The Effect of the China Connect*

Chang Ma† John Rogers‡ Sili Zhou§

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Abstract

Liberalization improves allocative efficiency but generates volatility. In the short run, foreign capital flows lower funding costs and enhance market efficiency. Domestic investment decisions change through both a funding cost channel and a learning channel. In the long run, foreign capital flows make domestic firms more sensitive to global shocks. The "China Connect", a carefully designed partial equity market liberalization in a capital-abundant country, provides a quasi-natural policy experiment to investigate the capital inflow effects of liberalization using firm-level data. Identification is further improved by the unique Chinese environment including the trapped savings problem, significant domestic capital misallocation, and overall tight capital controls.

Keywords: Equity Market Liberalization; Quasi-Natural Policy Experiment; Market Efficiency

JEL Classification: F38; E40; E52; G15

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†Fanhai International School of Finance, Fudan University (changma@fudan.edu.cn).

‡Fanhai International School of Finance, Fudan University (johnrogers@fudan.edu.cn).

§Faculty of Business Administration, University of Macau (silizhou@um.edu.mo).

1 Introduction

Understanding the effects of globalization continues to grow in importance as events like Brexit, escalating protectionism, pandemic-induced supply chain realignments, corporate delistings, and geopolitical tensions suggest that a deglobalization in trade and financial markets is underway. For developing countries, a primary consideration related to globalization is whether to open their capital accounts to allow foreign (domestic) investors to participate in the domestic (foreign) stock market. Although this is a long-studied topic, the literature has not provided robust evidence on the macroeconomic effects of liberalization (Henry 2007, Kose, Prasad, Rogoff, and Wei 2009). There is growing consensus that stock market liberalization improves allocative efficiency and boosts investment and growth, at least for the capital-scarce, small countries that are typically the subject of investigation (Bekaert, Harvey, and Lundblad 2005, Chari and Henry 2004, 2008, Gourinchas and Jeanne 2006). Whether these benefits apply to a large *capital-abundant country* like China is an open question, however. Meanwhile, liberalization also brings costs as it exposes the country to volatile capital flows (Rey 2015, di Giovanni, Kalemli-Ozcan, Ulu, and Baskaya 2022).

In this paper, we use the launch of the "China Connect" to investigate–using firm-level data–the capital inflow effects of liberalization, including both the short-run allocative efficiency and long-run heightened volatility. The China setting provides a unique quasi-natural experiment because the liberalization allows only a subset of Chinese firms to be traded by foreign investors, while the remaining firms are left out. Moreover, the liberation did not coincide with other major economic reforms. Furthermore, the unique Chinese environment–by which we mean large trapped savings, significant domestic capital misallocation, and overall tight capital controls–allows us to better identify the channels through which foreign capital transmits to the domestic economy.

The Shanghai (Shenzhen)-Hong Kong "Stock Connect" program, the China Connect, allows investors in mainland China and Hong Kong to trade *eligible* stocks listed on the other market, with these trades working through the exchange and clearing houses in their "own" market and settled in RMB. The first wave of the Connect in Nov 2014, linking the Shanghai exchange to Hong Kong, was a major step toward internationalizing China's security markets. In Dec 2016, the program was

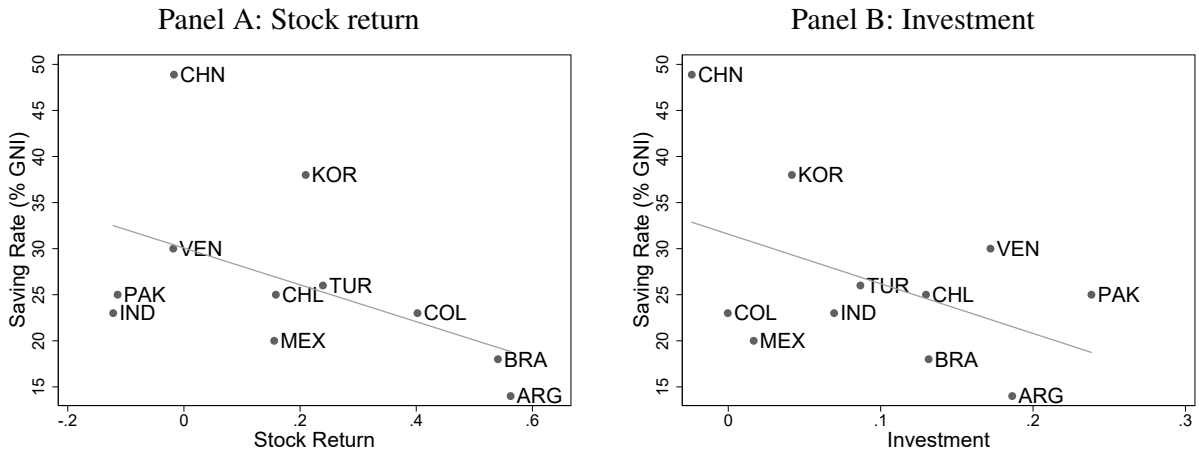
extended to the Shenzhen exchange.[1] Although the Connect is an important loosening of capital account restrictions, it is carefully designed to avoid excessively volatile capital flows (see Prasad 2017 and Song and Xiong 2018). Therefore, different from other stock market liberalizations, the China Connect provides a natural experiment to study the effects of liberalization, as it exogenously divides the Chinese mainland market into control and treatment groups.

Textbook theory suggests an allocative efficiency of liberalization by lowering funding costs, especially for capital-scarce small countries. It is unclear whether this traditional benefit applies to China (at least in *aggregate*), a very large economy/stock market with significant trapped domestic savings. Figure 1 plots national savings rates against post-liberalization changes in stock prices and investment for liberalization episodes commonly studied in the literature. For low-saving countries like Brazil and Argentina three decades ago, liberalizations brought large increases in stock prices and investment. This differs in large, capital-abundant China around the "Stock Connect". Indeed, the China Connect was launched not so much to utilize cheaper financing from global markets but to promote international usage of the RMB (Guo, Jiang, Qi, and Zhao 2020).

If capital-abundant countries cannot benefit from lower funding costs in the aggregate, why do they need foreign capital? We identify two potential benefits from liberalization. First, liberalization improves market efficiency. With Chinese asset prices being over-valued due to trapped savings and limited investment outlets (Bekaert, Ke, and Zhang 2021c), a foreign presence can make the market more efficient, especially in a retail-driven environment (Bae, Bailey, and Mao 2006, Kacperczyk, Sundaresan, and Wang 2021, Lundblad, Shi, Zhang, and Zhang 2022). When stock prices become more informative, corporate investment becomes more efficient through a learning channel. Second, the lower funding cost from liberalization can still be helpful in a capital-abundant country if the trapped domestic savings are not allocated efficiently. In the case of China, with significant capital misallocation, large and state-owned firms enjoy preferential access to capital while small and private-owned firms face significant constraints (Song, Storesletten, and

[1] Cross-boundary fund flows are cleared and settled on the net through subsidiaries set up by local exchanges and there exist daily quotas. The daily quota of trading capitalization was 13 billion RMB for the Shanghai Exchange and 10.5 billion RMB for the Hong Kong Exchange. In addition, naked short selling through the Connect is forbidden.

Figure 1 COUNTRIES WITH LOWER SAVINGS BENEFIT MORE FROM EQUITY MARKET LIBERALIZATION: STOCK RETURNS AND INVESTMENT AROUND LIBERALIZATIONS



NOTE. Panel A (B) plots gross savings as a % of GNI versus stock return (investment) adjustment around liberalization episodes, as taken from Chari and Henry 2004. We display the average monthly stock return less the pre-liberalization average for all listed firms within a country upon liberalization. We also display the average annual corporate investment less the pre-liberalization average for all listed firms within the country in the liberalization year. Firm-level data is from Worldscope. The national saving rate is from World Development Indicators. Argentina (Sep 1989), Brazil (May 1991), Chile (Oct 1989), Columbia (Dec 1991), India (Nov 1992), Korea (Jan 1992), Mexico (May 1989), Pakistan (Feb 1991), Turkey (Aug 1989) and Venezuela (Jan 1996). For China (Nov 2014).

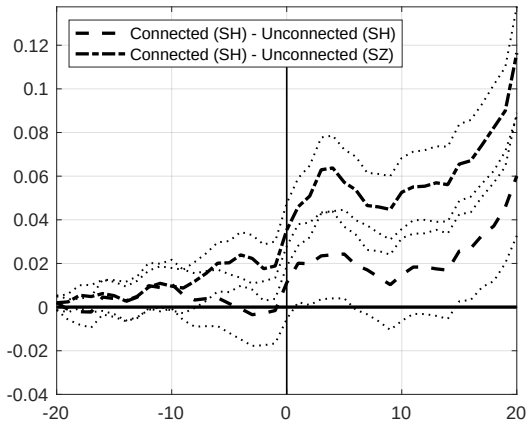
Zilibotti 2011, Liu, Spiegel, and Zhang 2021b). Different firms thus respond differently to liberalization. Liberalization can thus improve domestic allocative efficiency by improving the market mechanism and reducing domestic capital misallocation, something we formally test for China.

Because foreign capital is subject to the influence of U.S. monetary policy and other external shocks (Rey 2015), liberalization can also be costly. Existing work on this is hampered by an important identification problem: when a country liberalizes its stock market, it typically allows foreigners to trade all stocks. The China Connect liberalization allows us to identify the costs by comparing the post-liberalization effects of global shocks between connected and unconnected firms. This enhances our understanding of the effectiveness of capital flow management policy, considering that China has imposed tight capital controls to protect itself from global shocks.

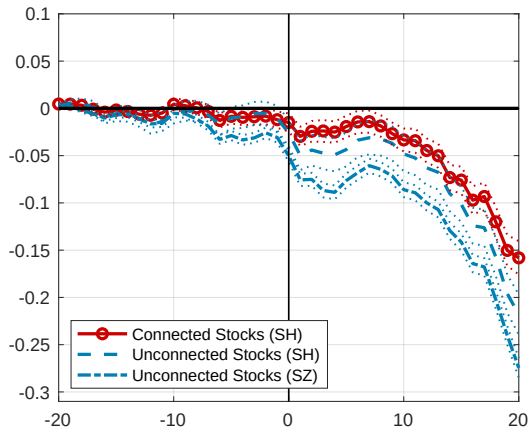
Do the benefits of liberalization outweigh the costs? We document three features of the data that point to benefits. First, we use short-term stock price responses around the formal launch of the Connect in Nov. 2014. As depicted in Figure 2, we observe a general decline in valuation

Figure 2 DAILY STOCK RETURNS AROUND THE CONNECT ANNOUNCEMENT: 10 NOV 2014

Panel A: Differential effects



Panel B: Overall effects



NOTE: Cumulative abnormal return (CAR) based on a market model centered on Nov 10, 2014 (with 95% c.i.). The estimation window is [-300, -30] and we restrict firms to have at least 100 trading days at the estimation window. Panel A plots the differences between connected stocks (SH) and unconnected stocks in Shanghai (SH) and between connected stocks (SH) and unconnected stocks in Shenzhen (SZ). Panel B plots the CAR for three different groups of stocks based on their status when the China Connect was announced.

along with a significant rise in connected stock prices relative to unconnected stocks. The magnitude of this response is comparable to previous liberalization episodes (Chari and Henry 2004). Regressions using monthly stock returns buttress these results.

Second, we find that connected stocks that have a lower covariance with the global market experience a higher price revaluation, consistent with the notion that Chinese stocks provide diversification benefits for foreign capital (Shan, Tang, Wang, and Zhang 2022). Moreover, over-valued stocks drop more, which suggests that the liberalization leads to a correction of the overvaluation in the Chinese market, improving the efficiency of capital allocation.

Finally, against the backdrop of liberalization introducing more foreign capital, we show that the Chinese stock market has become more efficient. We show that the price informativeness measures of Dávila and Parlatore (2021) rise after liberalization for connected firms relative to unconnected ones. Because the measure captures the signal about future fundamentals contained in stock prices, our results suggest that liberalization increased price efficiency. How so? We argue that the China Connect attracted more foreign-informed traders into an otherwise retail-driven mar-

ket (Lundblad, Shi, Zhang, and Zhang 2022), which then produced new information and improved corporate governance (Kacperczyk, Sundaresan, and Wang 2021, Yoon 2021). Furthermore, the China Securities Regulatory Commission and the Securities and Futures Commission of Hong Kong signed a memorandum of understanding on the China Connect in 2014 to share information and cooperate in law enforcement.[2] The improved information environment and corporate governance for connected firms make their stock prices more informative about future fundamentals.

We next explore the transmission channel of liberalization. We find that connected firms invest more than unconnected ones post-liberalization. Although the economic magnitude is moderate, it is nonetheless surprising considering that China is a large economy with excess investment. Further exploration suggests that the higher investment is driven by the more financially constrained firms such as small-sized and private-owned enterprises. Connected large and state-owned enterprises, however, did not increase their investment. Therefore, the traditional funding cost channel can still benefit capital-abundant China because it reduces existing capital misallocation between private (small) and state-owned (large) firms.

To further understand capital account liberalization, we investigate a new *learning channel*, i.e., corporate managers learning from prices when making decisions. Chinese managers actively learn from stock prices to guide real investment decisions (Goldstein, Liu, and Yang 2022). With a more informed stock price, their learning activity might lead to more efficient investment. We test this channel following Chen, Goldstein, and Jiang (2007) and find that the investment-Q sensitivity is more correlated with the price informativeness measure for connected firms post-liberalization. The results are robust in controlling for the amount of insider information and local analyst coverage, which suggests that the information contained in the stock price is new and helpful to managers. Therefore, we argue that liberalization can bring allocative efficiency to China by improving the market mechanism to signal value. This benefit, although indirect as in Kose et al. (2009), might be more important for liberalizations in capital-abundant countries.

Our final contribution on the cost-benefit front, we investigate long-run effects. The China

[2]See details at https://apps.sfc.hk/edistributionWeb/gateway/EN/news-and-announcements/news/doc?refNo=14PR127

Connect liberalization exposed some Chinese firms to the influence of global shocks, including U.S. monetary policy shocks (Rogers, Scotti, and Wright 2018), the VIX, the global financial cycle factor (Miranda-Agrippino and Rey 2020), and global risk aversion (Bekaert, Hoerova, and Xu 2021b). Using difference-in-differences estimation, we find that connected firms experience a higher sensitivity to those shocks than unconnected ones after the Connect, both in stock returns and investment. These results suggest a rather powerful transmission of global shocks post-liberalization even with the tight capital controls, consistent with Rey (2015).

We devote considerable attention to methodological concerns, which emerge from the fact that connected firms were not selected randomly, that this choice may not be orthogonal to unobserved factors that also affect firm equity returns and investment, and that the effect of the Connect may vary as a function of observed firm characteristics. This concern would be more worrisome if selection were made on a firm-by-firm basis, with firms lobbying to influence the decision. However, the selection is made by the China Securities Index Co., Ltd, monitored by the China Security Regulatory Commission. Selection follows the construction of stock indexes in the market. There is no evidence that firms can affect the index construction methodology. Nevertheless, we have carefully undertaken standard methods like propensity score matching and Heckman's corrections, as well as running a battery of robustness tests on both observables and unobservables (Altonji, Elder, and Taber 2005, Oster 2019). We conclude that our inferences concerning the effects of the China Connect are not the result of sample selection bias. We also pay careful attention to potential confounders around liberalization as suggested by McLean et al. (forthcoming) and find our documented capital inflow effects are not affected by those concerns.

Related literature We contribute to three strands of literature. First, to a large literature on the effects of stock market liberalization. This has emphasized a lower funding cost channel for liberalization in capital-scarce countries (Bekaert and Harvey 2000, Bekaert et al. 2005, Chari and Henry 2004, 2008, Quinn and Toyoda 2008, Gupta and Yuan 2009, Larrain and Stumpner 2017, Moshirian et al. 2020). Our focus is on liberalization in a capital-abundant country and the identification of a new transmission mechanism through improved market efficiency. Moreover, we show

that the traditional funding cost channel is present only for financially constrained firms, consistent with Jotikasthira, Lundblad, and Ramadorai (2013). Our analysis enriches our understanding of the overall effects of stock market liberalization. For example, Bekaert et al. (2005) document an annual 1% boost to real output growth following equity market liberalization, an effect that is larger than found elsewhere (see Henry 2007, Kose et al. 2009 for example). Considerable efforts have been made to understand the channels of these output growth effects. The learning channel through improved market efficiency could potentially help explain the large output effect.

Second, we contribute to the literature on the transmission of global shocks. A large body of work has emphasized the special role of U.S. monetary policy shocks, including recent work by Degasperi et al. (2020), Bräuning and Ivashina (2020), Bekaert et al. (2021b), Chari et al. (2021). We also investigate shocks to the VIX as in di Giovanni et al. (2022), the global financial cycle (Miranda-Agrippino and Rey 2020), and global risk aversion (Xu 2019). Differently, we focus on the increased spillover of global shocks that can be attributed to liberalization. Our results thus add to the literature on the effect of financial integration on domestic economic volatility (Bekaert et al., 2006, Levchenko et al., 2009) and the literature on the effects of capital controls policy (Rey 2015, Alfaro et al. 2017).

Third, our paper belongs to the emerging literature that investigates the effect of the China Connect. For example, Chan and Kwok (2017) and Liu, Wang, and Wei (2021a) study the asset price response to the Connect, testing risk-sharing and speculative demand hypotheses. Our paper also investigates the asset price response but focuses more on price efficiency. Our analysis is thus connected to work by Chen et al. (2019), Bian, Chan, and Shi (2020), He, Wang, and Zhu (2022), and Lundblad et al. (2022) who analyze the superior return predictability of foreign flows through the China Connect and investigate its source. Different from their work, we provide an in-depth analysis of the Connect, focusing on both its short-run real effects and long-run spillover effects.

2 Institutional background

China's two domestic stock exchanges, the Shanghai (SHSE) and Shenzhen Stock Exchange (SZSE) were established in Dec 1990 and Apr 1991, respectively. The A-share markets combined are the second largest in the world in terms of market capitalization, trailing only the U.S.. The number of listed firms has been growing since market inception, with more than 3,600 firms listed and traded. Foreign investors were traditionally restricted from trading in the A-share market. After the Asian financial crisis, the China Securities Regulatory Commission (CSRC) took a gradual and prudential approach to opening the financial markets (Song and Xiong 2018). However, most of the liberalization involves institutional investors, such as the Qualified Foreign Institutional Investor (QFII) program launched in 2002.[3] Similarly, some programs relax restrictions on domestic Chinese residents purchasing overseas stocks. The Qualified Domestic Institutional Investor (QDII) program was launched in 2006 to satisfy the long-desired diversification motive of Chinese households and businesses toward global assets.

Different from the QFII and QDII programs, which are relatively small and apply only to qualified institutional investors, the China Connect is big and includes both *institutional and retail investors*.[4] Moreover, it is a two-way liberalization, allowing investors on both sides of the markets in mainland China and Hong Kong to trade eligible stocks listed on the other market. The program was announced on Apr 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, regarded as a relatively low barrier to entering both markets.[5] The Connect was officially launched on Nov 17, 2014, with the formal participant list of stocks released on

[3] Obtaining QFII licenses was extremely difficult. In the first year, only 12 qualified foreign investors were approved and the approval ceased during 2006-07. The QFII program allows foreign investors to first convert FX into RMB and then invest in RMB-denominated assets. In contrast, the Renminbi Qualified Foreign Institutional Investors (RQFII) program introduced in 2011 allows to use offshore RMB directly. These programs, although limited in size and only targeting *qualified institutional investors*, quickly became popular as global investors diversified into China.

[4] See http://english.sse.com.cn/investors/shhkconnect/introduction/comparing.

[5] See http://www.gov.cn/xinwen/2014-04/10/content_2656483.htm and 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.

Nov 10, 2014, as detailed in Table D1. On Dec 6, 2016, the Shenzhen Stock Exchange was also connected, with the joint announcement released early on Aug 6, 2016, and the formal participant list released on Nov 25, 2016.[6] Overall, more than one thousand stocks from the mainland have become connected to overseas investors, including both value and growth stocks.

As noted above, only eligible mainland (Hong Kong) stocks can be traded by foreigners (domestic investors) through the China Connect. Regulators update the list periodically according to certain criteria, largely based on whether those stocks belong to some indexes. In the case of the Shanghai exchange, those include all the constituent stocks of the SSE 180 Index, SSE 380 Index, and all "A-H" dual-listed stocks. Once connected, 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.

The China Connect significantly increases the importance of foreign investors in the Chinese economy. For example, foreign capital in China was around $0.3 trillion (3% of the market) in 2019, less than that for domestic institutional investors, at around $1 trillion (10%), but sizable compared to other countries, e.g., $0.16 trillion (8% of the market) for India, which has a capital controls policy similar to China's (Bena, Ferreira, Matos, and Pires 2017). How might the liberalization have non-trivial effects when the share of foreign capital in the Chinese market is not huge? On the one hand, foreign inflows play the role of "smart money" in affecting asset prices because domestic institutional investors follow them (Bian et al. 2020, Lundblad et al. 2022). On the other hand, foreign inflows contain useful information that can make the stock price more informative about future fundamentals (Bae et al. 2006, 2012, Kacperczyk et al. 2021). In addition, foreigners only need to improve the general information environment and/or play the role of monitoring in the Chinese market. All these channels do not require a large size of foreign inflows. Indeed, the improved market efficiency with foreign presence is consistent with the policymakers' efforts in sharing information for connected firms when launching the Connect program. Therefore, the effect of foreign inflows is completely plausible even with the smaller size of inflows.

[6] Details in http://www.csrc.gov.cn/pub/newsite/zjhxwfb/xwdd/201608/t20160816_302227.html.

3 Hypothesis development

Stock market liberalization in a capital-abundant country is quite different from that in a capital-scarce economy, as typically examined in the literature. Equity valuations in China have been, on average, elevated rather than depressed despite attendant risks. Thus, a general valuation *decline* is more likely upon liberalization as potentially trapped savings move through Hong Kong and offshore for diversification purposes. Furthermore, foreign presence in the mainland market might make it more efficient in an otherwise retail-driven setting. Taken together, one might expect asset prices to adjust downward after the Connect, especially for over-valued stocks based on global comparables. In addition to this short-run effect, liberalization can bring in more volatility. It is thus unclear how stock prices respond to liberalization initially. We expect connected stocks to fall less (rise more) than unconnected ones assuming that liberalization generates net benefits.

Hypothesis 1. *Liberalization in capital-abundant countries results in a fall in asset prices, less so for connected stocks and more so for over-valued stocks.*

Given the two-way nature of the China Connect, we expect on the one hand that more foreign capital will flow into connected stocks, which leads to higher stock prices than unconnected ones. If foreign investors purchase Chinese stocks for their own diversification purposes, one should expect an even higher connected stock price response for those with a lower covariance term with the global market, i.e. $\sigma^{i,W}$. Furthermore, there is also a spillover effect from more foreign capital purchasing connected stocks on unconnected ones, captured by the covariance term $\sigma^{i,C}$. The intuition is as follows. When foreign investors buy connected stocks, domestic investors have to sell as the short-run supply of connected stocks is fixed. Domestic investors tend to rebalance from connected stocks to unconnected ones, especially those with a higher covariance term with the connected stocks. We have a simple model in Appendix C to formally illustrate these predictions.

Stock prices can also respond to Chinese residents having a chance to invest in the Hong Kong market, a negative common capital outflow effect. Our simple model predicts that this capital outflow effect will be stronger for those firms with a higher covariance term with the Hong Kong

market, i.e. $\sigma^{i,HK}$. This is under the assumption that Chinese investors rebalance from Chinese stocks to Hong Kong stocks for their own diversification purposes. Indeed, the capital outflow effect can be much stronger than what the model predicts, especially if magnified by people's expectations of further liberalization following the Connect. Estimating those capital outflow effects is important yet challenging as it behaves as a negative common effect to all stocks.

