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The Effect of the China Connect

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Abstract

Stock market liberalization generates benefits and costs. We estimate these effects using the Shanghai (Shenzhen) - Hong Kong Stock Connect, an important opening that allows foreign investors to trade a subset of mainland Chinese firms. The liberalization brought connected Chinese firms lower funding costs and more investment, but also increased sensitivity to foreign shocks. These effects are stronger for firms whose stock return has a higher covariance with the world market return and for firms relying more on external financing. We find that both (greater) risk sharing and (lower) funding cost channels explain our results.

Keywords: Capital Account Liberalization; Capital Controls; Global Financial Cycle; Foreign Spillovers; China Connect; Corporate Investment
JEL Classification: F38; E40; E52; G15

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1 Introduction

Many developing countries have opened their capital accounts, allowing foreign investors to participate in the domestic stock market. There is a growing consensus that stock market liberalization improves allocative efficiency and boosts investment and economic growth (e.g. Chari and Henry (2004, 2008), Bekaert, Harvey, and Lundblad (2005), Gupta and Yuan (2009), Larrain and Stumpner (2017)). However, open capital markets can also be costly. For example, speculative foreign capital flows can trigger excessive volatility in the capital account, which in the extreme can lead to financial crises (e.g., the 1997 Asian financial crisis; more generally, see Reinhart and Reinhart (2008)). Even outside of crisis episodes, countries that are financially integrated internationally seem to be subject to the global financial cycle, hindering the ability to pursue a self-interested monetary policy (see Rey (2015), Miranda-Agrippino and Rey (2020), Han and Wei (2018)). Related to this, many countries that pursued an open capital account have started to manage capital inflows, including Brazil, Colombia, Indonesia, Korea, and Thailand. The International Monetary Fund has changed important elements of its view on countries managing their capital account under certain circumstances (Basu, Boz, Gopinath, Roch, and Unsal (2020)). These considerations call for additional careful analysis of stock market liberalization.

The existing literature is based mainly on country-level liberalization episodes. These papers document direct, beneficial effects of market liberalization such as improving firm performance and boosting innovative activities (e.g. Chari and Henry (2004, 2008), Bekaert et al. (2005), Mitton (2006), Moshirian, Tian, Zhang, and Zhang (2020)). However, these country-level liberalization episodes often occur simultaneously with other economic reforms and/or macroeconomic policy changes. Furthermore, in most cases, a country allows foreigners to trade *all* stocks. These features complicate identification of the causal effects of liberalization, something we make progress on.

In this paper, we contribute to the literature on capital account liberalization by examining the effects of the China Connect on Chinese firms. The China Connect was an important and unique stock market liberalization. It refers to the Shanghai (Shenzhen) - Hong Kong "Stock Connect" program. This program allows investors on both sides of the markets in mainland China and Hong Kong — including investors in mainland China, Hong Kong, and foreign countries — to trade eligible stocks listed on the other market, with these trades working through the exchange and clearing houses in their "own" market. The first wave of the Connect program, announced in April 2014 and begun in November 2014, represented a major step toward internationalizing China's

security markets. In December 2016, the program was extended to the Shenzhen exchange.

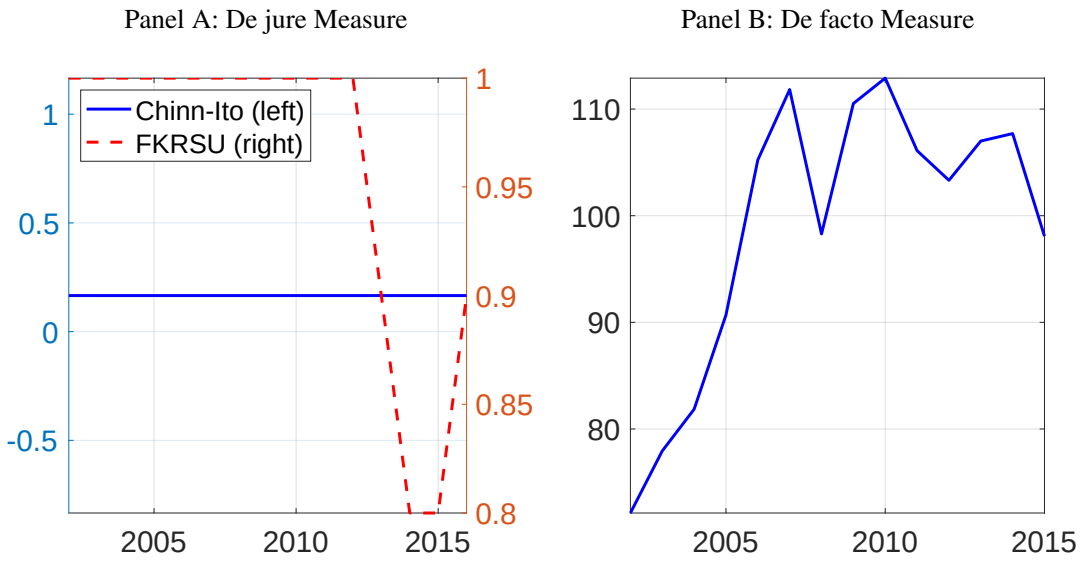
Analyzing the China Connect allows us to bypass the above-mentioned hindrances to identification, thus allowing us to estimate the causal effects — both costs and benefits — of stock market liberalization that few papers are able to investigate. There are two features that make the Connect policy experiment unique. First, the equity market liberalization took place amid an overall capital controls policy in China that remained tight and unchanged, reflecting a long-standing cautious attitude of Chinese policymakers towards liberalization (Song and Xiong (2018) and Brunnermeier, Sockin, and Xiong (2018)). This can be seen in Figure 1, which depicts widely used measures of capital account restrictions in China (Chinn and Ito (2006), Fernández, Klein, Rebucci, Schindler, and Uribe (2016), and Lane and Milesi-Ferretti (2007)).

The second important feature of the China Connect program is that it allows only a subset of Chinese firms to be traded by foreign investors, while the remaining firms are left out. Thus, different from historical liberalizations, the China Connect naturally creates two groups of stocks in the domestic market, one with more liberalization than the other.[1] We exploit the firm-level differences that resulted from the Connect to estimate differences in various firm-level outcomes.[2] In the cases of stock market liberalizations when foreign investors become the marginal investor for domestic stocks, we expect an immediate shift in stock price movements, from behaving according to a domestic benchmark (like the CAPM) to a world benchmark. Thus, upon liberalization, we should observe firm-level heterogeneity in stock price movements, with connected firms behaving differently than unconnected firms since they are more exposed to foreign capital. We should also observe connected firms experiencing a different price revaluation depending on how risk-sharing shifts from the domestic to the international market. Moreover, any such revaluation of stock

[1] There are other papers that also use firm-level data to estimate the effects of equity market liberalizations. For example, Chari and Henry (2004, 2008) and Mitton (2006) use the investible and non-investible index lists constructed by the International Finance Corporation (IFC). This classification is based on the selection criterion adopted by the IFC based on the IFC analysts' reviewing a stock's trading activity (see Chari and Henry (2004)). However, foreign investors can still trade non-investible stocks by other channels, as authorities opened all stocks for trade. In contrast, foreign investors cannot easily trade "non-investible" stocks in the China Connect as it is prohibited by the program. In this sense, the China Connect provides a cleaner identification.

[2] 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. It is also different from the Chinese liberalization allowing certain qualified foreign institutional investors to purchase domestic stocks since 2002. However, the China Connect includes Chinese firms that are dual listed in both A and H markets — another unique setting that has been studied by, e.g., Jia, Wang, and Xiong (2017). As noted by Prasad (2017), the Connect is a controlled capital account liberalization policy, with trading subject to a maximum cross-border investment quota together with a daily quota.

Figure 1 CHINESE CAPITAL ACCOUNT RESTRICTIONS



NOTE. Panel A plots de jure measures of capital controls from Chinn and Ito (2006) and Fernández, Klein, Rebucci, Schindler, and Uribe (2016). A higher value for the former (latter) means a higher (lower) degree of capital account openness. Panel B plots the de facto measure, the sum of gross stocks of foreign assets and liabilities as a ratio to GDP, from Lane and Milesi-Ferretti (2007).

prices could be transmitted to firms' investment expenditures through a cost of funding channel. Investment expenditures of connected firms should rise after liberalization, relative to unconnected firms, through reduced funding costs on secondary markets.

We begin by examining the time around the first wave of the China Connect, in 2014, and document several positive effects. We find, first, that connected firms have higher cumulative abnormal stock returns than unconnected firms around the announcement day of the China Connect. The difference lasts for more than 20 days and is close to 6%. We further find that the return difference is due to a risk-sharing channel, consistent with Chari and Henry (2004). Second, we find that connected firms invest more than unconnected ones, 0.7% more on average, in the 10 quarters after the China Connect. We also attribute this difference to a risk-sharing channel, a finding that is different from Chari and Henry (2008) who find that only a common shock channel is at work in their liberalization episodes. Third, we find that connected firms have (i) higher profitability and sales growth, and (ii) lower funding costs in both debt and equity. These ultimately encourage

firms to shift from bank loans to equity issuance and as a result have lower leverage ratios.[3]

These positive effects of the Connect are consistent with existing literature that examines episodes at the national level. Going further, we test additional implications of liberalization, inspired by the literature on the global financial cycle (Rey (2015)). Once a country liberalizes its stock market, domestic stock prices should respond to external shocks because foreign investors are affected by these shocks. In that case, the global financial cycle factor can influence the Chinese economy through the Connect even in an environment in which China maintains a tight capital controls policy nationwide. In this sense, the Connect creates a hole in the wall of China's national capital controls policy. We test this, using the fact that the China Connect creates two groups of firms. Since connected firms are more exposed to foreign factors than unconnected firms, their investment sensitivity to foreign shocks should rise due to a cost of funding channel. Also, there should be firm-level heterogeneity depending on how sensitive are their funding costs to variations in global markets. Thus, in this second part of the paper, we estimate the effects on Chinese firms' investment from shocks to U.S. monetary policy (Rogers, Scotti, and Wright (2018)), which is taken to be the crucial driver of the global financial cycle (Rey (2015) and Miranda-Agrippino and Rey (2020)). Using a difference-in-differences approach, we find that firms in the Connect are more sensitive to Fed monetary policy shocks than those that remain outside the Connect, after the liberalization. The empirical results are both statistically and economically significant. For example, the investment rate of connected firms declines by 0.3 % more (i.e. 9% of average investment rates) than unconnected ones after inclusion following a one standard deviation (15 basis point) unexpected tightening of U.S. monetary policy, all else constant.

We run a battery of robustness tests that control for the effects of potential confounding factors, paying special attention to firm size. We furthermore examine external shocks other than U.S. monetary policy shocks and find that U.S. monetary policy shocks dominate. Finally, we run various placebo tests. We find no investment sensitivity differences between connected and unconnected firms to (i) Chinese monetary policy shocks or (ii) in the sample period before the launch of the China Connect. Moreover, we find that constituent index firms do not have a statistically different investment sensitivity to U.S. monetary policy shocks than other firms.[4]

[3] This result is consistent with Allen, Qian, Shan, and Zhu (2019), who find that externally listed Chinese firms outperform domestically listed Chinese firms.

[4] Because the Connect selects stocks mainly based on the constituent indexes that have long existed, this indicates that what matters for the Connect is that foreign investors can trade those stocks, as opposed to simply being included in the indexes. This reinforces the notion that our results are driven by different access to foreign capital.

Why these effects from the Connect?

These results naturally invite the question why connected firms' investment responds more to U.S. monetary shocks. One explanation would be if these firms directly raise capital from the Connect program. However, this is by and large not true, as the Connect does not support initial public offerings (*Information Book for Investors*, HKEX website). Instead, we argue that this negative effect of the China Connect is due to a cost of funding channel. First, the stock prices of connected firms respond more negatively to U.S. monetary policy shocks than prices of unconnected firms, after the launch of the Connect. This may be transmitted in a way that causes a decline in investment. Second, we find that firms whose stock returns co-move more with the global market return are affected relatively more by U.S. monetary policy shocks after inclusion in the Connect. This too suggests the presence of a risk-premium channel, an important component of funding costs. Finally, we find that firms relying more on external financing are more sensitive to foreign shocks in the Connect sample period, which again indicates that their funding costs are more readily determined by foreign investors after the launch of the program. Thus, even though firms don't directly raise capital from the Connect program, their investment is more sensitive to U.S. monetary policy, as in the global financial cycle literature, because connected firms' stocks are more correlated with the world market.

Methodological concerns: sample selection

We devote considerable attention to methodological concerns, which effectively emerge from the fact that connected firms were not selected randomly and that choice may not be orthogonal to unobserved factors that also affect firm equity returns, financing costs, investment, etc. This concern would be more worrisome if selection were made on a firm-by-firm basis, with firms lobbying to influence the decision. However, selection is made by the China Securities Index Co., Ltd, monitored by the regulator, the China Security Regulatory Commission. As documented below, selection strictly follows the construction of stock indexes in the market. There is no evidence that firms can affect the index construction methodology. Another concern is that the effect of the Connect may not be homogeneous across firms, but may vary as a function of firm characteristics. Simple difference-in-differences estimates may be biased if there are some firms which were connected but there are no comparable firms which were left unconnected, and vice-versa. Matching methods eliminate this potential source of bias by pairing connected (treated) with un-

connected (control) firms that have similar observed attributes. Using observations in the treatment and control groups over the "region of common support" eliminates this source of bias. In general, conventional matching methods assume that, conditional on the observed variables, the counterfactual outcome distribution of the treated firms is the same as the observed outcome distribution of firms in the control group (see Heckman, Ichimura, and Todd (1997)). Addressing these issues leads us to believe that the link between being in the Connect and the resulting firm-level outcomes we document is causal.

In the next section, we provide a more fleshed out literature review. Following that, we describe the institutional features of the Connect. Section 4 develops our main hypotheses through a simple theoretical framework. Section 5 describes our data, including how we address sample selection issues. Sections 6 and 7 discuss estimation strategy and present results. Section 8 concludes.

2 Literature review

We contribute to several strands of literature. First, to a large literature showing the benefits of stock market liberalization such as Henry (2000a,b, 2003), Bekaert et al. (2005), Chari and Henry (2004, 2008), Quinn and Toyoda (2008) among others. These papers look at stock prices, investment, and output growth after a country liberalizes its stock market. For example, Bekaert et al. (2005) attribute an annual 1% boost to real output growth that is due to equity market liberalization. This effect is larger than found elsewhere in the literature on capital account liberalization (see Kose, Prasad, Rogoff, and Wei (2009) for example). Considerable efforts have been made to understand the channels for these output growth effects. Some researchers use firm-level data, as we do, to assist identification (Chari and Henry (2004), Mitton (2006) and Chari and Henry (2008)). Gupta and Yuan (2009) find that liberalization reduces financial constraints and thus boosts the size of existing firms. Larrain and Stumpner (2017) find an improvement in capital allocation following liberalization. Moshirian et al. (2020) find greater technological innovation after the liberalization. Liberalization has been found to generate other positive spillover effects. For example, Liu, Wang, and Wei (2018) document reduction in bank loan rates after a stock market liberalization. Bae, Bailey, and Mao (2006) find an improvement in the information environment: increased openness is associated with increases in firm-specific information and analyst coverage, and decreases in earnings management, for example.

Our contribution to this first strand of literature is two-fold. First, is better identification. In previous papers, even those using firm-level data, identification is hindered by the fact that liberalizations occur at the national level. When a country opens up, it grants access to all stocks.[5] Moreover, with country-level liberalizations, identification is impeded by the simultaneous occurrence of other types of reforms. The China Connect, on the other hand, creates two groups of firms in a reasonably exogenous manner. Our second contribution is to document both costs and benefits of stock market liberalization. To our knowledge, we are the first to document the overall effects.

