book value of total assets. Size is the natural logarithm of total assets. Tobin Q is the ratio of book value of total assets minus the book value of equity plus the market value of equity by book value of total assets. Cash flow is measured as earnings before interest and taxes (EBIT) plus depreciation and taxes scaled by lagged total assets. Revenue growth is defined as the growth rate of revenue. Local GDP growth is calculated as quarterly change of nominal GDP at the provincial level where firm headquartered. All variables are winsorized at the top and bottom 1% to rule out outliers.

Connect_{it} is a dummy variable indicating whether firm i is included in the Connect program at quarter t. Firms can be included or excluded periodically. There may also be a time lag between the announcement date and effective date for a firm to be included in the Connect (see Table 1). To capture this effect, we make the dummy 1 (0) for all quarters of the year in which the firm is first included in (removed from) the Connect.[12]

The coefficient on the interaction term, β_3, is designed to capture the conditional change of corporate investment sensitivity to U.S. monetary policy shocks, controlling for firm-level characteristics and local economic conditions. Following the literature, we use lagged Tobin's Q, cash flows and sale growth at the firm level to control for firm heterogeneity. We also use the quarterly change of nominal GDP at the provincial level to control for local economic cycles, relying on the firm's

[12]Our results still hold if we do not conduct such an adjustment. We prefer the adjustment for an additional reason. The periodic in-and-out of the connect program is due to the adjustment of the stock indices that are typically happening in June or December each year. The selection criteria can be found at the official website of Shanghai Stock Exhcange and Shenzhen Stock Exchange. The announcement of such a change can happen several months before it is actually implemented. Therefore, our adjustment to the connect dummy can capture the announcement effect of being included in (excluded from) the program.

headquarter address to identify its location.

We add into our regression both firm and year fixed effects to control for unobserved individual and year effects. Furthermore, we also introduce quarterly dummies to adjust for seasonality. The standard errors are clustered on two dimensions, at both firm level and year level (see Petersen (2009)). To control for regional time-variation, we also include interaction terms between regions and year indicators as an alternative specification.[13]

Table 4 reports our baseline specification. The first three columns, those without the foreign spillover terms, present the positive effect of the Connect on Chinese corporate investment, i.e. testing our hypothesis 3. Consistent with previous literature, stock market liberalization can spur corporate investment, perhaps through a reduction in equity financing cost (Henry (2000b) and Chari and Henry (2008)), something we will explore in the following section. Our results suggest that average quarterly corporate investment increased by 5.71% once a firm included in the Connect,[14] both statistically significant and economically large.

Columns (4)-(9) present our baseline results for testing hypothesis 1. The first three columns use simple aggregation of MPS^{US} across months in a quarter while the last three columns use the value (date) weighted sum. In columns (4) and (7), we report the regression of corporate investment on MPS_t^{US}, Connect_{it} and the interaction term, with firm, year fixed effects, and quarter dummies. Columns (5) and (8) add firm characteristics such as Tobin's Q, cash flow, sales growth and local economic conditions, measured by provincial GDP growth. Consistent with our hypothesis that firms in the Connect are more exposed to foreign shocks, the interaction term is negative, and both economically and statistically significant. Results are highly robust to the measure of US monetary policy shock. The reduction in conditional investment rates ranges between 0.020 and 0.094 depending on the specification. In our baseline specification in column (5) and (8), a 1 percent unexpected increase in the US monetary policy shock reduces corporate investment by 0.020 and 0.094 percent on average for firms included in the Connect compared

[13] Like U.S., geographic regions in China can be also classified as six areas based on National Census Bureau: Bohai, Central, Northeast, Northwest, Southeast, Southwest.

[14] The calculation of economic magnitude is as follows: 0.002/0.035 = 5.71%.

Table 4 Corporate Investment and FOMC Shocks

	CAPX/ Lag Assets								
				Equal Weighted			Value Weighted		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Connect	0.002**	0.003***	0.003***	0.002*	0.002**	0.003***	0.002*	0.002**	0.003***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
MPS^{US}*Connect				-0.020**	-0.020**	-0.020***	-0.089**	-0.094**	-0.094***
				(0.010)	(0.010)	(0.005)	(0.036)	(0.039)	(0.020)
MPS^{US}				-0.008*	-0.011**	-0.011***	-0.017	-0.020	-0.020**
				(0.004)	(0.004)	(0.002)	(0.014)	(0.017)	(0.008)
Lag Tobin Q		0.001***	0.001***		0.001***	0.001***		0.001***	0.001***
		(0.000)	(0.000)		(0.000)	(0.000)		(0.000)	(0.000)
Cash Flow		0.178***	0.179***		0.180***	0.180***		0.179***	0.180***
		(0.010)	(0.009)		(0.010)	(0.009)		(0.010)	(0.009)
Sale Growth		0.002***	0.002***		0.002***	0.002***		0.002***	0.002***
		(0.000)	(0.000)		(0.000)	(0.000)		(0.000)	(0.000)
GDP growth		0.023	0.038*		0.029*	0.046**		0.024	0.038*
		(0.016)	(0.021)		(0.015)	(0.020)		(0.016)	(0.022)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Region FE * Year FE	No	No	Yes	No	No	Yes	No	No	Yes
Year FE	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No
Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	87740	87740	87740	87740	87740	87740	87740	87740	87740
Adjusted R-squared	0.386	0.407	0.409	0.387	0.408	0.410	0.387	0.408	0.410

NOTE. For all the estimates, the dependent variable is corporate investment, defined as quarterly capital expenditure scaled by the beginning-of-quarter book value of total assets. Column (4)-(6) use quarterly sum of MPS^{US} and column (7)-(9) use quarterly value-weighted sum of MPS^{US}. All standard errors are clustered at both firm and year level and reported in parentheses. *, ** and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

to firms not in the Connect, after controlling for investment opportunities and economic conditions. In term of economic magnitudes, these coefficients translate into reductions of 2.80 % and 6.98 % (respectively) based on the average investment rate and MPS_t^{US}.[15] Columns (6) and (9) consider unobserved local regional time variation by introducing an interaction term of year and region dummies. The results remain consistent with our hypothesis.

5.2 Parallel Trends Assumption

The validity of difference-in-difference tests relies on the parallel trends assumption: before the Connect, those pilot firms exhibit a similar pattern of investment sensitivity to MPS^{US} as the control firms. To examine this, we introduce 7 dummies, Connect -3, Connect -2, Connect -1, Connect 0 (the year when Connect Program was effective), Connect 1, Connect 2 and Connect 3+, to flag the years relative to the effective year. For example, Connect 3+ refers to years beyond three years after the connection. We then re-estimate our baseline regression by replacing the Connect dummy with these seven indicators and interact them with MPS^{US} shocks. If the parallel trends assumption holds, we should expect that interaction terms with Connect -3, Connect -2, Connect -1 have a relatively smaller magnitude and less significance than the other interaction terms.

Table 5 reports the results. Because results here and throughout are robust to the calculation of the monetary policy shock, we display from here on results using only the equal weighted measure of MPS^{US}, in order to save space[16]. The coefficients on the interaction term between the pre-trend dummies (i.e. Connect -3, Connect -2, Connect -1) and MPS^{US} are close to zero and not statistically significant, suggesting that the parallel trends assumption is likely to be satisfied. These results have two implications. First, the Shanghai (Shenzhen)-Hong Kong Connect could not be anticipated by the treated firms. Furthermore, even though some firms might be able to anticipate the possible outcome after the Connect, they cannot react before the Connect actually took place. Second, the negative response of corporate investment

[15] The calculation of economic magnitude is as follows: 0.020*0.049/0.035 = 2.80%; 0.094*0.026/0.035 = 6.98%

[16] The result of value weighted MPS^{US} is also robust and upon request.