In addition to the price effects of liberalization, one could also expect that the market becomes more efficient, in the sense that prices better reflect value. Foreign investors have started to become more important in the Chinese stock market, even if it is still a retail-driven market. As most foreign investors are institutional and informed, their presence can increase the price informativeness of Chinese stocks, especially connected ones.

Hypothesis 2. *Liberalization introduces more foreign investors in the Chinese stock market, which increases the price efficiency of connected stocks more than unconnected ones.*

Even though the China Connect is about stock market liberalization, there could also be real effects (Bond et al. 2012). On the one hand, stock prices adjust to a new equilibrium level upon liberalization. If this changes funding costs (or discount rates), one might expect corporate investment to change accordingly. This is the traditional funding cost channel emphasized in the previous literature (Chari and Henry 2008). In the case of China, capital investment is *too large*, at least in the aggregate, and is distorted by political influence and capital misallocation. It is thus unclear whether the funding cost channel is important at the aggregate level. Nevertheless, some smaller, private firms may benefit from the funding cost channel given that they are more financially constrained. On the other hand, stock price changes can affect corporate investment decisions through a learning channel (Chen et al. 2007). With improved market efficiency from liberalization, corporate investment can change as managers learn from stock prices. In the case of China, Goldstein et al. (2022) surveyed top managers in Chinese listed firms and found that those managers indeed monitor the stock market to learn information to guide real investment decisions and to access external financing.

Hypothesis 3. *Liberalization changes investment through both a traditional funding cost channel for financially constrained firms and a new learning channel via improved market efficiency.*

In addition to the short-run effects of liberalization, the Connect program may make global shocks more easily transmitted to China (Henry 2007, Jotikasthira et al. 2012). This could come from a portfolio rebalancing of foreign investors. As the liberalization allows foreign investors to trade Chinese stocks more easily, connected firms will experience additional exposure to global shocks in both stock prices and corporate investment.

Hypothesis 4. *Liberalization brings in long-run extra volatility, making connected firms more sensitive to global shocks than unconnected ones in both stock returns and corporate investment.*

In sum, we study both the short-run and long-run effects of liberalization using the China Connect as a quasi-natural experiment. For the former, as it is by nature "short-run", we focus on a short window around the 2014 announcement, ruling out expectations of future inclusion in the Connect. No Shenzhen stocks became connected at that time.[7] For the long-run sensitivity to global shocks, we combine both the Shanghai and Shenzhen waves. In this analysis, expectations considerations are not as concerning because the hypothesized channel is through foreigners' portfolio rebalancing. What matters for them is whether the Chinese stock is in the Connect program.

4 Data

Our dataset has two parts. First is information on Chinese listed firms. For firm-level accounting information, we use the China Stock Market and Accounting Research (CSMAR) Database. For return information, we use WIND, the largest financial data provider in China. For Chinese macro-level information, we use the CEIC dataset and WIND. We also collect data on measures of global shocks. Detailed construction information is in Appendix A.

Our sample starts when all A-share stocks were traded on the Shanghai and Shenzhen Exchanges. As is conventional, we drop financial and utility firms since they share different disclo-

[7] We check robustness on the short-run effects of the 2016 Connect announcement in Appendix G.

sure regulations and their liquidity positions are special compared with firms in other sectors. We also require firms to have at least two years of historical data. We exclude firms listed after 2014 to abstract from new IPOs. Our sample runs from 2003-19, with the beginning chosen to reflect when the CSRC required all listed firms to file quarterly financial reports.[8] We drop observations with missing key values such as investment, Tobin's Q, cash flow, etc..

Stock prices We focus on actively traded A-share stocks. Prices are dividend-inclusive and RMB-denominated. Monthly (daily) returns are constructed as the log difference in the closing price each month (day). We also construct three different measures of individual firms' covariance term: covariance with domestic connected stocks portfolio $\sigma^{i,C}$, Hong Kong eligible stocks portfolio $\sigma^{i,HK}$ and global markets $\sigma^{i,W}$. We use the equal-weighted return of the Shanghai SSE 180 and SSE 380 index as a proxy for the domestic connected stocks portfolio before 2016. We add the Shenzhen SZSE Component Index and Small and ChiNext Index after Dec 2016 when the Shenzhen market became connected. For Hong Kong-eligible stocks, we use the average return of the Hang Seng Composite Large Cap and Mid Cap Index.[9] For the global market, we use the RMB-denominated MSCI World Total Return Index. For all covariances, we use historical 36-month rolling windows.

Firm investment Our corporate investment variable is constructed using capital expenditures divided by the 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.[10] We also include other standard variables widely used in the investment-Q specification such as 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 the 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

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

[9] Stocks in the Hang Seng Composite Small Cap Index with a market capitalization of no less than HKD 5 billion are also eligible after Dec 2016. The results remain unchanged if we consider that addition.

[10] 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.

and taxes scaled by lagged total assets; and Sales growth, defined as the growth rate of revenue.

Global shocks We collect a large set of global shocks widely used in the literature, including a U.S. monetary policy shock (MPS^{US}), constructed by Rogers et al. (2018), a VIX index (in logs), the global financial cycle factor constructed by Miranda-Agrippino and Rey (2020), and a global risk aversion index constructed by Bekaert et al. (2021a). The U.S. monetary policy shock is a high-frequency surprise series, measuring changes in yields from 15 minutes before the FOMC announcement to 30 minutes afterward.[11] We thus aggregate MPS^{US} within each month (quarter) using a simple sum of the surprises that occur each period. For the other three shocks, we simply take either the monthly or quarterly frequency data to match with our sample (Table D2).

Summary statistics Table D3 reports summary statistics used in both monthly stock price and quarterly investment regressions. As is conventional, we winsorize our sample at the top and bottom 1% of all continuous variables to mitigate outliers. The average monthly return is 5.5% in Nov 2014 for all firms. Unsurprisingly, firms have a higher covariance with connected stocks $\sigma^{i,C}$, followed by the covariance with Hong Kong $\sigma^{i,HK}$ and lowest with the world market $\sigma^{i,W}$. The low covariance with the world market suggests that global investors can have a higher diversification benefit by investing in China (Shan et al. 2022). We also show a correlation table in Table D4. Those three covariance terms are correlated, in particular for $\sigma^{i,W}$ and $\sigma^{i,HK}$. Moreover, those covariance terms are both negatively correlated with market cap. Quarterly capital expenditure is 3.2% on average, with a standard deviation of 4.0%.[12] Tobin's Q is 2.5 on average with a standard deviation of 1.7. Size is 21.9 on average with a standard deviation of 1.3. The mean of cash flow is 3.5% with a standard deviation of 4.3%. Sales growth is 0.21 on average with a standard deviation of 0.54. All statistics are consistent with previous studies on China (e.g., Cao et al. 2016).

Connected and unconnected firms Table D5 compares ex-ante differences between connected

[11] The series is a combination of three surprises: Target Fed Funds rate surprises, which were zero between Dec 2008 and Dec 2015; Forward Guidance surprises; and Large Scale Asset Purchase surprises (zero before QE1). The series also includes a handful of inter-meeting announcements. See the original paper for the underlying data and details on the construction of the surprises. We use the Eastern U.S. time zone, a half-day behind China. This is not an issue for our analysis of quarterly data.

[12] For comparison, in Ottonello and Winberry (2020), they report that the U.S. quarterly investment rate is about 0.5% on average with a standard deviation of 9.3%.

and unconnected firms, one period before the Connect. Consistent with the purpose of index stocks, firms that would eventually become connected are larger and have lower return volatility. We account for the effect of these differences in Section 5.3.

Ownership structure We define state-owned enterprises as firms whose ultimate owner or block holder is a government-related entity. It should be noted that the ownership structure might change periodically. We construct a dummy variable for state-owned enterprises to reflect such changes. In our firm-quarter observations (2003-19), 49% of firms are state-owned enterprises. The first wave of the Connect in Nov 2014 mainly involved state-owned enterprises. For example, 430 out of 559 connected stocks are SOE (77%) compared with 595 out of 1847 unconnected stocks being SOE (32%). In the second wave, 870 stocks were newly connected, of which only 294 were SOE (34%) (see Table D1). Table D6 presents the differences between private-owned enterprises and state-owned enterprises. Compared to POEs, SOEs have a lower investment rate, larger firm size, and a lower Tobin's Q, consistent with the literature (Song et al. 2011).

5 Short-run effects of the Connect

5.1 Stock price adjustment with improved market efficiency

We test the short-run effects of liberalization using an event-study approach to examine stock price changes around the launch of the China Connect. We look at both the announcement effect and monthly adjustment. In this way, we test the first hypothesis, focusing on the cross-sectional differences in connected and unconnected stocks. We also test the second hypothesis on market efficiency using price informativeness measures.

Announcement effects

Stock prices are forward-looking and their adjustments should incorporate relevant information about the effects of liberalization. There are two big waves of the Connect, and we expect the first wave in Shanghai to have a stronger effect than the second one in Shenzhen. Connecting

Shanghai to Hong Kong surely gave investors expectations of a future liberalization in Shenzhen, and stock prices might have reflected those expectations well before Shenzhen was connected.[13] The Shanghai Connect program was first announced on Apr 10, 2014. On Nov 10, 2014, the program and the specific list of eligible stocks were formally confirmed (Liu et al. 2021a). We look at the response of both connected and unconnected stocks to infer the liberalization benefits.

Panel A of Figure 2 plots the difference in market-model-based cumulative abnormal returns between connected and unconnected stocks in the announcement window (trading days [-20, 20]) centered on Nov 10, 2014. Consistent with our prior, liberalization brings in net benefits. Upon the announcement, connected stocks experienced a significant appreciation compared to unconnected ones due to more access to foreign capital. Compared with Shanghai unconnected stocks, connected stocks experience nearly a 2% rise in abnormal returns initially and a persistent rise to 5% even after 20 days. Compared with Shenzhen unconnected stocks, the effects are even more pronounced, with an initial rise of 4% and a persistent increase to 10% after 20 days. This is reasonable as the first wave of the China Connect did not include stocks in Shenzhen. These positive capital inflow effects of liberalization are consistent with previous literature.

Foreign presence can also lead to a valuation decline as Chinese stocks are over-valued. To assess this, we look separately at both connected and unconnected stocks in Panel B. Indeed, stock prices fall upon the announcement of the Connect. The fall starts even before announcement day but becomes more dramatic afterward, even more so five trading days after the announcement day (Nov 17, 2014) when the program was formally launched.[14] Economically, the overall effects are large and persistent, around -2% initially for the connected stocks and up to -20% after 20 days.

[13] Further complicating analysis of the Shenzhen Connect, there are four groups of stocks in the market once Shenzhen is liberalized: old connected Shanghai Stocks, old unconnected Shanghai Stocks but indirectly affected by the Shanghai Connect, newly connected Shenzhen stocks, and unconnected Shenzhen stocks. Exploring the Shenzhen wave is thus more challenging and results should be read with caution. We display results for the Shenzhen Connect announcement separately in Appendix G. We find that both the magnitude and persistence of the Shenzhen wave are weaker, as investors already anticipate that the Connect program will be extended to Shenzhen.

[14] Notice that there are significant variations before and after announcement day. This is likely because the market had to digest a lot of news related to the China Connect. Moreover, there was information leakage as to when the program would be announced to launch. All such events should affect stock price responses. We have compiled those related events in Figure E2. Even though the fall in stock price starts before day 0 because of information leakage, the price falls more afterward, which suggests that the additional information on announcement day is still meaningful and incorporated into stock prices.

For unconnected stocks, the negative effects are even more pronounced, initially -3% (-6%) for Shanghai (Shenzhen) unconnected stocks and up to -25% (-30%) after 20 days.[15]

The announcement analysis confirms our first hypothesis. Liberalization in a capital-abundant country leads to an overall decline in asset prices. This could come from a more efficient market environment due to the foreign presence. Nevertheless, liberalization generates net benefits to connected stocks, again due to more access to foreign capital. Both effects belong to the capital inflow effects of liberalization, which will be formally tested.

The overall decline in asset prices could also come from a capital outflow effect: because the program allows trapped savings to move to Hong Kong more easily for diversification purposes, domestic stock prices decline. Completely identifying the capital outflow effect is challenging as the China Connect belongs to ongoing policy efforts to relax capital outflows in China and investors might view the launch of the Connect as a signal of further liberalization. Different from the capital inflow effects that can be identified through the design of policy experiment, the identification of capital outflow effects might be subject to numerous confounding factors.

Does the same concern threaten our identification of the capital inflow effects? Our answer is no. We list several potential confounding factors (additional policy changes) in Table B1. Unlike the Connect program, none of them differentiated between connected and unconnected stocks. As a smell test, we estimate stock price responses (7-day cumulative abnormal returns CAR [-3, +3] based on a market model) to those policies in Table 1 and compare them to the estimated effects of the China Connect policy shock. If any of the policy changes affected connected and unconnected stocks differently, we would detect it through this event-window analysis. Table 1 shows that connected and unconnected stocks respond differently *only to the China Connect announcement*.

[15] One should interpret with caution the standard event window results when it comes to the negative common effect on both connected and unconnected stocks. The China Connect affects the whole Chinese A-share market and thus the market factor that is used to calculate the cumulative abnormal return (CAR). In our later regression analysis, we confirm that the whole Chinese A-share market likely experienced a negative common effect when compared with other international stocks. For robustness, we also calculate the CAR using a global market model where the global market return is more immune from the effect of China Connect. We find that the negative common effect indeed is milder but the differential effect stays at the same magnitude. See Figure E1 for an illustration.

Table 1 STOCK MARKET RESPONSE TO CONTEMPORANEOUS POLICY CHANGES IN 2014

Event dates	10-Jan	19-Feb	12-May	11-Jun	4-Jul	26-Sep	1-Nov	**China Connect**	27-Dec
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Connect	-0.003	-0.006	0.002	-0.004	-0.007	-0.006	0.006	0.026***	0.005
	(0.004)	(0.005)	(0.004)	(0.005)	(0.005)	(0.004)	(0.005)	(0.005)	(0.004)
B/M	0.008	0.002	0.007	0.002	-0.004	0.001	0.014*	0.012**	0.008
	(0.007)	(0.005)	(0.007)	(0.007)	(0.004)	(0.005)	(0.008)	(0.006)	(0.008)
Leverage	0.012	0.038**	0.062***	0.051***	0.053***	0.022**	0.024***	0.024***	0.041***
	(0.015)	(0.019)	(0.012)	(0.014)	(0.015)	(0.009)	(0.008)	(0.008)	(0.007)
Size	-0.009***	-0.023***	-0.018***	-0.018***	-0.019***	-0.018***	-0.020***	-0.010***	-0.005**
	(0.003)	(0.003)	(0.003)	(0.004)	(0.004)	(0.003)	(0.003)	(0.003)	(0.003)
ROA	-0.028	0.000	-0.001**	0.000	-0.000	0.000**	-0.000	0.000**	0.001***
	(0.051)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Turnover	0.814**	0.403	-0.711***	-0.059	0.039	-0.303	-0.253	-0.740***	-0.825***
	(0.321)	(0.314)	(0.273)	(0.295)	(0.380)	(0.270)	(0.235)	(0.245)	(0.224)
Volatility	-0.483***	-0.577***	-0.494***	-0.596**	-2.416***	-2.183***	-2.079***	-0.935***	-2.287***
	(0.035)	(0.054)	(0.131)	(0.243)	(0.528)	(0.356)	(0.289)	(0.345)	(0.338)
Amihud	56.538	-10.104	-48.363	15.5	-12.372	-77.037	-79.038	-54.508	-3.540
	(47.586)	(37.532)	(41.189)	(52.064)	(56.139)	(60.012)	(82.529)	(80.911)	(49.263)
Buy-hold-return	0.038	0.033	-0.004	0.066**	-0.045	-0.026	-0.053***	-0.053***	-0.019
	(0.024)	(0.024)	(0.027)	(0.027)	(0.035)	(0.019)	(0.016)	(0.016)	(0.015)
Constant	0.194**	0.527***	0.379***	0.402***	0.481***	0.481***	0.475***	0.212***	0.108*
	(0.079)	(0.075)	(0.079)	(0.086)	(0.080)	(0.071)	(0.075)	(0.075)	(0.060)
Observations	2075	2076	2077	2077	2110	2120	2123	2123	2123
Adjusted R^2	0.106	0.12	0.122	0.077	0.086	0.071	0.125	0.101	0.166
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

NOTE. The dependent variable is a 7-day cumulative abnormal return based on a market model centered on the event date. Event dates mark the changes in Chinese capital control policy in 2014 as documented in Table B1. The connect dummy is an indicator for eligible stocks in the Connect program. We add firm-level controls including B/M (book-to-market ratio), leverage, size, ROA, turnover, volatility, Amihud illiquidity measure, and Buy-and-hold return. We also include industry-fixed effects. Robust standard errors clustered at the firm level are reported in parentheses. *, ** and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

Monthly stock prices

The announcement effect results confirm our priors on liberalization. However, because it might take time for stock prices to incorporate new information about additional foreign presence in the market, we look at monthly stock return adjustment around Nov. 2014 and ask: Do connected firms experience a positive price revaluation? Do all Chinese firms experience a negative common shock and more so for over-valued stocks? We estimate the following regressions to test Hypotheses 1.

$$\Delta ln(\text{Stock Price}_i[0]) = \alpha + \left(\beta_1 + \beta_2 * \sigma^{i,W}\right) * \text{Connect}_i + \beta_3 \sigma^{i,C} + \beta_4 \sigma^{i,HK} + \beta_5 Z_i + \varepsilon_i \quad (1)$$

where the dependent variable is $\Delta ln(\text{Stock Price}_i[0])$, i.e. the month "0" unexpected stock price change in Nov 2014. Following Chari and Henry (2004), we define the unexpected stock price

Table 2 STOCK PRICE REVALUATION AROUND THE CONNECT: NOV 2014

	Month [0]				Month [0, 1]			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Connect	0.033***	0.019***	0.017***	0.014	0.134***	0.093***	0.080***	0.115***
	(0.004)	(0.006)	(0.006)	(0.011)	(0.010)	(0.012)	(0.013)	(0.022)
$\sigma^{i,C}$		0.056***	0.058***	0.056***		0.139**	0.154**	0.140**
		(0.021)	(0.022)	(0.021)		(0.060)	(0.064)	(0.061)
Connect* $\sigma^{i,W}$		-0.022*	-0.019	-0.022*		-0.086***	-0.080***	-0.079***
		(0.012)	(0.012)	(0.012)		(0.025)	(0.027)	(0.025)
$\sigma^{i,HK}$		0.002	0.002	0.002		0.036	0.034	0.039
		(0.018)	(0.019)	(0.018)		(0.049)	(0.053)	(0.050)
$\sigma^{i,W}$		0.008	0.009	0.007		-0.012	-0.005	-0.019
		(0.010)	(0.010)	(0.010)		(0.022)	(0.024)	(0.023)
Market cap*Connect			0.091***				0.521***	
			(0.032)				(0.078)	
Market cap*Unconnect			0.034*				0.200***	
			(0.020)				(0.034)	
Turnover*Connect				0.918**				1.769***
				(0.362)				(0.568)
Turnover*Unconnect				0.752***				2.820***
				(0.274)				(0.446)
Market cap	0.053***	0.052***			0.278***	0.272***		
	(0.018)	(0.018)			(0.032)	(0.030)		
Turnover	1.081***	0.856***			3.348***	2.644***		
	(0.249)	(0.242)			(0.352)	(0.373)		
Volatility	5.066***	4.937***	5.606***	5.103***	4.627***	3.484***	5.053***	4.377***
	(0.666)	(0.645)	(0.593)	(0.634)	(0.536)	(0.550)	(0.636)	(0.570)
Domestic fund share	-0.002***	-0.001***	-0.001***	-0.001***	-0.004***	-0.002***	-0.001**	0.001
	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)
QFII share	0.002*	0.002	0.002	0.002	0.004*	0.004	0.002	0.006
	(0.001)	(0.001)	(0.001)	(0.001)	(0.003)	(0.003)	(0.002)	(0.005)
Sales growth [+1]	0.008	0.006	0.005	0.007	-0.007	-0.009	-0.012	-0.005
	(0.006)	(0.006)	(0.006)	(0.006)	(0.009)	(0.008)	(0.008)	(0.008)
Constant	-0.096***	-0.048**	-0.043**	-0.046**	-0.277***	-0.113***	-0.085**	-0.128***
	(0.013)	(0.019)	(0.020)	(0.020)	(0.017)	(0.040)	(0.041)	(0.041)
Observations	2044	2044	2044	2044	2006	2006	2006	2006
Adjusted R^2	0.261	0.301	0.294	0.297	0.285	0.358	0.338	0.329

NOTE. The dependent variable is the cumulative log stock return (adjusted for pre-liberalization mean) around the China Connect in Nov 2014. Time 0 means the month of Nov 2014. Columns (1)-(4) use the month 0 while Columns (5)-(8) use the month of Nov and Dec. The independent variables are a connect (unconnect) dummy variable for those (in)eligible stocks for foreign investors, $\sigma^{i,HK}$ (covariance term with Hong Kong eligible stocks for domestic investors), $\sigma^{i,W}$ (covariance term with world market), $\sigma^{i,C}$ (covariance term with domestic connected stocks), market cap, turnover, volatility, domestic fund share, QFII share and future sales growth (adjusted for pre-liberalization average). We standardized all the covariance terms. Robust standard errors clustered at the firm level are reported in parentheses. *, ** and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively. All variable constructions are in Appendix A.

change for a firm i in the liberalization month as its monthly return minus its average pre-liberalization monthly return. This unexpected monthly return should incorporate news from the liberalization. Accordingly, we also look at the cumulative unexpected change in months [0, +1]. In the regression, the key independent variable is a Connect dummy that flags the eligible stocks for foreign investors. We also include firm-level variables such as $\sigma^{i,W}$ (covariance term with the global market), $\sigma^{i,C}$ (covariance term with the portfolio of connected stocks), $\sigma^{i,HK}$ (covariance term with the portfolio of Hong Kong eligible stocks for domestic investors), market capitalization, turnover ratio, volatility, shares held by domestic funds, shares held by QFII investors and future sales growth (minus its pre-liberalization average level). To facilitate comparison, we standardize all covariance terms. Controlling future sales growth is important as it measures cash flow news, thus leaving the price change a signal for discount rate news. Standard errors are clustered at the firm level.[16]

We expect connected firms to have a larger price revaluation than unconnected ones due to more foreign capital, i.e. $\beta_1 > 0$. If global investors purchase connected stocks for diversification purposes, one expects them to buy stocks less correlated with the global market, i.e. $\beta_2 < 0$. Table 2 confirms our prior. The total positive effect on connected stocks relative to unconnected stocks is very robust and economically sizable, as captured by the coefficient on the connect dummy in columns (1) and (5). In the liberalization month, connected stock prices rose by 3.3% relative to unconnected stocks and rose to 13.4% cumulatively in two months, compared with an average monthly return of 5.5% in Nov 2014. The price revaluation is comparable to those in previous liberalization episodes like Chari and Henry (2004), which documents a 6% price difference between eligible and ineligible stocks.

We also find evidence that the effect on connected stocks depends on their covariance term with the global market. Our estimates indicate that two connected firms with one standard deviation different $\sigma^{i,W}$ experience a 2.2% price difference in addition to the average 1.9% common effect once included in the program (column (2)). Such a cross-sectional difference in $\sigma^{i,W}$ from liberalization is consistent with the notion that the diversification motive into the Chinese market

[16] We also cluster the standard errors at the industry level in Table E1. The results are robust.

from global investors is strong (Shan et al. 2022).