Second, our paper contributes to the literature on the global financial cycle. For example, Rey (2015) and Miranda-Agrippino and Rey (2020) provide compelling evidence that a global financial cycle leads 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 affects the local economy (see di Giovanni, Kalemli-Ozcan, Ulu, and Baskaya (2017)). However, Cerutti, Claessens, and Rose (2019) challenge the importance of the global financial cycle in explaining capital flows. Our finding relates to this literature in two ways. First, we find that the spillover effects of U.S. monetary policy shocks are significant, in our case to Chinese firms in the context of a well-identified liberalization. Second, we present evidence on the mechanism through which U.S. monetary policy shocks are transmitted, a cost of funding channel.

Third, our paper contributes to the literature on capital controls. One conclusion from the Global Financial Cycles literature is that capital controls can create a useful wall against external shocks (see IMF (2012), Jeanne, Subramanian, and Williamson (2012), Rey (2015) and Miranda-Agrippino and Rey (2020)). The empirical evidence for the effectiveness of capital controls is mixed, however (Magud, Reinhart, and Rogoff (2018), Rebucci and Ma (2020) and Erten, Korinek, and Ocampo (forthcoming)). One difficulty 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.[6] For example, Forbes, Fratzscher, and Straub (2015) find that most capital flows management measures do not significantly achieve stated objectives of exchange rate

[5] Even using a classification of firms into investible and non-investible, e.g., from lists constructed by the International Finance Corporation (IFC), as done in other papers, does not circumvent endogeneity issues. This is because that classification is based on the selection criterion adopted by the IFC. Presumably, foreign investors can still invest in non-investible stocks through other channels. However, the China Connect does not allow foreign investors to trade non-connected stocks, thus giving us a cleaner identification.

[6] An exception is Brazil (see Alfaro, Chari, and Kanczuk (2017) who study the effect of capital controls in Brazil).

management, capital flows management, monetary policy independence, and taming volatility. However, Miniane and Rogers (2007) and Han and Wei (2018) do find evidence that capital controls buffer the spillover effects from U.S. monetary policy to emerging market exchange rates and interest rates, while Ostry, Ghosh, Chamon, and Qureshi (2012) and Bruno, Shim, and Shin (2017) find some supporting evidence for the effectiveness of capital controls on bank credit.[7] Our paper provides a sharp identification from which we can establish causal relationships. As stock market liberalization can be viewed as a relaxation of capital controls policy, our findings on the overall effects of stock market liberalization also apply to capital controls policy.

Fourth, our paper belongs in the emerging literature using the China Connect as a natural experiment to test theoretical predictions. For example, Xing, Xu, Zheng, and Zhang (2018) use the Connect to test the impact of capital market openness on high frequency market quality. Similarly, Liu, Wang, and Wei (2018) use the policy shock to test the speculative nature of beta and the multiplier effect of speculation on demand shocks. Bian, Chan, and Shi (2020) look at whether the launch of the China Connect has stabilized market volatility. Different from those papers, which mainly focus on short-run effects on the stock market, we also analyze macroeconomic transmission and study both real and financial effects of the Connect.

Finally, our paper belongs to the literature on corporate investment and Fed monetary policy. For example, Ottonello and Winberry (2020) 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, Rogers, and Sun (2019) find that monetary policy uncertainty significantly delays U.S. firm investment in ways that are in line with both real options theory and a financial frictions channel. We find that Chinese corporate investment is negatively affected by contractionary U.S. monetary policy shocks, as we document a reduction in corporate investment for connected firms relative to unconnected ones following a contractionary shock.

[7] A relatively new literature justifies the use of capital controls to address pecuniary externalities or aggregate demand externalities. For pecuniary externalities, see Lorenzoni (2008), Jeanne and Korinek (2018, 2010), Bianchi (2011), Korinek (2018), Benigno, Chen, Otrok, Rebucci, and Young (2013) and Ma (2020). For papers with aggregate demand externalities, see Korinek and Simsek (2016) and Farhi and Werning (2016).

3 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. Their A share markets combined are the second largest in the world in terms of market capitalization, trailing only the United States. The number of listed firms has been growing since market inception, with more than 3,600 firms listed and traded at the end of 2019.

Foreign investors were traditionally restricted from trading in the A-share market.[8] 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) and Song and Xiong (2018)). Foreign investors were restricted to trade on the B-share market. It was not until late 2001 that B-shares became open to domestic investors. The B shares listed on the Shanghai and Shenzhen Stock Exchanges are denominated in USD and HKD, respectively (see Fernald and Rogers (2002)). However, B-share issuance has died out since 2002 when the Qualified Foreign Institutional Investor (QFII) program was initiated to certain overseas *institutional* investors, which allowed limited access to A-share stocks. Obtaining QFII licences was extremely difficult, requiring applicants to meet certain standards for financial stability. In the first year, only 12 qualified foreign investors were approved and approval ceased during 2006-2007.[9] Nevertheless, the introduction of QFII has benefited the domestic Chinese market, to the extent that the presence of international investors in China boosts stock price informativeness (see Carpenter, Lu, and Whitelaw (2020)) or generates spillover effects to other markets (see Liu, Wei, and Zhou (2020)).

Different from the QFII program, which is relatively small and applies only to qualified institutional investors, the China Connect is a big liberalization that includes *institutional and retail investors*.[10] The program was first proposed in 2007 by the Binhai New Area of Tianjin and the Bank of China. However, regulators postponed the program until on April 10, 2014, when the CSRC and Hong Kong Securities and Futures Commission (SFC) made a joint announcement to start the program. The program included all foreign investors as well as any mainland investors who have a stock account with balances no less than 500,000 RMB (approximately 72,000 USD),

[8] 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.

[9] Detailed comparison between the QFII/QDII and Stock Connect can be found at: http://english.sse.com.cn/investors/shhkconnect/introduction/comparing.

[10] Figure A.1 displays the composition of foreign investors in Chinese markets under the QFII and China Connect.

regarded as a relatively low barrier to enter both markets.[11] The Connect was officially launched on November 17, 2014. In December 2016, the Shenzhen Stock Exchange was also connected to the Hong Kong Stock Exchange. The Shenzhen Exchange includes both growth and high-tech startup firms like ChiNext. Overall, more than one thousand stocks from the mainland have become connected to overseas investors, including both value stocks and growth stocks.

There are two salient features of the China Connect that differentiates it from previous stock market liberalizations in other countries (see Bekaert et al. (2005) for example). First, the overall capital controls policy in China remains tight (Figure 1). Although the Connect is an important stock market liberalization and thus a loosening of capital account restrictions, it is carefully designed to avoid excessively volatile capital flows. International participants can only purchase Chinese stocks through their local brokers in RMB, which is ultimately settled and cleared by a subsidiary of Hong Kong Exchanges and Clearing Limited. Moreover, trading through the program is 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. In addition, short selling through the Connect is forbidden. These features suggest that the China Connect policy shock is unlikely to coincide with other contemporaneous policy reforms.

Second, the China Connect does not include all mainland stocks. For the Shanghai-Hong Kong Connect, eligible stocks include all the constituent stocks of the SSE 180 Index, SSE 380 Index, and all SSE-listed A shares that are not included as constituent stocks of the relevant indices but which have corresponding H shares listed on SEHK (so called "A-H" dual listed stocks), except for SSE-listed shares which are not traded in RMB and SSE-listed shares which are under risk alert (including shares of "ST companies", "*ST companies companies" and shares subject to the delisting process under the SSE rules). Similarly, for Shenzhen-Hong Kong, eligible stocks include all constituent stocks of the SZSE Component Index, SZSE Small/Mid Cap Innovation Index which have a market capitalization of no less than RMB 6 billion and all the SZSE A-H dual listed stocks, except for SZSE-listed shares which are not traded in RMB and for SZSE-listed shares which are under risk alert (including shares of "ST companies", "*ST companies companies" and shares subject to the delisting process under the SSE rules) or under delisting arrangement.[12] Once con-

[11] Detailed information can be found on the website of the Hong Kong Stock Exchange. https://www.hkex.com.hk/-/media/HKEX-Market/Mutual-Market/Stock-Connect/Getting-Started/Information-Booklet-and-FAQ/Information-Book-for-Investors/Investor_Book_En.pdf

[12] Detailed information can be found from the Hong Kong Stock Exchange at https://www.hkex.com.hk/

nected, eligible securities are included and excluded based on adjustments made to the indexes and the timing at which relevant A shares are placed under risk alert or released from risk alert. The authority makes adjustments semi-annually, based on certain criteria. As the selection rules for the China Connect program are very clear, inclusion or exclusion is exogenous to individual firms. Thus, different from other countries' stock market liberalizations, the China Connect provides a natural experiment for stock market liberalization, as it exogenously divides the Chinese mainland market into control and treatment groups.

Even though the overall size of foreign capital in the Chinese market is not huge, we argue that it can plausibly create a non-negligible effect on the domestic market. Figure A.1 shows the relative size of foreign and domestic investors, as well as industry distribution, in the Connect program. The share of foreign capital in total tradable market value is around $0.3 trillion (3% of the market) at 2019, less than that for domestic institutional investors, at around $1 trillion (10%). However, foreign capital has been shown to be "smart", as it improves market efficiency and thus influences stock prices (see Bae et al. (2006), Bae et al. (2012), Bian et al. (2020) and Kacperczyk et al. (forthcoming)). Moreover, this $0.3 trillion in foreign investment in China is sizable compared to other countries, e.g., $0.16 trillion (8% of market) for India, which has a capital controls policy similar to China's (Bena, Ferreira, Matos, and Pires (2017)). Therefore, to the extent that foreign capital gives rise to spillovers such as improving market efficiency and corporate governance, it plausibly generates effects even with a relatively small size in the market. And to the extent that foreign capital serves as "smart" money which leads domestic investors to follow, movements in it will generate the sorts of effects that we document.

4 Theoretical motivation and hypothesis development

We provide a simple theoretical framework following Chari and Henry (2004, 2008) to guide our empirical analysis. In particular, we study the effect of the China Connect through the lens of a cost of funding channel. Following the launch of the China Connect, equity prices adjust due to increased access to foreign capital. This ultimately affects corporate investment via a cost of funding channel. Along with this, equity prices become more sensitive to external shocks, which leads to greater investment sensitivity to those shocks.

Mutual-Market/Stock-Connect/Getting-Started/Information-Booklet-and-FAQ?sc_lang=en.

4.1 A simple conceptual framework

Our analytical framework combines insights from the literature on financial liberalization and on the global financial cycle. We follow the standard neoclassical production framework, e.g. Chari and Henry (2004, 2008), to analyze the impact of the China Connect on firm-level outcomes such as stock prices and investment. The Connect program can have an effect on investment through stock prices because the optimal corporate investment decision equates the marginal benefit of production to the cost of funding. To simplify analysis, we consider a case where all funding is through equity, implying that the cost of funding equals the equity return.[13] Therefore, any changes in equity prices can affect investment through the cost of funding channel.

Under the optimal investment plan, domestic firms equate the marginal product of capital to its cost of funding (equity return), $E[R_i]$. Before the launch of the Connect, the stock return is assumed to be priced based on a domestic capital asset pricing model (CAPM). Therefore, the optimality conditions are given by

$$E[f_i'(k_i)] = E[R_i] \tag{1}$$

$$E[R_i] = r + \gamma \text{cov}(r_i, r_M) \tag{2}$$

where $f_i(\cdot)$ is a concave production function like Cobb-Douglas, k_i is capital per unit of effective labor (total capital stock over total effective labor), $E[R_i]$ is the required equity return, r the domestic risk-free rate, γ the risk-aversion parameter for the domestic marginal investor, and $\text{cov}(r_i, r_M)$ is the covariance term between the equity return r_i for firm i and the domestic market return r_M.

The key feature of the China Connect is that it allows foreign investors to trade eligible stocks in the Chinese market. Therefore, the Connect is less likely to directly affect the marginal benefit of production since that is determined by technology. However, funding costs (equity returns) might change with liberalization because foreign investors can trade domestic stocks. In particular, for stocks whose marginal investors are foreigners, their equity returns will be priced based on a world capital asset pricing model (CAPM).[14] In that case, stock prices will transition from behaving

[13] This assumption is innocuous because connected and unconnected firms do not have significantly different leverage ratios before the launch of the China Connect (see Table A.7).

[14] Our focus here is on the behavior of *connected* stocks. The China Connect is a case of partial liberalization, where the domestic interest rate is unlikely to change. This differs from historical full liberalizations in other countries. Chari and Henry (2004) address the issue of full liberalization versus partial, an important consideration in their multi-country setting. They argue that partial liberalization does not best characterize the historical episodes. By their metric,

according to a domestic CAPM to a world CAPM. Ultimately, those changes could affect corporate investment through the cost of funding channel. To see this, it is useful to write the optimal conditions for those firms as

$$E[f_i'(k_i^*)] = E[R_i^*] \tag{3}$$

$$E[R_i^*] = r^* + \gamma^* \text{cov}(r_i, r_W) \tag{4}$$

where k_i^* is capital per unit of effective labor, $E[R_i^*]$ is the new required equity return, r^* is the global risk-free rate, γ^* is the risk-aversion for the marginal investor, and $\text{cov}(r_i, r_W)$ is the covariance between the equity return r_i for firm i and the global market return r_W.[15]

4.2 Expanded market access effects

At the moment of stock market liberalization, foreign investors have more access to Chinese stocks. In the case where those foreign investors are the marginal investors, equity returns for those connected stocks will adjust from being determined by a domestic CAPM model benchmark to a world CAPM model benchmark:

$$\Delta E[R_i^*] \equiv E[R_i] - E[R_i^*] = r - r^* + \gamma \text{DIFCOV}_i + (\gamma - \gamma^*)\text{cov}(r_i, r_W) \tag{5}$$

where $\text{DIFCOV}_i = \text{cov}(r_i, r_M) - \text{cov}(r_i, r_W)$ is the covariance term difference, i.e. a measure of risk-sharing as in Chari and Henry (2004, 2008). Intuitively, a higher level of DIFCOV_i is associated with greater adjustment of stock prices following liberalization, and thus a higher diversification benefit by moving away from au tarky. Moreover, $(\gamma - \gamma^*)\text{cov}(r_i, r_W)$ captures the change in risk-aversion from the domestic investor to the foreign marginal investor. Presumably, they will not have the same degree of risk-aversion. More likely, domestic investors will have higher risk-aversion than foreign investors. If that is the case, stock prices will adjust more for firms whose return has a higher covariance with the global market.

the China Connect is a partial liberalization that will affect connected firms most. In Appendix section A.2, we analyze the effect of the Connect on unconnected stocks, and show that the price changes are insignificant. For this reason, we focus on the effect of the Connect on connected firms, using unconnected firms as the control group.

[15] Here both the global risk-free rate and global market return are in RMB because the China Connect is settled in RMB for foreign investors. In equilibrium, a foreign investor should be indifferent about the risk-adjusted returns between China Connect stocks and a world portfolio.

The adjustment in stock prices can also translate into a change in firm-level investment. To see this, subtract equation (3) from equation (1),

$$\Delta E[f_i'(k_i^*)] \equiv E[f_i'(k_i)] - E[f_i'(k_i^*)] = \Delta E[R_i^*] = r - r^* + \gamma \text{DIFCOV}_i + (\gamma - \gamma^*)\text{cov}(r_i, r_W) \quad (6)$$

According to the new classical production framework, stock returns will be translated to firm investment decisions because the cost of funding is lower after liberalization. The simple framework abstracts from many real world complications such as adjustment costs of investment and financial frictions; these could potentially delay the response of investment to stock price changes. However, given the comprehensive nature of the China Connect program, if anything one might expect firms to front-load their investment decisions.

Testable predictions emerge from equations (5) and (6). First, stock prices and investment should respond to liberalization if international investors are the marginal investors or have a much larger influence on the stocks. This prediction is testable because the Connect enables international investors to trade only a subset of all domestic stocks. Connected firms should be influenced more by foreign investors than unconnected firms.