Table 5 Corporate Investment and FOMC Shocks: Parallel Trend Assumption

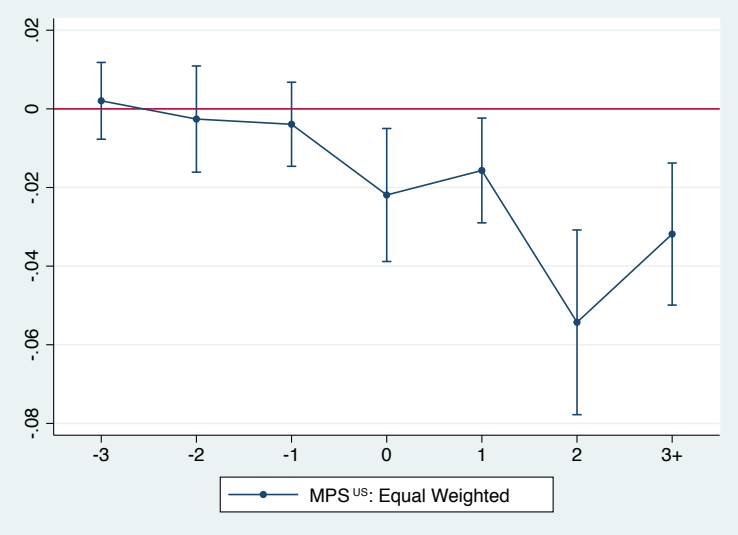
	CAPX/ Lag Assets		
	(1)	(2)	(3)
MPS^{US}*Connect -3	-0.001	0.002	0.002
	(0.004)	(0.005)	(0.005)
MPS^{US}*Connect -2	-0.002	-0.003	-0.003
	(0.006)	(0.007)	(0.008)
MPS^{US}*Connect -1	-0.004	-0.004	-0.004
	(0.005)	(0.005)	(0.003)
MPS^{US}*Connect 0	-0.024***	-0.022**	-0.022***
	(0.009)	(0.009)	(0.007)
MPS^{US}*Connect 1	-0.016**	-0.016**	-0.016***
	(0.007)	(0.007)	(0.005)
MPS^{US}*Connect 2	-0.050***	-0.054***	-0.054***
	(0.012)	(0.012)	(0.009)
MPS^{US}*Connect 3+	-0.034***	-0.032***	-0.031***
	(0.009)	(0.009)	(0.007)
MPS^{US}	-0.007*	-0.010**	-0.010***
	(0.004)	(0.004)	(0.002)
Connect	0.002*	0.002***	0.003***
	(0.001)	(0.001)	(0.001)
Lag Tobin Q		0.001***	0.001***
		(0.000)	(0.000)
Cash Flow		0.180***	0.180***
		(0.010)	(0.009)
Sale Growth		0.002***	0.002***
		(0.000)	(0.000)
GDP Growth		0.028*	0.045**
		(0.015)	(0.020)
Firm FE	Yes	Yes	Yes
Region FE * Year FE	No	No	Yes
Year FE	Yes	Yes	No
Quarter FE	Yes	Yes	Yes
Observations	87740	87740	87740
Adjusted R-squared	0.387	0.409	0.410

NOTE. For all the estimates, the dependent variable is corporate investment, defined as quarterly capital expenditure scaled by the beginning-of-quarter book value of total assets. We use seven Connect dummies to interact with MPS^{US}, Connect -3, Connect -2, Connect -1, Connect 0 (the year when Connect Program was effective), Connect 1, Connect 2 and Connect 3+, to flag the years relative to the effective year. All standard errors are clustered at both firm and year level and reported in the parentheses. *, ** and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

to the MPS^{US} only shows up after the Connect, as seen by comparing the connected firms versus their unconnected peers.

As further shown in Table 5, the coefficients on the interaction between MPS^{US} and Connect 0 (Connect 1) are statistically significant at the 1% level (except for Connect 0 in column (2) and Connect 1 in column (1) and (2) at only 5%). The coefficients on the interaction term between Connect 3+ and MPS^{US} are twice larger than the interaction term between Connect 1 and MPS^{US}, suggesting that the effect of MPS^{US} takes time to materialize in corporate investment. Figure 2 plots the coefficients in column (2). It suggests that the effect of U.S. monetary policy shocks on corporate investment is both negative and long lasting for the connected firms.

Figure 2 Corporate Investment Sensitivity to MPS^{US}: Parallel Trends Assumption



NOTE. The figure plots corporate investment sensitivity to MPS^{US} of connected firms relative to unconnected firms, i.e. the coefficient estimates with 95 % confidence interval from column (2) in Table 5.

In sum, Table 5 and Figure 2 suggest that the connected and unconnected firms share a similar pattern in corporate investment sensitivity to MPS^{US} shocks before the Connect, satisfying the parallel trends assumption of DID estimation. More importantly, it also allows a causal interpretation for the dynamic effects of MPS^{US} shocks on corporate investment (for treated versus non-treated firms) by showing

that the effects are gradually growing and only show up after the Connect.

5.3 Heckman Two-Stage Estimation

We also employ a Heckman two-stage regression to alleviate the concern over the selection issue in our estimation. Specifically, we first run a probit model that determines the connect dummy. This step is to predict what kind of firm characteristics could lead to be select in the Connect program. In the second stage, we re-estimate our baseline regression with the inverse Mills ratio (IMR) as an additional explanatory variable to correct for the selection bias.

Table 6 presents the estimation results. In the first-stage Probit regression model, we add stock volatility, measured as the volatility of daily stock return in each quarter, firm size measured as the natural logarithm of market capitalization, leverage, firm age and an indicator for whether or not firm pays cash dividend as explanatory variables to predict whether a firm is selected into the Connect program. The results suggest that firms are more likely to be selected into the Connect with a lower stock volatility, a larger firm size, a lower leverage, a mature firm and a non-dividend payer. In the second stage panel estimation, our baseline results still hold once we include the inverse Mills ratio, calculated from the first-stage regression, as an explanatory variable to correct the selection bias.

5.4 Robustness

We conduct a battery of robustness tests. First, we conduct alternative estimation method to baseline regression. Second, we consider alternative specifications of our proxy for external shocks. Third, we conduct a Placebo test.