When more foreign capital flows into China for connected stocks, it also affects unconnected stocks through portfolio rebalancing. Domestic investors have to sell connected stocks to foreigners and thus rebalance towards unconnected stocks. Our theory in Appendix C suggests that this portfolio rebalancing on unconnected stocks is positively correlated with $\sigma^{i,C}$, implying that $\beta_3 > 0$. Columns (2) and (6) confirm the effect on unconnected stocks. Note that this positive effect of liberalization on unconnected stocks is qualitatively different from findings in the previous literature. For example, Chari and Henry (2004) also finds a positive effect on unconnected stocks due to a change in the risk-free rate affecting all stocks. In the case of China, there is virtually no change in the risk-free rate, as capital controls remain tight.

Following Chari and Henry (2004), we also control for the effect of firm size and turnover in columns (3), (4), (7), and (8). These specifications address the concern that price pressure from more demand might explain the positive effects of the China Connect. We find that larger firms experience a larger price revaluation once connected. Similarly, firms with higher liquidity (turnover) also experience a higher price evaluation. Adding those terms dwarfs the coefficient on the Connect dummy. Nonetheless, the baseline effects are robust.

The constant term α captures the average effects of the China Connect on all stock, which is significantly negative in all specifications, consistent with the message from the announcement effect in Figure 2.[17] We also compare all Chinese stocks with other international stocks in Appendix F and find that the negative effect of liberalization is robust.

We interpret the overall valuation decline as a capital inflow effect of liberalization: more foreign investors make the market environment more efficient. Chinese stocks were over-valued before liberalization due to the trapped savings and limited investment outlets (a famous example is the long-standing A-H premium). Prices of many assets, including equities, are larger than

[17] Because the China Connect is a two-way liberalization, one may also want to test the effect of locals having more diversification opportunities on the mainland market. Specifically, when it occurs, all mainland stocks should fall due to portfolio rebalancing, as illustrated by our simple model in Appendix C. In particular, stocks with a higher covariance term with Hong Kong eligible stocks, $\sigma^{i,HK}$, should fall more, i.e., $\beta_4 < 0$. Unfortunately, we did not find support for this channel. The coefficient on $\sigma^{i,HK}$ is insignificantly positive in all specifications. This suggests a rather limited effect on domestic stock prices from the locals' diversification towards Hong Kong.

might be expected based on global comparables, the opposite problem from the usual narrative in previous liberalization episodes. Foreign presence might make prices fall.

We test this hypothesis using cross-sectional variation that captures whether Chinese stocks are over-valued. Specifically, we define a sector-level earnings yield difference between China and the U.S. as in Bekaert et al. (2021c), i.e. Earnings yields$^{CH/US}$ $\equiv$ Earnings yields$^{\text{China}}$ $-$ Earnings yields$^{\text{US}}$, where Earnings yields$^{\text{China}}$ (Earnings yields$^{\text{US}}$) is the earnings yield at the sector level for China (U.S.). We expect that firms in a relatively high P/E ratio industry (compared to the U.S.) experience a larger price decline when the China Connect is launched. As earnings yields are the inverse of P/E ratios, the coefficient on Earnings yields$^{CH/US}$ should be positive.

Table 3 presents the results. The coefficient on earnings yields$^{CH/US}$ is significantly positive, indicating that the China Connect lowers stock prices for firms in a high P/E ratio (low earnings yields) industry. Economically, stocks in a more over-valued Chinese industry (25^{th} percentile of Earnings yields$^{CH/US}$, i.e. -3%) experienced a 0.7%(=0.346*2%) price decline (based on column (2)) compared to a less over-valued one (75^{th} percentile of Earnings yields$^{CH/US}$, i.e. -1%). Moreover, the effects are stronger for connected stocks (0.8%=0.394*2% from column (2)), as seen from the positive coefficient on the interaction term between Connect and Earnings yields$^{CH/US}$. The stock price response suggests that the liberalization leads to a correction of the overvaluation in the Chinese market. The effect is even stronger for connected stocks, suggesting that foreign presence is beneficial for overall market efficiency, as we formally test below.

Improved market efficiency

After the launch of the Connect, stock market might become more efficient and prices better reflect value. To test this hypothesis, we construct both the market- and firm-level price informativeness measures following the literature and investigate their responses to liberalization.

Our first approach is to construct a *market-level* price informativeness measure (*BPS* henceforth) as in Bai, Philippon, and Savov (2016) and Carpenter, Lu, and Whitelaw (2020). The idea is

Table 3 EXPLORING THE PRICE ADJUSTMENTS: EARNINGS YIELDS

	Month[0]		Month[0, 1]	
	(1)	(2)	(3)	(4)
Connect	0.031***	0.035***	0.128***	0.131***
	(0.004)	(0.005)	(0.009)	(0.010)
Earnings yields$^{CH/US}$	0.446***	0.346***	1.412***	1.331***
	(0.082)	(0.093)	(0.166)	(0.192)
Connect*Earnings yields$^{CH/US}$		0.394**		0.313
		(0.192)		(0.380)
Market cap	0.058***	0.056***	0.289***	0.287***
	(0.018)	(0.018)	(0.030)	(0.031)
Turnover	1.100***	1.113***	3.384***	3.399***
	(0.249)	(0.249)	(0.351)	(0.351)
Volatility	5.132***	5.107***	4.632***	4.614***
	(0.670)	(0.670)	(0.530)	(0.528)
Domestic fund share	-0.002***	-0.002***	-0.003***	-0.003***
	(0.000)	(0.000)	(0.001)	(0.001)
QFII share	0.002**	0.001**	0.003**	0.003**
	(0.001)	(0.001)	(0.002)	(0.002)
Sales growth [+1]	0.007	0.007	-0.006	-0.006
	(0.006)	(0.006)	(0.009)	(0.009)
Constant	-0.092***	-0.093***	-0.259***	-0.260***
	(0.013)	(0.013)	(0.017)	(0.017)
Observations	2028	2028	1993	1993
Adjusted R^2	0.273	0.274	0.309	0.309

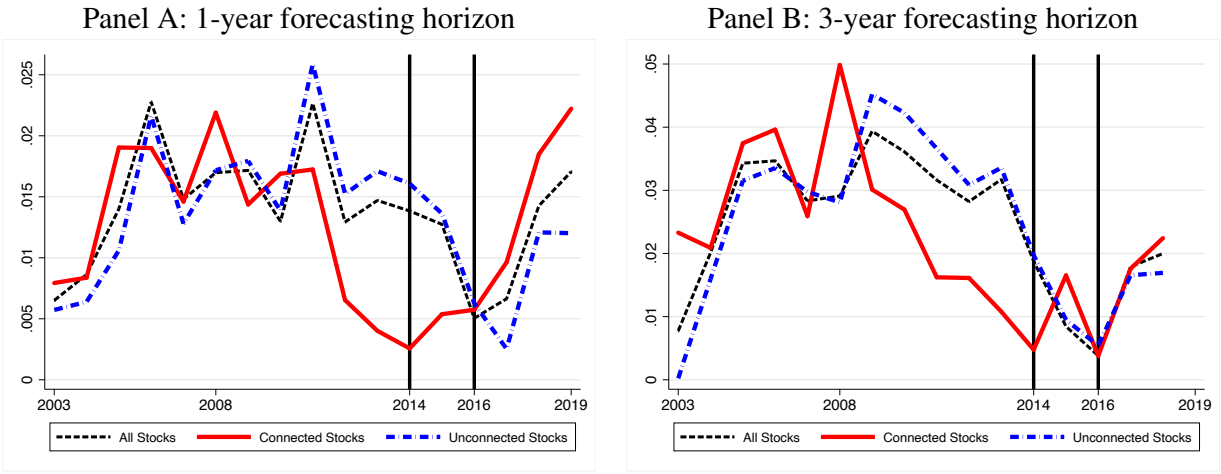
NOTE. The dependent variable is the cumulative log stock return (adjusted for pre-liberalization mean) around the China Connect in Nov 2014. Time 0 means the month of Nov 2014. Columns (1)-(2) use the monthly return of Nov while Columns (3)-(4) use the cumulative monthly return from Nov to Dec. The independent variables are a dummy variable for eligible stocks, the sector-level earnings yield difference between China and the U.S., market cap, turnover, volatility, domestic fund share, QFII share, and future sales growth (adjusted for pre-liberalization average). Robust standard errors clustered at the firm level are reported in parentheses. *, ** and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively. All variable constructions are reported in Appendix A.

to run a cross-sectional regression between future earnings and current prices.

$$\frac{E_{i,t+h}}{A_{i,t}} = a_t + b_t \times \log\left(\frac{M_{i,t}}{A_{i,t}}\right) + c_t \times \log\left(\frac{E_{i,t}}{A_{i,t}}\right) + d_t^s \times \mathbb{1}_{i,t}^s + \varepsilon_{i,t+h} \tag{2}$$

where h is the forecasting horizon, $E_{i,t}$ is the net profit for firm i at year t, $A_{i,t}$ is total asset, $M_{i,t}$ is the market value of the firm and $\mathbb{1}_{i,t}^s$ is a sector indicator to control for industry effects. All variables are deflated using the GDP deflator.

Figure 3 PRICE INFORMATIVENESS ABOUT FUTURE PROFIT



NOTE. Figure shows the predicted variation $b_t \times \sigma_t \left[\log\left(\frac{M_{i,t}}{A_{i,t}}\right)\right]$ from annual cross-sectional regressions as in Bai et al. (2016) and Carpenter et al. (2020), i.e.,

$$\frac{E_{i,t+h}}{A_{i,t}} = a_t + b_t \times \log\left(\frac{M_{i,t}}{A_{i,t}}\right) + c_t \times \log\left(\frac{E_{i,t}}{A_{i,t}}\right) + d_t^s \times \mathbb{1}_{i,t}^s + \varepsilon_{i,t+h},$$

where $E_{i,t}$ is the net profit for firm i at year t, $A_{i,t}$ is total asset, $M_{i,t}$ is the market value of the firm and $\mathbb{1}_{i,t}^s$ is a sector indicator to control for industry effects. All variables are deflated using the GDP deflator. Panel A shows the forecasting horizon $h = 1$ and Panel B shows the forecasting horizon $h = 3$. We estimate the cross-sectional regressions for all stocks, connected stocks, and unconnected stocks respectively year by year over the period 2003 to 2019. The estimation for Panel B ends in 2018 due to data availability.

The *BPS* measure is then constructed by the predicted variation $b_t \times \sigma_t \left[\log\left(\frac{M_{i,t}}{A_{i,t}}\right)\right]$ for each year t, where $\sigma_t(\cdot)$ is the cross-sectional standard deviation. To get a *BPS* measure for connected and unconnected stocks respectively, we conduct the cross-sectional regression (2) for all stocks, connected stocks, and unconnected stocks separately, year by year over the period 2003 to 2019. We analyze 1-year and 3-year forecasting horizons, as seen in Figure 3.

The *BPS* price informativeness measures occasionally move up and down. Importantly, the measure for the connected stocks increased after 2014, consistent with the prior that the China Connect improves price efficiency for connected stocks. At the same time, the measures for unconnected stocks decreased.[18] This pattern holds for both the 1-year and 3-year forecasting horizons.

[18]There is a secular decline in price informativeness for connected stocks before 2014. We are agnostic about the reason. One potential explanation is due to the decline of price efficiency for state-owned enterprises after the post-crisis stimulus (Carpenter et al. 2020) and most of the connected stocks are state-owned enterprises.

In 2016 when the China Connect further extended to the Shenzhen market, price efficiency further increased for connected stocks. For unconnected stocks, the efficiency measure also rises in the 3-year forecasting horizon, which suggests a potential spillover effect for continued liberalization. We formally test whether the connected stocks experience a statistically higher increase in price efficiency than unconnected stocks post-liberalization following Carpenter et al. (2020) in Table E2. Our regression analysis confirms the message of Figure 3.

The time-series dynamics of the *BPS* measures are only suggestive evidence of improved price efficiency post-liberalization. To further nail down the causal relationship, we adopt a second approach that constructs a *firm-level* price informativeness (*DP* henceforth) measure following Dávila and Parlatore (2021). The *DP* measure captures the relative precision of the signal about future payoffs contained in stock prices. Specifically, we run two regressions for each firm in a rolling window: (i) changes in asset prices on changes in asset payoffs, and (ii) changes in asset prices on changes in asset payoffs and *future* changes in asset payoffs. The normalized difference in R^2s of these two regressions measures the relative price informativeness, as shown in Dávila and Parlatore (2021), which captures the information about future payoffs contained in asset prices.

We test Hypothesis 2 concerning the effect of liberalization on price informativeness for individual stocks using the following regression.

$$\text{Price Informativeness}_{it} = \alpha + \beta * \text{Connect}_i + Z_{it} + \varepsilon_{it} \tag{3}$$

where Price Informativeness$_{it}$ is the *DP* measure constructed following Dávila and Parlatore (2021). We use the abnormal price informativeness measure for a firm i at time t, defined as the deviation of price informativeness from its historical average in the three years immediately preceding liberalization. The idea is to examine the abnormal price informativeness that can be attributed to the Connect, similar to a standard difference-in-differences approach.[19] We also test the parallel trend assumption in Figure E3. As the price informativeness measure might adjust slowly to lib-

[19]We prefer to investigate the behavior of abnormal price informativeness measures because we use the same estimation strategy to examine the abnormal investment rate later to be comparable to the previous literature as in Chari and Henry (2008). Nevertheless, we show the standard difference-in-differences approach in Table E3.

eralization, we analyze three different time windows after the Connect (4 quarters, 8 quarters, and 12 quarters). The key independent variable includes a Connect dummy for eligible stocks. We also include firm-level controls that Dávila and Parlatore (2021) find to be important cross-sectionally for price informativeness, including firm size, market-to-book ratio, turnover, and various types of institutional ownership such as QFII share, domestic fund share, and state ownership. We also include industry and time-fixed effects to control for unobserved industry-invariant and time trends. Standard errors are clustered at both industry and time levels as in Petersen (2009).

Table 4 presents our results. Connected firms experience an increase in abnormal price informativeness compared to unconnected firms post-liberalization. Columns (1)-(3) analyze all firms in 4 quarters, 8 quarters, and 12 quarters after the liberalization, respectively. Connected firms experience a higher abnormal increase in *DP* than unconnected ones by 1.9% in one year and 2.3% in three years post-liberalization. The improvement in *DP* is both statistically and economically significant, compared to the average *DP* measures of 8.1% in the sample. We also divide our sample by firm size and state ownership. We find that the improvement in *DP* exists in all sub-samples, suggesting that the improvement is not driven by firm heterogeneity. The improvement is stronger for smaller size firms and private-owned firms.[20]

Our analysis suggests that the liberalization makes stock prices more informative about future fundamentals. Through which channel does the liberalization increase stock price informativeness? It could come from the cross-boundary regulatory and enforcement cooperation between the mainland and Hong Kong regulators. The memorandum of understanding, signed on Oct 17, 2014, between the China Securities Regulatory Commission and the Securities and Futures Commission of Hong Kong sets guidelines for the Connect in three key areas: (1) sharing information and alert-

[20]We examine robustness in Table E4 using classic measures of informativeness such as the probability of informed trading (*PIN*) following Easley et al. (1996) and price nonsynchronicity (*1-R2*) following Roll (1988). The *PIN* measure utilizes information from the trading process and directly estimates the probability of informed trading in a stock based on a structural market microstructural model. By construction, informed traders will trade on their information only if they think it is not yet publicly known. *PIN* thus indirectly measures the amount of private information from tradings. The *1-R2* measure, however, is constructed based on stock return variation, where *R2* is the R^2 from a regression of stock i's stock returns on a market return and the industry portfolio. Conceptually, *1-R2* measures the firm-specific variation in its stock price and is thus related to the amount of private information. We find that both *PIN* and *1-R2* are higher for connected firms than unconnected ones post-liberalization.

Table 4 IMPROVED PRICE INFORMATIVENESS AROUND THE CONNECT: 2014 Q4

	All firms			Small	Large	Private	State
	1-4 Q	1-8 Q	1-12 Q	1-8 Q		1-8 Q	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Connect	0.019***	0.021***	0.023***	0.028***	0.018***	0.041***	0.006**
	(0.003)	(0.002)	(0.002)	(0.005)	(0.003)	(0.004)	(0.003)
Size	-0.000**	-0.000***	-0.000***	0.001***	-0.000***	0.000***	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Log(M/B)	-0.006***	-0.007***	-0.007***	0.005	-0.003*	-0.003	0.001
	(0.002)	(0.002)	(0.001)	(0.003)	(0.002)	(0.003)	(0.001)
Domestic fund share	-0.000	-0.000	-0.000	-0.001	-0.001	-0.000	-0.001
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
QFII share	0.006***	0.008***	0.007***	0.001	0.009***	0.015***	-0.001
	(0.002)	(0.001)	(0.001)	(0.003)	(0.001)	(0.002)	(0.001)
State ownership	0.001***	0.001***	0.001***	0.001***	0.001***	0.002***	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Turnover	0.026***	0.026***	0.026***	0.031***	0.024***	0.027***	0.002
	(0.003)	(0.003)	(0.003)	(0.005)	(0.004)	(0.005)	(0.003)
Constant	-0.065***	-0.066***	-0.067***	-0.098***	-0.059***	-0.076***	-0.011**
	(0.003)	(0.003)	(0.003)	(0.008)	(0.004)	(0.004)	(0.005)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	6184	12763	19297	5902	6861	7320	5425
Adjusted R^2	0.064	0.069	0.073	0.073	0.078	0.041	0.037

NOTE. The dependent variable is a quarterly price informativeness measure constructed following Dávila and Parlatore (2021), adjusted for its pre-liberalization average. The independent variables are a Connect dummy variable for eligible stocks, firm size, market-to-book ratio, domestic fund share, QFII share, state ownership, and turnover. We include industry and time-fixed effects. The analysis is conducted for all firms (columns 1-3), small vs. large firms (columns 4-5), and private vs. state-owned firms (columns 6-7). All standard errors are clustered at both industry and time and reported in parentheses. *, ** and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively. All variable construction is in Appendix A.

ing each other to potential wrongdoings of listed companies under the Stock Connect; (2) standard procedures requesting facilitation from each other during investigations; and (3) potential cooperation on law enforcement actions. This memorandum thus enhanced legal oversight and market supervision of connected firms. In addition, foreign investors might also bring new perspectives to the stock trade and require firms to disclose more information. For example, Lundblad et al. (2022) provides convincing evidence that foreign investors in the Connect are informed traders. Yoon (2021) documents that connected firms significantly increase the number of selective private meetings hosted by major foreign brokers but do not use public disclosure channels. With more information available, foreign presence can improve the price efficiency through their trade in the

Connect program. Consistent with these results, we also find that connected firms are covered by more foreign analysts. Moreover, both the information environment and corporate governance for connected firms have improved (see Table E8).

5.2 Larger and better corporate investment

Liberalization can affect corporate investment through two channels. On the one hand, corporate investment rises with a lower funding cost, the predominant channel found by previous literature (Bekaert et al. 2005, Mitton 2006, Chari and Henry 2008). On the other hand, the corporate investment might change through a learning channel—with more information contained in the stock prices, managers might alter their investment decision accordingly (Chen et al. 2007). Both channels are plausible in the case of the Chinese economy. Because investment adjustment might be slow, we look at several quarters after the launch. Again, we test whether there is a capital inflow effect of the Connect on investment, and focus on the Shanghai wave.[21] We estimate:

$$I_{it} = \alpha + \beta * \text{Connect}_i + \gamma * Z_{it} + \varepsilon_{it} \tag{4}$$

where I_{it} is the abnormal investment rate for a firm i at time t, defined as the deviation of investment rate from the average investment rate in the three years immediately preceding the liberalization as in Chari and Henry (2008). The idea is to examine the abnormal investment rate that can be attributed to the China Connect. Again, this is similar to a standard difference-in-differences approach. We use it to facilitate comparison with previous literature. Nevertheless, we have conducted a standard difference-in-differences estimation around the same period ([-8Q: 8Q] centered at 2014 Q4) for robustness in Table E5 and test the parallel trend assumption in Figure E3. The key variables include a Connect dummy for eligible stocks, along with standard firm-level controls such as firm size, Tobin's Q, cash flow, and sales growth. To control for the overall GDP growth slowdown in China over this period, we first estimate a GDP growth beta (β_i^{GDP}) for each firm and

[21] For comparison, we investigate investment adjustment for Shenzhen firms in the second wave of the Connect in Table G2. We find weaker but non-negligible effects.

then multiply it by the overall GDP growth rate as a control variable. We also include industry and time-fixed effects to control for unobserved industry and time factors. Standard errors are clustered at both industry and time (Petersen 2009).

Table 5 reports the results. Columns (1)-(3) show that connected firms raise investment relative to unconnected ones at horizons of 4, 8, and 12 quarters after Nov. 2014. On average, their abnormal investment rate is statistically higher than for unconnected firms at around 0.2% (0.8% annualized). Compared to the average corporate investment rate of 3.2% in our sample, this magnitude is moderate. Moreover, consistent with the slow response nature of the corporate investment, the statistical power gets stronger with a longer horizon. Compared to findings in previous liberalization episodes, however, our number is smaller. For example, Chari and Henry (2008) report an average of 4.1% on the annual investment rate for historical liberalization episodes. This is consistent with the message of Figure 1, as China is a capital-abundant country. Nevertheless, there is still a non-trivial positive effect on investment from more foreign capital when the Connect is launched. This is due to the cross-sectional variation from capital market distortions within China.

We investigate two important cross-sectional features: firm size in Columns (4)-(5) and ownership structure in Columns (6)-(7). Interestingly, the positive corporate investment for connected firms is mostly driven by small and private-owned firms. Large firms, once connected, do not change investment compared to unconnected ones. However, state-owned enterprises lower investment once included in the Connect. This is consistent with the funding cost channel, as smaller and private-owned firms are more likely to be financially constrained. Once included in the program, their financial constraints are relaxed thanks to a lower funding cost. This result indicates that the China Connect could enhance allocative efficiency for corporate investment by alleviating capital misallocation in China. The lower investment rate for state-owned enterprises, however, indicates a channel other than the funding cost channel. State-owned firms are not financially constrained. Their investment level, if anything, might be excessive relative to their productivity, the so-called capital misallocation problem in the literature. The investment response of state-owned firms once included in the Connect might be more efficient, something we formally test below.

Table 5 INVESTMENT ADJUSTMENT AFTER THE CHINA CONNECT: 2014 Q4

	All firms			Small	Large	Private	State
	1-4 Q	1-8 Q	1-12 Q	1-8 Q		1-8 Q	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Connect	0.002	0.002**	0.002**	0.009***	-0.001	0.005***	-0.003***
	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)
Size	0.001**	0.002***	0.002***	0.003**	0.000	0.003***	0.000
	(0.001)	(0.001)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)
Tobin's Q	0.002***	0.002***	0.002***	0.003***	0.001	0.003***	0.002***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)
Cash flow	0.081***	0.062***	0.053***	0.029*	0.106***	0.077***	0.060***
	(0.017)	(0.013)	(0.010)	(0.015)	(0.015)	(0.016)	(0.016)
Sales growth	0.001	0.001*	0.002***	0.000	0.002	0.002**	0.002**
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
β_i^{GDP} * GDP growth	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Constant	-0.068***	-0.071***	-0.071***	-0.106***	-0.043***	-0.099***	-0.028**
	(0.015)	(0.011)	(0.010)	(0.028)	(0.012)	(0.018)	(0.011)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	6701	13567	20469	6378	7189	7766	5780
Adjusted R^2	0.146	0.141	0.143	0.133	0.172	0.158	0.183

NOTE. The dependent variable is a quarterly abnormal corporate investment rate, defined as the difference between the investment rate and its pre-liberalization average. The independent variables are a connect dummy variable for eligible stocks, Tobin's Q, cash flows, sales growth, and the interaction term between GDP growth beta (β_i^{GDP}) and GDP growth rate. We include industry and time-fixed effects. The analysis is conducted for all firms (columns 1-3), small vs. large firms (columns 4-5), and private vs. state-owned firms (columns 6-7). All standard errors are clustered at both industry and time and reported in parentheses. *, ** and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively. All variable construction is in Appendix A.