Second, there are two different channels for the adjustment of stock prices and investment. From equations (5) and (6), two factors are changed after the liberalization. The first is a common factor, the risk-free rate difference $r - r^*$. Given that the Connect allows foreign investors to trade connected firms, it can affect the pricing of all connected firms through the common risk-free channel. In addition, there will be firm-specific components for those connected firms, measured by the risk-sharing measure γDIFCOV_i and a risk-aversion difference between domestic and foreign investors $(\gamma - \gamma^*)\text{cov}(r_i, r_W)$. Firms with a higher DIFCOV should experience greater repricing after liberalization, other things equal, because those firms benefit more from ri sk-sharing. Moreover, firms with a higher covariance term with the world market will benefit more if domestic marginal investors have higher risk aversion than foreign investors. From these theoretical predictions:

Hypothesis 1. *Firms included in the Connect experience positive effects upon inclusion, such as higher stock prices and investment, compared to firms left out of the p rogram. Moreover, these effects are stronger for firms with a higher risk-sharing measure (i.e. a higher DIFCOV$_i$) and a higher covariance term with the global market (i.e. a higher cov(r_i, r_W)).*

4.3 Additional effects of the Connect

After the launch of the China Connect, foreign investors became eligible to trade Chinese stocks that are included in the program. If external shocks affect foreign investors' funding costs or risk aversion, those shocks might now be transmitted to Chinese connected stocks through portfolio rebalancing by foreign investors. As a result, connected stock prices should respond more to external shocks after the launch of the China Connect; this could ultimately affect corporate investment. There are two ways for an external shock to affect foreign investors and thus connected stock prices. One is through the global risk free rate r^* and the other is via the price of risk γ^*.

In this paper, we focus on one particular external shock, a U.S. monetary policy shock, that arguably affects both the global risk free rate and the risk aversion of global investors (see Kalemli-Ozcan (2019), Miranda-Agrippino and Rey (2020)). U.S. monetary policy shocks have been shown to drive the global financial cycle, and thus could have an impact on Chinese investment through the Connect program even though China has imposed a tight capital controls policy. Specifically, following a U.S. monetary contraction, (1) the global risk free rate r^* increases and (2) the global risk-aversion coefficient γ^* becomes higher.[16] Both lead to a reduction in domestic investment due to their influence on the cost of funding. Those effects should work differently after the Connect, as connected firms become more sensitive to external shocks than unconnected firms because the former have more access to foreign capital. Second, there will be two different channels through which external shocks affect connected firms. The first is a risk free rate channel, which reflects a common shock to all connected stocks after the Connect through its influence on foreign investors. The second is a risk-aversion channel, which is firm-specific and depends on the covariance between the firm's stock return and the global market return, i.e. $\text{cov}(r_i, r_W)$.[17]

Importantly, these effects should be insignificant before the Connect because the cost of funding as shown in equation (2) is unaffected by U.S. monetary policy shocks. As seen in both the Chinn-Ito index or Fernández et al. (2016) index of capital account restrictions (see Figure 1), China has imposed tight and persistent capital controls, albeit with a small relaxation after 2014.

[16] The assumption that the risk aversion of foreign investors rises with an increase in U.S. interest rates is not unrealistic. Miranda-Agrippino and Rey (2020) provide compelling empirical evidence that global risk aversion rises with contractionary U.S. monetary policy. Moreover, they show that this rise is plausible in a model with heterogeneous investors where U.S. monetary policy affects global banks' leverage and risky asset prices, and thus global risk aversion. In addition to the evidence offered by the global financial cycles literature, we show in Table 7 that connected stock prices fall following a positive U.S. monetary policy shock, after the launch of the China Connect.

[17] This logic is similar to the risk-sharing channel identified in Chari and Henry (2004, 2008).

De facto capital account restrictions, as measured by the sum of gross stocks of foreign assets and liabilities as a ratio of GDP, indicate an upward trend for China starting from the early 2000s, with fluctuations around 100 after 2 010. That China's overall capital controls policy has not changed significantly in recent decades implies that the impact of the global financial cycle on the domestic economy before the Connect should be minimal. On one hand, the domestic risk-free rate should be less sensitive (insensitive) to U.S. monetary policy because China has imposed very tight capital controls (Han and Wei (2018)). On the other hand, it is less likely that domestic investors' risk aversion will be affected by the global financial cycle before the Connect since capital controls policy prevents them from accessing international financial markets.[18] As a result, one should not expect any significant transmission from U.S. monetary policy to Chinese investment before the Connect (barring leakages in overall capital controls).

In sum, China's tight capital controls policy plays the role of a "great wall" between the domestic economy and the international market, reducing the impact of the global financial cycle. With the introduction of the Connect, domestic investment should be more sensitive to the cycle due to a funding cost channel: for connected firms, their investment should be more sensitive to U.S. monetary policy shocks compared with both the unconnected firms and themselves prior to inclusion in the Connect. Thus,

Hypothesis 2. *Firms included in the Connect program become more sensitive to external shocks than unconnected firms, after the Connect. Moreover, firms with relatively higher sensitivity to the global market (i.e., higher* $cov(r_i, r_W)$*) in the Connect program have more sensitive investment expenditures to external shocks after the Connect.*

5 Data and sample selection

5.1 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 Shanghai

[18] Even with the QFII program starting from 2002, the influence is likely to be limited because the QFII program is relatively small and has tight quota restrictions.

Stock Exchange and Shenzhen Stock Exchange. 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 require firms to have at least two years of historical data as in Fama and French (1993). We exclude firms listed after year 2014 to abstract from new IPOs. Our sample period runs from 2002 to 2019, with the beginning date chosen to reflect when the CSRC required all listed firms to file quarterly financial reports.[19] We drop observations with missing key values for investment, Tobin's Q or cash flow. The final sample comprises 109,774 firm-quarter observations, covering 2,120 unique firms. The detailed distribution by industry and year can be found in Table A.5 of the Appendix.

Our measure of corporate investment is defined as capital expenditures divided by beginning-of-quarter book value of total assets (lagged total assets), where 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.[20] We control for an array of firm-level characteristics that might affect corporate investment (see Julio and Yook (2012) and Cao, Julio, Leng, and Zhou (2016) for example). Key control variables include Tobin's Q: the book value of total assets minus the book value of equity plus the total market value of equity (close price at quarter end multiplied by share outstanding) scaled by book value of total assets; size, the natural logarithm of the 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 mitigate outliers. The details of variable construction are in Appendix Table A.6.

Table A.4 reports summary statistics for the firm characteristics. Quarterly capital expenditure is 3.2% on average, with a standard deviation of 4.2%, slightly higher than for U.S. listed firms (see Jens (2017)). Tobin's Q is 2.5 on average with a standard deviation of 1.8. Size is 21.8 on average with a standard deviation of 1.3. The mean of cash flow is 3.4% with a standard deviation of 4.5%. Sales growth is 0.39 on average with a standard deviation of 0.78. All statistics are consistent with previous studies on China (see Cao et al. (2016) for example).

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

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

5.2 Sample selection

Our objective is to identify the average effect of the China Connect on outcomes such as stock prices, investment, and financing costs for Chinese firms that were included in the program, i.e., the average impact of treatment on the treated. Specifically, we are interested in comparing, e.g., investment of connected firms to the counterfactual — investment of unconnected firms at the same point in time. Conceptually, we would like firms to have been randomly assigned to the Connect and compare the average outcomes of the two groups. Absent that, we use a difference-in-differences method that mimics a random selection hypothetical under reasonable conditions.[21] This compares the change in outcomes in the treatment group before and after the Connect announcement to the change in outcomes in the control group. By comparing changes, we control for firm characteristics that might be correlated with the Connect decision and with the outcomes. The change in the control group is thus an estimate of the true counterfactual: what would have happened to the treatment group had there been no Connect. As described above, firms in the Connect were not chosen randomly, but instead were selected based on whether they belong to the constituent indexes. Selection into the Connect is thus a decision made at the national level, and follows construction of the stock indexes themselves.[22] This alleviates some of the concerns noted above, but what remains is to control for the selection issue inherited from construction of the indexes. We elaborate on this below.

Table A.7 provides a comparison of ex-ante differences between connected and unconnected firms, for the two big waves of the Connect, of: investment, size, Tobin's Q, cash flow, sales growth, market to book ratio, cash holdings, age, sales growth, Global Cov (historical covariance of firm i's stock return with the MSCI world market return), DIFCOV (difference between the historical covariance of firm i's return with local market and its covariance with the MSCI world market), return volatility, market cap and leverage. See Appendix Table A.6 for details. As seen in Table A.7, there are some statistically significant differences between connected and unconnected firms before the two waves. For example, firms that would eventually become connected have

[21] The concern is that firms that were chosen for the Connect could be different from those that remained outside, and that these differences are correlated with the outcomes of interest, such as financing costs and investment sensitivity to foreign shocks. For example, politically connected firms for which financing costs are already low(er) may have been the ones included. In principle, many of the (unobservable) characteristics that may confound identification are those that vary across firms but are fixed over time. Our difference-in-differences method controls for this unobserved heterogeneity, and is conventional.

[22] Private conversations with a governor at the SHSE confirm this.

Table 1 FIRST STAGE LOGIT MODEL AND EFFECTIVENESS OF PROPENSITY SCORING MATCHING

Panel A: First Wave of China Connect (2014)											
Panel A1: Logit Model		Panel A2: Effectiveness of PSM									
	Connect Dummy (Shanghai)			Connected Firms			Unconnected Firms			Mean Difference	
Stock Volatility	-7.605***			(1)	(2)	(3)	(4)	(5)	(6)	(7)=(2)-(5)	
	(1.177)			N	Mean	S.D.	N	Mean	S.D.		
Market Cap	0.901***	Stock Volatility	*Pre-match*	4,136	0.029	0.024%	17,024	0.032	0.012%	-0.003	***
	(0.015)		*Post-match*	3,805	0.029	0.024%	3,571	0.029	0.024%	0.000	
ROA	0.324	Market Cap	*Pre-match*	4,067	23.429	1.349%	16,545	22.806	0.560%	0.623	***
	(0.366)		*Post-match*	3,805	23.314	1.212%	3,571	23.168	1.423%	0.145	***
M/B	-0.301***	ROA	*Pre-match*	4,204	0.023	0.048%	17,568	0.020	0.026%	0.003	***
	(0.008)		*Post-match*	3,805	0.023	0.051%	3,571	0.023	0.056%	0.001	
Leverage	0.460**	M/B	*Pre-match*	4,067	3.008	3.650%	16,545	5.469	4.423%	-2.461	***
	(0.086)		*Post-match*	3,805	3.117	3.819%	3,571	4.158	7.038%	-1.041	***
Constant	-21.042***	Leverage	*Pre-match*	4,204	0.231	0.236%	17,568	0.190	0.120%	0.041	***
	(0.346)		*Post-match*	3,805	0.229	0.252%	3,571	0.211	0.271%	0.018	***
Observations	46459										
Pseudo R^2	0.152										
Panel B: Two Waves of China Connect (2014-2019)											
Panel B1: Logit Model		Panel B2: Effectiveness of PSM									
	Connect Dummy			Connected Firms			Unconnected Firms			Mean Difference	
Stock Volatility	-27.310***			(1)	(2)	(3)	(4)	(5)	(6)	(7)=(2)-(5)	
	(0.984)			N	Mean	S.D.	N	Mean	S.D.		
Market Cap	1.672***	Stock Volatility	*Pre-match*	20,195	0.025	0.008%	88,432	0.028	0.004%	-0.003	***
	(0.013)		*Post-match*	16,464	0.025	0.009%	16,684	0.026	0.008%	0.000	***
ROA	-7.353***	Market Cap	*Pre-match*	19,964	23.257	0.588%	87,551	21.990	0.316%	1.267	***
	(0.263)		*Post-match*	16,464	23.067	0.555%	16,684	23.069	0.691%	-0.002	
M/B	-0.170***	ROA	*Pre-match*	20,415	0.027	0.030%	89,329	0.021	0.014%	0.006	***
	(0.004)		*Post-match*	16,464	0.026	0.033%	16,684	0.027	0.035%	0.000	
Leverage	-0.409***	M/B	*Pre-match*	19,964	3.106	1.809%	87,475	3.753	1.328%	-0.647	***
	(0.066)		*Post-match*	16,464	3.144	2.046%	16,684	3.225	2.038%	-0.081	***
Constant	-37.733***	Leverage	*Pre-match*	20,415	0.223	0.108%	89,329	0.228	0.057%	-0.006	***
	(0.296)		*Post-match*	16,464	0.221	0.121%	16,684	0.219	0.128%	0.002	
Observations	107173										
Pseudo R^2	0.303										

NOTE. In Panel A1 and B1, the dependent variable is a dummy variable indicating whether the firm is included in the Connect. The sample involves the first wave in 2014 in Panel A and two waves of the Connect in 2014-2019 in Panel B. As the sample in 2014-2019 involves periodical inclusion/exclusion of firms, we also include industry, province, exchange fixed effects and quarter dummies in the Logit model in Panel B1. *, ** and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

higher investment, larger size, higher cash flows, lower market to book ratio, lower risk-sharing measure, lower stock return volatility, and higher market capitalization. Anecdotal evidence suggests that although size is an important factor for inclusion in the Shanghai Stock indexes, there is no simple rule. Thus, to model and control for selection, we use Heckman's Two-Stage estimator and a Propensity Score Matching exercise. We base these investigations on our reading of public information concerning index construction and the ex-ante firm differences in Table A.7.

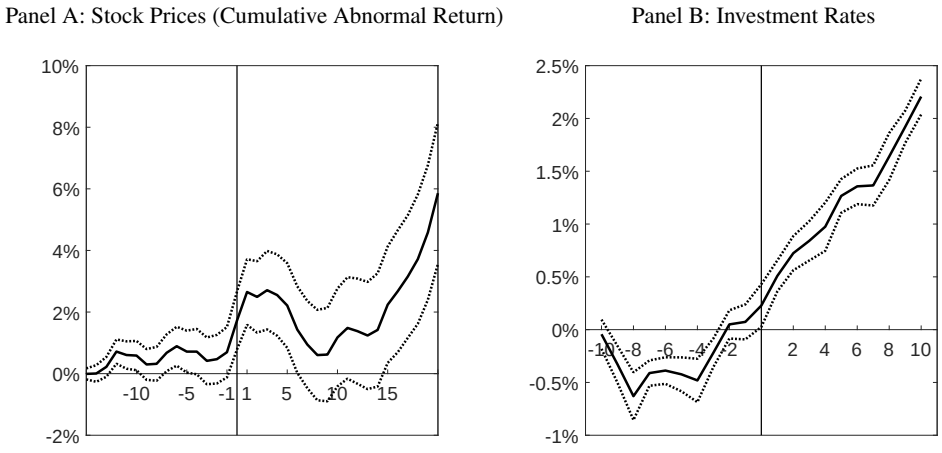
In our first stage logit model of Connect selection, we include stock return volatility, market cap, return on asset, market to book ratio, leverage, and controls for industry, province, and exchange fixed effects.[23] The selection of control factors combines information on the construction of indexes and the ex-ante differences in Table A.7. We also try other types of controls and the results are consistent. Table 1 presents the results of our first-stage logit regression predicting selection probability. We work with two samples, one with only the first wave of the Connect (up to 10 quarters after 2014) and the other featuring both waves (2014-2019). As seen from Panel A1 and B1 of Table 1, the factors significantly affect the inclusion/exclusion status of firms. In the second step, we include the "Inverse Mills Ratio" (IMR) from this logit regression, as is conventional.[24]

In addition to the Heckman two-stage estimator, we also conduct our analysis on a (propensity score) matched sample based on the first-stage selection model. Specifically, we start with the logit regression in Panel A1 (or B1), then exclude (1) unconnected-firm observations whose propensity scores are less than the propensity score of the connected stocks at the first percentile of the treatment propensity score distribution, and (2) all treatment observations whose propensity score is greater than the propensity score of the control observation at the ninety-ninth percentile of the untreated distribution. Re-estimating our econometric model with these "nearest neighbors" on the common support region allows us to analyze the extent of this source of bias. Panel A2 and B2 of Table 1 show that the matched sample significantly reduces the ex-ante differences in connected and unconnected firms.