Alternative specification to the baseline model

Our results are highly robust to many alternative specifications. In Panel A of Table A.4 in the Appendix, we replace firm fixed effect with industry fixed effects. The coefficients on the interaction term are quantitatively similar to our baseline results. Panel B adds lagged investment to our baseline regression to alleviate concerns on

Table 6 Heckman Two-Stage Regression

Panel A: First Stage Probit	Connect Dummy	Panel B: Second Stage Panel Regression	CAPX/ Lag Assets		
	(1)		(2)	(3)	(4)
Volatility	-11.459***	MPS^{US}*Connect	-0.024**	-0.022**	-0.023**
	(0.613)		(0.012)	(0.011)	(0.011)
Size	0.744***	MPS^{US}	-0.008*	-0.010**	-0.011**
	(0.008)		(0.004)	(0.004)	(0.004)
Leverage	-0.329***	Connect	0.034***	0.023***	0.025***
	(0.056)		(0.006)	(0.005)	(0.005)
Age	0.060***	IMR	-0.021***	-0.014***	-0.014***
	(0.001)		(0.003)	(0.003)	(0.003)
Dividend Dummy	-0.044**	Lag Tobin Q		0.001***	0.001***
	(0.021)			(0.000)	(0.000)
		Cash Flow		0.179***	0.179***
				(0.011)	(0.011)
		Sale Growth		0.002***	0.002***
				(0.000)	(0.000)
		GDP growth		0.030*	0.041*
				(0.016)	(0.022)
Industry FE	Yes	Firm FE	Yes	Yes	No
Province FE	Yes	Firm FE * Quarter FE	No	No	Yes
Exchange FE	Yes	Year FE	Yes	Yes	Yes
Quarter FE	Yes	Quarter FE	Yes	Yes	No
Observations	81963	Observations	81963	81963	81963
Pseudo R-squared	0.316	Adjusted R-squared	0.396	0.416	0.418

NOTE. Panel A reports first stage Probit model with the connected dummy as dependent variable. Panel B is the regression with corporate investment as the dependent variable, defined as quarterly capital expenditure scaled by the beginning-of-quarter book value of total assets. All standard errors at Panel B are clustered at both firm and year level and reported in the parentheses. *, ** and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

investment mis-measurement. The coefficient on lagged investment is significantly positive, suggesting that investment is persistent. The magnitude of the interaction term is even larger than in our baseline regression. Panel C uses an alternative measure of the US monetary policy shock, identified by Bu et al. (2019) (BRW for brevity).[17] The estimation results are consistent with our baseline results although with a relatively smaller magnitude and less significance. Panel D introduces a lagged MPS^{US} term and its interaction with the connect dummy. The idea is to see whether corporate investment is slowly responsive to external shocks. The coefficients on lagged interaction term are insignificant, suggesting that the decline in corporate investment is mainly driven by contemporary monetary policy shocks.

[17] This measure applies a Fama-MacBeth procedure to the response of the full maturity spectrum of interest rates to FOMC announcements, to identify the policy shock, and compares favorably to the alternatives in the literature.

Other measures of external shocks

We also include different measures of external shocks to examine whether our results relying on MPS^{US} is robust. Table A.5 in the Appendix presents the results. Panel A adds the VIX index and its interaction with Connect. Panel B adds the dollar index return and its interaction with Connect. Panel C adds the bilateral exchange rate change between dollar and RMB and its interaction with Connect. Panel D adds the monetary policy uncertainty index of Husted et al. (forthcoming) and its interaction with Connect. Panel E adds the news-based economic policy uncertainty index from Baker et al. (2016) and its interaction with Connect. Panel F adds a GDP-weighted average of national EPU indices for 16 countries that account for two-thirds of global output and its interaction term with Connect (see Davis (2016) for the construction of such index). The results suggest that the interaction term of MPS^{US} shock and Connect remains statistically significant. Moreover, the magnitude is similar to our baseline results.

Placebo test: effect of Chinese monetary policy

Our baseline results suggest that being connected makes corporate investment more sensitive to external shocks. However, both connected and unconnected firms are exposed to Chinese monetary policy shock. There should be no difference between those two types of firms' responses to Chinese monetary policy shocks. To formally test this, we use the Chinese monetary policy shock estimated by Chen et al. (2018)[18] and repeat our baseline regression. The results in Table A.6 of the Appendix show that there is no significant difference between these two types of firms in their response to Chinese monetary policy shocks.

We note that our sample comprises all A-listed firms, including dual listed ones. For those that can also be listed on other stock markets, one might worry that our results are being driven by them. Thus, we drop the dual listed firms, re-estimate our results in Table A.7 in the Appendix, and find that our baseline results still hold.

[18] We are grateful for the datasets shared by Chen et al. (2018)

6 Firm Heterogeneity

We next investigate the channels through which the US monetary policy shock affects domestic investment. In particular, we test our Hypothesis 2 on whether firms with weaker financial conditions are affected more by U.S. monetary policy shocks. To this end, we implement sub-sample tests to explore any heterogeneity in the treatment group. For example, we divide our full sample into two groups in each quarter based on measures of firm characteristics. We then re-estimate our baseline regression on these two sub-samples separately.

Table 7 summarizes the estimation results. Panel A divides firms into tradable and non-tradable sectors. The results indicate that firms in the non-tradable sector are affected more than those in the tradable sector. This finding is consistent with the balance sheet effect. For example, when there is a currency mismatch in firms' balance sheets, the dollar value of the debt increases and net worth decreases following a US monetary policy contraction. Therefore, one should expect firms in the non-tradable sector to be affected more since their revenue, and hence income stream, on the asset side is more likely linked to the domestic currency. In panels B and C, we divide firms into two groups according to their median level of foreign sales share and total leverage by each quarter respectively. The foreign sales share is defined as the proportion of foreign sales to total sales. To the extent that a firm's business is more sensitive to external shocks, one should expect that firms with more exposure to foreign sales are more affected by external shocks after the Connect. In Panel B, we report evidence of this effect. In Panel C, we see that firms with a relatively high leverage are more sensitive to external shocks other things equal, consistent with the balance sheet channel. Finally, Panel E divides firms into state owned enterprises (SOE) and non-state owned enterprises (non-SOE), defined as whether the largest shareholder belongs to government related entities. We find no significant differences between SOEs and non-SOEs, as both are equally affected by US monetary policy shocks.

Table 7 Corporate Investment and FOMC Shocks: Firm Heterogeneity

	CAPX/ Lag Assets								
	(1)	(2)	(3)	(4)		(5)	(6)	(7)	(8)
Panel A: Tradable v.s. Non Tradable Sector					*Panel C: Total Leverage*				
	NT	T	NT	T		High	Low	High	Low
MPS^{US}*Connect	-0.021**	-0.017*	-0.021**	-0.016*	MPS^{US}*Connect	-0.023**	-0.016*	-0.025***	-0.014***
	(0.010)	(0.009)	(0.010)	(0.009)		(0.010)	(0.009)	(0.006)	(0.005)
MPS^{US}	-0.009*	-0.006*	-0.011**	-0.009**	MPS^{US}	-0.007	-0.009**	-0.011***	-0.010***
	(0.005)	(0.004)	(0.005)	(0.004)		(0.005)	(0.004)	(0.003)	(0.002)
Connect	0.002	0.002	0.002*	0.003*	Connect	0.002**	0.002	0.003*	0.003**
	(0.001)	(0.002)	(0.001)	(0.001)		(0.001)	(0.002)	(0.001)	(0.001)
Observations	58466	29274	58466	29274	Observations	45702	42038	45702	42038
Adjusted R-squared	0.386	0.392	0.408	0.413	Adjusted R-squared	0.404	0.438	0.434	0.454
Panel B: Foreign Sales %					*Panel D: State Owned Enterprise (SOE)*				
	High	Low	High	Low		SOE	non-SOE	SOE	non-SOE
MPS^{US}*Connect	-0.023**	-0.017*	-0.022**	-0.018*	MPS^{US}*Connect	-0.019*	-0.019*	-0.019*	-0.019**
	(0.011)	(0.010)	(0.011)	(0.009)		(0.011)	(0.010)	(0.011)	(0.009)
MPS^{US}	-0.008*	-0.008**	-0.010**	-0.011***	MPS^{US}	-0.005	-0.011*	-0.008**	-0.012**
	(0.005)	(0.004)	(0.005)	(0.004)		(0.003)	(0.006)	(0.003)	(0.006)
Connect	0.006***	-0.001	0.006***	-0.001	Connect	0.001	0.003**	0.002	0.004***
	(0.001)	(0.001)	(0.001)	(0.001)		(0.002)	(0.001)	(0.002)	(0.001)
Observations	41523	44887	41523	44887	Observations	32289	48862	32289	48862
Adjusted R-squared	0.454	0.382	0.470	0.402	Adjusted R-squared	0.392	0.446	0.419	0.459
Firm Controls	No	No	Yes	Yes	Firm Controls	No	No	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Firm FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Year FE	Yes	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes	Yes	Quarter FE	Yes	Yes	Yes	Yes