The transmission channel of liberalization

The overall investment adjustment after the China Connect may seem surprising juxtaposed against the existing literature. In capital-abundant China, corporate investment is too large in aggregate. Yet, we still find higher investment adjustment on average in the case of the Connect liberalization. What explains this? Is there any new channel in addition to the traditional funding cost channel at play? Do the improved price efficiency results documented above play a role? We test both a learning channel and a funding cost channel to understand the investment result.

The **learning channel** posits that managers learn from additional information in asset prices when they make corporate investment decisions. Goldstein et al. (2022) document that Chinese

listed firms indeed monitor the stock market to glean information. Given that price informativeness increases after the Connect, we expect corporate investment to change accordingly. To test this mechanism, we rely on the strategy of Chen et al. (2007) and estimate:

$$\begin{aligned} I_{it} &= \alpha + (\beta_0 + \beta_1 * \text{Connect}_i) * \text{Price Informativeness}_{i,t-1} \times Q_{i,t-1} + (\gamma_0 + \gamma_1 * \text{Connect}_i) * Q_{i,t-1} \\ &+ (\mu_0 + \mu_1 * \text{Connect}_i) * \text{Price Informativeness}_{i,t-1} + \Gamma * Z_{it} + \varepsilon_{it} \end{aligned} \tag{5}$$

The key insight from Chen et al. (2007) is to investigate the relationship between the investment-Q sensitivity and price informativeness measures. When managers learn new information from prices and use it in investment decisions, there should be a positive correlation between investment-Q sensitivity and price informativeness measures. We investigate whether connected firms have an even higher positive correlation relative to unconnected ones, i.e. $\beta_1 > 0$. As liberalization increases the information content in connected stock prices, we also expect managers to benefit in their corporate investment decision, conditional on (1) those managers learning from stock prices (as shown by Goldstein et al. 2022); and (2) this information is new and useful to those managers.

Our Dávila and Parlatore (2021) measure is likely capturing new and useful information for managers. It directly measures the signal about future fundamentals contained in stock prices, which should be useful for managers to make investment decisions.[22] Moreover, this information is also likely to be new as it comes from foreign-informed traders. Lundblad et al. (2022) document that order flows from foreign investors in the China Connect have strong predictive power for future stock returns, suggesting that these foreigners are well-informed. Those investors are likely to bring in new information either from their new perspective or professionalism. Nevertheless, we still want to control existing information known to the corporate insiders.[23] Following Chen et al. (2007), we control the managerial information, proxied by the intensity of a firm's insider trading activities in a given period, and existing information in the domestic financial market, proxied by

[22] The classic measures of *PIN* and *1-R2* do not directly measure the amount of information contained in stock prices, and we find weaker results when using those two measures.

[23] Indeed, He et al. (2022) find that part of the return predictability by order flows in the China Connect is driven by mainland insiders who tend to evade the see-through surveillance by round-tripping via the Stock Connect program.

Table 6 EXPLORING LEARNING CHANNEL

	All Sample: 1-8 Q		Small	Large	Private	State
	(1)	(2)	(3)	(4)	(5)	(6)
Connect*Q*Price informativeness	0.030***	0.027***	0.064**	0.013	0.030	0.030***
	(0.010)	(0.010)	(0.025)	(0.010)	(0.019)	(0.007)
Connect*Q	0.002***	0.002***	-0.003**	0.005***	0.006***	0.000
	(0.000)	(0.001)	(0.002)	(0.001)	(0.002)	(0.001)
Connect*Q*Managerial information		-0.000	0.000	-0.001*	-0.001**	0.001
		(0.000)	(0.001)	(0.001)	(0.001)	(0.001)
Connect*Q*Local analyst		-0.000	0.001	-0.001	-0.002**	-0.001*
		(0.000)	(0.001)	(0.001)	(0.001)	(0.001)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	12801	12801	5917	6884	7230	5551
Adjusted R^2	0.150	0.156	0.151	0.181	0.173	0.186

NOTE. The dependent variable is a quarterly abnormal corporate investment rate, defined as the difference between the investment rate and its pre-liberalization average. We use the triple interactions among a Connect dummy, Tobin's Q, and the price informativeness measure constructed following Dávila and Parlatore (2021). Columns (2)-(6) also include triple interactions among the Connect dummy, Tobin's Q, and measures for managerial information (insider tradings) and the number of local analysts. Other control variables are the same as in Table 5. To save space, we do not show the control variables and other interaction terms. The analysis is conducted for all firms (columns 1-2), small vs. large firms (columns 3-4), and private vs. state-owned firms (columns 5-6). All standard errors are clustered at both industry and time and reported in parentheses. *, ** and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively. All variable construction is described in Appendix A.

local analyst coverage of a firm. This exercise is important because a learning channel is valid only when new information is in the stock prices.

Table 6 presents the results. Column (1) shows that connected firms have a higher investment-Q sensitivity than unconnected firms (0.002), which suggests that the liberalization increases efficiency in the sense that investment is more responsive to growth opportunities proxied by Tobin's Q. Moreover, the investment-Q sensitivity for connected firms is more correlated with the price informativeness measure, consistent with the learning channel. Economically, this learning channel is also significant. For a firm in the 75^{th} percentile of the *DP* distribution (8.1%), its investment-Q sensitivity increases by another 0.002(=0.03*(8.1-0.5)%) compared to the firm in the 25^{th} percentile (0.5%) once included in the Connect. Controlling for managerial information and local analysts is important as it ensures that the learning channel comes from the new information to corporate insiders. Indeed, this exercise reduces the investment-Q sensitivity estimate slightly

(column (2)). We also test the learning channel for small vs. large in columns (3)-(4) and private vs. state-owned enterprises in columns (5) and (6). The learning channel is more pronounced in small firms and state firms. For large and private firms, the investment-Q sensitivity is positively correlated with price informativeness but statistically insignificant. As state-owned firms are typically viewed as having low corporate governance, we further sort firms by measures of corporate governance, such as state ownership, related party transactions, and tunneling activities (Allen et al. forthcoming). We find that the learning channel is more prominent for firms with higher state ownership, related party transactions, or tunneling activities (Table E6). The results hold for all firms and small firms, respectively. Our analysis thus suggests an even more important role of learning from liberalization for low corporate governance firms, consistent with the view that foreign presence can exert a discipline/monitoring role in corporate decisions (Bena et al. 2017).

We also test the **funding cost channel** in Table 7, using measures of funding cost changes widely employed in the literature. Our first group of measures includes monthly changes in valuation ratios in Nov 2014, such as price-to-book ratio, price-to-earnings ratio, and price-to-dividend ratio.[24] To facilitate comparison, we standardize all of those measures. Given that those ratios reflect funding cost changes, we expect firms with more changes in valuation ratios to increase their investment more. Columns (1)-(3) confirm this prior. Moreover, the effect is economically significant. For example, firms in the 75^{th} percentile of the price-to-book ratio change (30.5%) increase investment by 0.8%(=0.092*(30.5+4.4)/3.98%) more than firms in the 25^{th} percentile (-4.4%) once included in the Connect.[25] Because stock price responses incorporate both cash flow and discount rate news, we separate discount rate news and cash flow news following Campbell and Shiller (1988). According to columns (4)-(5), only discount rate news explains investment

[24] Valuation ratios are good predictors for future returns. We show in Table E7 that they can negatively predict future returns in one quarter and one year respectively. Meanwhile, their predictability of future profit is not robust. In the one-quarter horizon, they predict future profit with an opposite sign. In a one-year horizon, only the P/E ratio predicts a higher one-year profit with a statistically positive sign. The evidence is consistent with the view that asset prices mostly reflect discount rate news rather than cash flow news (Cochrane 2011).

[25] The standard deviation of the P/B ratio change is 3.98. Similarly, firms in the 75^{th} percentile of the P/E ratio change (7.66) increase investment by 0.15%(=0.012*(7.66+0.96)/68.59) more than firms in the 25^{th} percentile (-0.96) once included in the Connect. Firms in the 75^{th} percentile of the P/D ratio change (16.66) increase investment by 0.12%(=0.005*(16.66+1.36)/77.76) more than firms in the 25^{th} percentile (-1.36) once included in the Connect.

Table 7 EXPLORING FUNDING COST CHANNEL

	All sample: 1-8 Q					
	(1)	(2)	(3)	(4)	(5)	(6)
Connect	0.002***	0.004***	0.005***	0.003***	0.003***	-0.009***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)
Connect*ΔP/B	0.092***					
	(0.025)					
Connect*ΔP/E		0.012***				
		(0.002)				
Connect*ΔP/D			0.005***			
			(0.001)			
Connect*Discount rate news				-0.006***		
				(0.001)		
Connect*Cash flow news					0.001	
					(0.001)	
Connect*External finance						0.011***
						(0.002)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	12295	9913	8118	10248	10248	13567
Adjusted R^2	0.151	0.165	0.178	0.171	0.166	0.143

NOTE. The dependent variable is a quarterly abnormal corporate investment rate, defined as the difference between the investment rate and its pre-liberalization average. We use interaction terms between the Connect dummy and funding cost measures, such as change of P/B ratio, P/E ratio, P/D ratio, discount rate news, cash flow news following Campbell and Shiller (1988), and external finance measure constructed following Rajan and Zingales (1998). We standardize all funding cost measures except for the external finance measure. The control variables are the same as in Table 5. To save space, we do not show the control variables. All standard errors are clustered at both industry and time and reported in parentheses. *, ** and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively. All variable construction is in Appendix A.

changes while cash flow news does not. We also expect firms relying more on external financing to have greater investment responses. Using the traditional measure of Rajan and Zingales (1998), the industry median of the difference between capital expenditures and cash flow from operations, divided by capital expenditure, we find that connected firms with a higher measure of external finance invest more (column 6).

Our exploration of the investment results suggests that both the learning and funding cost channels are likely to exist. In Appendix Table E8, we further provide evidence consistent with these two channels. In particular, we find that connected firms have lower funding costs in both debt and equity than unconnected ones. These ultimately encourage firms to shift from bank loans to sea-

soned equity offerings and as a result, have lower leverage ratios. The finding of a higher seasoned equity offering for connected firms is direct evidence of the funding cost channel. Moreover, connected firms also reduce the form of external financing relying on pledged stocks, a sign of relaxed financing constraints. As for the learning channel, we find that connected firms have more foreign analyst coverage post-liberalization, consistent with the view that foreign investors may generate more information. The foreign presence also serves as external monitoring and thus improves corporate governance, as can be seen by reduced tunneling activity, lower related party transactions, and a higher percentage of independent directors for the connected firms post-liberalization.

Our analysis documented the short-run capital inflow effects of liberalization in both stock prices and corporate investment. As the size of foreign inflows is not large, are the documented effects plausible economically? As discussed in Section 2, the size of foreign inflows does not need to be large as they can play the role of "smart money" in affecting asset prices and can make the stock price more informative about future fundamentals. We have provided consistent evidence in stock prices. For the real effects, the new learning channel through capital inflows is easier to rationalize even with a small economic magnitude. For this channel to work, foreigners only need to improve the general information environment and/or play the role of monitoring, which could increase the price informativeness and corporate governance of connected firms. The relative size doesn't need to be large. We have confirmed this with auxiliary evidence in Appendix Table E6. Moreover, the improved market efficiency is consistent with the policymakers' efforts in sharing information for connected firms when launching the Connect program. Therefore, the real effect of foreign inflows is completely plausible even with the smaller size of inflows.

5.3 Sample selection

Sample selection is a potentially serious concern if the connect decision were made at the firm level, as firms would have the incentive to lobby. As for the China Connect, selection occurs at the national level. However, there might exist sample selection issues related to the index construction which could bias our estimation. On the documented short-run effects from the launch of the Con-

nect, i.e., the monthly stock price reaction and the quarterly investment adjustment, our baseline estimation (OLS results) might overstate the effect of the Connect. This is because index construction tends to select firms with stable performance. We address the potential sample selection issue in three ways. First is Heckman's two-stage estimation. The second is propensity score matching. We also run a battery of robustness tests on both observables and unobservables.

Heckman's two-stage results We base specifics of our investigation on a reading of public information concerning index construction and the ex-ante firm differences in Table D5. In our first stage Probit model of Connect selection, we use a Shanghai-Hong Kong Connect dummy, $\text{Connect}_i^{\text{Shanghai}}$, and the periodically adjusted connected stock dummy, Connect_{it}, as dependent variables, and include stock return volatility, market cap, and both industry and year fixed effects.[26] We also try other types of controls and the results are consistent. As seen from Table D7, consistent with our prior, less volatile stocks and large-cap stocks are more likely to be eligible stocks for foreign investors. In the second step, we include the "Inverse Mills Ratio" (IMR) from this Probit regression, as is conventional.

Propensity score matching We also conduct our analysis on a (propensity score) matched sample based on the first-stage selection model. Specifically, we start with a Probit estimation, 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. We also calibrated at 2.5% and 5% and found that the results remain unchanged. Re-estimating the estimation model with these "nearest neighbors" on the common support region allows us to analyze the extent of this source of bias. The matching variables we chose are size, turnover, sales growth and leverage in 2013 Q4. We also added more characteristics such as ROE, and dividend payment to the matching criteria for robustness and the results are very similar (results available upon request). Table D8 presents evi-

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

Table 8 SAMPLE SELECTION

	Heckman's two-stage (1)	Propensity score matching (2)	OLS (3)
Panel A: Stock price adjustment around the Connect (Nov 2014)			
Connect	0.570***	0.046***	0.134***
	(0.026)	(0.014)	(0.010)
Observations	1717	619	2006
Adjusted R^2	0.376	0.231	0.285
Panel B: Price informativeness measure adjustment after the China Connect (2014 Q4)			
Connect	0.125***	0.024***	0.026***
	(0.018)	(0.002)	(0.002)
Observations	13163	4894	13559
Adjusted R^2	0.048	0.039	0.046
Panel C: Investment adjustment after the China Connect (2014 Q4)			
Connect	0.030***	0.003**	0.002**
	(0.007)	(0.001)	(0.001)
Observations	13171	4894	13567
Adjusted R^2	0.143	0.174	0.141
Panel D: Learning channel for investment adjustment			
Connect*Q*Price informativeness	0.028***	0.033***	0.027***
	(0.010)	(0.012)	(0.010)
Observations	12421	4688	12801
Adjusted R^2	0.158	0.193	0.156
Panel E: Funding cost channel for investment adjustment			
Connect*ΔP/B	0.091***	0.127***	0.092***
	(0.026)	(0.044)	(0.025)
Observations	11948	4632	12295
Adjusted R^2	0.155	0.174	0.151

NOTE. Panel A replicates the regression in Table 2. The dependent variable is the two-month cumulative log stock return (adjusted for pre-liberalization mean) around the China Connect in Nov 2014. Standard errors are clustered at the firm level. Panel B replicates the regression in Table 4, i.e. 8 quarters after 2014 Q4. The dependent variable is the price informativeness measure constructed following Dávila and Parlatore (2021) (adjusted for pre-liberalization mean). Standard errors are clustered at both the industry and time levels. Panel C replicates the regression in Table 5, i.e. 8 quarters after 2014 Q4. The dependent variable is the quarterly abnormal corporate investment rate, defined as the difference between the investment rate and its pre-liberalization average level. Standard errors are clustered at both industry and time levels. Panel D and E replicate the regressions to explore the learning and funding cost channels in Table 6 and 7 respectively. The dependent variable is the quarterly abnormal corporate investment rate. Panel D only reports the triple interactions among a Connect dummy, Tobin's Q, and the price informativeness measure. Panel E only reports the interaction term between the Connect dummy and the change in price-to-book ratios. Standard errors are clustered at both industry and time levels. All standard errors are reported in parentheses. *, ** and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

dence of the effectiveness of our propensity score matching (PSM) exercise. Panel A presents the summary statics of key variables in 2013 Q4, one year before the Connect. Without the matching, Connected firms are larger and more levered, but have a lower turnover ratio and sales growth rate. These features are consistent with the index construction method that aims to include large firms with stable performance measures. In addition, connected firms also differ from unconnected firms in other dimensions such as investment, Tobin's Q, cash flow, market-to-book ratio, cash holdings, ROA, and firm age. Our procedure mimics the SSE 180 and 380 selection criteria. In Panel B, we report the results after matching. It shows that the differences in size, turnover, sales growth, leverage, and several other firm variables are mostly eliminated.

Table 8 shows that the OLS results are robust in terms of statistical significance to using Heckman's two-stage and PSM. In terms of economic magnitude or the sample selection bias, Heckman's two-stage and PSM results differ. Heckman's two-stage estimation suggests that the OLS estimation underestimates stock price adjustments, price informativeness adjustments, and investment adjustments. However, the PSM estimation suggests that the OLS estimation of stock price adjustment is too large while the other estimation results are not affected by the sample selection issue. The disagreement between Heckman's two-stage and PSM results on the sample selection issue is less severe for the estimation results investigating the learning and funding cost channels—the OLS estimation is essentially the same as Heckman's two-stage and PSM results.

In addition to Heckman's two-stage and PSM estimation, we also conduct a battery of robustness tests for both observables and unobservables. For the observables such as industry skewness, profitability, Tobin's Q, cashflows, and state ownership, we investigated the robustness of our results by adding an interaction term between those observed characteristics and time-fixed effects (FE). As shown in Table E9, all of our results are robust. Both statistical and economic significance barely change. The only exception is the investment regression. The Connect dummy loses significance once the interaction between the SOE dummy and time FE is included. This is not surprising because the SOE and POE firms have different responses in investment once included in the Connect (see Table 5). Connected POEs raise investment while connected SOEs decrease

investment. Indeed, this differential response between SOE and POE in the China setting is the reason we explored the new learning channel in addition to the traditional funding cost channel.

We also explore whether unobservables could affect our analysis. The index company indeed has some discretion to select stocks in addition to its published stock characteristics, which arguably can be a source of an "unobservable". However, we don't believe such an unobservable should matter much in our empirical analysis. We perform a formal econometric analysis to detect the importance of unobservables to explain our treatment effect, following Altonji, Elder, and Taber (2005) and Oster (2019). The literature suggests calculating a test statistic that captures the importance of unobservables relative to the observables, which under some mild conditions should eliminate the observed treatment effect, denoted by δ. The literature also suggests that results with $\delta > 1$ can be viewed as robust because it is hard to believe that the unobserved variables are more important in explaining the treatment than the observed variables. We conducted the analysis in Table E9. We find that all our results are robust to the potential omitted unobserved variables.[27]

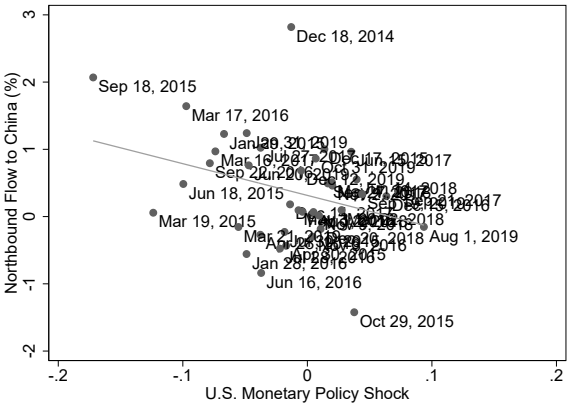
6 Larger spillover effects of the Connect

Liberalization can bring in costs by exposing the country to the influence of global shocks. In the case of China, it is less clear whether this effect shows up given that China has imposed the tightest capital controls policy worldwide to protect itself from global shocks (Rey 2015). However, the Connect liberalization indeed creates a "hole" in the "wall" of capital controls policy, which might make connected firms more affected than unconnected ones. Impressionistic evidence shown in Figure 4 indicates that capital flows into China through the Connect (northbound flows) are negatively correlated with U.S. monetary policy shocks on FOMC days while capital flows into Hong

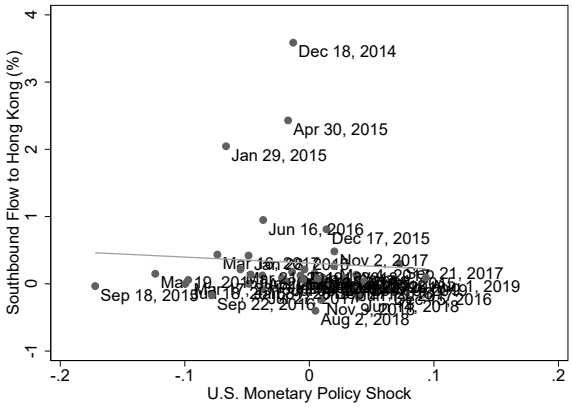
[27] As a final note on selection issues, we had an informal conversation in Dec 2022 with the senior policymaker who helped design the Connect program. He explicitly claimed that the program wants to make sure that the selection criteria are as clear/transparent/fair as possible. Policymakers do not want to surprise the market by manipulating the selection criteria. It was the reason why they simply used the index as the only criterion to select stocks. Moreover, the index construction method has been in place for many years. It is very hard to imagine that the way it is constructed is tailored to the Connect program. This reassures us that concerns about sample selection and unobservables are not severe. They are taken care of by our numerous robustness checks.

Figure 4 CHINA CAPITAL FLOWS AND U.S. MONETARY POLICY SHOCKS

Panel A: Northbound flows into Mainland China



Panel B: Southbound flows into Hong Kong



NOTE. The figure shows the correlation between capital flows (through the Connect program) and U.S. monetary policy shocks on FOMC announcement days (in Chinese local time). Panel A shows northbound net flows (in percentage change) into mainland China and Panel B shows southbound net flows (in percentage change) into Hong Kong.

Kong are not. This suggests that global shocks might affect connected firms through capital flows. We conduct a formal difference-in-differences estimation of both stock price and investment sensitivity to global shocks. We use a longer sample period before COVID-19, 2003-2019, and focus on a firm-specific time-variant variable, Connect_{it} that flags the eligible status of Chinese stocks.