[23]The 180 SSE index selects stocks on size, trading values and turnover ratio. The 380 SSE index selects stocks which have listed more than five years and haven't distributed cash dividends and stock dividend in the latest five years. Detailed information can be found at: http://www.csindex.com.cn/en.

[24]We find robustness with and without sample selection corrections, but report only the former to save space.

Figure 2 IMPACT EFFECTS OF THE CHINA CONNECT: CONNECTED RELATIVE TO UNCONNECTED FIRMS



NOTE. Panel A plots the difference in cumulative abnormal returns between connected and unconnected stocks around the announcement window (days -15, 20) in the Shanghai-Hong Kong Stock Connect program. The vertical line marks the announcement date for the list of eligible stocks to be included in the Connect, November 10, 2014. Panel B plots the difference in cumulative adjusted investment rates between connected and unconnected stocks around the announcement quarter. t=0 stands for 2014Q4, t= [-10,-1] is the pre-connect period and t=[+1,+10] is the post-connect period. The 95% confidence interval is plotted in the dashed lines.

6 Positive effects of the China Connect

6.1 Time-series findings

As illustrated above, the China Connect allows foreign investors to purchase domestic connected stocks. Those stocks will be more influenced by foreign factors. In the case where foreign investors are the marginal investors for those stocks, the stock price will adjust from a domestic Capital Asset Pricing Model (CAPM) benchmark to a global CAPM. Moreover, these adjustments will also translate into a higher investment rates. Given that the China Connect creates two groups of stocks, we can test for differences in stock prices and investment rates between connected and unconnected firms. To this end, we construct an event window analysis centering on the launch of China Connect in November 2014.

Panel A of Figure 2 plots the difference in cumulative abnormal returns between connected and unconnected stocks around the announcement window (day [-15, 20]) centered on Nov. 10,

2014 when the market first knew the list of eligible stocks.[25] Consistent with our simple theoretical framework, this effect of the Connect is seen immediately in stock prices: connected stocks experience a significant appreciation compared to unconnected ones upon announcement of the program. The rising, positive effect on stock returns for connected firms relative to unconnected firms is statistically significant and economically large. Moreover, the effects seem very persistent, rising close to 6% after 20 days.

The positive effects on stock prices coincide with higher investment rate for connected firms. Panel B in Figure 2 plots the cumulative differences in investment rates between connected and unconnected firms. As the adjustment from stock prices to investment rates takes time, we study an event window for 21 quarters centered at 2014 Q4. In order to make things comparable, we subtract from firm i's investment rate in quarter t its average investment rate in the 20 quarters preceding the Connect (t=[-20,-1]), following Chari and Henry (2008). Clearly, the positive effects of liberalization on investment are large and significant. Cumulatively, connected firms invest 1% more than unconnected firms four quarters after the Connect. Moreover, the effects are persistent — connected firms cumulatively invest 2% more than unconnected firms 10 quarters afterward. Differently from Chari and Henry (2008), we do not find a decline in the investment differences even after 10 quarters. One potential reason is that we have two waves of liberalization with only 8 quarters in between and our event window is 10 quarters after the first wave of the Connect.

6.2 Panel regression results

To formally test our Hypothesis 1, we estimate the following panel regressions:

$$Y_{it} = \alpha + \beta_0 * \text{Connect}_i + \beta_1 * \text{DIFCOV}_i + \beta_2 * \text{Connect}_i * \text{DIFCOV}_i + \text{Control}_{it} + \varepsilon_{it} \qquad (7)$$

where Y_{it} are outcome variables for firm i at time t such as stock price change or investment rate. For stock price changes, we use a monthly frequency starting from one month before the liberalization up to 2 months. For other firm-level variables, we examine 10 quarters after the first wave of the China Connect. $\text{Connect}_i = 1$ indicates firms first selected into the China Connect program on Nov 17, 2014. DIFCOV_i is a risk-sharing measure for firm i that captures the difference

[25] We only consider stocks listed on the Shanghai Stock Exchange since the first Connect is between Shanghai and Hong Kong, an unexpected event to investors. We choose Nov. 10, 2014 (rather than Nov. 17, 2014) as our announcement day because the list of eligible stocks was announced on Nov. 10.

Table 2 STOCK PRICE REVALUATION AROUND THE CONNECT

	Month [-1]			Month [-1, 0]			Month [-1, 1]			Month [-1, 2]		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Connect	-0.002	-0.036	-0.033	0.112***	0.050	0.045	0.427***	0.263***	0.258***	0.193***	0.092*	0.098**
	(0.023)	(0.024)	(0.025)	(0.032)	(0.034)	(0.034)	(0.049)	(0.052)	(0.053)	(0.046)	(0.049)	(0.050)
Connect*DIFCOV		0.040	0.035		0.090*	0.099**		0.336***	0.346***		0.146**	0.135*
		(0.032)	(0.033)		(0.048)	(0.049)		(0.080)	(0.083)		(0.069)	(0.071)
Connect*Global Cov			-0.041			0.088			0.071			-0.140
			(0.078)			(0.112)			(0.197)			(0.178)
Global Cov			-0.039			0.017			0.088			0.100
			(0.042)			(0.056)			(0.087)			(0.085)
DIFCOV		-0.079***	-0.082***		-0.126***	-0.124***		-0.257***	-0.249***		-0.203***	-0.195***
		(0.012)	(0.012)		(0.016)	(0.016)		(0.023)	(0.024)		(0.022)	(0.023)
MarketCap	0.010*	0.008	0.008	0.008	0.005	0.005	0.058***	0.052***	0.053***	0.078***	0.074***	0.075***
	(0.005)	(0.005)	(0.005)	(0.007)	(0.007)	(0.007)	(0.010)	(0.010)	(0.011)	(0.010)	(0.010)	(0.010)
Volatility	5.532***	5.674***	5.679***	12.606***	13.088***	13.089***	13.031***	14.891***	14.878***	12.899***	14.533***	14.512***
	(0.415)	(0.409)	(0.409)	(0.580)	(0.595)	(0.594)	(0.766)	(0.832)	(0.831)	(0.736)	(0.805)	(0.804)
Constant	-0.289***	-0.228***	-0.222***	-0.423***	-0.331***	-0.332***	-1.342***	-1.167***	-1.180***	-1.540***	-1.416***	-1.436***
	(0.075)	(0.075)	(0.075)	(0.102)	(0.102)	(0.103)	(0.147)	(0.152)	(0.153)	(0.141)	(0.146)	(0.147)
IMR	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2339	2260	2260	2312	2233	2233	2264	2187	2187	2196	2121	2121
Adjusted R^2	0.164	0.171	0.172	0.359	0.371	0.372	0.448	0.484	0.485	0.420	0.447	0.448

NOTE. The dependent variable is the cumulative log stock return around the China Connect at the first wave. The first three columns (1)-(3) use stock returns one month before the Connect. Columns (4)-(6) use the month before and current month of the Connect. Columns (7) -(9) use the month before, current month, and month after the Connect launch. Columns (10)-(12) add one more month to the end of that period. DIFCOV is defined as cov(r_i, r_M)-cov(r_i, r_W), where r_i is the stock return for firm i, r_M is the domestic stock return and r_W is the global market return. Global Cov is defined as cov(r_i, r_W). Market cap is the natural logarithm of the market capitalization of total assets. Volatility is defined as variance of daily stock return within a month.*, ** and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

of stock return covariance between the domestic market return and world market return, based on the 36 months before the Connect. We also include firm-level controls such as market cap, stock price volatility, etc.

Table 2 presents estimates for stock prices.[26] We present four sets of results. The first looks at stock price changes one month *before* the formal announcement, for stocks that were to become included in the Connect. From column (1), we see that the effect on (soon to be) connected stocks is insignificantly different from z ero. However, according to columns (4), (7), and (10), there is a strong positive effect on the stock prices of connected firms beginning with the month of the formal announcement going through (at least) two months after. This stock price revaluation is consistent with our Hypothesis 1 and with previous literature (Chari and Henry (2004)).[27] Table

[26]To save space, we show only results including IMR as control. Results without IMR are consistent. We also run our regression on a matched sample using the propensity scoring matching method, and find results largely consistent although the risk-sharing channel loses some statistical significance.

[27]We use the market model to calculate the cumulative abnormal return. A 250-day estimation window is used to estimate the β coefficient between the market return and stock return. A 30-day gap between the estimation window

Table 3 EFFECTS ON INVESTMENT

	Investment					
	Panel A: Raw Sample			Panel B: Propensity Score Matching		
	(1)	(2)	(3)	(4)	(5)	(6)
Connect	0.007***	-0.001	-0.002	0.005***	-0.001	-0.002
	(0.001)	(0.003)	(0.004)	(0.001)	(0.004)	(0.004)
Connect*DIFCOV		0.016**	0.018*		0.014*	0.017**
		(0.007)	(0.008)		(0.007)	(0.007)
Connect*Global Cov			0.010			0.013
			(0.018)			(0.022)
Global Cov			0.029**			0.039
			(0.012)			(0.028)
DIFCOV		-0.016**	-0.013**		-0.013	-0.010
		(0.005)	(0.005)		(0.007)	(0.008)
Size	-0.001	-0.002	-0.001	-0.001	-0.001	-0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Tobin's Q	0.001**	0.001**	0.001**	0.001	0.001	0.001
	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)
Cash Flow	0.190***	0.189***	0.192***	0.225***	0.221***	0.226***
	(0.010)	(0.012)	(0.011)	(0.016)	(0.017)	(0.017)
Sales Growth	0.004***	0.004***	0.004***	0.003***	0.003***	0.003***
	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)
GDP Growth	0.044	0.046	0.045	-0.041	-0.031	-0.035
	(0.027)	(0.025)	(0.024)	(0.061)	(0.058)	(0.051)
Constant	-0.004	0.013	0.009	-0.003	0.010	0.005
	(0.026)	(0.032)	(0.031)	(0.035)	(0.037)	(0.035)
IMR	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	19404	18484	18484	7072	6804	6804
Adjusted R^2	0.100	0.107	0.109	0.129	0.132	0.136

NOTE. The dependent variable is quarterly corporate investment, 10 quarters after the China Connect at the first wave. The investment rate for each firm i at quarter t is adjusted by average preceding 20 quarters before the Connect. DIFCOV is defined as cov(r_i, r_M)-cov(r_i, r_W), where r_i is the stock return for firm i, r_M is the domestic stock return and r_W is the global market return. Global Cov is measured as cov(r_i, r_W). We also include industry fixed effect in all specifications. Panel A uses all the firms while Panel B uses matched sample after propensity scoring matching method. All standard errors are clustered at both industry and year level and reported in parentheses. *, ** and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

2 also presents evidence of stock-level heterogeneity on both the risk-sharing channel and investor risk aversion channel. The positive and significant coefficient on the interaction term between the *Connect* dummy and risk-sharing measure (DIFCOV) indicates a significant risk-sharing channel. This effect is large and persists. On the other hand, we do not find evidence for a statistically significant effect from changes in investor risk aversion, as can be seen from the coefficient on the interaction between Global Cov and Connect.

and event window is required. Moreover, we require at least 100 days return data in the estimation window. We also estimate it using the Fama-French three-factor and Carhart four-factor models, and results remain robust.

Table 4 EFFECTS OF THE CHINA CONNECT ON FIRM OUTCOMES

	EBIT (1)	Sales Growth (2)	Ln (Cost of Debt) (%) (3)	Change of ln(D/P)(%) (4)	Leverage (5)	Seasonal Equity Offering (6)
Connect	0.035*	0.038**	-0.090**	-0.053***	-0.036***	0.018**
	(0.017)	(0.011)	(0.027)	(0.007)	(0.009)	(0.005)
Size	-0.008	-0.001	-0.003	0.013**	0.009***	-0.012***
	(0.006)	(0.002)	(0.011)	(0.004)	(0.002)	(0.002)
Tobin's Q	0.005	-0.006***	0.001	0.010***	-0.002	0.006
	(0.003)	(0.001)	(0.009)	(0.001)	(0.002)	(0.004)
Cash Flow	0.817***	0.107*	0.533***	-0.531***	-0.221**	-0.077
	(0.120)	(0.054)	(0.134)	(0.124)	(0.067)	(0.076)
Sales Growth	0.009	0.986***	-0.012*	0.037***	0.005***	0.004
	(0.005)	(0.001)	(0.005)	(0.009)	(0.001)	(0.003)
GDP Growth	-0.310	0.179	-0.189	-0.373	-0.207	-0.067
	(0.439)	(0.283)	(0.305)	(0.224)	(0.153)	(0.402)
Constant	0.116	-0.359***	0.011	-0.241**	-0.176**	0.249***
	(0.098)	(0.038)	(0.271)	(0.082)	(0.068)	(0.052)
IMR	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	19404	19404	19404	19404	19404	19404
Adjusted R^2	0.004	0.980	0.025	0.010	0.039	0.003

NOTE. The dependent variables are quarterly corporate outcomes, 10 quarters after the China Connect at the first wave, including EBIT (EBIT to book assets) in column (1), Sales growth in column (2), Log of Cost of Debt in column (3), Change of Ln(Dividend to Price) in column (4), Leverage ratio (debt to book assets) in column (5), seasonal equity offering in column (6). All corporate outcome for each firm i at quarter t is adjusted by average preceding 20 quarters before the Connect. DIFCOV is defined as $\text{cov}(r_i, r_M)$-$\text{cov}(r_i, r_W)$, where r_i is the stock return for firm i, r_M is the domestic stock return and r_W is the global market return. Global Cov is measured as $\text{cov}(r_i, r_W)$. We also include industry fixed effect in all specifications. Firm controls are similar as in Table 3. All standard errors are clustered at both industry and year level and reported in parentheses. *, ** and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

Table 3 presents estimates of the effect of the Connect on investment. We follow Chari and Henry (2008) and adjust the investment rate for each firm i at quarter t by subtracting its average level in 20 quarters before the Connect. We furthermore present results after correcting for sample selection issues, as described above. In column (1), the coefficient on Connect is positive and statistically significant, and suggests that connected firms invest 0.7 percentage points more than unconnected firms, around 22% of the average corporate investment rate. These results imply that connected firms indeed respond more than unconnected firms, possibly through a common shock channel or firm-heterogeneity channel. As shown in columns (2) and (3), we find that the risk-sharing channel dominates both the common shock channel and investor risk aversion channel. Specifically, the interaction between Connect and the risk-sharing measure DIFCOV is positive and significant. Once we include the risk-sharing measure, neither the Connect dummy itself nor the interaction between Global Cov and Connect is statistically significant.[28] These results are robust to estimating only on the matched sample of firms identified by our propensity score

matching procedure, as seen in columns (4)-(6).