NOTE. For all the estimates, the dependent variable is corporate investment, defined as quarterly capital expenditure scaled by the beginning-of-quarter book value of total assets. Panel A divides the firms into tradable and non-tradable sectors. Panel B divides the firms into two groups according to the median level of foreign sales share, defined as the share of foreign sales to total sales, at each quarter. Panel C divides the firms into two groups according to the median level of leverage, defined as the sum of short-term borrowing and long-term debt divided by total assets, at each quarter . Panel D divides the firms into state owned enterprise (SOE) and non-state owned enterprise (non-SOE). All standard errors are clustered at both firm and year level and reported in the parentheses. *, ** and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

Real Options vs. Financial Constraints

We consider two channels through which external shocks affect corporate investment, as have been studied in the literature: the real options channel which builds on irreversible investment and the financial constraint channel which builds on financial budgeting. We present evidence on these two channels in Table 8.

Panels A and B divide the sample by two measures of the irreversibility of firm investment: property, plant and equipment (PPE) and depreciation. We find no support for real options channel. Next, we construct measures of financial constraints. In panel C, we add to the regression a Kaplan-Zingales (KZ) index we construct for Chinese firms following Kaplan and Zingales (1997),[19] while in Panel D we present results with the WW index from Whited and Wu (2006).[20] In Panel E we present results with HP index in Hadlock and Pierce (2010),[21] while Panel F presents a dividend payout measure.

As in the previous literature, firms with a higher KZ index, a higher WW index, a higher HP index and a zero dividend payout dummy are considered to be financially constrained. As the results show, we find mixed results for the financial constraint channel. For the HP index and cash dividend measure, we find evidence that firms with tighter financial constraints are affected more by US monetary pol-

[19] We constructed the KZ index for Chinese firms as in Lamont et al. (2001), relying on the coefficients from Kaplan and Zingales (1997).

$$KZ_{i,t} = -1.1001CF_{i,t} + 0.2826Q_{i,t} + 3.1392TLTD_{i,t} - 39.3678TDIV_{i,t} - 1.3147Cash_{i,t}$$

where $CF_{i,t}$ is cash flows, $Q_{i,t}$ is the Tobin's Q, $TLTD_{i,t}$ is the ratio of long term debt to total assets, $TDIV_{i,t}$ is the ratio of total dividends to assets and $Cash_{i,t}$ is the ratio of liquid assets to total assets.

[20] The WW index is constructed following Whited and Wu (2006) as follows

$$WW_{i,t} = -0.091 * CF_{i,t} - 0.062 * DIVP_{i,t} + 0.021 * LTD_{i,t} - 0.044 * TA_{i,t} + 0.102ISG_{i,t} - 0.035 * SG_{i,t}$$

where $CF_{i,t}$ is the ratio of liquid assets to total assets, $DIVP_{i,t}$ is an indicator that takes the value of 1 if the firm pays cash dividends and 0 otherwise, $LTD_{i,t}$ is the long-term debt divided by the lagged total assets, $TA_{i,t}$ is the log of total assets, $ISG_{i,t}$ is the average industry sales growth estimated separately for each two-digit CSIC industry in each year and $SG_{i,t}$ is the sales growth.

[21] We constructed HP index for Chinese firms replying on the following specification.

$$HP_{i,t} = -0.737Size_{i,t} + 0.043Size_{i,t}^2 - 0.040Age_{i,t}$$

where $Size_{i,t}$ is the firms' size and $Age_{i,t}$ is the number of years the firm is listed.

Table 8 Real Options vs. Financial Constraint

CAPX/ Lag Assets									
Real Option Channel									
Panel A: PPE					*Panel B: Depreciation*				
	High	Low	High	Low		High	Low	High	Low
MPS^{US}*Connect	-0.010	-0.026**	-0.012	-0.025**	MPS^{US}*Connect	0.000	-0.020**	0.004	-0.020**
	(0.009)	(0.010)	(0.009)	(0.010)		(0.018)	(0.008)	(0.020)	(0.008)
MPS^{US}	-0.010*	-0.006*	-0.013**	-0.008**	MPS^{US}	-0.020*	-0.005	-0.026***	-0.007
	(0.005)	(0.004)	(0.005)	(0.003)		(0.012)	(0.004)	(0.009)	(0.004)
Connect	0.003**	-0.000	0.004***	0.000	Connect	0.003**	0.001	0.005***	0.002**
	(0.001)	(0.001)	(0.001)	(0.001)		(0.001)	(0.001)	(0.002)	(0.001)
Observations	43871	43869	43871	43869	Observations	25543	62197	25543	62197
Adjusted R-squared	0.419	0.436	0.451	0.446	Adjusted R-squared	0.400	0.368	0.429	0.383
Financial Constraint									
Panel C: KZ index					*Panel D: WW index*				
	FC	UFC	FC	UFC		FC	UFC	FC	UFC
MPS^{US}*Connect	-0.015*	-0.023**	-0.014*	-0.021*	MPS^{US}*Connect	-0.020**	-0.028**	-0.017*	-0.025**
	(0.008)	(0.011)	(0.008)	(0.011)		(0.009)	(0.013)	(0.009)	(0.012)
MPS^{US}	-0.006	-0.010**	-0.010**	-0.012***	MPS^{US}	-0.007	-0.009**	-0.009**	-0.012***
	(0.004)	(0.004)	(0.005)	(0.004)		(0.004)	(0.004)	(0.004)	(0.004)
Connect	0.002**	0.001	0.003***	0.002	Connect	0.002**	0.001	0.003**	0.002
	(0.001)	(0.001)	(0.001)	(0.001)		(0.001)	(0.001)	(0.001)	(0.001)
Observations	44862	42878	44862	42878	Observations	43852	43888	43852	43888
Adjusted R-squared	0.380	0.460	0.402	0.476	Adjusted R-squared	0.368	0.435	0.383	0.459
Panel E: HP index					*Panel F: Cash Dividend*				
	FC	UFC	FC	UFC		Payer	Non-Payer	Payer	Non-Payer
MPS^{US}*Connect	-0.029**	-0.021**	-0.025**	-0.020**	MPS^{US}*Connect	-0.019	-0.016**	-0.023	-0.014*
	(0.012)	(0.008)	(0.011)	(0.008)		(0.020)	(0.008)	(0.020)	(0.007)
MPS^{US}	-0.008*	-0.007*	-0.011***	-0.010**	MPS^{US}	-0.014*	-0.005	-0.016***	-0.006
	(0.004)	(0.004)	(0.004)	(0.004)		(0.007)	(0.004)	(0.006)	(0.004)
Connect	0.003***	0.003**	0.004***	0.002*	Connect	0.000	0.002**	0.002	0.003***
	(0.001)	(0.001)	(0.001)	(0.001)		(0.001)	(0.001)	(0.001)	(0.001)
Observations	43852	43888	43852	43888	Observations	26696	61044	26696	61044
Adjusted R-squared	0.448	0.376	0.469	0.393	Adjusted R-squared	0.429	0.359	0.454	0.372
Firm Controls	No	No	Yes	Yes	Firm Controls	No	No	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Firm FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Year FE	Yes	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes	Yes	Quarter FE	Yes	Yes	Yes	Yes