6.1 Stock price sensitivity to global shocks

We first investigate the effect of global shocks on connected stocks relative to unconnected stocks using the difference-in-differences method,

$$r_{it} = \alpha_i + \alpha_t + \beta * \text{Connect}_{it} \times \text{Global Shock}_t + \gamma * Z_{it} + \varepsilon_{it} \tag{6}$$

where r_{it} is the monthly excess return for stock i at month t, Connect_{it} equals 1 if the stock is included in the China Connect, Z_{it} includes standard firm-level controls for stock price regression such as lagged stock return, market cap, turnover, volatility, domestic fund share, QDII shares, and future sales growth. We include the interaction term between Chinese monetary policy, proxied

Table 9 STOCK PRICE SENSITIVITY TO GLOBAL SHOCKS

	U.S. monetary policy shock (1)	VIX (2)	Global financial cycle (3)	Risk aversion (4)
Global Shock$_t$ $*$ Connect$_{it}$	-0.005***	-0.002***	0.011***	-0.022***
	(0.001)	(0.001)	(0.002)	(0.002)
$M2_t^{China}$ $*$ Connect$_{it}$	-0.000	-0.000	-0.001	-0.001
	(0.001)	(0.001)	(0.001)	(0.001)
Connect$_{it}$	-0.002*	-0.002**	0.006*	-0.001
	(0.001)	(0.001)	(0.001)	(0.001)
Lag dependent variable	-0.107***	-0.107***	-0.107***	-0.107***
	(0.006)	(0.006)	(0.006)	(0.006)
Market cap	0.057***	0.057***	0.057***	0.057***
	(0.003)	(0.003)	(0.003)	(0.003)
Turnover	1.492***	1.492***	1.488***	1.494***
	(0.038)	(0.038)	(0.038)	(0.038)
Volatility	2.476***	2.477***	2.476***	2.477***
	(0.049)	(0.049)	(0.049)	(0.049)
Domestic fund share	-0.001***	-0.001***	-0.001***	-0.001***
	(0.000)	(0.000)	(0.000)	(0.000)
QFII share	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Sales growth [+1]	0.005***	0.005***	0.005***	0.005***
	(0.000)	(0.000)	(0.000)	(0.000)
Constant	-0.057***	-0.056***	-0.053***	-0.051***
	(0.002)	(0.002)	(0.002)	(0.002)
Firm FE	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes
Observations	276564	276564	276564	276564
Adjusted R^2	0.171	0.171	0.171	0.172

NOTE. The dependent variable is the monthly excess stock return. Global shocks include the U.S. monetary policy shock identified by Rogers et al. (2018) in column (1), changes in the VIX index (in logs) in column (2), global financial cycle constructed by Miranda-Agrippino and Rey (2020) in column (3), and the change in risk aversion index constructed by Bekaert et al. (2021b) in column (4). We standardize all the global shocks. All standard errors are clustered at both stock and time levels and reported in parentheses. *, ** and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively. Variable construction is described in Appendix A.

by the M2 growth rate, and the connect dummy to control for the effect of Chinese policy. We also include firm and time-fixed effects to control for unobserved firm and time trends. Standard errors are clustered at both the firm and time level following Petersen (2009). We employ a large collection of global shocks, including the U.S. monetary policy shock identified by Rogers et al. (2018), change in the VIX index (in logs), the global financial cycle factor of Miranda-Agrippino and Rey (2020), and change in risk aversion index constructed by Bekaert et al. (2021b). We use our estimation equation (6) to test whether the connected stock return has a higher sensitivity to

global shocks than unconnected ones after the China Connect is launched.

Table 9 presents the results. To facilitate comparison, we standardize all global shocks. Our variable of interest is the interaction term between a global shock and the connect dummy. This captures the effect of global shocks on the excess returns of connected stocks compared to unconnected stocks. We find that all global shocks have significant effects, with the expected sign. For example, a higher U.S. monetary policy shock (or a higher change in the VIX, a lower global financial cycle factor, or a higher change in risk aversion) is associated with a negative response of connected excess stock return compared to unconnected ones. This is consistent with Figure 4 that foreign capital flows out of emerging market economies like China when these shocks occur. Economically, this effect is also significant. A one standard deviation U.S. monetary policy shock lowers connected excess stock return by 0.5%, similar to the effect of one standard deviation change in the VIX (0.2%) but smaller than the global financial cycle (1.1%) and risk aversion (2.2%) shocks. Compared to the average monthly excess stock return of 0.5% and standard deviation of 14.5%, this estimate is economically sizable.[28] Thus, we conclude that the China Connect has increased stock price sensitivity significantly.

6.2 Investment sensitivity to global shocks

We also investigate whether corporate investment is more sensitive to global shocks. As investment might slowly respond to shocks, we estimate the following specification as in Gulen and Ion (2016) and Husted, Rogers, and Sun (2019).

$$I_{it} = \alpha_i + \alpha_t + \beta_1 * \text{Global Shock}_{t-1} \times \text{Connect}_{it-1} + \beta_2 * \text{Connect}_{it-1} + \Gamma Z_{it} + \varepsilon_{it} \qquad (7)$$

where i indexes the firm and t is a time index (quarterly frequency). The dependent variable is corporate investment I_{it}. Global Shock$_{t-1}$ includes the same shocks as above. Connect$_{it-1}$ indicates

[28] Also notice that one standard deviation of a global shock is large. In the case of U.S. monetary policy shock, one standard deviation shock is 8.7%. Therefore, 1% of a U.S. monetary policy shock lowers connected excess stock return by 0.06% (=0.5/8.7%).

Table 10 INVESTMENT SENSITIVITY TO GLOBAL SHOCKS

	U.S. monetary policy (1)	VIX (2)	Global financial cycle (3)	Risk aversion (4)
Global Shock$_{t-1}$ * Connect$_{it-1}$	-0.002***	-0.001***	0.003***	-0.003**
	(0.001)	(0.000)	(0.001)	(0.001)
Connect$_{it-1}$	-0.001	-0.001	0.002	-0.001
	(0.001)	(0.001)	(0.001)	(0.001)
Connect$_{it}$	0.001*	0.001*	0.001	0.001*
	(0.001)	(0.001)	(0.001)	(0.001)
Size	0.004***	0.004***	0.004***	0.004***
	(0.000)	(0.000)	(0.000)	(0.000)
Tobin's Q	0.002***	0.002***	0.002***	0.002***
	(0.000)	(0.000)	(0.000)	(0.000)
Cash flow	0.137***	0.137***	0.141***	0.137***
	(0.004)	(0.004)	(0.004)	(0.004)
Sales growth	0.001***	0.001***	0.001***	0.001***
	(0.000)	(0.000)	(0.000)	(0.000)
β_i^{GDP} * GDP growth	0.005***	0.005***	0.005***	0.005***
	(0.000)	(0.000)	(0.000)	(0.000)
MPS$_{t-1}^{China}$ * Connect$_{it-1}$	-0.001	-0.000	0.001	-0.001
	(0.001)	(0.001)	(0.001)	(0.001)
Constant	-0.086***	-0.085***	-0.090***	-0.085***
	(0.006)	(0.006)	(0.006)	(0.006)
Firm FE	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes
Observations	89383	89383	87723	89383
Adjusted R^2	0.453	0.453	0.455	0.453

NOTE. The dependent variable is a quarterly investment. Global shocks include the U.S. monetary policy shock identified by Rogers et al. (2018) in column (1), changes in the VIX index (in logs) in column (2), global financial cycle constructed by Miranda-Agrippino and Rey (2020) in column (3), and the change in risk aversion index constructed by Bekaert et al. (2021b) in column (4). We standardize all the global shocks. Firm-level controls include size, Tobin's Q, cash flows, and sales growth. We add an interaction term between GDP growth beta (β_i^{GDP}) and GDP growth rate, and an interaction term between Chinese monetary policy shock (Chen et al. 2018) and the Connect dummy. All standard errors are clustered at both firm and time levels and reported in parentheses. *, ** and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively. All variable constructions are in Appendix A.

whether the firm i's stock is included in the China Connect at time $t-1$. The controls Z_{it} include contemporaneous Connect$_{it}$ dummy, lagged Tobin's Q, cash flows, sales growth, and firm size. To control for the effect of overall GDP growth on investment over this period, we again add an interaction term between the GDP growth beta (β_i^{GDP}) and the overall GDP growth rate as a control variable. We also add the interaction term between a Chinese monetary policy shock identified by Chen, Ren, and Zha (2018) and Connect$_{it-1}$ to control for any effect of Chinese monetary policy

on connected firms. We add both firm and time-fixed effects to control for unobserved individual and time effects. Standard errors are clustered at both firm and time levels (see Petersen 2009).

Table 10 presents our results. Similar to the stock sensitivity results, the investment sensitivity is higher for connected stocks compared to unconnected ones after the Connect. Moreover, their effects are also economically significant. One standard deviation of the U.S. monetary policy shock lowers connected firm investment by 0.2% compared to unconnected ones. The magnitude is similar to a one standard deviation change in the VIX index (0.1%), global financial cycle factor (0.3%), and change in risk aversion index (0.3%). Compared with the average investment rate of 3.2% and the standard deviation of 4.0%, the increased spillover effect is moderate.[29]

Our results on the heightened long-run volatility from liberalization are robust.[30] In Appendix H, we conduct further analysis focusing on U.S. monetary policy shock, a relatively well-identified shock using high-frequency data (on FOMC announcement days), which allows us to better infer causality such as conducting a difference-in-differences estimation like (6) on stock returns but on FOMC days. We also use the China Connect to identify the specific transmission mechanism of U.S. monetary policy shocks through either global risk-free rates or global risk aversion and investigate their relative importance in light of our simple model in Appendix C.

The post-liberalization spillover effects in China are interesting and somewhat surprising, considering that China has imposed the tightest capital control policy. It suggests a rather powerful transmission mechanism for global shocks even with tight capital controls, consistent with Rey (2015) and adds a cautionary note to the liberalization programs in other countries.

[29] Given that the one standard deviation shock is large, the increased spillover effect on investment is economically moderate. For example, a 1% increase in the U.S. monetary policy shock lowers the investment rate of connected firms by 0.02% (=0.2/8.7%).

[30] Thanks to the China Connect, Chinese A-shares are included in MSCI's emerging market index that serves a major role in global fund management benchmarking after 2017. We explore the influence of such an inclusion in our spillover effects by adding an interaction term between global shocks and a dummy variable for the MSCI-included stocks in Table E10. Our spillover results are robust. Interestingly, connected stocks held by MSCI are less sensitive to global shocks in their stock returns, which suggests that the passive flows tracking the MSCI index are long-term and thus less sensitive to global shocks.

7 Conclusion

Few issues have stirred such passionate debate among researchers and policymakers as the effects of financial globalization. For developing countries, the topic is of enormous practical relevance, not least because countries such as China and India are still very much in the early stages of financial globalization and face numerous ongoing decisions about further integration. We add to this discussion by analyzing the transmission mechanism of an important and unique stock market liberalization in China. We find that the traditional funding cost channel benefits only financially constrained firms such as small and private-owned firms. Large and state-owned firms do not benefit from the lower funding costs as they do not face the same capital scarcity problems. Moreover, we find that liberalization also affects investment through a new learning channel. With a greater foreign presence, stock prices become more informative about future fundamentals. As managers actively learn from stock prices, their investment decisions change accordingly. We find that the learning channel is more prominent for low corporate governance firms, which suggests that liberalization can improve efficiency.

The learning channel of liberalization is new to the literature. Although we find it in a capital-abundant country, we believe it also works more generally. Together with the traditional funding cost channel, liberalization can generate more allocative efficiency. On the one hand, it narrows the existing domestic capital misallocation by relaxing financial constraints. On the other hand, it improves the market mechanism to signal value and thus improves managerial decisions. Our findings are consistent with the indirect benefits of liberalization proposed by Kose et al. (2009) but with an important difference. We emphasize benefits through market mechanisms rather than structural reform on institutional quality, domestic financial sector, etc.

In addition to the benefits of liberalization, we also document larger spillover effects. In a country with such a tight capital control policy, this suggests a rather powerful transmission channel of global shocks. As a result, policymakers should fully understand the tradeoff between allocative efficiency and volatility. Measuring the overall welfare implications of 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

January 2024

Table of Contents

A Variable definitions

Chinese firm-level data

Age Difference between fiscal year and IPO year. Source: CSMAR.

Bank loan Aggregated bank loan amount for each firm within a quarter divided by the book value of total assets measured at quarter end. Source: CSMAR.

Cash Cash and cash equivalents divided by the book value of total assets measured at quarter end. Source: CSMAR.

Cash flow Income before extraordinary items plus depreciation and amortization divided by the book value of assets, measured at quarter end. Source: CSMAR.

Cash flow news The cash flow news measure is from VAR estimation on monthly stock return following Campbell and Shiller (1988). Source: CSMAR.

Connect A dummy equal to one if a Chinese listed firm is included in the Shanghai (Shenzhen)-Hong Kong Connect Program and zero otherwise. Source: Hong Kong Stock Exchange.

Cost of debt Short-term market borrowing rate multiplied by short-term corporate leverage ratio plus long-term borrowing rate multiplied by long-term corporate debt ratio. Source: CSMAR.

Covariance with domestic connected portfolio $\sigma^{i,C}$ Historical covariance of firm stock return with eligible stocks in the China Connect for foreign investors. We use the equal-weighted return of the Shanghai SSE 180 and SSE 380 market indices as a proxy for domestic connected stocks before Dec 2016. We added the Shenzhen SZSE Component Index and Small and ChiNext Index to the eligible portfolio (equally weighted) after Dec 2016. We use the 36-month rolling window to construct the covariance at each quarter (month) end. Source: CSMAR, WIND.

Covariance with global market $\sigma^{i,W}$ Historical covariance of firm stock return with the MSCI world stock market index (RMB denominated). We use a 36-month rolling window to construct the covariance at each quarter (month) end. Source: CSMAR, MSCI, WIND.

Covariance with Hong Kong eligible stocks $\sigma^{i,HK}$ Historical covariance of firm stock return with

the Hong Kong eligible stocks for mainland investors. For Hong Kong-eligible stocks, we use the average return of the Hang Seng Composite Large Cap and Mid Cap Index. We use a 36-month rolling window to construct the covariance at each quarter (month) end. Source: CSMAR, WIND.

ΔD/P Change of aggregated dividend yield (in logs) within a quarter. Source: CSMAR.

ΔP/B Change of price-to-book value of assets (in logs) in Nov 2014. Source: CSMAR.

ΔP/D Change of price-to-dividend (in logs) at Nov 2014. Source: CSMAR.

ΔP/E Change of price-to-earnings (in logs) at Nov 2014. Source: CSMAR.

Domestic fund share (%) The ratio of shares held by the domestic fund at year-end. Source: CSMAR.

Discount rate news The discount rate news measure is from VAR estimation on monthly stock return following Campbell and Shiller (1988). Source: CSMAR.

Earnings Earnings divided by total assets (book value) measured at quarter end. Source: CSMAR.

Earnings yield$^{CH/US}$ Sector-level earnings yield differences between China and the U.S.. The earnings yield is the sum of earnings across all firms in the sector over the sector's market capitalization, following Bekaert et al. (2021c). We use Source: CSMAR and Compustat.

EBIT Earnings before income and taxes (EBIT) divided by the book value of total assets measured at quarter end. Source: CSMAR.

External financing Industry median of the difference between capital expenditure and cash flow from operations, divided by the capital expenditure at each quarter end. Source: CSMAR.

Foreign sales Foreign revenue divided by the total revenue at the fiscal year-end. Source: WIND.

Foreign analyst coverage The aggregated number of foreign analysts' forecasts or recommendations for each firm within a quarter. Source: I/B/E/S.

GDP growth beta ($\beta_i^{\mathbf{GDP}}$) Estimated using a regression of quarterly investment on GDP growth rate along with quarter seasoned dummy variables in a rolling window. Source: CSMAR, CEIC.

Investment Capital expenditure divided by book value of lagged assets at quarter end. Capital exp. equals 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. Source: CSMAR.

Large A dummy variable equals one if a firm's book value of total assets is above median at quarter end, and zero otherwise. Source: CSMAR, WIND.

Leverage Book value of debt divided by the book value of total assets measured at each quarter end. Source: CSMAR.

Local analyst Natural logarithm of the number of local analysts issuing forecasts or recommendations for each firm within a quarter. Source: CSMAR.

Managerial information The natural logarithm of the aggregated amount of transactions by insiders for each firm within a quarter. Source: CSMAR.

Market cap The firm's close price at month end multiplied by its month-end share outstanding divided by the aggregated market capitalization. Source: CSMAR.

M/B The firm's aggregated market capitalization divided by the book value of shareholder equity at each quarter end. Source: CSMAR.

Independent director (%) Number of independent directors divided by the board size for each firm at fiscal year-end. Source: CSMAR.

1-R2 *R2* is from a daily return regression on market and industry returns following Roll (1988).

PIN Probability of informed trading measure estimated following Easley et al. (1996).

Price informativeness Quarterly price informativeness measure constructed following Dávila and Parlatore (2021) in a 10-year rolling window. Source: CSMAR.

Private A dummy variable equals one if a firm's ultimate owner or block holder is held by a non-government entity (private entity), and zero otherwise. Source: CSMAR, WIND.

QFII share (%) The ratio of shares held by qualified foreign institutional investors (QFII) at year-end. Source: CSMAR.

Related party transactions The aggregated amount of money that a listed firm paid out for its related-party transactions in a given quarter, scaled by total assets. Source: CSMAR.

ROA Net income divided by book value of total assets at quarter end. Source: CSMAR.

Sales growth The firm's year-over-year change in sales. Source: CSMAR.

Small A dummy variable equals one if a firm's book value of total assets is below median at quarter end, and zero otherwise. Source: CSMAR, WIND.

Seasoned equity offering Aggregated amount of equity through private placement a firm aimed to raise within a quarter divided by the book value of assets. Source: CSMAR.

Size Natural logarithm of the book value of total assets at quarter end. Source: CSMAR.

State ownership Percentage of shares held by government-related entity among top 10 shareholders at year-end. Source: CSMAR, WIND.

State (SOE) A dummy variable equals one if a firm's ultimate owner or block holder is a government-related entity, and zero otherwise. Source: CSMAR, WIND.

Stock pledged Aggregated value of share pledged within a quarter divided by the book value of total assets at quarter end. Source: WIND.

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 quarter end. Source: CSMAR.

Turnover Average daily turnover over the past 12 months. Turnover is defined as trading volume (in shares) divided by total shares outstanding. Source: CSMAR.

Tunneling Book value of other receivables scaled by market cap. Source: CSMAR.

Volatility Average daily return volatility in the past 12 months. Volatility is the standard deviation of daily stock return. Source: CSMAR.

Macro variables

Domestic credit (% GDP) Domestic credit to the private sector by banks as a share of GDP. Source: World Development Indicators.

GDP growth rate Annual percentage growth rate of GDP based on constant local currency. Source: World Development Indicators.

Global financial cycle Variables constructed by Miranda-Agrippino and Rey (2020) .

Gross savings (% GNI) Gross savings are calculated as gross national income less total consumption, plus net transfers. Source: World Development Indicators.

Log(GDP per capita) Natural logarithm of GDP per capita (measured as GDP divided by the midyear population) in constant 2010 U.S. dollar. Source: World Development Indicators.

Log(Population) Natural logarithm of the total population based on the de facto definition of population. Source: World Development Indicators.

MPS_t^{US} Combination of three monetary policy surprises at each FOMC announcement, converted to quarterly frequency using a simple aggregation. Rogers et al. (2018).

$\text{MPS}_t^{\text{China}}$ Shock to Chinese M2 growth rate. Source: Chen et al. (2018).

M2 growth Year-over-year M2 growth rate. Source: CEIC.

RMB/USD exchange rate Log change of RMB to USD index at quarter end. Source: WIND.

Risk aversion Change of risk aversion index. Source: Bekaert et al. (2021b) .

Trade (% GDP) The sum of exports and imports of goods and services measured as a share of GDP. Source: World Development Indicators.

VIX The log change of VIX level at each quarter(month) end. Source: CBOE.

International firm-level data

Our international firm-level data covers 43251 firms in 46 economies. The list includes ARG (110), AUS (2002), BEL (137), BGR (177), BRA (678), CAN (3406), CHE (303), CHL (176), CHN (4346), DEU (819), DNK (191), EGY (163), ESP (168), FIN (208), FRA (771), GBR (1703), GRC (280), HRV (101), IDN (575), IND (2850), ISR (454), ITA (362), JOR (121), JPN (3776), KOR (2163), LKA (193), MEX (202), MYS (931), NLD (162), NOR (256), NZL (138), PAK (282), PER (169), PHL (262), POL (546), ROU (147), RUS (449), SAU (128), SGP (643), SWE (881), THA (591), TUR (398), TWN (1991), USA (7603), VNM (901), ZAF (338). The variable constructions are given by the following lists.

$\mathbb{1}^{j=\textbf{Mainland China}}$ A dummy variable for listed firms at mainland China. Source: Worldscope.

Investment Capital exp. (item 04601) over lagged assets (item 02999). Source: Worldscope.

Leverage Long-term debt (item 03251) over lagged assets (item 02999). Source: Worldscope.

Log (Assets) Natural log of (book value of) total assets in dollars (02999). Source: Worldscope.

Return Natural logarithm of monthly return. The monthly return is calculated as a change in the monthly close price. Source: Datastream, Worldscope.

Sales growth Year-over-year sales growth, $ dollars (item 01001) Source: Worldscope.

Tobin's Q Assets (item 02999) plus the market value of equity (item 08001) minus book value of equity (item 03501) divided by total assets (item 02999). Source: Worldscope.

Campbell-Shiller decomposition

We separate the discount rates news from cash flows news following Campbell and Shiller (1988). Specifically, we use a log-linear approximation for the decomposition of returns:

$$\underbrace{r_{t+1} - E_t r_{t+1}}_{\eta_{r,t+1}} = \underbrace{(E_{t+1} - E_t) \sum_{j=0}^{\infty} \rho^j \Delta d_{t+1+j}}_{\eta_{CF,t+1}} - \underbrace{(E_{t+1} - E_t) \sum_{j=1}^{\infty} \rho^j r_{t+1+j}}_{\eta_{DR,t+1}} \tag{A1}$$

where r_{t+1} is a log stock return, Δd_{t+1} is the dividend growth (in log), and ρ is a discount coefficient. $\eta_{CF,t+1}$ and $\eta_{DR,t+1}$ denote the news about future cash flows and discount rates respectively. By this accounting identity, the return innovation ($\eta_{r,t+1}$) must be associated with either cash flow news, discount rate news, or both. To implement the decomposition, we adopt a parsimonious VAR model as follows.

$$\begin{bmatrix} r_{t+1} \\ dp_{t+1} \\ x_{t+1} \end{bmatrix} = a + A \begin{bmatrix} r_t \\ dp_t \\ x_t \end{bmatrix} + \begin{bmatrix} \varepsilon^r_{t+1} \\ \varepsilon^{dp}_{t+1} \\ \varepsilon^x_{t+1} \end{bmatrix} \tag{A2}$$

where x_t is an arbitrary stationary predictor variable, taken to be a scalar for illustration purposes. a and A are a 3-by-1 vector and a 3-by-3 matrix of constant parameters. ε^r_{t+1}, ε^{dp}_{t+1} and ε^x_{t+1}

are VAR innovations. Given the VAR system, one can derive the following relations.

$$\eta_{r,t+1} = \varepsilon^{r}_{t+1} \tag{A3}$$

$$\eta_{CF,t+1} = (e1' + e1'\lambda) \begin{bmatrix} \varepsilon^{r}_{t+1} \\ \varepsilon^{dp}_{t+1} \\ \varepsilon^{x}_{t+1} \end{bmatrix} \tag{A4}$$

$$\eta_{DR,t+1} = e1'\lambda \begin{bmatrix} \varepsilon^{r}_{t+1} \\ \varepsilon^{dp}_{t+1} \\ \varepsilon^{x}_{t+1} \end{bmatrix} \tag{A5}$$

where $e1' = [1\ 0\ 0]$ and $\lambda \equiv \rho A(I - \rho A)^{-1}$ with I denoting the identity 3-by-3 matrix.

To get an estimate for discount rate news for individual stock returns, we first run a VAR estimation for each stock using the monthly frequency data and then get a time-series estimation of $\eta_{CF,t+1}$ and $\eta_{DR,t+1}$ respectively. In our estimation, we take $\rho = 0.96$ and x_t to include Chinese Fama-French three factors. We then use the cumulative series covering the period of the China Connect to get an estimate for the discount rate news measure.