We also examine other firm-level outcomes, including corporate performance, funding costs, and financing activities. Table 4 presents the results.[29] Consistent with Mitton (2006), we find that stock market liberalization boosts firm-level earnings and sales. For connected firms, their EBIT (earnings before interest and taxes) and sales growth are higher than unconnected ones. The positive effects on the real side come from a reduction in funding costs. Specifically, equity financing costs respond more to the announcement of the China Connect, as we saw from the immediate equity price change in Figure 2. The dividend to price ratio for connected firms falls relative to unconnected firms (column (4)), consistent with the aggregate-level evidence on dividend to price ratio in Henry (2003). Moreover, we find that the cost of debt declines with liberalization, suggesting a spillover effect from stock market liberalization to the debt market. One potential reason is that debt investors will utilize stock market information to better gauge a firm's credit risk, thus reducing debt financing costs. To the extent that this occurs, the China Connect lowers the equity financing costs of connected firms, which in turn benefits the debt market. This finding is consistent with Liu et al. (2020), who use loan level data to measure the cost of debt and find that the launch of the QFII program reduces it. We also estimate the effect of the Connect on the quantity of debt and equity. We find that connected firms have lower leverage than unconnected firms (column (5)). One potential reason is that cheaper equity financing allows them to issue more equity, or cut debt, or a combination. We find strong evidence that connected firms indeed issue more equity (column (6)), taking advantage of the cheap financing. Thus, switching from debt to equity financing lowers firm leverage and reduces total funding costs.[30]

In sum, we find large effects of the China Connect on equity prices and investment. Those effects are due to a risk-sharing channel: among connected firms, the benefits are larger for those

[28] These results differ from Chari and Henry (2008), who find that a common shock channel dominates the risk-sharing channel. This is likely because Chari and Henry (2008) look at historical liberalization episodes that are typically conducted at a national level and could be accompanied by other economic reforms. Moreover, when those countries liberalize, domestic interest rates change. In the China Connect, strict capital controls remained in place at the national level, helping isolate Chinese interest rates from U.S. monetary policy. In that case, the benefit from stock market liberalization is more likely working through a risk-sharing channel.

[29] We report results only with the Heckman correction. Results are similar but with slightly weaker statistical significance in the smaller matched sample using propensity scoring.

[30] We also estimated the effect of the Connect on firms' stock pledging. Presumably, firms with tighter financial constraints use stocks as pledge for further financing. Given that the China Connect boosts stock prices for connected firms, one wonders whether firms take advantage of the stock prices to pledge loans. We do not find evidence of this, however. If anything, connected firms actually pledge less of their stocks, consistent with the notion that the stock market liberalization loosens financing constraints (Gupta and Yuan (2009)).

with a higher DIFCOV. These effects on equity prices and investment affect other firm-level outcomes. We find that connected firms have higher profit and larger sales growth. Those effects are attributed to cheaper financing thanks to the Connect, both in equity and debt. In response to the liberalization, connected firms also issue more equity, resulting in lower leverage. In addition, we find no evidence that connected firms use more pledged stocks for external financing. All of these findings suggest a beneficial effect from liberalization that is consistent with previous literature, now with enhanced identification.

7 External shocks and the China Connect

As argued in our theoretical framework, the Connect provides a channel through which foreign capital can influence the domestic economy via equity trading. Fluctuations in equity prices may in turn affect corporate investment, thus potentially making connected firms' investment expenditures more sensitive to external shocks after the Connect. To formally test this, we conduct a difference-in-differences estimation of the investment sensitivity to U.S. monetary policy shocks.

7.1 Estimation strategy: difference-in-differences

We utilize the following augmented version of the standard investment-Q specification.

$$Y_{it} = \alpha_i + \alpha_s + \beta_1 \text{Connect}_{it} + \beta_2 \text{MPS}_t^{\text{US}} + \beta_3 \text{MPS}_t^{\text{US}} \times \text{Connect}_{it} + \Gamma Z_{it} + \varepsilon_{it} \tag{8}$$

where i indexes the firm and t is a time index (quarterly frequency). The dependent variable is corporate investment Y_{it}, defined as quarterly capital expenditure scaled by book value of total assets at the beginning of the quarter. α_i is a firm fixed effect and α_s is a year fixed effect. The explanatory variables of interest are MPS_t^{US}, Connect_{it}, and their interaction.[31] In our regressions, Connect_{it} is a dummy variable indicating whether firm i is included in the Connect program in quarter t. Firms can be included or excluded periodically, as explained above, and there is often a lag between the announcement date and effective date for a firm to be included (see Table A.2). Thus, we make the dummy 1 (0) for all quarters of the year in which the firm is first included in

[31] The specification can be also interpreted as a triple interaction because Connect_{it} changes periodically.

(removed from) the Connect.[32] The controls Z_{it} include both firm-level and macro-level variables that could potentially affect corporate investment decisions. Following the literature, we use lagged Tobin's Q, cash flows, sales growth, and firm size to control for firm heterogeneity. We also use the quarterly change of nominal GDP at the provincial level to control for local economic cycles, with the firm's headquarter address identifying its location.[33] We add both firm and year fixed effects to control for unobserved individual and year effects, and quarter dummies to adjust for seasonality. Standard errors are clustered at both industry and year level (see Petersen (2009)). We also try clustering at both firm and year level and the results remain unchanged. To control for regional time-variation, we also include interaction terms between regions and year indicators as an alternative specification and find that our results are robust.[34]

We use the Fed monetary policy shock series (MPS^{US}) of Rogers et al. (2018). Theirs is a combination of three surprises: Target Fed Funds rate surprises, which were zero between December 2008 and December 2015; Forward Guidance surprises; and Large Scale Asset Purchase surprises (zero before QE1). This is a high-frequency surprise series, measuring changes in yields from 15 minutes before the Federal Open Market Committee (FOMC) announcement to 30 minutes afterward.[35] The MPS^{US} series begins in January 1990 and ends in December 2019.[36] During our sample period (2002-2019), there are 222 shocks with a mean of -0.017 and standard deviation of 0.116 (See Table A.3). To match the U.S. monetary policy shock with our quarterly firm data, we aggregate MPS^{US} within each quarter in two ways, as in Ottonello and Winberry (2020). One is a simple sum of the (typically two) surprises that occur each quarter. The idea is to capture the cumulative amount of monetary policy shocks in a given quarter. Recognizing the slow adjustment of corporate investment decisions, we also use a value weighted sum to construct the quarterly

[32] Our results still hold if we don't make this adjustment. We prefer the adjustment for an additional reason. The periodic in-and-out of the Connect is due to adjustment of the stock indexes that are typically done in June or December each year. The announcement of inclusion and exclusion can happen several months before implementation. Our adjustment to the Connect dummy captures this announcement effect. See Table A.10 and A.11 in the Online Appendix when we (1) do not do this adjustment, and (2) eliminate all the periodic changes to the indexes and keep only the two big waves in 2014 Q4 and 2016 Q4.

[33] In Table A.12 of the Online Appendix, we also include lagged year-over-year M2 growth and the 7-day Repo rate in China to control for Chinese monetary policy. Our main results are robust.

[34] Geographic regions in China can be classified into six areas based on the National Census Bureau: Bohai, Central, Northeast, Northwest, Southeast, Southwest. We use firm headquarters to identify region.

[35] The series also includes a handful of inter-meeting announcements. See the original paper (or Wright's website) for the underlying data and details on construction of the surprises.

[36] We use the Eastern U.S. time zone, a half-day behind the Chinese time zone. This is not an issue for our analysis of quarterly data.

MPS^{US}, where the weight is given by the number of days remaining in the quarter after FOMC announcement day. Results are highly robust, so we display only the simple aggregation.

7.2 Parallel trends assumption

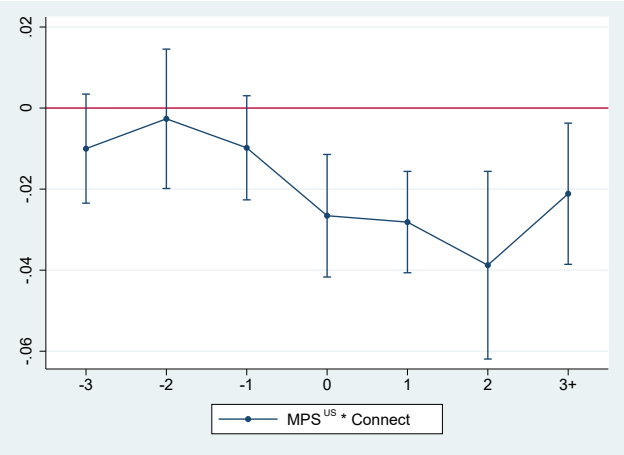
We begin by evaluating the validity of our difference-in-differences regression framework. This relies on the parallel trends assumption: before the Connect, treated firms exhibit a similar pattern of investment sensitivity to MPS^{US} as do control firms. To test this, we introduce seven dummies: Connect (-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 other interaction terms.

Figure 3 displays the seven coefficients. The interaction terms on pre-trend dummies (i.e. Connect (-3), Connect (-2), Connect (-1)) and MPS^{US} are close to zero and not statistically significant, satisfying the parallel trends assumption. These results have three 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 to MPS^{US} only shows up after the Connect. Furthermore, the coefficients on the interaction between MPS^{US} and Connect (0) (Connect (1)) are statistically significant. The coefficients on the interaction term between Connect (2) and MPS^{US} are larger than the interaction term between Connect (1) and MPS^{US}, suggesting that the effect of MPS^{US} on corporate investment takes time to materialize. Our findings indicate that the effect of U.S. monetary policy shocks on corporate investment is significantly negative and long lasting for connected firms.

7.3 Investment sensitivity

Table 5 reports the results that are key to understanding the spillover effects from U.S. monetary policy. We present estimates from: Panel OLS in columns (1)-(3), Heckman Second-Stage re-

Figure 3 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 coefficients of $\{\beta_s\}_{s=-3}^{3}$ estimated from $Y_{it} = \alpha_i + \alpha_s + \sum_{s=-3}^{3} \beta_s \text{Connect}_{it+s} \times \text{MPS}_t^{US} + \text{MPS}_t^{US} + \Gamma Z_{it} + \varepsilon_{it}$. We also present a 95 % confidence interval.

gressions in columns (4)-(6), and Propensity Score Matching (PSM) in columns (7)-(9). These establish robustness to different attempts to tackle sample selection issues.[37]

Panel OLS Columns (1)-(3) present the panel OLS results. The first column, which excludes foreign spillover terms, shows the positive effect of the Connect on Chinese corporate investment, consistent with results above. The estimates indicate that average quarterly investment increased by 3.1% once a firm was included in the Connect (0.001/0.032 = 3 .1%). This is statistically significant, and l arge. Columns (2)-(3) present tests of Hypothesis 2 . In column (2), we report the regression of investment on MPS_t^{US}, Connect_{it}, and the interaction term, with firm and year fixed effects, and quarter dummies. Column (3) adds firm c haracteristics: Tobin's Q, cash fl ow, sales growth, size, and provincial GDP growth. Consistent with our hypothesis, the interaction term is negative and significant. The reduction in investment is around 0.02, after controlling for investment opportunities and economic conditions. Following a one standard deviation increase in the U.S. monetary policy shock (15 bps), connected firms' investment drops by 0.3% (= 0.02*0.15)

[37] Note recent critiques of the Heckman and PSM methods in Tucker (2010) and Wolfolds and Siegel (2019), who argue in favor of OLS.

Table 5 EFFECTS OF THE CHINA CONNECT: INVESTMENT SENSITIVITY TO US MONETARY POLICY SHOCK

Panel B: Investment									
	OLS Regression			Heckman Two-Stage			Propensity Score Matching		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Connect	0.001*	0.001	0.001	0.023***	0.030***	0.023***	0.021***	0.029***	0.023***
	(0.001)	(0.001)	(0.001)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
MPS^{US}*Connect		-0.015***	-0.018***		-0.023***	-0.023***		-0.026***	-0.025***
		(0.005)	(0.005)		(0.005)	(0.005)		(0.005)	(0.005)
MPS^{US}		-0.007***	-0.010***		-0.009***	-0.011***		-0.009**	-0.010***
		(0.002)	(0.003)		(0.002)	(0.003)		(0.004)	(0.003)
Size	0.001**		0.001**	-0.001*		-0.001**	-0.003***		-0.004***
	(0.001)		(0.001)	(0.001)		(0.001)	(0.001)		(0.001)
Tobin's Q	0.001***		0.001***	0.001**		0.001***	0.000		0.000
	(0.000)		(0.000)	(0.000)		(0.000)	(0.000)		(0.000)
Cash Flow	0.163***		0.164***	0.150***		0.151***	0.115***		0.114***
	(0.009)		(0.009)	(0.009)		(0.009)	(0.011)		(0.011)
Sales Growth	0.002***		0.002***	0.002***		0.002***	0.004***		0.004***
	(0.001)		(0.001)	(0.001)		(0.001)	(0.001)		(0.001)
GDP Growth	0.035**		0.037**	0.038**		0.041**	0.022		0.025
	(0.017)		(0.017)	(0.017)		(0.017)	(0.027)		(0.026)
Constant	-0.021	0.013**	-0.024	0.033*	0.007	0.031*	0.076***	0.002	0.082***
	(0.016)	(0.006)	(0.016)	(0.019)	(0.008)	(0.019)	(0.029)	(0.007)	(0.029)
IMR	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Quarter Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	109774	109774	109774	102862	102862	102862	32082	32082	32082
Adjusted R^2	0.392	0.371	0.393	0.402	0.386	0.403	0.506	0.495	0.508

NOTE. The dependent variable is corporate investment, defined as quarterly capital expenditure scaled by the beginning-of-quarter book value of total assets. Other firm level controls can be found at A.6. All standard errors are clustered at both industry and year level and reported in the parentheses. *, ** and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

more than unconnected firms, or 9% of average investment. The effect of U.S. monetary policy shocks on unconnected firms is around half of that (column (2)), suggesting that the investment sensitivity for connected firms is around 3 times larger than for unconnected firms.[38]

Heckman two-stage results To assess the potential bias from sample selection, we use a Heckman Two-Stage estimator. As in the earlier results, we first use the logit model (Panel B1 of Table 1) that gives us determinants of the Connect dummy: stock volatility, market cap, ROA, market to book ratio, leverage, and industry, province, and exchange fixed effects. We then re-estimate our baseline regression (8) adding the inverse Mills ratio (IMR), the logit model's probability density function divided by the cumulative distribution function. Columns (4)-(6) of Table 5 present the results. The effect of the Connect and the interaction term on firm investment are consistent with the panel OLS results, now with a larger magnitude.

Propensity score matching As discussed above, our objective is to construct a new sample by finding unconnected firms with observables similar to those of connected firms. We first use the Logit regression estimates of the probability of a firm being connected, then exclude (1) unconnected-firm observations whose propensity scores are less than the propensity score of the connected stocks at the first percentile of the treatment propensity score distribution and (2) all connected firms whose propensity score is greater than the propensity score of the unconnected firm at the ninety-ninth percentile of that distribution. Re-estimating the difference-in-differences model with these "nearest neighbors" on the common support region allows us to analyze the extent of this source of bias. As seen in columns (7)-(9) of Table 5, our results are robust: the interaction between MPS_t^{US} and Connect_{it} remains significantly negative. Because the PSM exercise substantially reduces sample size, we revert back to the full sample in the remaining results.

7.4 Robustness

We provide three sets of robustness tests on the spillover effects. First, we use an alternative model specification that incorporates potential confounding factors. Second, we horse race our U.S. monetary policy shock with other types of external shocks. Third, we run placebo tests.

[38] Unconnected firms may also be responding to U.S. monetary policy shocks because of spillover effects from foreign investors' trading on connected stocks to unconnected ones. Moreover, QFII allows foreigners to trade all domestic stocks after 2003.

Potpourri Table A.8 presents six alternative specifications that add potential confounding factors. In Panel A, we replace firm fixed effects with industry fixed effects. Panel B drops the dual-listed stocks, including A-B and A-H dual listed, in order to see whether these already-opened firm shares are driving our baseline results. Panel C adds the interaction term between firm size and U.S. monetary policy shocks. In all three exercises, the coefficients on the interaction term are similar to our baseline results. Panel D uses the alternative measure of U.S. monetary policy shocks estimated by Bu et al. (forthcoming).[39] Results are consistent with our baseline. Panel E adds lagged investment to the baseline specification. The new coefficient is significantly positive, suggesting that investment is persistent, while the interaction term remains statistically significant. Panel F introduces a lag of MPS^{US} and its interaction with Connect, to see if investment responds slowly to external shocks. The coefficients on the lagged interaction term are insignificant, however.