NOTE. For all the estimates, the dependent variable is corporate investment, defined as quarterly capital expenditure scaled by the beginning-of-quarter book value of total assets. Panel A divides the firms into two groups according to the median level of PPE ratio, calculated as book value of property, plant and equipment (PPE) divided by book value of total asset, at each quarter. Panel B divides the firms into two groups according to the median level of their depreciation rate, defined as depreciation divided by total assets, at each quarter. Panel C divides the firms into two groups according to the median level of KZ index constructed by Kaplan and Zingales (1997), at each quarter. Panel D divides the firms into two groups according to the median level of WW index constructed by Whited and Wu (2006) at each quarter. Panel E divides the firms into two groups according to the median level of HP index constructed by Hadlock and Pierce (2010) at each quarter. Panel F divides the firms into two groups according to whether firms have paid cash dividend to their shareholders. All standard errors are clustered at both firm and year level and reported in the parentheses. *, ** and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

icy shocks once included in the Connect. For the KZ index and WW index, we do not find such supportive results. Hence, although there is not much evidence of a real options channel, we do find some evidence for the financial constraint channel.

7 The (Positive) Effect of the China Connect

The results so far suggest that firms included in the Connect have investment expenditures that are more sensitive to foreign shocks than firms not in the Connect. Connected firms with weak financial positions are especially vulnerable. If this were the only effect of the Connect, we would expect that firms would prefer to remain unconnected. It motivates us to explore additional effects, especially positive effect of the Connect, which we take up in this section. We structure the discussion around two practical questions. First, is being in the Connect a bad thing? Second, what are the implications of an economy being more sensitive to global shocks? For the first question, our answer is no. We show that being in the Connect reduces firms' financing costs and thus boosts investment. For the second question, there may be unintended and important negative consequences, particularly concerning monetary policy transmission in China and the independence of Chinese monetary policy. As we will show, firms hold more cash after the Connect to hedge against external shocks. To the extent that US monetary policy transmits to the Chinese economy through the Connect, the increased sensitivity of the Chinese economy to external shocks implies diminished feasibility and effectiveness of an independent Chinese monetary policy.

7.1 Is being in the Connect a bad thing? No.

First, the effect of being in the Connect, *ceterus paribus*, is to boost firm investment, as seen from the positive coefficient on the Connect dummy in Table 4. Second, the event window analysis shows that the connected stocks experience a significant value appreciation, compared with unconnected ones during the announcement of

the program.[22] Figure 3 shows the cumulative abnormal returns difference between connected and unconnected stocks surrounding the event date.[23,24] The rising, positive effect on stock returns for connected firms relative to unconnected firms is statistically significant and economically large. Third, in Table 9, we present the effects of the Connect on measures of firm performance and financing costs. As seen in columns (1)-(4), returns on assets (ROA) and equity (ROE) are significantly higher for those in the Connect than those outside. Furthermore, financing costs such the cost of debt (measure for debt financing) and dividend to price ratio (measure for cost of capital) are significantly lower for the connected firms (columns (5)-(8)). In sum, the Connect firms exhibit sizable stock price revaluations, increased growth rate of capital stock, and better firm performance, consistent with Chari and Henry (2004, 2008), which coincides with a reduction in financing costs.

7.2 Implications of being more sensitive to global shocks

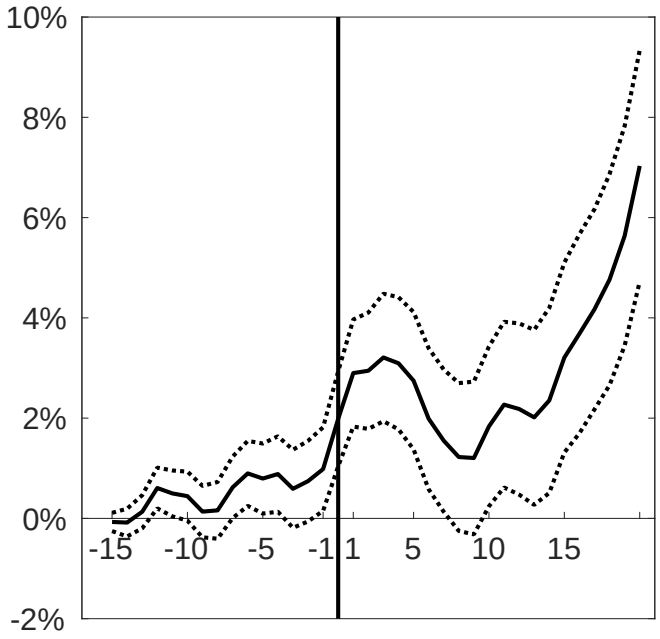
Finally, we consider implications for an economy whose corporate investment expenditures are more sensitive to external shocks. Table 10 shows that firms included in the connect hold more cash after the connection. This reflects the precautionary motivation for firms to hedge against the external shocks. But even with more cash holdings, firms in the connect are more sensitive to FOMC shocks (row 2). This evidence reinforces the notion that U.S. monetary policy has a large spillover effect on emerging market economies considering that China has the tightest capital controls policy around the globe (see Kalemli-Ozcan (2019)). One potential downside of the extra sensitivity to U.S. monetary policy regards the independence of Chinese monetary policy. In light of the (additional) foreign spillover effects of working through the Connect, Chinese monetary policy might have to respond to

[22] We only consider stocks listed on Shanghai Stock Exchange since the first Connect is between Shanghai and Hong Kong, which is regarded as an unexpected event to investors.

[23] We choose Nov. 10, 2014 (rather than Nov. 17, 2014) as our announcement day because the list of eligible stocks (to be included in the Connect from Nov 17) was announced on Nov. 10.

[24] We use the market model to calculate the cumulative abnormal return. A 250-day estimation window is used to estimated the β coefficient between the market return and stock return. A 30-day gap between the estimation window and event window is required. Moreover, we require at least 100 days of available return data. We also perform Fama-French three-factor, Carhart four-factor model and the results are identical.

Figure 3 Cumulative Abnormal Returns Around Announcement Day:
Connected Firms relative to Unconnected Firms



NOTE. The figure plots the difference of cumulative abnormal returns based on market model between connected and unconnected stocks around the announcement window (-15, 20) of Shanghai-Hong Kong Stock Connect program. The 95% confidence interval are plotted at dashed line. The vertical line marks the announcement date for the list of eligible stocks to be included in the Stock Connect, i.e. Nov. 10, 2014.