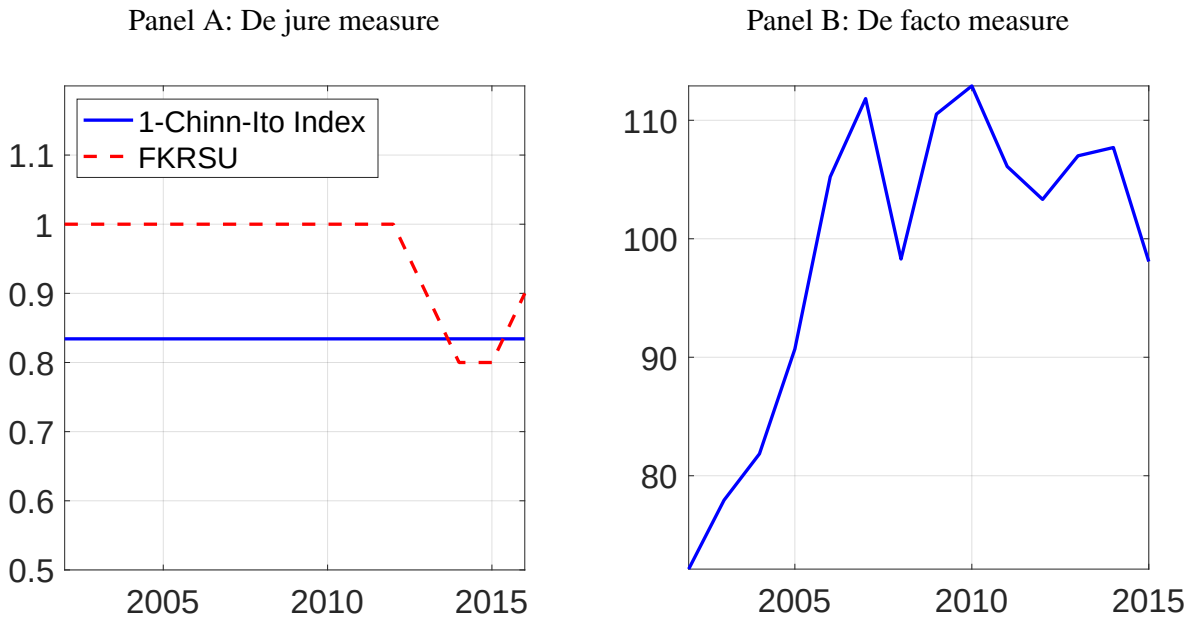
B The background of the China Connect

China has imposed very tight capital controls (see Figure B1). Even though policymakers have made efforts to relax cross-border transactions, it is hard to see those changes in the *de jure* capital controls measures as they only capture the extensive margin of policy. In the case of China, capital flow management is typically conducted through the way policies are implemented. In the *de facto* measure, there was a clear trend in liberalizing the capital account before the global financial crisis in 2008. Since then, China has tightened its capital outflows and meanwhile encouraged capital inflows, which contributed to its unprecedented rise in FX reserves in 2013.

An important motivation for launching the China Connect was to facilitate international usage of the RMB. This applies both to foreign investors so that they can invest more easily in RMB-denominated assets, and to domestic investors to use RMB to invest overseas. Since 2013, China's capital account management has undergone a paradigm shift when policymakers were more willing to relax capital flows (Miao and Deng 2020). There are at least three reasons for this change. First, policymakers had become increasingly concerned about "hot money" inflows and over-accumulation of reserves. Second, China wants to encourage more companies to invest abroad, especially in "Belt and Road" countries. Third, China intentionally accelerated the process of RMB internationalization. Nevertheless, the China Connect is a carefully designed and controllable mutual market access experiment. All transactions are settled in RMB; cross-boundary fund flows are cleared and settled on the net through subsidiaries set up by local exchanges; and there exist daily quotas on both sides of flows that can be adjusted by policymakers.

Table B1 summarizes the key changes in capital controls policy in 2014 based on the IMF's AREAER database. For FDI, the government streamlined the procedure and replaced the application-for-approval system with registration. For portfolio investment, China relaxed controls on insurance companies and domestic institutional investors. In Nov 2014, the China Connect was launched. For other investments, there was also a relaxation. Even though policymakers wanted to relax capital flows, they implemented their policy agenda gradually (Song and Xiong 2018). No other economic reforms were conducted at this time. Moreover, none of those policy changes

Figure B1 CHINESE CAPITAL ACCOUNT RESTRICTIONS



NOTE. Panel A plots de jure measures of capital controls, i.e. 1- Chinn-Ito index of financial openness (Chinn and Ito 2006) and FKRSU measure of capital controls (Fernández, Klein, Rebucci, Schindler, and Uribe 2016). 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).

matter for our identification of the capital inflow effect from the China Connect (Table 1).

The China Connect was received well. According to the HKEX, the average daily turnover in Northbound trading was RMB 5.84 billion in the first 20 trading days, while the average Northbound quota usage was RMB 3.39 billion, or 25.3% of the daily quota. In the same period, Southbound trading was RMB 757 million with the average daily quota usage at RMB 477 million or 4.5 % of the daily quota.[1] Initially, the size of northbound flows was larger than southbound flows. But after 2015, southbound flows exceed northbound flows cumulatively (see Figure B2).

Although the China Connect is an important stock market liberalization, its absolute size is not large. Turnover is around 2% of the total turnover in the Shanghai A-share market. In terms of its relative size in holding shares, Figure B3 plots the dynamics of foreign investors from 2003 to 2019. The China Connect quickly replaced the QFII program to become the largest channel

[1] See https://www.hkex.com.hk/News/News-Release/2014/141214news?sc_lang=en for further details.

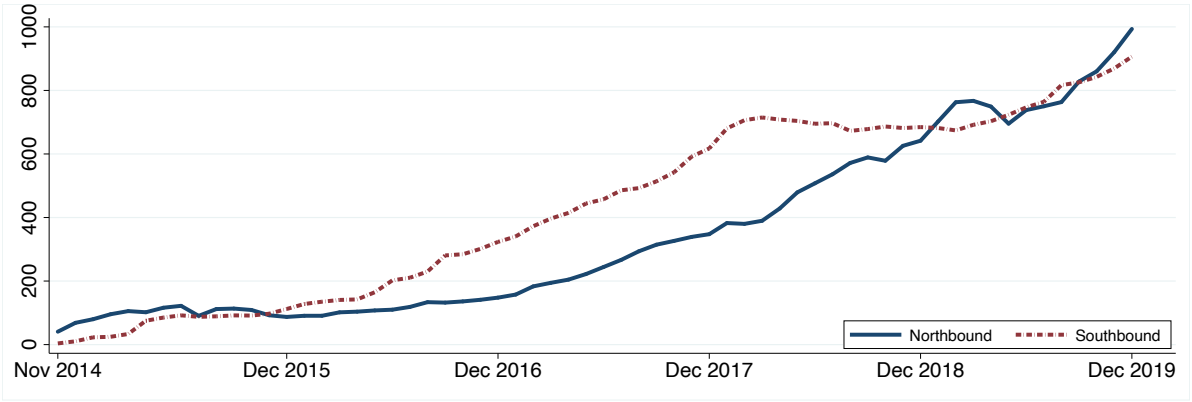
Table B1 CHANGES IN CHINESE CAPITAL CONTROLS POLICY IN 2014

Category	Date	Description
FDI	01/10/2014	The requirement to verify underlying documents was canceled for profit repatriation less than US$50,000. For larger amounts, banks must verify the board of directors' resolutions on the distribution of profits (or the partners' resolution on the distribution of profits) and the originals of the tax filing forms.
	06/11/2014	Renminbi (RMB) settlement of direct investment transactions was simplified. Banks were allowed to settle inward and outward direct investments in RMB based on the three principles of "know your customer," "know your business," and "conduct due diligence," relying on the income and payment instructions submitted by domestic enterprises.
	07/04/2014	The foreign exchange administration of round-trip investment was reformed and the registration of financing and changes in financing were canceled.
	12/27/2014	Approval requirement for outward direct investments except in sensitive countries, regions, and sensitive industries were canceled and replaced with a filing system.
Portfolio investment	02/19/2014	The limit on investments of an insurance company in foreign and domestic listed and unlisted equity investments and real estate was increased from 20% to 30% of the insurance company's total assets at the end of the previous quarter. The limit for a single investment in equities, fixed-income assets, and real estate and a single investment in the same legal person was set at 5% and 20% of an insurance company's total assets at the end of the previous quarter respectively. The total balance does not include equity shares of insurance enterprises invested with their own funds and real estate purchased with their funds for their use, whose balance may not exceed 50% of their total net asset at the end of the previous quarter.
	11/01/2014	Limits and quotas on the total amount and the share of various financial instruments in the investment portfolio were eliminated for Qualified domestic institutional investors' overseas RMB investments.
	11/17/2014	**China mainland and Hong Kong investors were allowed to invest in the Shanghai and Hong Kong stock exchanges, respectively, under certain conditions and subject to limits.**
Other investment	01/10/2014	Restrictions on the purpose and maturities of offshore lending were relaxed.
	05/12/2014	Limitations on cross-border guarantees by residents and nonresidents (both inward and outward) were canceled.
	09/26/2014	Foreign non-financial enterprises were allowed to use renminbi (RMB) raised through the issuance of RMB-denominated debt instruments in the domestic market in China and abroad. Renminbi (RMB) funds raised abroad were allowed to be used for debt servicing.
	11/01/2014	Transnational enterprise groups were allowed to carry out cross-border surplus and deficit funds transfers and allocation business between resident and external nonfinancial member enterprises, based on their own business and management needs.

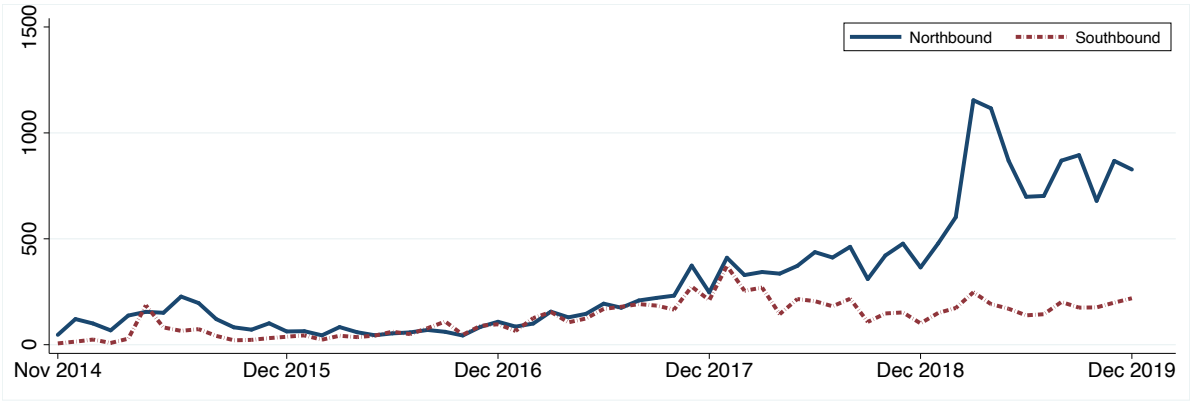
NOTE. Data source: IMF AREAER Database.

Figure B2 TRADINGS IN THE CHINA CONNECT

Panel A: Cumulative inflows in the Connect (in billions RMB)



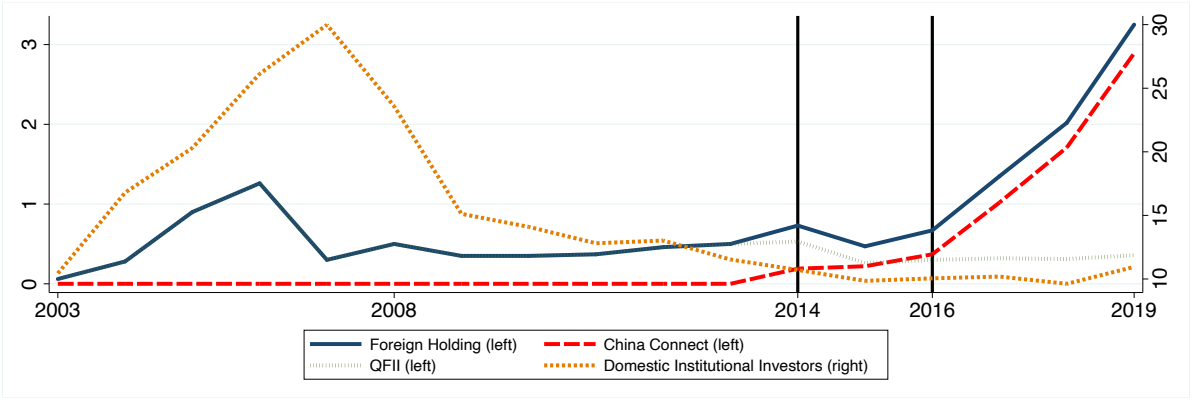
Panel B: Turnover in the Connect (in billions RMB)



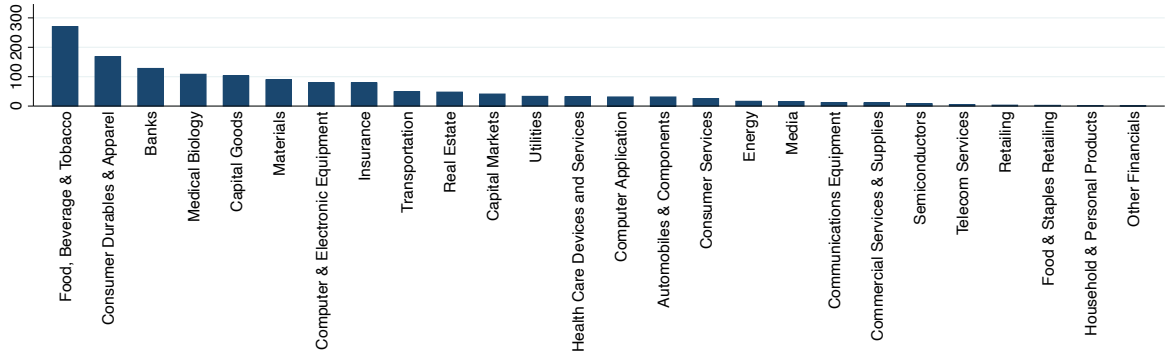
NOTE. Panel A plots the cumulative inflows (net buy) through the Connect. Panel B plots turnover (buy+sell) through the Connect. Source: WIND.

Figure B3 FOREIGN INVESTORS' PARTICIPATION IN CHINESE MARKET

Panel A: Investors composition (% of tradable market value)



Panel B: Market value by industry in the China Connect in 2019 (in billions RMB)



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

through which foreigners hold Chinese stocks. Nevertheless, the total share of foreigners in the Chinese market was around 3% in 2019, smaller than that of the domestic institutional investors, more than 10%. Given that foreign investors manage "smart money" and many domestic institutional investors follow them, the northbound flows can generate a significant price impact on the market. Figure B3 shows a wide distribution of foreign holdings across industries in the China Connect in 2019. The China Connect investors prefer stocks in the food, beverage & tobacco industries while holding fewer stocks in other financials. We also check which industry characteristics are correlated with industry distribution. We find that industries held more by the China

Connect investors have a lower covariance with the global market (correlation at -0.51), a higher profitability measure (correlation with ROA and ROE at 0.42), a higher tradable market value (correlation at 0.86) and a higher cash flow (correlation at 0.43). Those industries also have a higher investment rate and higher stock return, but the correlations are not statistically significant, which suggests that the industry skewness does not drive our results. In our analysis, we carefully pay attention to the skewed industry distribution of the Connect foreign holdings. Our results are robust to controlling for industry-level time trends (Table E9).

C A simple theoretical framework

We set up a simple model to analyze the effect of the China Connect on stock prices. The model is similar in spirit to Chari and Henry (2004) but differs from their case with complete liberalization since we focus on an environment with partial liberalization (our Federal Reserve working paper version follows their framework). We consider a static setting with three types of assets for domestic investors: connected and unconnected domestic stocks and eligible Hong Kong stocks. Domestic investors with mean-variance utility trade those assets and thus in equilibrium affect their prices. Denote stock prices by P^i, with $i \in \{C, UC\}$ where C and UC stand for connected and unconnected stocks. Domestic investors take Hong Kong stock prices as given because they are unlikely to be the marginal investors in that market. Thus, we normalize P^{HK} to 1. Similarly, denote the dividend (or cash flow) by $\mu^i + \varepsilon^i$ with μ^i as the expected value, $E[\varepsilon^i] = 0$ and $E[\varepsilon^i \varepsilon^j] \equiv \sigma^{ij}$ where $i, j \in \{C, UC, HK\}$.

Domestic investors with an initial wealth (W_0) and risk-aversion parameter γ choose among risk-free assets (y) with a safe return r, connected stocks (x^C), unconnected stocks (x^{UC}), and Hong Kong stocks (x^{HK}) to maximize their expected mean-variance utility over the period-1 wealth, W_1. The optimization problem is given by

$$\max_{x^C, x^{UC}, x^{HK}, y} E[W_1] - \frac{\gamma}{2} Var[W_1], \tag{C1}$$

$$\text{s.t.} \quad W_0 = y + P^C x^C + P^{UC} x^{UC} + x^{HK}, \tag{C2}$$

$$W_1 = y(1+r) + x^C(\mu^C + \varepsilon^C) + x^{UC}(\mu^{UC} + \varepsilon^{UC}) + x^{HK}(\mu^{HK} + \varepsilon^{HK}) \tag{C3}$$

$$x^{HK} \leq \bar{x}^{HK} + \Delta\bar{x}^{HK} \tag{C4}$$

To capture the unsatisfied diversification demand for Hong Kong stocks due to capital controls, we assume that there exists a quantity restriction on investing in the Hong Kong market, captured by (C4), with $\bar{x}^{HK}, \Delta\bar{x}^{HK} > 0$. This could be due to regulatory restrictions or other behavioral factors. The launch of the China Connect arguably relaxes this constraint, i.e. $\Delta\bar{x}^{HK} > 0$.

We first solve the optimality conditions without the last constraint (C4) given by

$$P^C = \frac{\mu^C - \gamma(x^C\sigma^{C,C} + x^{UC}\sigma^{UC,C} + x^{HK}\sigma^{HK,C})}{1+r} \tag{C5}$$

$$P^{UC} = \frac{\mu^{UC} - \gamma(x^{UC}\sigma^{UC,UC} + x^{C}\sigma^{UC,C} + x^{HK}\sigma^{HK,UC})}{1+r} \tag{C6}$$

$$x^{HK} = \frac{\mu^{HK} - 1 - r - \gamma(x^C\sigma^{C,HK} + x^{UC}\sigma^{UC,HK})}{\gamma\sigma^{HK,HK}} \tag{C7}$$

We further assume that the optimal diversification needs of domestic investors in Hong Kong stocks are not met. Thus, the optimal diversification level x^{HK} exceeds the capital controls policy, $\bar{x}^{HK} + \Delta\bar{x}^{HK}$. In equilibrium, investing in Hong Kong is thus given by the maximum amount $\bar{x}^{HK} + \Delta\bar{x}^{HK}$. The asset markets for both connected and unconnected stocks are also clear. Denote the total net supply of connected and unconnected stocks available to domestic investors by $\bar{x}^C - \Delta\bar{x}^C > 0$ and $\bar{x}^{UC}$, respectively. More foreign capital flowing into connected stocks lowers the available stocks to domestic investors, i.e. $\Delta\bar{x}^C > 0$. The market clearing conditions are thus given by

$$x^C = \bar{x}^C - \Delta\bar{x}^C \tag{C8}$$

$$x^{UC} = \bar{x}^{UC} \tag{C9}$$

In equilibrium, the following relationship for stock prices holds.

$$P^C = \bar{P}^C + \frac{\gamma\sigma^{C,C}}{1+r}\Delta\bar{x}^C - \frac{\gamma\sigma^{HK,C}}{1+r}\Delta\bar{x}^{HK} \tag{C10}$$

$$P^{UC} = \bar{P}^{UC} + \frac{\gamma\sigma^{UC,C}}{1+r}\Delta\bar{x}^C - \frac{\gamma\sigma^{HK,UC}}{1+r}\Delta\bar{x}^{HK} \tag{C11}$$

where $\bar{P}^C \equiv \frac{\mu^C - \gamma(\bar{x}^C\sigma^{C,C} + \bar{x}^{UC}\sigma^{UC,C} + \bar{x}^{HK}\sigma^{HK,C})}{1+r}$ and $\bar{P}^{UC} \equiv \frac{\mu^{UC} - \gamma(\bar{x}^{UC}\sigma^{UC,UC} + \bar{x}^{C}\sigma^{UC,C} + \bar{x}^{HK}\sigma^{HK,UC})}{1+r}$ denote the equilibrium stock prices before the launch of the China Connect.

Although we assume that domestic investors take Hong Kong stock prices as given, the launch of the Connect did coincide with a rise in the prices of Hong Kong-eligible stocks (see Table E11). This likely reflects flow pressures from mainland China to Hong Kong. This is not taken to suggest

that Chinese investors play the role of marginal investors in the Hong Kong market through the China Connect. Rather, it suggests that there exists an inelastic demand for foreign assets on the part of domestic investors. Needless to say, such a demand might change with other factors such as the expected return and risks in the Hong Kong market or the exchange rate. At the launch of the China Connect, the increased demand for Hong Kong assets is arguably a reflection of the growing and unsatisfied diversification needs for global assets, something constrained by existing capital controls. For that reason, we assume that the optimal quantity of Hong Kong assets is constrained exogenously by $\bar{x}^{HK}$ and that the China Connect simply relaxes this constraint by $\Delta\bar{x}^{HK} > 0$.

We have assumed that there is a reduction in connected stocks available to domestic investors because of the China Connect, denoted by $\Delta\bar{x}^{C} > 0$. This can be rationalized by the optimal choice of international investors. Assume that they take domestic connected stock prices and returns as given and choose a portfolio of the global risk-free assets (A^F) with return r^*, domestic connected stocks with return $r^C + \varepsilon^C$ and global stocks (x^W) with price (P^W) and payoff $\mu^W + \varepsilon^W$.[2] Their initial (final) wealth is given by W_0^F (W_1^F). Their utility is also mean-variance with risk aversion γ^*. We further assume that the international investor is marginal in the global stock market and holds all the world stocks in equilibrium. Their maximization problem is given as

$$\max_{\Delta\bar{x}^C, x^W, A^F} E[W_1^F] - \frac{\gamma^*}{2} Var[W_1^F], \tag{C12}$$

$$\text{s.t.} \quad W_0^F = A^F + \Delta\bar{x}^C + P^W x^W, \tag{C13}$$

$$W_1^F = A^F(1 + r^*) + \Delta\bar{x}^C(1 + r^C + \varepsilon^C) + x^W(\mu^W + \varepsilon^W) \tag{C14}$$

The demand function for global investors on connected stocks is given by

$$\Delta\bar{x}^C = \frac{r^C - r^* - \gamma^* \bar{x}^W \sigma^{C,W}}{\gamma^* \sigma^{C,C}} \tag{C15}$$

where $\sigma^{C,W}$ is the covariance term between connected stocks and the global market. Intuitively, global investors optimally choose the amount of connected stocks and global stocks, taking into

[2] We normalize connected stock expected returns for simplicity. As is easily seen, $1 + r^C = \frac{\mu^C}{P^C}$ holds by definition.

account their risks. In particular, their demand for connected stocks is negatively correlated with their covariance risks.