Other measures of external shocks We also add other measures of external shocks along with MPS^{US}. Table 6 presents the results. Panel A adds the VIX index and its interaction with Connect. Panel B adds a U.S. dollar index return and its interaction with Connect. Panel C adds the bilateral \$/RMB exchange rate change and its interaction with Connect. Panel D adds the monetary policy uncertainty index of Husted et al. (2019) and its interaction with Connect. Panel E adds the news-based economic policy uncertainty index from Baker, Bloom, and Davis (2016) and its interaction with Connect. Panel F adds a GDP-weighted average of EPU indices for 16 countries that account for two-thirds of global output and its interaction with Connect (see Davis (2016)). Panel G adds world uncertainty (Ahir, Bloom, and Furceri (2018)) and its interaction with Connect, and Panel H does the same with the TED spread. In all cases, the interaction between the MPS^{US} shock and Connect remains statistically significant and similar in magnitude to our baseline results.[40]

Placebo effects First, we examine the investment sensitivity of connected firms to Chinese monetary policy shocks. Presumably, this should not be systematically different across connected and unconnected firms. Second, we estimate on a sample before the launch of China Connect and test whether there are investment sensitivity differences between the (soon to be) "connected" and "un-

[39] This measure applies a Fama-MacBeth procedure to the response of the full maturity spectrum of interest rates to FOMC announcements. The measure compares favorably to alternatives in the literature.

[40] One exception is column (1) in Panel B with the dollar return index. The coefficient marginally loses significance, consistent with the notion that the dominant role of the dollar is one transmission channel for U.S. monetary policy.

Table 6 EFFECTS OF THE CHINA CONNECT: ALTERNATIVE EXTERNAL SHOCKS

	Investment					
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: VIX Index from CBOE S&P 500				*Panel E: News-based Economic Uncertainty Index from BBD*		
MPS^{US}*Connect	-0.015***	-0.018***	-0.023***	MPS^{US}*Connect	-0.018***	-0.020***	-0.025***
	(0.005)	(0.005)	(0.005)		(0.005)	(0.005)	(0.005)
Log(VIX)*Connect	-0.001	-0.001	0.002	EPU*Connect	0.002	0.001	-0.001
	(0.002)	(0.002)	(0.002)		(0.001)	(0.001)	(0.001)
Connect	0.005	0.003	0.019***	Connect	-0.001	-0.001	0.025***
	(0.004)	(0.004)	(0.005)		(0.002)	(0.002)	(0.003)
Observations	109774	109774	102862	Observations	109774	109774	102862
Adjusted R^2	0.371	0.393	0.403	Adjusted R^2	0.371	0.393	0.403
Panel B: Dollar Index Return				*Panel F: Global Economic Policy Uncertainty Index from BBD*		
MPS^{US}*Connect	-0.008	-0.011**	-0.017***	MPS^{US}*Connect	-0.015***	-0.017***	-0.022***
	(0.006)	(0.005)	(0.006)		(0.005)	(0.005)	(0.006)
Dollar Return*Connect	-0.012	-0.012	-0.009	GEPU *Connect	0.000	-0.000	-0.002*
	(0.015)	(0.015)	(0.013)		(0.001)	(0.001)	(0.001)
Connect	0.001	0.001	0.023***	Connect	0.001	0.001	0.027***
	(0.001)	(0.001)	(0.003)		(0.002)	(0.002)	(0.003)
Observations	109774	109774	102862	Observations	109774	109774	102862
Adjusted R^2	0.372	0.393	0.403	Adjusted R^2	0.371	0.393	0.403
Panel C: Exchange Rate Return of RMBUSD				*Panel G: World Uncertainty Index from ABF*		
MPS^{US}*Connect	-0.014**	-0.016***	-0.024***	MPS^{US}*Connect	-0.015***	-0.017***	-0.021***
	(0.006)	(0.006)	(0.006)		(0.005)	(0.005)	(0.005)
RMB/USD *Connect	0.050***	0.031*	0.038**	WUI *Connect	0.001	0.000	0.000
	(0.017)	(0.017)	(0.017)		(0.000)	(0.000)	(0.000)
Connect	0.001	0.001	0.023***	Connect	0.000	0.001	0.024***
	(0.001)	(0.001)	(0.003)		(0.001)	(0.001)	(0.003)
Observations	109774	109774	102862	Observations	109774	109774	102862
Adjusted R^2	0.371	0.393	0.403	Adjusted R^2	0.371	0.393	0.403
Panel D: Monetary Policy Uncertainty Index from HRS				*Panel H: TED Rate*		
MPS^{US}*Connect	-0.015***	-0.018***	-0.023***	MPS^{US}*Connect	-0.014***	-0.017***	-0.022***
	(0.005)	(0.005)	(0.005)		(0.005)	(0.005)	(0.005)
MPU*Connect	-0.000	-0.000	-0.001	TED Rate *Connect	0.007	0.005	-0.003
	(0.001)	(0.001)	(0.001)		(0.005)	(0.005)	(0.005)
Connect	0.001	0.001	0.025***	Connect	-0.001	-0.001	0.024***
	(0.002)	(0.001)	(0.003)		(0.002)	(0.002)	(0.003)
Observations	109774	109774	102862	Observations	109774	109774	102862
Adjusted R^2	0.371	0.393	0.403	Adjusted R^2	0.371	0.393	0.403
IMR	No	No	Yes	IMR	No	No	Yes
Firm Controls	No	Yes	Yes	Firm Controls	No	Yes	Yes
Firm FE	Yes	Yes	Yes	Firm FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Year FE	Yes	Yes	Yes
Quarter Dummy	Yes	Yes	Yes	Quarter Dummy	Yes	Yes	Yes

NOTE. The dependent variable is corporate investment. Panel A adds the VIX index and its interaction with Connect. Panel B adds a dollar index return and its interaction with Connect. Panel C adds the bilateral exchange rate return between the dollar and RMB and its interaction with Connect. Panel D adds a monetary policy uncertainty index (MPU) identified by Husted et al. (2019) 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). Panel G adds a world uncertainty index from Ahir et al. (2018). Panel H uses the TED spread measured as the difference between interest rates on interbank loans and short-term U.S. government debt. All standard errors are clustered at both industry and year level and reported in parentheses. *, ** and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

connected" firms. We define connected firms based on 2014, the first wave. Because those stocks

do not have more access to foreign capital before 2014, we should not see a significant difference in investment sensitivity between connected and unconnected firms. Table A.9 presents results. For Chinese monetary policy shocks, we use the series of Chen, Ren, and Zha (2018), an estimated shock to Chinese M2 growth. Panel A shows that the Chinese M2 growth shock positively affects corporate investment, but the effect is statistically insignificant and the interaction term between the Chinese monetary policy shock and Connect is statistically insignificant. The two types of firms do not respond differently to Chinese monetary policy shocks. Furthermore, the U.S. shock results remain. Panel B presents results using the pre-Connect period (2003-2013), and shows that connected firms' investment sensitivity is insignificantly different from unconnected firms.[41]

7.5 Channels

Our theoretical framework suggests a cost of funding channel that justifies the differential investment sensitivity. To formally test this channel, we present three sets of results. First, connected and unconnected stocks respond differently to U.S. monetary policy shocks using daily data. Second, connected firms with a higher sensitivity to the global market respond more to U.S. monetary policy shocks. Third, firms relying more on external financing have higher investment sensitivity.

Cost of funding channel: stock responses to U.S. monetary policy shocks

We examine high-frequency stock price responses of connected firms to U.S. monetary policy shocks after the Connect. We use a 2-day event window around FOMC meetings. For each stock, we use two models to calculate the cumulative abnormal return, following Liu, Shu, and Wei (2017). We define connected firms using the information in 2014, the first wave of the Connect. Table 7 presents the results. We find that connected firm stock prices fall more than unconnected firm stock prices in response to a contractionary U.S. monetary policy shock after the launch of the Connect. In contrast, the difference is insignificant before the Connect. The stock response differences to U.S. monetary policy shocks could potentially explain the investment sensitivity to U.S. monetary policy shocks, as it is consistent with the cost of funding channel.

[41] Interestingly, U.S. monetary policy affects both connected and unconnected firms during this period. One conjecture is that foreign capital can access all Chinese stocks beginning with the QFII program. Indeed, when we conduct the same exercise during 1998-2002, before the launch of QFII, the effect of the U.S. monetary policy shock on corporate investment is statistically insignificant. Therefore, the influence of foreign capital on the Chinese market can be traced back to QFII, while the Connect creates two groups of stocks that are differentially affected by foreign shocks.

Table 7 STOCK REACTION TO US MONETARY POLICY SHOCKS: BEFORE AND AFTER THE CHINA CONNECT

	Return (0,+1) Market Adjusted Model			Return (0,+1) CAPM Model		
	Pre QFII	Pre China Connect	China Connect	Pre QFII	Pre China Connect	China Connect
	2000-2003	2003-2013	2014-2019	2000-2003	2003-2013	2014-2019
MPS^{US}*Connect	-0.000	-0.004	-0.048***	0.004	-0.004	-0.041***
	(0.002)	(0.004)	(0.006)	(0.002)	(0.002)	(0.006)
MPS^{US}	0.004**	-0.005**	-0.045***	0.000	-0.001	-0.032***
	(0.002)	(0.002)	(0.004)	(0.001)	(0.001)	(0.004)
Connect	-0.001**	0.001***	-0.001***	0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Constant	0.001	-0.000	-0.001***	-0.002***	-0.003***	-0.005***
	(0.001)	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	24672	99427	89922	22627	97395	85777
Adjusted R^2	0.001	0.003	0.018	0.001	0.005	0.012

NOTE. The dependent variable is cumulative abnormal return for each Chinese stock on FOMC announcement days. We choose two days after the FOMC meetings. we use two methods to construct the abnormal return. In the first three columns, we calculate abnormal return using stock return minus the market return and in the last three columns we use the CAPM model to estimate the abnormal return. Connect is defined as the first wave in the China Connect; it is constant for each stock. All standard errors are clustered at both industry and year level and reported in the parentheses. *, ** and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

Risk-premium channel

The stock price responses to U.S. monetary policy shocks suggest that connected firms have more risk exposure to external shocks. Here we examine several key channels explaining this. Our conceptual framework implies that firms in the connect, having higher covariance with the global market, should be more sensitive to U.S. monetary policy shocks because their risk-premiums are more responsive to the shock. To formally test the risk premium channel, we multiply our connect dummy, $Connect_{it}$ by a firm-level variable $Global\ Cov$, i .e. $cov(r_i, r_W)$, the historical covariance of firm i's stock return r_i with the global market return r_W. This produces a continuous measure capturing both the extensive and intensive margins of the risk-sharing channel. It equals zero when the firm cannot be traded by foreign investors but varies with the firm's sensitivity to the global market for a firm in the C onnect. We then replace the c onnect d ummy i n o ur baseline regression with Global Cov $*$ $Connect_{it}$. Panel A of Table 8 presents the results. The coefficient on Global Cov $*$ Connect is positive and significant F urthermore, t he i nteraction t erm between Global Cov $*$ Connect and the U.S. monetary policy shock is significantly negative, implying that

Table 8 RISK-PREMIUM AND EXTERNAL FINANCING CHANNEL

Investment												
Panel A: Risk Premium Channel				Panel B: External Financing Channel								
					Equity Dependence to Investment				Long-term Debt to Investment			
	(1)	(2)	(3)		High (1)	Low (2)	High (3)	Low (4)	High (5)	Low (6)	High (7)	Low (8)
(Global Cov*Connect)	0.013**	0.011**	0.032***	MPS^{US}*Connect	-0.026***	-0.013***	-0.031***	-0.019***	-0.024***	-0.012***	-0.030***	-0.017***
	(0.006)	(0.005)	(0.006)		(0.006)	(0.005)	(0.007)	(0.005)	(0.006)	(0.004)	(0.007)	(0.005)
(Global Cov*Connect)*MPS^{US}	-0.119***	-0.120***	-0.107***	MPS^{US}	-0.010***	-0.009***	-0.011***	-0.009***	-0.008***	-0.011***	-0.009***	-0.011***
	(0.037)	(0.037)	(0.039)		(0.003)	(0.002)	(0.003)	(0.002)	(0.003)	(0.002)	(0.003)	(0.002)
MPS^{US}	-0.008***	-0.011***	-0.011***	Connect	0.003**	0.000	0.027***	0.021***	0.001	0.002*	0.025***	0.023***
	(0.002)	(0.003)	(0.003)		(0.001)	(0.001)	(0.003)	(0.003)	(0.001)	(0.001)	(0.004)	(0.003)
				Observations	50518	59057	47064	55651	54754	54821	51737	50978
				Adjusted R^2	0.468	0.376	0.482	0.387	0.435	0.433	0.444	0.444
				Firm Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm Controls	No	Yes	Yes	IMR	No	No	Yes	Yes	No	No	Yes	Yes
IMR	No	No	Yes	Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Quarter Dummy	Yes	Yes	Yes		H_0: $\beta^H = \beta^L$							
Observations	107259	107259	101217	χ^2 Test	5.24**		4.61**		4.98**		5.48**	
Adjusted R^2	0.379	0.400	0.406	P-value	0.022		0.032		0.026		0.019	

NOTE. The dependent variable is corporate investment. Panel A reports results on the risk premium channel and Panel B reports results on the external financing channel. Global Cov is the historical covariance of an individual stock return with the MSCI world market return (exchange rate adjusted), estimated using a 36-month rolling window. Detailed information can be found at A.6. In Panel B, we divide firms into two groups based on the median level of equity (debt) dependence to investment in each quarter. All standard errors are clustered at both industry and year level and reported in the parentheses. *, ** and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

spillover effects from the global financial cycle are stronger for high covariance firms. On balance, those firms with higher covariance with the global market enjoy greater benefits after the Connect, along with greater sensitivity to the global financial cycle.

External financing channel

If the cost of funding channel is at work, we expect that firms relying more on external financing for investment will be more sensitive to U.S. monetary policy shocks.[42] To this end, we implement sub-sample tests exploring firm heterogeneity in the treatment group. For example, we divide our full sample into two groups in each quarter based on measures of external financing. This is constructed following Rajan and Zingales (1998) on firms' external equity (debt) financing to its capital expenditure. We then re-estimate our baseline regression on the two sub-samples separately. To the extent that the U.S. monetary policy shock affects domestic investment through the cost of funding, we expect that firms with different external financing conditions respond differently. Dividing firms according to their median level of equity dependence to investment or long-term debt to investment, as seen in Panel B of Table 8, we find that firms with greater reliance on external financing are more sensitive to U.S. monetary policy shocks after inclusion.

8 Conclusion

We exploit an important and unique capital account liberalization, the Shanghai (Shenzhen) - Hong Kong stock Connect, to jointly test hypotheses concerning the benefits and costs of stock market liberalization. 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 test the effect of liberalization and the effectiveness of capital controls policy. We find, first, that firms in the Connect enjoy a higher stock price revaluation and higher investment rates, with ultimately lower financing costs and higher earnings and sales growth, than firms outside of the Connect. Second, we find that connected firms have higher investment sensitivity to U.S. monetary policy shocks than unconnected ones, after the launch of the Connect. This reinforces the notion that U.S.

[42] We explore other types of firm heterogeneity in Appendix A.13, for example exposure to the external sector, as measured by tradables vs. non-tradables or the share of foreign sales in total sales. We do not find large differences between tradable and non-tradable firms, perhaps because Chinese firms issue very little dollar denominated debt. However, we find that firms with foreign sales have a higher investment sensitivity to U.S. monetary policy shock.

monetary policy has large spillover effects, even considering China's tight national capital controls (see Han and Wei (2018), Kalemli-Ozcan (2019)). One potential downside of the extra sensitivity to U.S. monetary policy relates to the independence of Chinese monetary policy. In light of the (additional) foreign spillover effects working through the Connect, Chinese monetary policy might have to respond to U.S. monetary policy in a way that deviates from its domestic mandate. For example, during events like the 2013 Taper Tantrum, Chinese monetary policy would have to ease in order to stabilize the domestic economy. To the extent that Chinese monetary policy transmission and independence are diminished by increased sensitivity to U.S. shocks, we would expect Chinese authorities to pull back on the Connect. The fact that the China Connect program was extended suggests that connected firms are able to hedge the negative consequences concerning increased sensitivity to external shocks. Our results add a cautionary note to countries considering fully opening their capital markets: there will be both benefits and costs, some of which are rather nuanced. Measuring the overall welfare implications from this liberalization requires a fully-fledged structural model that should make for interesting future research.