Table 9 Firm Performance, Financing Cost and the China Connect

	ROA		ROE		Cost of Debt (%)		Change of ln(D/P) (%)	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Connect	0.001***	0.001***	0.005***	0.005***	-0.014**	-0.016***	-0.022***	-0.023***
	(0.000)	(0.000)	(0.001)	(0.001)	-0.006	-0.006	-0.005	-0.005
Lag Tobin Q	-0.001***	-0.001***	-0.000	-0.000	0.012***	0.012***	0.018***	0.019***
	(0.000)	(0.000)	(0.000)	(0.000)	-0.001	-0.001	-0.001	-0.001
Cash Flow	0.915***	0.915***	1.652***	1.651***	0.294***	0.291***	-0.221***	-0.218***
	(0.006)	(0.006)	(0.054)	(0.054)	-0.05	-0.05	-0.039	-0.039
Sale Growth	-0.003***	-0.003***	-0.002*	-0.002*	-0.006**	-0.006**	0.060***	0.060***
	(0.000)	(0.000)	(0.001)	(0.001)	-0.003	-0.003	-0.008	-0.008
GDP growth	-0.008**	-0.008*	0.048*	0.053*	0.062	0.138	0.441***	0.858***
	(0.004)	(0.004)	(0.026)	(0.032)	-0.112	-0.123	-0.122	-0.166
Size	-0.000	-0.000	-0.005**	-0.005**	0.064***	0.064***	0.013***	0.013***
	(0.000)	(0.000)	(0.002)	(0.002)	-0.005	-0.005	-0.003	-0.003
Leverage	-0.010***	-0.010***	0.046***	0.046***	0.140***	0.143***	0.080***	0.081***
	(0.001)	(0.001)	(0.009)	(0.009)	-0.024	-0.023	-0.015	-0.015
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Region FE * Year FE	No	Yes	No	Yes	No	Yes	No	Yes
Year FE	Yes	No	Yes	No	Yes	No	Yes	No
Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	87740	87740	87737	87737	82464	82464	80271	80271
Adjusted R-squared	0.929	0.929	0.437	0.437	0.83	0.83	0.025	0.025

NOTE. The dependent variable is return on assets (ROA) in column (1)-(2), return on equity (ROE) in column (3)-(4), cost of debt (%) measured by borrowing cost in column (5)-(6), and change of dividend to price ratio, ln(D/P) (%) in column (7)-(8). All standard errors are clustered at firm level and reported in parentheses. *, ** and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

Table 10 Cash Holdings and FOMC Shocks

	Cash / Lag Assets					
	Equal Weighted			Value Weighted		
	(1)	(2)	(3)	(4)	(5)	(6)
Connect	0.001	0.004	0.007**	0.002	0.005	0.008**
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
MPS^{US}*Connect	-0.006	0.019**	0.019**	0.113***	0.174***	0.167***
	(0.008)	(0.009)	(0.009)	(0.025)	(0.027)	(0.027)
MPS^{US}	0.015***	0.007***	0.007***	0.005	-0.003	-0.002
	(0.002)	(0.002)	(0.002)	(0.006)	(0.006)	(0.006)
Size		0.014***	0.014***		0.014***	0.014***
		(0.003)	(0.003)		(0.003)	(0.003)
Cash Flow		0.361***	0.367***		0.361***	0.367***
		(0.023)	(0.023)		(0.023)	(0.023)
Lag Tobin Q		0.004***	0.004***		0.004***	0.004***
		(0.001)	(0.001)		(0.001)	(0.001)
Leverage		-0.243***	-0.240***		-0.243***	-0.240***
		(0.012)	(0.013)		(0.012)	(0.013)
Invest		0.043**	0.039*		0.042**	0.039*
		(0.021)	(0.021)		(0.020)	(0.021)
Dividend		-0.002*	-0.003**		-0.002*	-0.003***
		(0.001)	(0.001)		(0.001)	(0.001)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Region FE * Year FE	No	No	Yes	No	No	Yes
Year FE	Yes	Yes	No	Yes	Yes	No
Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	87740	84082	84082	87740	84082	84082
Adjusted R-squared	0.495	0.551	0.558	0.494	0.551	0.558

NOTE. For all the estimates, the dependent variable is cash holdings, defined as quarterly cash holdings scaled by the beginning-of-quarter book value of total assets. Column (1)-(3) use quarterly sum of MPS^{US} and column (4)-(6) use quarterly value-weighted sum of MPS^{US}. All standard errors are clustered at firm level and reported in the parentheses. *, ** and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

U.S. monetary policy in a way that deviates from its domestic mandate.[25]

[25]For example, in events like the 2013 Taper Tantrum, the Chinese monetary policy would have to follow with an easing in order to stabilize the domestic economy.

8 Conclusion

In this paper, we exploit an important and unique capital account liberalization shock in China, the Shanghai (Shenzhen)-Hong Kong stock Connect, to jointly test hypotheses concerning spillover effects from external shocks and the efficacy of capital controls policy. The Connect allows certain stocks to be eligible for foreign investors while restricting other shares to remain available only to domestic investors, and is a natural experiment to study the effect of external shocks.

We find two main results. First, Chinese firms are more negatively affected by US monetary policy shocks after trading in their shares became open to foreigners through the Connect. Cross-sectional evidence suggests that firms with relatively weaker financial conditions are affected more. Moreover, the results also support a financial channel at work, as firms in the non-tradables sector or with a higher share of foreign sales are important drivers of our results. If this were the only effect of the Connect, we expect that Chinese firms would act to remain outside of it. Furthermore, to the extent that Chinese monetary policy transmission and independence are diminished by this increased sensitivity to US shocks, we would expect Chinese authorities would pull back on the Connect. In this vein, our second main finding is that firms in the Connect raised more cash, enjoyed lower financing costs, and earned higher returns on equity (ROE) and assets (ROA) than firms outside of the Connect. This suggests that firms in the Connect are able to hedge the negative consequences concerning increased sensitivity to external shocks.

Our empirical findings have strong policy implications. The shock emphasized in the literature on Global Financial Cycles, US monetary policy shocks, has an important spillover effect that works through the opening of the domestic Chinese stock market. The shock can spill over even with a very tight overall capital controls policy. Nevertheless, our results indicate that capital controls policy is still effective in curbing its negative impact on Chinese corporate investment, thus preserving some degree of monetary policy independence relative to fully open capital markets.

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A Tables

Table A.1 Data Sample: Industry and Year Distribution

Panel A: Industry Distribution				**Panel B: Year Distribution**			
Industry	**#Obs**	**#Firm**	**Percentage**	**Year**	**#Obs**	**#Firm**	**Percentage**
Automobiles & Components	4523	107	4.9%	2002	1293	755	3.1%
Capital Goods	17683	467	21.5%	2003	2495	843	3.4%
Commercial Services & Supplies	3051	63	2.9%	2004	2929	946	3.8%
Communications Equipment	2020	54	2.5%	2005	3012	951	3.8%
Computer & Electronic Equipment	5562	161	7.4%	2006	2975	959	3.9%
Computer Application	3836	118	5.4%	2007	4397	1195	4.8%
Consumer Durables & Apparel	5499	144	6.6%	2008	4810	1289	5.2%
Consumer Services	1645	34	1.6%	2009	5031	1322	5.3%
Energy	2988	70	3.2%	2010	5918	1644	6.6%
Food & Staples Retailing	319	8	0.4%	2011	7197	1953	7.9%
Food, Beverage & Tobacco	5547	128	5.9%	2012	8168	2151	8.7%
Health Care Equipment & Services	773	24	1.1%	2013	8520	2172	8.8%
Household & Personal Products	470	10	0.5%	2014	8350	2172	8.8%
Materials	17394	416	19.1%	2015	7936	2169	8.8%
Media	2096	56	2.6%	2016	8022	2173	8.8%
Medical Biology	7031	162	7.5%	2017	6687	2055	8.3%
Retailing	2902	57	2.6%				
Semiconductors	456	9	0.4%				
Telecommunication Services	175	4	0.2%				
Transportation	3770	82	3.8%				
Total	**87740**	**2174**	**100%**	**Total**	**87740**	**24749**	**100%**