The China Connect has two main implications for stock prices. One is through more foreign capital, i.e. $\Delta\bar{x}^C > 0$ and the other is more diversification into global markets, i.e. $\Delta\bar{x}^{HK} > 0$. We, therefore, derive the following comparative statics:

$$\frac{dP^C}{d\Delta\bar{x}^C} = \gamma\frac{\sigma^{C,C}}{1+r} > 0, \tag{C16}$$

$$\frac{dP^{UC}}{d\Delta\bar{x}^C} = \gamma\frac{\sigma^{UC,C}}{1+r}, \tag{C17}$$

$$\frac{dP^i}{d\Delta\bar{x}^{HK}} = -\gamma\frac{\sigma^{i,HK}}{1+r}, \text{ for } i = C, UC \tag{C18}$$

Three testable implications emerge. First, for connected stocks, more foreign capital unambiguously drives up their prices. For unconnected stocks, their price responses depend on the covariance with connected stocks, $\sigma^{UC,C}$, i.e. $\frac{d}{d\sigma^{UC,C}}\left(\frac{dP^{UC}}{d\Delta\bar{x}^C}\right) = \frac{\gamma}{1+r} > 0$. Intuitively, connected stock prices rise due to more foreign capital purchases. As the total supply of connected stocks is fixed in the short run, domestic investors have to reduce their holdings of connected stocks to satisfy foreign investors' needs and then rebalance towards unconnected stocks. As a result, there is a spillover effect on unconnected stocks which depends on the covariance term with connected stocks. Second, connected stocks having a higher covariance term with global markets experience less price adjustment. For diversification purposes, global investors have a higher demand for connected stocks if they provide more diversification benefits, i.e. have a lower covariance with the global market. This is consistent with the risk-sharing mechanism in the full liberalization model in Chari and Henry (2004). Third, for both connected and unconnected stocks, the common effect of the China Connect from a diversification motive is ambiguous but negatively correlated with the covariance term with the Hong Kong market, i.e. $\frac{d}{d\sigma^{i,HK}}\left(\frac{dP^i}{d\Delta\bar{x}^{HK}}\right) = -\frac{\gamma}{1+r} < 0$ for $i = C, UC$.

Long-run spillover effect of the China Connect After the launch of the China Connect, foreign investors became eligible to trade Chinese stocks that are included in the program. If global shocks

affect foreign investors' opportunity costs or risk aversion, those shocks might now be transmitted to Chinese-connected stocks through a portfolio rebalancing by foreign investors. As a result, connected stock prices should respond more to global shocks after the launch of the China Connect. This could ultimately affect corporate investment. This can be seen from the following comparative statics analysis.

$$\frac{dP^C}{dr^*} = \frac{dP^C}{d\Delta\bar{x}^C}\frac{d\Delta\bar{x}^C}{dr^*} = -\frac{\gamma}{\gamma^*(1+r)} < 0 \tag{C19}$$

$$\frac{dP^C}{d\gamma^*} = -\frac{\gamma}{\gamma^*(1+r)}\frac{r^C - r^*}{\gamma^*} \tag{C20}$$

There are two ways for a global 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^*. According to the derivation above, we expect that the effect of global shocks (global interest rates) on connected stock prices is negative. Yet, its impact through risk aversion is heterogeneous and depends on the required risk premium from global investors, i.e. $\frac{r^C - r^*}{\gamma^*}$. In a world where the global capital asset pricing model applies, the required risk premium is proportional to the covariance term with the global market, i.e. $\sigma^{C,W}$. Therefore, connected firms have more negative responses to a global risk aversion shock if they have a higher covariance risk. Similarly, we can study the spillover effect from connected to unconnected stocks. The impact of global shocks on unconnected stocks is again ambiguous and depends on the covariance term with connected stocks, $\sigma^{UC,C}$.

$$\frac{dP^{UC}}{dr^*} = -\frac{\gamma\sigma^{UC,C}}{\gamma^*\sigma^{C,C}(1+r)} \tag{C21}$$

$$\frac{dP^{UC}}{d\gamma^*} = -\frac{\gamma\sigma^{UC,C}}{\gamma^*\sigma^{C,C}(1+r)}\frac{r^C - r^*}{\gamma^*} \tag{C22}$$

As the spillover effect from global shocks on the Chinese economy works through the Connect program, we expect that connected firms—with more access to foreign capital—become more sensitive to global shocks than unconnected firms. Moreover, our simple theoretical model also

provides a back-of-envelope calculation to decompose the relative importance of the risk-free rate and risk-aversion as transmission channels for global shocks. The risk-free rate channel is a common shock to all connected stocks while the risk-aversion channel is firm-specific and depends on the covariance between the firm's stock return and the global market return, i.e. $\sigma^{C,W}$. One can thus calculate their relative importance.

D Summary statistics tables

Table D1 SHANGHAI (SHENZHEN)-HONG KONG STOCK CONNECT PROGRAM OVERVIEW

Effective date	Initial announcement	Formal announcement	Number of firms (SOEs) added	Number of firms (SOEs) on list	Number of firms (SOEs) not on list
11/17/2014	04/10/2014	11/10/2014	559 (430)	559 (430)	1847 (595)
12/05/2016	08/16/2016	11/25/2016	870 (294)	1429 (724)	1511 (410)

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

Table D2 GLOBAL SHOCK: SUMMARY STATISTICS

Panel A: Monthly frequency (2013-2019)	Obs (1)	Mean (2)	Std (3)	P25 (4)	Median (5)	P75 (6)
U.S. monetary policy shock	204	-0.009	0.087	-0.020	0.000	0.020
Δ VIX	204	-0.004	0.169	-0.107	-0.025	0.071
Global financial cycle	196	0.448	1.066	-0.303	0.381	1.117
Δ Risk aversion index	204	-0.006	0.463	-0.097	-0.004	0.077
Panel B: Quarterly frequency (2013-2019)	Obs (1)	Mean (2)	Std (3)	P25 (4)	Median (5)	P75 (6)
U.S. monetary policy shock	68	-0.026	0.116	-0.066	-0.022	0.038
Δ VIX	68	-0.012	0.227	-0.144	-0.047	0.057
Global financial cycle	66	0.436	1.062	-0.330	0.285	1.138
Δ Risk aversion index	68	-0.016	0.567	-0.129	-0.028	0.048

NOTE. The U.S. monetary policy shock (daily data) is from Rogers et al. (2018). We then take a monthly (quarterly) sum of the shocks within a month (quarter). The VIX is from CBOE. Global financial cycles data (available until May 2019) is from Miranda-Agrippino and Rey (2020) and the risk aversion index is from Bekaert et al. (2021b).

Table D3 CHINESE FIRM-LEVEL DATA: SUMMARY STATISTICS

Panel A: Variables used in the monthly stock price regression (Nov 2014)						
	Obs	Mean	Std	P25	Median	P75
	(1)	(2)	(3)	(4)	(5)	(6)
Return [0]	2,191	0.055	0.109	-0.010	0.040	0.105
$\sigma^{i,C}(\%)$	2,285	0.380	0.233	0.299	0.390	0.478
$\sigma^{i,W}(\%)$	2,285	0.089	0.095	0.046	0.086	0.125
$\sigma^{i,HK}(\%)$	2,285	0.180	0.146	0.117	0.176	0.236
Market cap	2,293	0.102	0.139	0.029	0.053	0.115
Turnover	2,293	0.021	0.013	0.012	0.018	0.026
Volatility	2,288	0.025	0.009	0.019	0.023	0.030
Domestic fund share (%)	2,053	4.220	6.784	0.095	1.074	5.382
QFII share (%)	2,053	0.173	1.482	0.000	0.000	0.000
SOE dummy	2,234	0.396	0.489	0.000	0.000	1.000
Panel B: Variables used in the quarterly corporate investment regression (2003-2019)						
	Obs	Mean	Std	P25	Median	P75
	(1)	(2)	(3)	(4)	(5)	(6)
Investment	99,474	0.032	0.040	0.006	0.017	0.042
Size	99,474	21.915	1.349	21.025	21.774	22.638
Tobin's Q	99,474	2.450	1.702	1.372	1.905	2.870
Cash flow	99,474	0.035	0.043	0.009	0.027	0.054
Sales growth	99,474	0.208	0.540	-0.032	0.115	0.302
Domestic fund share (%)	76,086	3.858	5.791	0.237	1.556	5.018
QFII share (%)	76,086	0.140	1.052	0.000	0.000	0.000
SOE dummy	99,324	0.492	0.500	0.000	0.000	1.000

NOTE. Summary statistics for key variables used in our regressions. Panel A includes variables used in the monthly stock price regressions in Nov 2014, such as monthly return in Nov 2014, $\sigma^{i,C}$ (covariance term with domestic connected stocks), $\sigma^{i,W}$ (covariance term with world market), $\sigma^{i,HK}$ (covariance term with Hong Kong eligible stocks for domestic investors), market cap, turnover, volatility, domestic fund share, QFII share and SOE dummy (a dummy variable for state-owned enterprises). Panel B includes variables used in the quarterly corporate investment regressions from 2003 to 2019, such as investment, firm size, Tobin's Q, cash flow, sales growth, domestic fund share, QFII share, and SOE dummy. Detailed definitions are in Appendix A. All continuous variables are winsorized at the top and bottom 1%.

Table D4 CORRELATION TABLE FOR CHINESE FIRM-LEVEL DATA

Panel A: Correlations for variables used in the monthly stock price regression (Nov 2014)

	A1	A2	A3	A4	A5	A6	A7	A8	A9
A1: $\sigma^{i,C}(\%)$	1.000								
A2: $\sigma^{i,W}(\%)$	-0.046	1.000							
A3: $\sigma^{i,HK}(\%)$	0.243*	0.741*	1.000						
A4: Market cap	-0.027	-0.093*	-0.084*	1.000					
A5: Turnover	0.085*	0.163*	0.177*	-0.090*	1.000				
A6: Volatility	-0.050	0.177*	0.187*	0.045	0.478*	1.000			
A7: Domestic fund share (%)	-0.213*	-0.117*	-0.195*	0.402*	-0.133*	-0.121*	1.000		
A8: QFII share (%)	-0.009	-0.005	-0.002	0.087*	-0.034	-0.032	0.034	1.000	
A9: SOE dummy	0.222*	0.119*	0.179*	-0.087*	0.073*	-0.035	-0.073*	-0.015	1.000

Panel B: Correlations for variables used in the quarterly corporate investment regression (2003-2019)

	B1	B2	B3	B4	B5	B6	B7	B8
B1: Investment	1.000							
B2: Size	0.042*	1.000						
B3: Tobin's Q	0.000	-0.396*	1.000					
B4: Cash flow	0.358*	0.089*	0.157*	1.000				
B5: Sales growth	0.070*	0.022*	0.103*	0.160*	1.000			
B6: Domestic fund share (%)	0.158*	0.044*	0.203*	0.295*	0.083*	1.000		
B7: QFII share (%)	0.014*	0.035*	-0.001	0.051*	-0.007	0.044*	1.000	
B8: SOE dummy	-0.030*	0.192*	-0.211*	-0.043*	-0.035*	-0.024*	0.004	1.000

NOTE. Panel A includes variables used in the monthly stock price regressions in Nov 2014, such as $\sigma^{i,C}$ (covariance term with domestic connected stocks), $\sigma^{i,W}$ (covariance term with world market), $\sigma^{i,HK}$ (covariance term with Hong Kong eligible stocks for domestic investors), market cap, turnover, volatility, domestic fund share, QFII share and SOE dummy (a dummy variable for state-owned enterprises). Panel B includes variables used in the quarterly corporate investment regressions from 2003 to 2019, such as investment, firm size, Tobin's Q, cash flow, sales growth, domestic fund share, QFII share, and SOE dummy. Detailed definitions can be found in Appendix A. * indicates statistical significance at 1% level.

Table D5 EX-ANTE DIFFERENCES FOR CONNECTED AND UNCONNECTED FIRMS

	Connected (a)			Unconnected (b)			Difference (a)-(b)		
	Mean	Median	S.D	Mean	Median	S.D	Mean Diff		T-test
	(1)	(2)	(3)	(4)	(5)	(6)	(7)		(8)
Panel A: Snapshot for variables used in the monthly stock price regression at one month before the China Connect (Oct 2014)									
$\sigma^{i,C}$ (%)	0.439	0.439	0.162	0.363	0.378	0.242	0.076	***	6.47
$\sigma^{i,W}$ (%)	0.089	0.091	0.069	0.089	0.085	0.101	0.000		0.05
$\sigma^{i,HK}$ (%)	0.197	0.198	0.112	0.175	0.169	0.153	0.022	***	2.88
Market cap	0.088	0.052	0.119	0.107	0.055	0.144	-0.019	**	-2.63
Turnover	0.019	0.016	0.013	0.021	0.018	0.014	-0.002	***	-3.07
Volatility	0.022	0.021	0.008	0.026	0.024	0.010	-0.003	***	-6.66
Domestic fund share (%)	5.434	2.234	7.680	3.906	0.751	6.487	1.528	***	4.27
QFII share (%)	0.322	0.000	1.557	0.129	0.000	1.456	0.192	**	2.46
SOE dummy	0.639	1.000	0.481	0.332	0.000	0.471	0.307	***	12.47
Panel B: Snapshot for variables used in the quarterly investment regressions at one quarter before the China Connect (2014 Q3)									
Investment	0.034	0.026	0.032	0.037	0.025	0.039	-0.003		-1.52
Size	23.101	22.960	1.326	21.660	21.559	1.052	1.442	***	23.49
Tobin's Q	1.691	1.413	0.930	2.653	2.078	1.798	-0.962	***	-10.61
Cash flow	0.035	0.028	0.034	0.029	0.024	0.040	0.006	***	2.87
Sales growth	0.099	0.059	0.403	0.166	0.091	0.478	-0.068	***	-4.25
Domestic fund share (%)	3.045	1.370	4.210	3.484	1.896	4.220	-0.439	*	-2.66
QFII share (%)	0.245	0.000	0.838	0.143	0.000	1.526	0.102		1.29
SOE dummy	0.655	1.000	0.476	0.308	0.000	0.462	0.347	***	13.57

NOTE. Ex-ante differences in summary statistics for connected and unconnected firms. Panel A is a snapshot of variables used in the monthly stock price regressions one month before the China Connect (i.e. Oct 2014), including $\sigma^{i,C}$ (covariance term with domestic connected stocks), $\sigma^{i,W}$ (covariance term with world market), $\sigma^{i,HK}$ (covariance term with Hong Kong eligible stocks for domestic investors), market cap, turnover, volatility, domestic fund share, QFII share and SOE dummy (a dummy variable for state-owned enterprises). Panel B is a snapshot of variables used in the quarterly corporate investment regressions at one quarter before the China Connect (i.e. 2014 Q3), including investment, firm size, Tobin's Q, cash flow, sales growth, domestic fund share, QFII share and SOE dummy. Detailed definitions can be found in Appendix A. All continuous variables are winsorized at the top and bottom 1%. We compare the summary statistics differences between the connected and unconnected firms. *, ** and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

Table D6 SUMMARY STATISTICS DIFFERENCES IN OWNERSHIP STRUCTURE

	Private-owned enterprises (a)			State-owned enterprises (b)			Difference (a)-(b)		
	Mean	Median	S.D	Mean	Median	S.D	Mean Diff		T-test
	(1)	(2)	(3)	(4)	(5)	(6)	(7)		(8)
Investment	0.033	0.018	0.041	0.030	0.016	0.040	0.002	***	9.42
Size	21.659	21.596	1.134	22.178	21.994	1.495	-0.519	***	-61.81
Tobin's Q	2.802	2.202	1.892	2.085	1.652	1.387	0.718	***	68.00
Cash flow	0.036	0.029	0.044	0.033	0.025	0.042	0.004	***	13.63
Sales growth	0.226	0.126	0.566	0.189	0.105	0.512	0.037	***	10.89
Domestic fund share (%)	3.987	1.696	5.720	3.712	1.412	5.872	0.274	***	6.52
QFII share (%)	0.137	0.000	1.318	0.144	0.000	0.632	-0.008		-0.99

NOTE. Summary statistics differences in ownership structure for key variables used in the quarterly investment regression (2003-2019) including investment, firm size, Tobin's Q, cash flow, sales growth, domestic fund share, and QFII share. Detailed definitions can be found in Appendix A. We also present the differences between private-owned enterprises (POEs) and state-owned enterprises (SOEs) in column (7). *, ** and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

Table D7 DETERMINANTS OF CONNECTED STOCKS

	$\text{Connect}_i^{\text{Shanghai}}$	Connect_{it}
	(1)	(2)
Stock volatility	-5.987***	-6.942***
	(1.113)	(1.146)
Market cap	0.429***	0.709***
	(0.006)	(0.008)
Constant	-9.171***	-16.575***
	(0.149)	(0.200)
Industry FE	Yes	Yes
Time FE	Yes	Yes
Observations	52697	39871
Pseudo R^2	0.140	0.293

NOTE. The dependent variable is the Connect Dummy, defined as the eligible stocks in Nov 2014, $\text{Connect}_i^{\text{Shanghai}}$, in column (1) or the periodically adjusted eligible stocks, Connect_{it}, in column (2). Probit regressions were conducted from 2003 to 2019 and used stock volatility and market cap (those are important factors according to the index construction method) as independent variables. We also control for industry and time-fixed effects. Robust standard errors are clustered at the firm level and reported in parentheses. *, ** and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

Table D8 EFFECTIVENESS OF PROPENSITY SCORE MATCHING

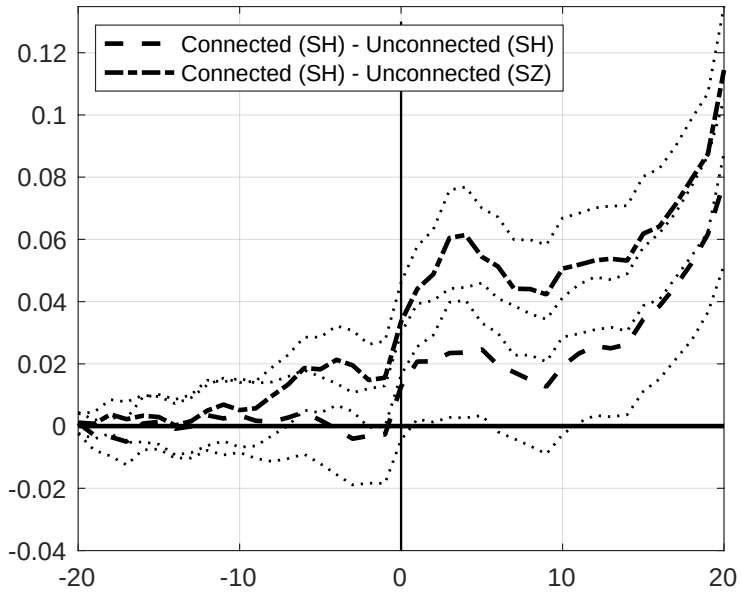
	Connected (a)			Unconnected (b)			Difference (a)-(b)		
	Mean	Median	S.D	Mean	Median	S.D	Mean Diff		T-test
	(1)	(2)	(3)	(4)	(5)	(6)	(7)		(8)
Panel A: Shanghai-Hong Kong Connect (2013Q4) before propensity score matching									
Matching variables									
Size	23.023	22.841	1.328	21.548	21.443	1.048	1.475	***	24.32
Turnover	0.013	0.011	0.009	0.016	0.013	0.010	-0.003	***	-5.30
Sales growth	0.426	0.378	0.256	0.467	0.394	0.314	-0.041	**	-2.47
Leverage	0.233	0.226	0.155	0.193	0.160	0.171	0.040	***	4.35
Unmatching variables									
Investment	0.053	0.044	0.043	0.058	0.044	0.053	-0.005	*	-1.71
Tobin's Q	1.805	1.477	1.137	2.536	1.938	1.829	-0.730	***	-7.85
Cash flow	0.076	0.071	0.043	0.062	0.058	0.052	0.014	***	5.07
M/B	2.372	1.897	1.749	3.522	2.605	3.162	-1.150	***	-7.20
Cash	0.161	0.134	0.107	0.204	0.167	0.141	-0.042	***	-5.74
ROA	0.048	0.042	0.038	0.035	0.032	0.050	0.013	***	4.97
Age	11.803	12.000	5.474	8.076	5.000	6.367	3.727	***	11.05
Panel B: Shanghai-Hong Kong Connect (2013Q4) after propensity score matching									
Matching variables									
Size	22.571	22.478	0.930	22.445	22.344	1.207	0.125		1.52
Turnover	0.014	0.013	0.009	0.014	0.012	0.010	0.000		-0.02
Sales growth	0.439	0.382	0.280	0.428	0.377	0.208	0.011		0.60
Leverage	0.230	0.223	0.157	0.243	0.240	0.179	-0.012		-0.96
Unmatching variables									
Investment	0.054	0.043	0.044	0.054	0.038	0.051	-0.001		-0.25
Tobin's Q	1.956	1.615	1.190	1.997	1.531	1.513	-0.041		-0.39
Cash flow	0.078	0.075	0.043	0.058	0.051	0.052	0.021	***	5.66
M/B	2.657	2.115	1.811	2.526	2.046	1.830	0.131		0.94
Cash	0.162	0.138	0.107	0.182	0.145	0.128	-0.020	**	-2.18
ROA	0.051	0.046	0.038	0.031	0.025	0.049	0.020	***	5.92
Age	12.156	12.000	5.393	10.251	12.000	6.368	1.905	***	4.21

NOTE. Panel A (B) provides summary statistics of connected and unconnected stocks and their differences for matching variables including firm size, turnover, sales growth, and leverage, along with unmatching variables such as investment, Tobin's Q, cash flow, market-to-book ratio, cash flows, ROA and firm age before (after) the propensity score matching. Detailed definitions can be found in Appendix A. *, ** and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

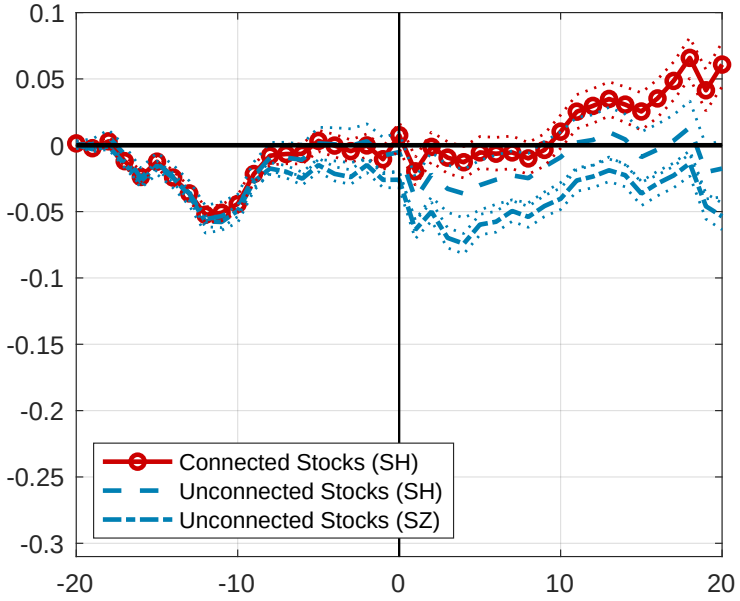
E Robustness on the effects of the China Connect

Figure E1 DAILY STOCK RETURNS AROUND THE CONNECT ANNOUNCEMENT (GLOBAL CAPM): 10 NOV 2014

Panel A: Differential effects

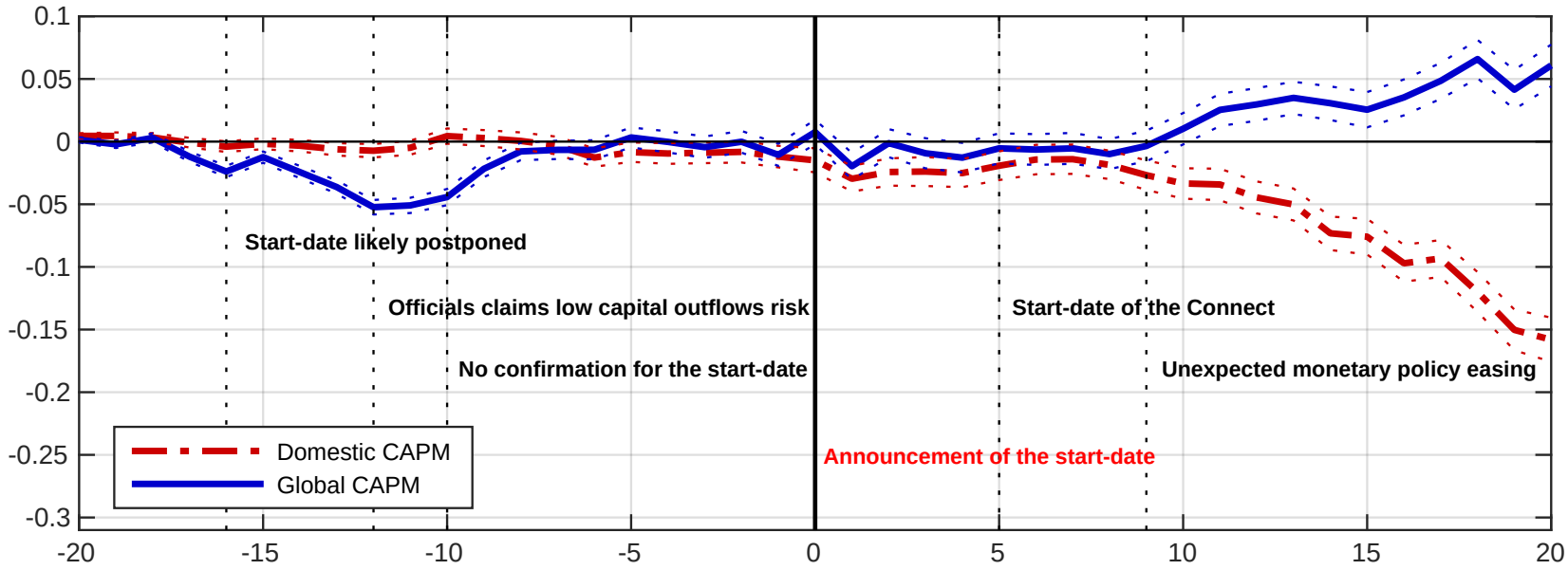


Panel B: Overall effects



NOTE: Cumulative abnormal return (CAR) based on a global market model centered on Nov 10, 2014 (with 95% c.i.). The estimation window is [-300, -30] and we restrict firms to have at least 100 trading days at the estimation window. Panel A plots the differences between connected stocks (SH) and unconnected stocks in Shanghai (SH) and between connected stocks (SH) and unconnected stocks in Shenzhen (SZ). Panel B plots the CAR for three different groups of stocks based on their status when the China Connect was announced.