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Internet Appendix

'The Effect of the China Connect'

(Intended for online publication only)

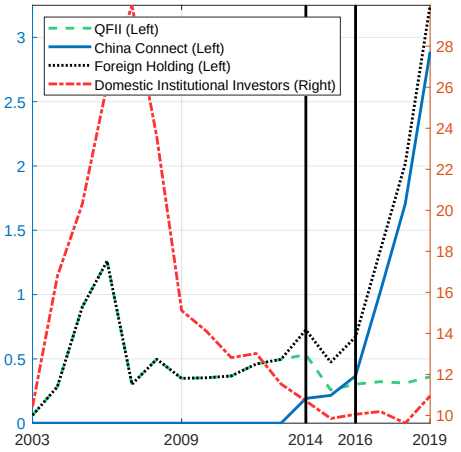
by C. Ma, and J. Rogers, and S. Zhou

November 2020

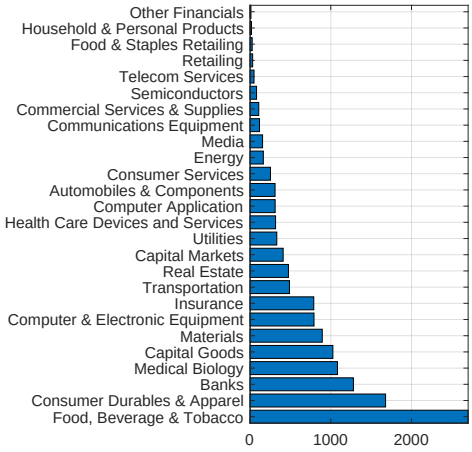
A.1 Figure

Figure A.1 FOREIGN INVESTORS' PARTICIPATION IN CHINESE MARKET

Panel A: Investor Composition (% of Tradable Market Value)



Panel B: Market Value by Industry in China Connect (in 100 Million Yuan)



NOTE. Panel A plots the share of investor holdings in total tradable market value. Foreign holdings include both QFII and China Connect. Panel B plots the industry market value for China Connect Program at the 2019 year end.

A.2 China Connect: a partial liberalization

The China Connect is a partial liberalization, as it allows investors to trade only eligible stocks. In our simple theoretical framework in Section 4, we focus on the price revaluation of *connected* stocks because their marginal investors are more likely to be foreign investors through the Connect. On the other hand, the marginal investors for unconnected stocks are less likely to change with the Connect because they are not allowed to be traded by foreign investors. However, there will be a change for those domestic investors via the China Connect that could potentially affect unconnected stocks. Because the China Connect is a dual-side liberalization that also allows domestic investors to trade eligible stocks on the Hong Kong Stock Exchange, the set of available stocks for domestic investors is enlarged. Thus, the systematic risk benchmark for domestic investors will include those eligible stocks from the Hong Kong market. Indirectly, this will affect the pricing of *unconnected* stocks even though foreign investors do not trade them directly. To capture this idea,

write the stock price equation for unconnected stocks after the Connect as follows:

$$E[R_i^{un,*}] = r + \gamma \text{cov}(r_i, r_M + r_H) \tag{9}$$

where $E[R_i^{un,*}]$ is the required expected return for unconnected stocks after the China Connect, r is the domestic risk-free rate, because (1) domestic marginal investors cannot borrow from China Connect, and (2) the Connect does not change the domestic risk-free rate. In addition, γ is the risk aversion coefficient for domestic investors, and $r_M + r_H$ is the sum of the domestic market return and the eligible Hong Kong stocks return; this captures the enlarged set of securities for domestic investors.[A.1] We assume that a well diversified portfolio for domestic investors after the Connect is an equal weighted portfolio of the domestic market and Hong Kong eligible stocks.

Under this assumption, the stock price revaluation for unconnected firms is given by (subtracting equation (9) from (2))

$$\Delta E[R_i^{un,*}] \equiv E[R_i] - E[R_i^{un,*}] = \gamma(\text{cov}(r_i, r_M) - \text{cov}(r_i, r_M + r_H)) = -\gamma \text{cov}(r_i, r_H) \tag{10}$$

Intuitively, the price revaluation for unconnected stocks only comes from risk-sharing for domestic marginal investors, which in turn is from a larger set of securities in the China Connect. In that sense, one should expect the price revaluation to be proportional to the covariance term with Hong Kong eligible stocks.

Table A.1 estimates the price revaluation of unconnected stocks, supplementing estimation equation (7) with the historical covariance term with the Hong Kong market $cov(r_i, r_H)$ and its interaction term with *Unconnect*, a dummy variable for unconnected stocks. This new interaction term is insignificant, indicating no price revaluation for unconnected firms. However, the interaction between DIFCOV and Connect remains significant in column (3), one month after the Connect program. The results suggest a much larger price revaluation for connected stocks than unconnected stocks in the partial liberalization of the China Connect. Based on these results, we focus only on the price revaluation of connected firms in our main text.

[A.1] We use both the Heng Seng Index and MSCI Hong Kong Index for the Hong Kong eligible stock portfolio. The results remain robust. Recall that under the China Connect, the Hong Kong Stock Exchange allows large and mid-cap stocks to be traded by mainland investors.

Table A.1 STOCK PRICE REVULATION FOR UNCONNECTED STOCKS

	Month [-1]	Month [-1, 0]	Month [-1, 1]	Month [-1,2]
	(1)	(2)	(3)	(4)
Connect	-0.035	0.036	0.262***	0.086*
	(0.024)	(0.034)	(0.052)	(0.049)
DIFCOV * Connect	0.002	-0.002	0.190**	0.065
	(0.032)	(0.051)	(0.082)	(0.072)
HK Cov*Unconnect	0.029	-0.095	0.013	0.131
	(0.047)	(0.065)	(0.104)	(0.096)
HK Cov	-0.065***	-0.105***	-0.209***	-0.168***
	(0.012)	(0.016)	(0.023)	(0.022)
DIFCOV	0.103**	0.300***	0.476***	0.227***
	(0.041)	(0.058)	(0.093)	(0.087)
Market Cap	0.009**	0.011*	0.069***	0.085***
	(0.004)	(0.006)	(0.009)	(0.009)
Volatility	5.459***	12.575***	13.712***	13.752***
	(0.401)	(0.585)	(0.795)	(0.787)
Constant	-0.257***	-0.429***	-1.445***	-1.610***
	(0.065)	(0.089)	(0.134)	(0.128)
IMR	Yes	Yes	Yes	Yes
Observations	2260	2233	2187	2121
Adjusted R^2	0.186	0.391	0.517	0.465

NOTE. The dependent variable is the cumulative log stock return around the China Connect's first wave. DIFCOV is defined as cov(r_i, r_M)-cov(r_i, r_W), where r_i is the stock return for firm i, r_M is the monthly domestic stock return and r_W is the monthly global market return. HK Cov is defined as cov(r_i, r_H), where r_H is the monthly MSCI Hong Kong Index return. All covariances are calculated on historical 36-month windows before the Connect. Connect is a dummy for connected stocks and Unconnect for unconnected stocks. Market cap is the natural logarithm of the market capitalization of total assets. Volatility is defined as variance of daily stock return within a month.*, ** and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

A.3 Tables

Table A.2 SHANGHAI (SHENZHEN)-HONG KONG STOCK CONNECT PROGRAM OVERVIEW

Effective Date	Announcement Date	Number of stocks added	Number of stocks on list
Nov 17, 2014	Apr 10, 2014	503	503
Dec 5, 2016	Aug 16, 2016	799	1302

NOTE. Number of stocks included in the Shanghai (Shenzhen)-Hong Kong Connect program in our sample.

Table A.3 U.S. MONETARY POLICY SHOCK: SUMMARY STATISTICS

	Daily	**Quarterly Sum**	**Quarterly Value-weighted**
Mean	-0.017	-0.032	-0.018
Median	-0.007	0.000	0.000
Std	0.116	0.148	0.098
Min	-0.603	-0.635	-0.574
Max	0.301	0.333	0.200
Num	222	121	121

NOTE. The original data is from Rogers et al. (2018). The quarterly sum column takes the simple sum of their FOMC announcement day measure within a quarter to construct the quarterly frequency series. 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.

Table A.4 FIRM-LEVEL VARIABLES: SUMMARY STATISTICS

	Obs	Mean	Std.Dev.	Min	Max
Investment	109774	0.032	0.042	-0.039	0.273
Size	109774	21.813	1.302	12.314	28.625
Tobin's Q	109774	2.517	1.852	0.790	18.719
Cash Flow	109774	0.034	0.045	-0.236	0.244
Sale Growth	109774	0.390	0.781	-0.912	3.700
Local GDP Growth	109774	0.096	0.029	-0.022	0.194

NOTE. This table reports descriptive statistics for key variables used in our sample from 2002 to 2019. Investment denotes the capital expenditure divided by the book value of total assets. Size is the natural logarithm of total assets. Tobin's 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. Sales growth is defined as the growth rate of sales. All variables are winsorized at the top and bottom 1% to rule out outliers.

Table A.5 DATA SAMPLE: INDUSTRY AND YEAR DISTRIBUTION

Panel A: Industry Distribution				Panel B: Year Distribution			
Industry	**#Obs**	**#Firm**	**Percentage**	**Year**	**#Obs**	**#Firm**	**Percentage**
Automobiles & Components	5549	104	5.05%	2002	2515	865	2.29%
Capital Goods	22205	452	20.23%	2003	3498	929	3.19%
Commercial Services & Supplies	3819	64	3.48%	2004	3844	1026	3.50%
Communications Equipment	2467	50	2.25%	2005	4073	1037	3.71%
Computer & Electronic Equipment	6438	142	5.86%	2006	4040	1060	3.68%
Computer Application	6255	144	5.70%	2007	4374	1167	3.98%
Consumer Durables & Apparel	6336	131	5.77%	2008	4781	1257	4.36%
Consumer Services	2001	36	1.82%	2009	5040	1290	4.59%
Energy	3590	63	3.27%	2010	5856	1604	5.33%
Food & Staples Retailing	493	10	0.45%	2011	7106	1908	6.47%
Food, Beverage & Tobacco	6717	119	6.12%	2012	8014	2097	7.30%
Health Care Devices and Services	1290	30	1.18%	2013	8311	2118	7.57%
Household & Personal Products	454	8	0.41%	2014	8143	2118	7.42%
Materials	20536	379	18.71%	2015	7751	2115	7.06%
Media	2960	60	2.70%	2016	7943	2119	7.24%
Medical Biology	9161	166	8.35%	2017	8047	2114	7.33%
Retailing	3189	51	2.91%	2018	8093	2115	7.37%
Semiconductors	1000	20	0.91%	2019	8345	2116	7.60%
Telecom Services	349	7	0.32%				
Transportation	4965	84	4.52%				
Total	109774	2120	100.00%	Total	109774		100.00%

Table A.6 VARIABLE CONSTRUCTION AND DATA SOURCES

Variable	Definition	Source
Panel A: Firm-level Variables		
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
Investment	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
Market Cap	The natural logarithm of the close price at quarter end multiply by the share outstanding at the end of quarter t.	CSMAR
Tobin's 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
Sale 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
Cash	Cash and cash equivalents divided by the book value of total assets measured at the end of quarter t-1(lagged total assets).	CSMAR
Cost of Debt	The sum of Short-term market borrowing rate multiple by short-term corporate leverage ratio and long-term borrowing rate multiple by long-term corporate debt ratio. The Cost of Debt is calculated for each firm at quarter t.	CSMAR
Change of ln(D/P)	The change of aggregated yield for each firm within quarter.	CSMAR, Henry (2003)
EBIT	The earnings before income and taxes (EBIT) divided by the book value of total assets measured at the end of quarter t.	CSMAR
Seasonal Equity Offering	The aggregated amount of fund a firm aim to raised within a quarter divided by the book value of total assets measured at the end of quarter t.	CSMAR
Stock Pledge	The aggregated value of share has been pledged within a quarter divided by the book value of total assets measured at the end of quarter t.	WIND
DIFCOV	The difference between the historical covariance of firm i's stock return with local market index and its covariance with the MSCI world stock market index. We use 36-month rolling window to construct DIFCOV at each quarter end.	CSMAR, MSCI, WIND
Global Cov	The historicial covariance of firm i's stock return with the MSCI world stock market index. We use 36-month rolling window to construct global covariance at each quarter end.	MSCI, WIND
Stock Volatility	The standard deviation of daily stock return within a quarter. Note that we require at least 20 trading days to construct this variable.	CSMAR
M/B	The ratio of market capitalization divided by book value of shareholder equity	CSMAR
Turnover	Average individual turnover rate	CSMAR
Age	The number of years since IPO.	CSMAR
Equity Dependence to Investment	The book value of shareholder equity divided by the capital expenditure at quarter t.	Rajan and Zingales (1998)
Debt Dependence to Investment	The book value of debt divided by the capital expenditure at quarter t.	Rajan and Zingales (1998)
Tradable	A dummy variable equals to one if a firm classified as tradable sector, and zero otherwise.	CSMAR
Nontradable	A dummy variable equals to one if a firm classified as Non-tradable sector, and zero otherwise.	CSMAR
Multinational	A dummy variable equals to one if a firm foreign sales larger than 0 at quarter t, and zero otherwise.	WIND
Domestic	A dummy variable equals to one if a firm has no foreign sales at quarter t, and zero otherwise.	WIND
Panel B: Macro Variables		
MPS^{US}	The combination of three unexpected Monetary Policy Surprises on each FOMC announcement. To match with quarterly financial reports, we use simple aggregation of each Monetary Policy Surprise at each quarter.	Rogers et al. (2018)
MPS^{China}	A measure for unexpected Chinese M2 growth rate	Chen et al. (2018)
Repo Rate	7-day Repo rate in China	Chang et al. (2016)
M2 Growth	Year-over-year M2 growth rate	Chang et al. (2016)
Local GDP Growth	Quarterly provincial nominal GDP growth rate	CEIC