Table A.2 Variable Construction and Data Source

Variable	Definition	Source
Connect	A dummy variable equals to one if a firm is included in the Shanghai (Shenzhen) Connect Program at quarter t, and zero otherwise.	Hong Kong Stock Exchange
MPS^{US}	The combination of three unexpected Monetary Policy Surprises on each FOMC announcement day. We use simple aggregation of each Monetary Policy Surprise at each quarter.	Rogers et al. (2018)
Capex	Capital expenditure divided by the book value of total assets measured at the end of quarter $t-1$ (lagged total assets).	CSMAR
Size	The natrual logarithm of the book value of total assets measured at the end of quarter t.	CSMAR
Tobin Q	The book value of total assets minus the book value of equity plus the market value of equity scaled by the book value of total assets at the end of quarter t.	CSMAR
Cash Flow	The income before extraordinary items plus depreciation and amortization divided by the book value of assets, measured at the end of quarter t.	CSMAR
Revenue Growth	A firm's quarterly sales growth rate	CSMAR
Leverage	The book value of debt divided by the book value of total assets measured at the end of quarter t.	CSMAR
ROA	Net income divided by the book value of total assets measured at the end of quarter $t-1$(lagged total assets)	CSMAR
ROE	Net income divided by the book value of shareholders' equity measured at the end of quarter $t-1$(lagged total assets)	CSMAR
Dividend Dummy	A dummy variable equals to one if a firm pay cash dividend on common stock at quarter t, and zero otherwise.	CSMAR
Foreign Sales	The ratio of foreign sales to total sales at the end of fiscal year t.	CSMAR, WIND
Local GDP Growth	Quarterly provincial nominal GDP growth rate	CEIC

Table A.3 Summary Statitics: Connected v.s Unconnected Firms

	Connected Firms (a)			Unconnected Firms (b)			Difference (b)-(a)	
	Number of Firms	Mean	S.D	Number of Firms	Mean	S.D	Mean Diff	T-test
Panel A: Shanghai- Hong Kong Connect (2014Q4)								
Capex	416	0.05	0.04	324	0.03	0.05	-0.02***	(-5.11)
Size	416	23.15	1.33	324	21.78	1.23	-1.37***	(-14.47)
Tobin Q	416	2.01	1.26	324	2.83	2.45	0.83***	(5.55)
Cash Flow	416	0.07	0.05	324	0.03	0.06	-0.04***	(-9.62)
Revenue Growth	416	0.42	0.18	324	0.47	0.34	0.05**	(2.57)
Panel B: Shenzhen - Hong Kong Connect (2016Q4)								
Capex	676	0.05	0.05	576	0.03	0.04	-0.01***	(-5.93)
Size	676	22.59	0.98	576	21.66	0.87	-0.93***	(-17.73)
Tobin Q	676	3.36	2.05	576	3.50	2.10	0.14	(1.22)
Cash Flow	676	0.07	0.05	576	0.06	0.05	-0.02***	(-6.01)
Revenue Growth	676	0.51	0.27	576	0.50	0.31	-0.01	(-0.85)

NOTE.This table reports summary statistics of key variables for connected v.s unconnected firms used in our sample. Panel A includes firms only listed on the Shanghai Stock Exchange at Q4 2014. Connected Firms represent firms are included in the Shanghai-Hong Kong Connect Program. Panel B includes firms only listed on Shenzhen Stock Exchange in 2016 Q4. Connected Firms represent firms are included in the Shenzhen -Hong Kong Connect Program. Capex denotes the capital expenditure divided by the book value of total assets. Size is the natural logarithm of total assets. Tobin Q is the ratio of book value of total assets minus the book value of equity plus the market value of equity by book value of total assets. Cash flow is measured as earnings before interest and taxes (EBIT) plus depreciation and taxes scaled by lagged total assets. Revenue growth, defined as the growth rate of revenue. Local GDP growth is calculated as quarterly change of nominal GDP at the provincial level where firm headquartered. All variables are winsorized at the top and bottom 1% to rule out outliers.

Table A.4 Corporate Investment and FOMC Shocks: Robustness

	CAPX/ Lag Assets					
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Industry Fixed Effect				*Panel C: Alternative Measure of Monetary Surprises*		
MPS^{US}*Connect	-0.022*	-0.025*	-0.025***	BRW*Connect	-0.015*	-0.015*	-0.015***
	(0.013)	(0.013)	(0.008)		(0.008)	(0.008)	(0.005)
MPS^{US}	-0.008**	-0.011**	-0.011***	BRW	-0.006*	-0.008**	-0.008***
	(0.004)	(0.004)	(0.002)		(0.003)	(0.003)	(0.002)
Connect	0.004**	0.001	0.001	Connect	0.003**	0.003***	0.003***
	(0.002)	(0.002)	(0.002)		(0.001)	(0.001)	(0.001)
Observations	87740	87740	87740	Observations	87740	87740	87740
Adjusted R-squared	0.168	0.217	0.220	Adjusted R-squared	0.386	0.408	0.410
Panel B: Including Lagged Dependent Variable				*Panel D: Including Lagged Monetary Surprise*			
MPS^{US}*Connect	-0.023**	-0.023**	-0.023***	MPS^{US}*Connect	-0.021**	-0.022**	-0.022***
	(0.011)	(0.011)	(0.006)		(0.010)	(0.010)	(0.006)
MPS^{US}	-0.007	-0.009**	-0.009***	MPS^{US}	-0.009*	-0.012**	-0.012***
	(0.005)	(0.005)	(0.002)		(0.005)	(0.005)	(0.002)
Connect	0.001	0.001	0.001*	Lag MPS^{US}*Connect	-0.002	-0.004	-0.004
	(0.001)	(0.001)	(0.001)		(0.004)	(0.004)	(0.004)
Lag DV	0.546***	0.536***	0.535***	Lag MPS^{US}	-0.004	-0.004	-0.005*
	(0.026)	(0.026)	(0.013)		(0.005)	(0.005)	(0.003)
				Connect	0.002*	0.002**	0.002**
					(0.001)	(0.001)	(0.001)
Observations	82532	82532	82532	Observations	87740	87740	87740
Adjusted R-squared	0.575	0.589	0.589	Adjusted R-squared	0.387	0.409	0.410
Firm Controls	No	Yes	Yes	Firm Controls	No	Yes	Yes
Firm FE	Yes	Yes	Yes	Firm FE	Yes	Yes	Yes
Region FE * Year FE	No	No	Yes	Region FE * Year FE	No	No	Yes
Year FE	Yes	Yes	No	Year FE	Yes	Yes	No
Quarter FE	Yes	Yes	Yes	Quarter FE	Yes	Yes	Yes

NOTE. For all the estimates, the dependent variable is corporate investment, defined as quarterly capital expenditure scaled by the beginning-of-quarter book value of total assets. Panel A use industry fixed effects instead of firm fixed effect. Panel B controls for lagged corporate investment. Panel C uses alternative monetary policy shock (BRW) identified by Bu et al. (2019). Panel D controls for lagged monetary policy shock. All standard errors are clustered at both firm (industry) and year level and reported in parentheses. *, ** and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

Table A.5 Corporate Investment and FOMC Shocks: Global Financial Cycles

	CAPX/ Lag Assets					
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: VIX Index from CBOE S&P 500				*Panel D: Monetary Policy Uncertainty Index from HRS*		
MPS^{US}*Connect	-0.023**	-0.023**	-0.023***	MPS^{US}*Connect	-0.025***	-0.024**	-0.024***
	(0.010)	(0.009)	(0.005)		(0.009)	(0.010)	(0.006)
VIX*Connect	-0.006***	-0.006***	-0.006**	MPU*Connect	-0.002	-0.001	-0.001
	(0.002)	(0.002)	(0.003)		(0.002)	(0.003)	(0.002)
Connect	0.019***	0.019***	0.019***	Connect	0.004	0.004	0.004
	(0.005)	(0.005)	(0.007)		(0.004)	(0.004)	(0.003)
Observations	87740	87740	87740	Observations	85797	85797	85797
Adjusted R-squared	0.387	0.409	0.410	Adjusted R-squared	0.391	0.413	0.415
Panel B: Dollar Index Return				*Panel E: News-based Economic Policy Uncertainty Index from BBD*			
MPS^{US}*Connect	-0.016**	-0.016**	-0.016***	MPS^{US}*Connect	-0.019*	-0.019*	-0.019***
	(0.008)	(0.007)	(0.005)		(0.011)	(0.011)	(0.006)
Dollar Return*Connect	-0.023	-0.025*	-0.025**	EPU*Connect	0.001	0.001	0.001
	(0.016)	(0.015)	(0.011)		(0.003)	(0.003)	(0.003)
Connect	0.002**	0.003***	0.003***	Connect	0.000	0.001	0.001
	(0.001)	(0.001)	(0.001)		(0.004)	(0.004)	(0.003)
Observations	87740	87740	87740	Observations	87740	87740	87740
Adjusted R-squared	0.387	0.409	0.410	Adjusted R-squared	0.387	0.409	0.410
Panel C: Exchange Rate Return of RMBUSD				*Panel F: Global Economic Policy Uncertainty from BBD*			
MPS^{US}*Connect	-0.015	-0.016*	-0.017***	MPS^{US}*Connect	-0.020*	-0.020*	-0.020***
	(0.009)	(0.010)	(0.005)		(0.011)	(0.011)	(0.006)
RMBUSD*Connect	0.020	0.011	0.013	GEPU*Connect	-0.000	-0.000	-0.000
	(0.025)	(0.023)	(0.022)		(0.002)	(0.002)	(0.002)
Connect	0.002	0.002**	0.003**	Connect	0.002	0.002	0.003
	(0.001)	(0.001)	(0.001)		(0.003)	(0.003)	(0.003)
Observations	87740	87740	87740	Observations	87740	87740	87740
Adjusted R-squared	0.387	0.409	0.410	Adjusted R-squared	0.387	0.409	0.410
Firm Controls	No	Yes	Yes	Firm Controls	No	Yes	Yes
Firm FE	Yes	Yes	Yes	Firm FE	Yes	Yes	Yes
Region FE * Year FE	No	No	Yes	Region FE * Year FE	No	No	Yes
Year FE	Yes	Yes	No	Year FE	Yes	Yes	No
Quarter FE	Yes	Yes	Yes	Quarter FE	Yes	Yes	Yes

NOTE. For all the estimates, the dependent variable is corporate investment, defined as quarterly capital expenditure scaled by the beginning-of-quarter book value of total assets. Panel A adds VIX index and its interaction with Connect. Panel B adds dollar index return and its interaction with Connect. Panel C adds bilateral exchange rate return between dollar and RMB and its interaction with Connect. Panel D adds a monetary policy uncertainty index (MPU) identified by Husted et al. (forthcoming) and its interaction with Connect. Panel E adds a news-based economic policy uncertainty index (EPU) from Baker et al. (2016) and its interaction with Connect. Panel F adds a GDP-weighted average of national EPU indices for 16 countries that account for two-thirds of global output (GEPU) and its interaction with Connect (see Davis (2016) for details). All standard errors are clustered at both firm and year level and reported in parentheses. *, ** and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

Table A.6 Corporate Investment and Chinese Monetary Policy Shocks

	CAPX/ Lag Assets					
	QoQ			YoY		
	(1)	(2)	(3)	(4)	(5)	(6)
MPS^{China} *Connect	-0.130	-0.164	-0.168	-0.015	-0.024	-0.026
	(0.192)	(0.214)	(0.120)	(0.057)	(0.065)	(0.060)
MPS^{China}	0.091	0.117*	0.122***	0.021	0.026	0.029
	(0.070)	(0.071)	(0.036)	(0.078)	(0.081)	(0.042)
Connect	0.002**	0.002***	0.003***	0.002*	0.003**	0.003**
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Lag Tobin Q		0.001***	0.001***		0.001***	0.001***
		(0.000)	(0.000)		(0.000)	(0.000)
Cash Flow		0.178***	0.179***		0.178***	0.178***
		(0.010)	(0.009)		(0.010)	(0.009)
Sale Growth		0.002***	0.002***		0.002***	0.002***
		(0.000)	(0.000)		(0.000)	(0.000)
GDP growth		0.028*	0.046**		0.025	0.040*
		(0.017)	(0.020)		(0.017)	(0.021)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Region FE * Year FE	No	No	Yes	No	No	Yes
Year FE	Yes	Yes	No	Yes	Yes	No
Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	87740	87740	87740	87740	87740	87740
Adjusted R-squared	0.386	0.408	0.409	0.386	0.407	0.409

NOTE. For all the estimates, the dependent variable is corporate investment, defined as quarterly capital expenditure scaled by the beginning-of-quarter book value of total assets. Column (1)-(3) use quarter-over-quarter (QoQ) change of MPS^{China} identified by Chen et al. (2018) and column (4)-(6) use year-over-year (YoY) change of MPS^{China}. All standard errors are clustered at both firm and year level and reported in parentheses. *, ** and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

Table A.7 Corporate Investment and FOMC Shocks: Drop Dual-listed Shares

	CAPX/ Lag Assets		
	(1)	(2)	(3)
MPS^{US}*Connect	-0.020**	-0.020**	-0.020***
	(0.010)	(0.010)	(0.006)
MPS^{US}	-0.008*	-0.011**	-0.011***
	(0.004)	(0.004)	(0.002)
Connect	0.002**	0.003***	0.003***
	(0.001)	(0.001)	(0.001)
Lag Tobin Q		0.001***	0.001***
		(0.000)	(0.000)
Cash Flow		0.181***	0.181***
		(0.010)	(0.009)
Sale Growth		0.002***	0.002***
		(0.000)	(0.000)
GDP growth		0.039**	0.057***
		(0.019)	(0.021)
Firm FE	Yes	Yes	No
Firm FE * Quarter FE	No	No	Yes
Year FE	Yes	Yes	Yes
Quarter FE	Yes	Yes	No
Observations	81151	81151	81151
Adjusted R-squared	0.382	0.404	0.406

NOTE. For all the estimates, the dependent variable is corporate investment, defined as quarterly capital expenditure scaled by the beginning-of-quarter book value of total assets. All standard errors are clustered at both firm and year level and reported in parentheses. *, ** and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.