Table A.7 SUMMARY STATISTICS: CONNECTED VS. UNCONNECTED FIRMS

	(1)	(2)	(3)	(4)	(5)	(6)	(7)		(8)
	Connected (a)			Unconnected (b)			Difference (a)-(b)		
	Mean	Median	S.D	Mean	Median	S.D	Mean Diff		T-test
Panel A: One Quarter before Shanghai- Hong Kong Connect (2014Q3)									
Investment	0.034	0.026	0.032	0.024	0.013	0.031	0.011	***	4.54
Size	23.077	22.917	1.337	21.803	21.772	1.255	1.273	***	13.03
Tobin's Q	1.685	1.413	0.924	2.329	1.596	2.049	-0.644	***	-5.57
Cash Flow	0.035	0.029	0.032	0.010	0.008	0.037	0.026	***	9.90
M/B	2.684	2.128	1.849	5.075	2.950	6.325	-2.390	***	-7.03
Cash	0.144	0.120	0.094	0.140	0.111	0.105	0.005		0.62
Age	12.683	13.000	5.482	14.571	15.000	4.791	-1.888	***	-4.85
Sales growth	0.538	0.519	0.174	0.570	0.518	0.330	-0.031		1.63
Global Cov%	0.067	0.067	0.057	0.069	0.067	0.060	-0.002		-0.23
DIFCOV%	0.317	0.313	0.109	0.349	0.346	0.104	-0.032	***	-3.98
Return Volatility	0.020	0.018	0.006	0.021	0.021	0.006	-0.002	***	-3.85
Market Cap	23.104	22.944	0.782	22.263	22.113	0.677	0.841	***	14.92
Leverage	0.244	0.243	0.151	0.253	0.241	0.182	-0.009		-0.69
Panel B: One Quarter before Shenzhen- Hong Kong Connect (2016Q3)									
Investment	0.032	0.021	0.032	0.025	0.017	0.028	0.006	***	3.68
Size	22.419	22.298	0.985	21.512	21.496	0.850	0.907	***	17.37
Tobin's Q	3.696	3.033	2.569	3.752	3.069	2.703	-0.056		-0.38
Cash Flow	0.040	0.034	0.039	0.021	0.020	0.033	0.018	***	8.86
M/B	4.732	3.966	3.184	5.460	4.300	5.381	-0.728	***	-2.89
Cash	0.164	0.129	0.113	0.149	0.122	0.101	0.015	**	2.45
Age	9.867	7.000	5.819	9.615	6.000	6.043	0.253		0.75
Sales growth	0.577	0.553	0.196	0.605	0.553	0.319	-0.028	*	-1.91
Global Cov%	0.127	0.128	0.076	0.130	0.134	0.083	-0.003		-0.54
DIFCOV%	1.167	1.052	0.512	1.234	1.138	0.503	-0.067	**	-2.32
Return Volatility	0.020	0.019	0.005	0.022	0.021	0.006	-0.002	***	-7.60
Market Cap	23.328	23.248	0.592	22.515	22.458	0.402	0.812	***	27.63
Leverage	0.179	0.160	0.147	0.172	0.136	0.148	0.007		0.79

NOTE. Summary statistics of key variables for connected and unconnected firms. Detailed definitions can be found in Appendix A.6. Panel A includes firms only listed on the Shanghai Exchange in 2014 Q3. Panel B includes firms listed on Shenzhen Stock Exchange in 2016 Q3. All variables are winsorized at the top and bottom 1%. *, ** and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

Table A.8 EFFECTS OF CHINA CONNECT: ROBUSTNESS

	Investment					
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Industry Fixed Effect				*Panel D: Alternative Measure of Monetary Surprise*		
MPS^{US}*Connect	-0.010***	-0.015***	-0.013***	BRW*Connect	-0.017***	-0.020***	-0.024***
	(0.003)	(0.004)	(0.003)		(0.005)	(0.006)	(0.006)
MPS^{US}	-0.008***	-0.010***	-0.010***	BRW	-0.007***	-0.007***	-0.008***
	(0.001)	(0.001)	(0.001)		(0.002)	(0.002)	(0.002)
Connect	0.005***	0.001	-0.009***	Connect	0.001	0.002**	0.024***
	(0.001)	(0.001)	(0.003)		(0.001)	(0.001)	(0.003)
Observations	109774	109774	102862	Observations	93336	89189	86953
Adjusted R^2	0.172	0.219	0.224	Adjusted R^2	0.382	0.410	0.414
Panel B: Drop Dual-listed Stocks				*Panel E: Including Lagged Dependent Variable*		
MPS^{US}*Connect	-0.016***	-0.018***	-0.024***	MPS^{US}*Connect	-0.023***	-0.024***	-0.027***
	(0.005)	(0.005)	(0.005)		(0.005)	(0.005)	(0.005)
MPS^{US}	-0.007***	-0.010***	-0.011***	MPS^{US}	-0.007***	-0.009***	-0.009***
	(0.002)	(0.002)	(0.002)		(0.003)	(0.003)	(0.003)
Connect	0.002*	0.001	0.025***	Connect	0.000	0.001	0.013***
	(0.001)	(0.001)	(0.003)		(0.001)	(0.001)	(0.002)
				Lag DV	0.544***	0.535***	0.532***
					(0.031)	(0.031)	(0.031)
Observations	101833	101833	95284	Observations	105281	105281	102862
Adjusted R^2	0.365	0.387	0.397	Adjusted R^2	0.565	0.578	0.579
Panel C: Size				*Panel F: Including Lagged Monetary Policy Shock*		
MPS^{US}*Connect	-0.011*	-0.014**	-0.019***	MPS^{US}*Connect	-0.016***	-0.018***	-0.024***
	(0.006)	(0.006)	(0.006)		(0.005)	(0.005)	(0.005)
MPS^{US}*Size	-0.003	-0.003*	-0.003*	MPS^{US}	-0.009***	-0.011***	-0.012***
	(0.002)	(0.001)	(0.002)		(0.003)	(0.003)	(0.003)
MPS^{US}	0.049	0.048*	0.053*	Lag MPS^{US} * Connect	0.002	0.001	0.000
	(0.034)	(0.029)	(0.032)		(0.005)	(0.005)	(0.005)
Connect	0.001*	0.001	0.024***	Lag MPS^{US}	-0.005*	-0.005*	-0.007**
	(0.001)	(0.001)	(0.003)		(0.003)	(0.003)	(0.003)
Size	-0.000	0.001**	-0.002**	Connect	0.001	0.001	0.024***
	(0.001)	(0.001)	(0.001)		(0.001)	(0.001)	(0.003)
Observations	109774	109774	102862	Observations	109774	109774	102862
Adjusted R^2	0.371	0.393	0.403	Adjusted R^2	0.371	0.393	0.403
Firm Controls	No	Yes	Yes	Firm Controls	No	Yes	Yes
IMR	No	No	Yes	IMR	No	No	Yes
Firm FE	Yes	Yes	Yes	Firm FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Year FE	Yes	Yes	Yes
Quarter Dummy	Yes	Yes	Yes	Quarter Dummy	Yes	Yes	Yes

NOTE. 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 effects. Panel B drops A-H and A-B dual listed stocks. Panel C controls for the size on the investment sensitivity to U.S. monetary policy shock. Panel D uses an alternative monetary policy shock (BRW) identified by Bu et al. (forthcoming). Panel E controls for lagged corporate investment. Panel F controls for a lagged monetary policy shock. All standard errors are clustered at both industry and year level and reported in parentheses. *, ** and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

Table A.9 EFFECTS OF CHINA CONNECT: PLACEBO TEST

Investment						
Panel A: Chinese Monetary Policy Shock						
	(1)	(2)	(3)	(4)	(5)	(6)
MPS^{China}	0.031	0.028	0.036	0.026	0.020	0.025
	(0.038)	(0.037)	(0.036)	(0.038)	(0.037)	(0.035)
Connect	0.001	0.002	0.001	0.001	0.001	0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
MPS^{China}*Connect		0.037	0.019		0.077	0.065
		(0.057)	(0.055)		(0.059)	(0.056)
MPS^{US}				-0.007***	-0.007**	-0.009***
				(0.003)	(0.003)	(0.003)
MPS^{US}*Connect					-0.021***	-0.023***
					(0.006)	(0.006)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Quarter Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Observations	105639	105639	105639	105639	105639	105639
Adjusted R^2	0.375	0.375	0.397	0.376	0.376	0.398
Panel B: Period before the China Connect						
	Pre QFII 1998-2002 (1)	Pre China Connect 2003-2013 (2)	All 1998-2013 (3)	Pre QFII 1998-2002 (4)	Pre China Connect 2003-2013 (5)	All 1998-2013 (6)
MPS^{US}*$Connect_{2014}$	-0.006	-0.001	-0.003	-0.006	-0.001	-0.003
	(0.006)	(0.003)	(0.002)	(0.009)	(0.003)	(0.002)
MPS^{US}	-0.010	-0.007**	-0.006**	-0.009	-0.007**	-0.006**
	(0.040)	(0.003)	(0.003)	(0.050)	(0.003)	(0.003)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	No	No	No
Quarter Dummy	Yes	Yes	Yes	No	No	No
Sector*Quarter FE	No	No	No	Yes	Yes	Yes
Observations	3393	55452	58845	3393	55452	58845
Adjusted R^2	0.540	0.453	0.438	0.545	0.458	0.444

NOTE. The dependent variable is corporate investment. The Chinese monetary policy shock MPS^{China} is the quarter-over-quarter (QoQ) change of M2 growth rate shock identified by Chen et al. (2018). Detailed information on the controls can be found in Appendix A.6. All standard errors are clustered at both industry and year level and reported in parentheses. *, ** and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

Table A.10 EFFECTS OF CHINA CONNECT:
ALTERNATIVE DEFINITION OF CONNECT DUMMY

	Investment					
	(1)	(2)	(3)	(4)	(5)	(6)
Connect	0.002**	0.001*	0.005***	0.002**	0.001	0.005***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
MPS^{US}*Connect				-0.010*	-0.016***	-0.020***
				(0.006)	(0.006)	(0.006)
MPS^{US}				-0.008***	-0.010***	-0.011***
				(0.003)	(0.003)	(0.003)
Size		0.001**	0.001		0.001**	0.001
		(0.001)	(0.001)		(0.001)	(0.001)
Tobin's Q		0.001***	0.001***		0.001***	0.001***
		(0.000)	(0.000)		(0.000)	(0.000)
Cash Flow		0.163***	0.160***		0.164***	0.161***
		(0.009)	(0.009)		(0.009)	(0.009)
Sale Growth		0.002***	0.002***		0.002***	0.002***
		(0.001)	(0.001)		(0.001)	(0.001)
GDP Growth		0.035**	0.038**		0.038**	0.042**
		(0.017)	(0.017)		(0.017)	(0.017)
Constant	0.014**	-0.021	-0.019	0.013**	-0.024	-0.022
	(0.006)	(0.016)	(0.017)	(0.006)	(0.016)	(0.017)
IMR	No	No	Yes	No	No	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Quarter Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Observations	109774	109774	102862	109774	109774	102862
Adjusted R^2	0.370	0.392	0.399	0.371	0.393	0.400

NOTE. The dependent variable is corporate investment, defined as quarterly capital expenditure scaled by the beginning-of-quarter book value of total assets. Connect_{it} equals 1 if a firms i is in the Connect for quarter t and 0 otherwise. Detailed information on the controls can be found in Appendix A.6. All standard errors are clustered at both industry and year level and reported in parentheses. *, ** and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

Table A.11 EFFECTS OF CHINA CONNECT:
ELIMINATE PERIODIC ADJUSTMENT TO INDEXES

	Investment					
	(1)	(2)	(3)	(4)	(5)	(6)
Connect	0.002*	0.002*	0.005***	0.002*	0.001	0.005***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
MPS^{US}*Connect				-0.010	-0.016***	-0.019***
				(0.006)	(0.006)	(0.006)
MPS^{US}				-0.008***	-0.010***	-0.011***
				(0.002)	(0.002)	(0.002)
Size		0.001	0.001		0.001*	0.001
		(0.001)	(0.001)		(0.001)	(0.001)
Tobin's Q		0.001***	0.001***		0.001***	0.001***
		(0.000)	(0.000)		(0.000)	(0.000)
Cash Flow		0.159***	0.156***		0.161***	0.157***
		(0.009)	(0.010)		(0.010)	(0.010)
Sale Growth		0.001**	0.001**		0.002***	0.001**
		(0.001)	(0.001)		(0.001)	(0.001)
GDP Growth		0.040**	0.043**		0.043**	0.047**
		(0.018)	(0.018)		(0.018)	(0.018)
Constant	0.014**	-0.015	-0.013	0.013**	-0.019	-0.017
	(0.006)	(0.017)	(0.018)	(0.006)	(0.017)	(0.018)
IMR	No	No	Yes	No	No	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Quarter Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Observations	90283	90283	84668	90283	90283	84668
Adjusted R^2	0.381	0.401	0.409	0.382	0.402	0.410

NOTE. The dependent variable is corporate investment. We keep only stocks that are added to the Connect in 2014 Q4 and 2016 Q4 and stocks that are never added to the Connect. Detailed information on the controls can be found in Appendix A.6. All standard errors are clustered at both industry and year level and reported in parentheses. *, ** and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

Table A.12 EFFECTS OF CHINA CONNECT: WITH MACRO CONTROLS

	Investment					
	(1)	(2)	(3)	(4)	(5)	(6)
Connect	0.001	0.001	0.022***	0.001	0.001	0.023***
	(0.001)	(0.001)	(0.003)	(0.001)	(0.001)	(0.003)
MPS^{US}*Connect				-0.019***	-0.021***	-0.026***
				(0.005)	(0.005)	(0.005)
MPS^{US}				-0.006**	-0.008***	-0.010***
				(0.003)	(0.003)	(0.003)
Lag Repo Rate	0.268***	0.223***	0.195***	0.245***	0.188***	0.151**
	(0.060)	(0.055)	(0.059)	(0.061)	(0.056)	(0.059)
Lag M2 Growth	0.016	0.004	0.002	0.019	0.010	0.008
	(0.016)	(0.017)	(0.017)	(0.016)	(0.017)	(0.017)
Size		0.001*	-0.002**		0.001*	-0.002**
		(0.001)	(0.001)		(0.001)	(0.001)
Tobin's Q		0.001***	0.001***		0.001***	0.001***
		(0.000)	(0.000)		(0.000)	(0.000)
Cash Flow		0.169***	0.156***		0.170***	0.157***
		(0.009)	(0.010)		(0.009)	(0.010)
Sale Growth		0.002***	0.002***		0.002***	0.002***
		(0.001)	(0.001)		(0.001)	(0.001)
GDP Growth		0.038**	0.041**		0.038**	0.041**
		(0.018)	(0.018)		(0.018)	(0.018)
Constant	0.006	-0.022	0.031*	0.005	-0.025	0.030
	(0.006)	(0.016)	(0.019)	(0.006)	(0.016)	(0.019)
IMR	No	No	Yes	No	No	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Quarter Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Observations	107751	107751	100840	107751	107751	100840
Adjusted R^2	0.374	0.395	0.405	0.374	0.396	0.406

NOTE. The dependent variable is corporate investment. Macro controls include the M2 growth rate and 7-day Repo rate in addition to the local GDP growth rate. Detailed information on the controls can be found in Appendix A.6. All standard errors are clustered at both industry and year level and reported in parentheses. *, ** and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

Table A.13 EFFECTS OF CHINA CONNECT: FIRM HETEROGENEITY

	Investment							
Panel A: Tradable v.s. Nontradable					*Panel B: Multinational (MNC) v.s. Domestic (DC)*			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	High	Low	High	Low	MNC	DC	MNC	DC
MPS^{US}*Connect	-0.019***	-0.015***	-0.025***	-0.018***	-0.030***	-0.018***	-0.040***	-0.025***
	(0.006)	(0.005)	(0.006)	(0.005)	(0.008)	(0.007)	(0.008)	(0.007)
MPS^{US}	-0.010***	-0.008***	-0.011***	-0.009***	-0.011***	-0.010***	-0.012***	-0.010***
	(0.003)	(0.002)	(0.003)	(0.002)	(0.003)	(0.002)	(0.003)	(0.002)
Connect	0.000	0.002	0.026***	0.017***	0.004***	-0.003*	0.032***	0.019***
	(0.001)	(0.001)	(0.003)	(0.004)	(0.001)	(0.002)	(0.004)	(0.005)
Observations	74086	35688	69374	33488	49682	41103	46597	38682
Adjusted R^2	0.391	0.398	0.402	0.408	0.472	0.395	0.483	0.401
Firm Controls	Yes	Yes	Yes	Yes	No	No	Yes	Yes
IMR	No	No	Yes	Yes	No	No	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	H0: $\beta^H = \beta^L$							
χ^2 Test	0.51		1.54		2.86*		4.08**	
P-value	0.477		0.214		0.091		0.043	

NOTE. The dependent variable is quarterly corporate investment. Panel A divides the firms into tradable and non-tradable sectors. Panel B divides the firms into two groups according to the level of foreign sales ratio, defined as the share of foreign sales to total sales, at the beginning of each year. The multinational firms are classified as foreign sales ratio larger than 0% and domestic firms are classified as no foreign sales. All standard errors are clustered at both industry and year level and reported in the parentheses. *, ** and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.