Figure E2 MARKET NEWS AROUND THE CONNECT ANNOUNCEMENT: 10 NOV 2014

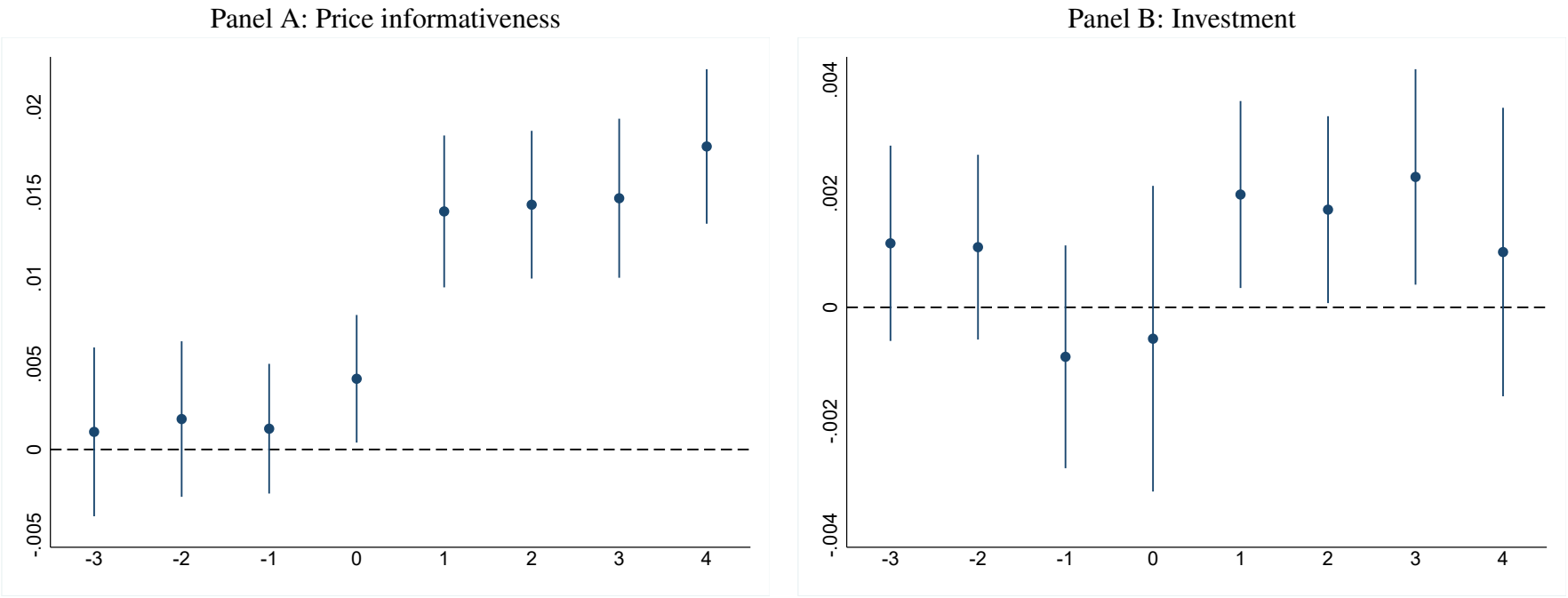


NOTE: Cumulative abnormal return (CAR) based on a global CAPM and a domestic CAPM centered on Nov 10, 2014 (with 95% c.i.) for connected stocks along with market news. The estimation window is [-300, -30] and we restrict firms to have at least 100 trading days at the estimation window. Related market news includes 1) Regulators signed MOU (memorandum of understanding) for the Connect but did not announce a formal commencement date during its regular briefing, contrary to market expectations; 2) With the new foreign exchange data released, officials alleviate the market concerns about capital outflows risk;[a] 3) HKEX announced no formal date for the implementation of the Connect amid market expectations of implementation in Oct;[b] 4) Announcement of the implementation date; 5) Formal launch of the Connect; 6) PBOC unexpectedly eased monetary policy.

[a] See http://www.safe.gov.cn/safe/2014/1023/5078.html.

[b] See https://www.hkex.com.hk/-/media/HKEX-Market/News/News-Release/2014/141026news.pdf.

Figure E3 PARALLEL TRENDS



NOTE. This figure tests the parallel trend assumption for the price informativeness and investment response. The coefficients $\{\beta_s\}_{s=-3}^{4}$ along with the 90% confidence interval estimated from $y_{it} = \alpha + \sum_{s=-3}^{4} \beta_s \text{Connect}_i * \mathbb{1}_{t+s} + \Gamma Z_{it} + \varepsilon_{it}$, where y_{it} is the quarterly price informativeness measures constructed following Dávila and Parlatore (2021) and corporate investment for firm i at quarter t. Firm-level controls are the same as in Table 4 and 5 respectively. Standard errors are clustered by firm and time.

Table E1 STOCK PRICE REVALUATION AROUND THE CONNECT AT NOV 2014: ROBUSTNESS

	Month [0]				Month [0,1]			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Connect	0.026***	0.017*	0.017*	0.013	0.115***	0.082***	0.074***	0.094***
	(0.007)	(0.009)	(0.008)	(0.008)	(0.008)	(0.017)	(0.020)	(0.026)
σ^{iC}		0.044**	0.045**	0.044**		0.123*	0.134**	0.124*
		(0.020)	(0.020)	(0.020)		(0.061)	(0.064)	(0.062)
Connect*$\sigma^{i,W}$		-0.019***	-0.018**	-0.019***		-0.076**	-0.071**	-0.071**
		(0.007)	(0.007)	(0.006)		(0.028)	(0.029)	(0.030)
$\sigma^{i,HK}$		-0.005	-0.005	-0.004		0.011	0.009	0.016
		(0.012)	(0.012)	(0.012)		(0.036)	(0.036)	(0.037)
$\sigma^{i,W}$		0.012*	0.013**	0.011*		0.002	0.008	-0.006
		(0.006)	(0.006)	(0.006)		(0.019)	(0.019)	(0.019)
Market cap*Connect			0.063*				0.471***	
			(0.033)				(0.082)	
Market cap*Unconnect			0.043**				0.233***	
			(0.017)				(0.030)	
Turnover*Connect				0.627***				1.414***
				(0.155)				(0.473)
Turnover*Unconnect				0.536				2.193***
				(0.322)				(0.456)
Market cap	0.051**	0.052***			0.289***	0.284***		
	(0.019)	(0.016)			(0.035)	(0.031)		
Turnover	0.756***	0.621**			2.585***	2.116***		
	(0.226)	(0.246)			(0.440)	(0.389)		
Volatility	5.226***	5.163***	5.636***	5.301***	5.075***	4.192***	5.397***	4.928***
	(0.604)	(0.592)	(0.643)	(0.592)	(0.845)	(0.835)	(0.827)	(0.900)
Domestic fund share	-0.002***	-0.001***	-0.001***	-0.001***	-0.002***	-0.001	-0.001	0.002**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)
QFII share	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.002
	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.003)
Sales growth [+1]	0.006	0.005	0.004	0.006	-0.000	-0.003	-0.005	-0.001
	(0.007)	(0.007)	(0.007)	(0.007)	(0.013)	(0.012)	(0.012)	(0.013)
Constant	-0.093***	-0.059**	-0.056**	-0.056**	-0.277***	-0.147***	-0.124**	-0.152**
	(0.014)	(0.022)	(0.022)	(0.023)	(0.030)	(0.051)	(0.053)	(0.055)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2044	2044	2044	2044	2006	2006	2006	2006
Adjusted R^2	0.332	0.353	0.349	0.349	0.395	0.442	0.429	0.413

NOTE. The dependent variable is the cumulative log stock return (adjusted for pre-liberalization mean) around the China Connect in Nov 2014. Time 0 means Nov 2014. Columns (1)-(4) use month 0 while Columns (5)-(8) use the months Nov and Dec. The independent variables are a connect (unconnect) dummy variable for those (in)eligible stocks for foreign investors, $\sigma^{i,HK}$ (covariance term with Hong Kong eligible stocks for domestic investors), $\sigma^{i,W}$ (covariance term with world market), $\sigma^{i,C}$ (covariance term with domestic connected stocks), market cap, turnover, volatility, domestic fund share, QFII share and future sales growth (adjusted for pre-liberalization average). We standardized all the covariance terms. We also add industry-fixed effects. Robust standard errors clustered at the industry level are reported in parentheses. *, ** and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively. All variable constructions are reported in Appendix A.

Table E2 THE CHINA CONNECT AND STOCK PRICE INFORMATIVENESS ABOUT FUTURE PROFIT

Panel A: Earning as dependent variable									
	$h=1$ (1-year)			$h=2$ (2-year)			$h=3$ (3-year)		
	b_1	b_2	b_2-b_1	b_1	b_2	b_2-b_1	b_1	b_2	b_2-b_1
Panel estimate	0.0003	0.0084	0.0081	-0.0021	0.0065	0.0085	-0.0060	0.0076	0.0136
t-statistics	0.16	3.82	7.97	-0.62	1.99	3.76	-1.31	1.76	5.24
Cross-sectional	0.0027	0.0071	0.0044	0.0021	0.005	0.0030	-0.0009	0.008	0.0087
Panel B: EBIT as dependent variable									
	$h=1$ (1-year)			$h=2$ (2-year)			$h=3$ (3-year)		
	b_1	b_2	b_2-b_1	b_1	b_2	b_2-b_1	b_1	b_2	b_2-b_1
Panel estimate	0.0030	0.0102	0.0072	-0.0007	0.0089	0.0096	-0.0056	0.0083	0.0140
t-statistics	0.96	3.67	3.54	-0.16	2.25	3.00	-0.94	1.58	3.48
Cross-sectional	0.0058	0.0082	0.0024	0.0046	0.007	0.0021	0.0019	0.008	0.0062

NOTE. The table shows estimates of the coefficients b_1, b_2, and b_2-b_1 along with their t-statistics from panel regressions of the form

$$\frac{E_{i,t+h}}{A_{i,t}} = a_{0t} + a_{1t} \times \text{Connect}_{it} + [b_{0t} + (b_1 * 1_{t\leq 2014} + b_2 * 1_{t>2014}) * \text{Connect}_{it}] \times \log\left(\frac{M_{i,t}}{A_{i,t}}\right) + c_t \times \log\left(\frac{E_{i,t}}{A_{i,t}}\right) + d_t^s \times \mathbb{1}_{i,t}^s + \varepsilon_{i,t+h},$$

where Connect_{it} includes the eligible stocks, for forecasting horizons $k=1,2,3$ over the period 2003 and $2021-k$. The row labeled "Cross-sectional" is the corresponding sub-period averages of estimates of yearly coefficients b_{1t} from annual cross-sectional regressions of the form

$$\frac{E_{i,t+h}}{A_{i,t}} = a_{0t} + a_{1t} \times \text{Connect}_{it} + (b_{0t} + b_{1t} * \text{Connect}_{it}) \times \log\left(\frac{M_{i,t}}{A_{i,t}}\right) + c_t \times \log\left(\frac{E_{i,t}}{A_{i,t}}\right) + d_t^s \times \mathbb{1}_{i,t}^s + \varepsilon_{i,t+h}.$$

Panel A uses earnings as the proxy for E_{it} while Panel B uses EBIT for robustness. A statistically positive b_2-b_1 suggests that the price efficiency for connected stocks is higher than unconnected ones post-liberalization.

Table E3 PRICE INFORMATIVENESS RESPONSE TO THE CHINA CONNECT AROUND 2014 Q4

Time:[-8Q: 8Q]					
	All firms	Small	Large	Private	State
	(1)	(2)	(3)	(4)	(5)
$\text{Connect}_i * \text{Post}_t$	0.029***	0.036***	0.019***	0.033***	0.007***
	(0.002)	(0.004)	(0.002)	(0.003)	(0.002)
Size	0.000***	-0.001***	0.000***	0.000***	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Log (M/B)	0.002	-0.004	0.006***	0.002	0.005***
	(0.001)	(0.002)	(0.002)	(0.002)	(0.001)
Domestic fund share	0.000	0.001**	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
QFII share	0.003***	0.000	0.003***	0.005***	0.000
	(0.001)	(0.002)	(0.001)	(0.002)	(0.001)
State ownership	-0.000	-0.001***	0.000***	-0.001***	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Turnover	0.007***	0.009***	0.006***	0.008***	0.002
	(0.002)	(0.003)	(0.002)	(0.003)	(0.002)
Constant	0.030***	0.074***	0.025***	0.042***	0.028***
	(0.003)	(0.007)	(0.003)	(0.004)	(0.004)
Firm FE	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes
Observations	28161	13209	14952	16529	11593
Adjusted R^2	0.739	0.726	0.790	0.734	0.759

NOTE. This table estimates the effect of the China Connect on the price informativeness measure (*DP*) constructed following Dávila and Parlatore (2021) using a difference-in-differences approach in a short window [-8Q: 8Q] around 2014 Q4. Post is a dummy variable that equals one if the period is after the China Connect and zero otherwise. We estimate the specification $DP_{it} = \alpha * \text{Connect}_i * \text{Post}_t + \beta Z_{it} + \varepsilon_{it}$, where Z_{it} are firm-level controls. We add both firm and time-fixed effects in the regression and estimate the specification alternatively for all firms, small vs. large firms, and private vs. state-owned firms. Standard errors are clustered at both firm and time levels. *, ** and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

Table E4 IMPROVED PRICE INFORMATIVENESS AROUND THE CONNECT AT 2014 Q4: ROBUSTNESS

	PIN			*1-R2*		
	1-4 Q	1-8 Q	1-12 Q	1-4 Q	1-8 Q	1-12 Q
	(1)	(2)	(3)	(4)	(5)	(6)
Connect	0.014***	0.012***	0.004*	0.007	0.008*	0.021***
	(0.004)	(0.003)	(0.002)	(0.004)	(0.005)	(0.005)
Size	-0.032***	-0.035***	-0.034***	0.002	0.010**	0.010***
	(0.002)	(0.001)	(0.001)	(0.006)	(0.004)	(0.003)
Log (M/B)	-0.023***	-0.027***	-0.029***	0.002	0.007	0.006*
	(0.002)	(0.002)	(0.001)	(0.004)	(0.004)	(0.003)
Domestic fund share	-0.000	-0.000	-0.000	0.001	0.002***	0.002***
	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)
QFII share	-0.001	-0.001	-0.001***	-0.002	-0.001	0.000
	(0.001)	(0.001)	(0.000)	(0.001)	(0.001)	(0.001)
State ownership	0.000***	0.000***	0.000***	-0.000	0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Turnover	-0.054***	-0.072***	-0.084***	0.002	0.047***	0.045***
	(0.005)	(0.005)	(0.004)	(0.007)	(0.009)	(0.008)
Constant	0.726***	0.793***	0.782***	0.072	-0.149	-0.151**
	(0.037)	(0.032)	(0.025)	(0.138)	(0.095)	(0.074)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	4988	10436	15732	6772	13991	21180
Adjusted R^2	0.164	0.182	0.202	0.381	0.398	0.374

NOTE. The dependent variable is a quarterly measure of price informativeness, adjusted for its pre-liberalization average. We construct the measures following Easley et al. (1996) (*PIN*) in columns (1)-(3), and Roll (1988) (*1-R2*) in columns (4)-(6) respectively. The independent variables are a Connect dummy variable for those stocks eligible to foreign investors, firm size, market-to-book ratio, domestic fund share, QFII share, state ownership, and turnover. We also include industry effects and time-fixed effects. We analyzed during 4 quarters, 8 quarters, and 12 quarters after 2014 Q4. All standard errors are clustered at both industry and time and reported in parentheses. *, ** and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively. Variable constructions are in Appendix A.

Table E5 INVESTMENT RESPONSE TO THE CHINA CONNECT AROUND 2014 Q4

Time: [-8Q: 8Q]					
	All firms	Small	Large	Private	State
	(1)	(2)	(3)	(4)	(5)
$\text{Connect}_i * \text{Post}_t$	0.003***	0.006***	0.001	0.004***	-0.000
	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)
Size	0.008***	0.010***	0.008***	0.008***	0.013***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)
Tobin's Q	0.002***	0.001***	0.003***	0.001***	0.003***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Cash flow	0.113***	0.085***	0.140***	0.107***	0.103***
	(0.008)	(0.012)	(0.012)	(0.011)	(0.012)
Sales growth	-0.000	-0.001	-0.000	0.000	-0.001
	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)
β_i^{GDP}*GDP growth	0.003***	0.004***	0.001***	0.003***	0.001***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Constant	-0.169***	-0.211***	-0.162***	-0.158***	-0.274***
	(0.019)	(0.032)	(0.033)	(0.024)	(0.035)
Firm FE	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes
Observations	29587	13898	15689	16887	12657
Adjusted R^2	0.542	0.522	0.606	0.546	0.545

NOTE. This table estimates the effect of the China Connect on investment using a difference-in-differences approach in a short window [-8Q: 8Q] around 2014 Q4. Post equals one if the period is after the China Connect and zero otherwise. We estimate the specification $I_{it} = \alpha * \text{Connect}_i * \text{Post}_t + \beta Z_{it} + \varepsilon_{it}$, where Z_{it} is the firm-level and macro-level controls. We add both firm and time-fixed effects in the regression and estimate the specification alternatively for all firms, small vs. large firms, and private vs. state-owned firms. Standard errors are clustered at both firm and time levels. *, ** and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

Table E6 THE LEARNING CHANNEL AND CORPORATE GOVERNANCE

Panel A: All firms						
	Related party transactions		State ownership		Tunnelling	
	High	Low	High	Low	High	Low
	(1)	(2)	(3)	(4)	(5)	(6)
Connect*Q*Price informativeness	0.032***	0.025	0.041***	0.004	0.037***	0.012
	(0.009)	(0.016)	(0.011)	(0.019)	(0.008)	(0.019)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	5195	7606	6956	5845	6422	6377
Adjusted R^2	0.164	0.150	0.192	0.168	0.131	0.188
Panel B: Small firms						
	Related party transactions		State ownership		Tunnelling	
	High	Low	High	Low	High	Low
	(1)	(2)	(3)	(4)	(5)	(6)
Connect*Q*Price informativeness	0.059**	0.071*	0.084***	-0.044	0.058***	0.068
	(0.024)	(0.040)	(0.025)	(0.080)	(0.019)	(0.048)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2103	3814	3217	2700	2999	2916
Adjusted R^2	0.151	0.150	0.183	0.168	0.126	0.189

NOTE. The dependent variable is the quarterly abnormal corporate investment rate, defined as the difference between the investment rate and its pre-liberalization average. We focus on the triple interactions among a Connect dummy, Tobin's Q, and the price informativeness measure constructed following Dávila and Parlatore (2021). We use the same control variables as in Table 6. To save space, we do not show the control variables and other interaction terms. We divide firms by related party transactions (columns 1-2), state ownership (columns 3-4), and tunneling activities (columns 5-6). We conduct the sub-sample analysis for all firms in panel A and only small-sized firms in panel B. All standard errors are clustered at both industry and time and reported in parentheses. *, ** and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively. All variable construction is described in Appendix A.

Table E7 RETURN AND PROFIT PREDICTABILITY OF VALUATION RATIOS IN CHINA

Panel A: Future return						
	$h=1$ (one quarter)			$h=4$ (one year)		
	P/B	P/E	P/D	P/B	P/E	P/D
	(1)	(2)	(3)	(5)	(6)	(7)
Valuation ratio	-0.081***	-0.010***	-0.005***	-0.236***	-0.026***	-0.011***
	(0.004)	(0.001)	(0.001)	(0.009)	(0.003)	(0.001)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	76448	63559	87598	69413	58191	79853
Adjusted R^2	0.504	0.489	0.493	0.618	0.602	0.586
Panel B: Future profit						
	$h=1$ (one quarter)			$h=4$ (one year)		
	P/B	P/E	P/D	P/B	P/E	P/D
	(1)	(2)	(3)	(5)	(6)	(7)
Valuation ratio	0.007	-0.004***	-0.005***	0.006	0.004***	-0.001
	(0.004)	(0.000)	(0.000)	(0.004)	(0.002)	(0.001)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	76708	64057	87726	69961	58819	81869
Adjusted R^2	0.346	0.555	0.161	0.197	0.234	0.094

NOTE. The table estimates the predictability regression of $y_{i,t+h} = \alpha + \beta * \text{Valuation ratio}_{it} + \Gamma * Z_{it} + \varepsilon_{i,t}$, where the dependent variable is alternatively quarterly return and profit measure (EBIT) in panels A and B respectively. Valuation ratios include price-to-book ratios (in logs), price-to-earnings ratios (in logs), and price-to-dividend ratios (in logs) respectively. Control variables are the same as in Table 5. We also include firm and time-fixed effects in all specifications. All standard errors are clustered at both firm and time levels and reported in parentheses. *, ** and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively. We analyze $h=1$ (one quarter) and $h=4$ (one year) respectively.

Table E8 EFFECTS OF THE CHINA CONNECT ON FIRM OUTCOMES

	Panel A: Funding structure						*Panel B: Information and governance*			
	Cost of debt	ΔD/P	Leverage	Seasoned equity offering	Stocks pledged	Bank loan	Foreign analyst coverage	Tunnelling	Related party transactions	Independent directors (%)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Connect	-0.134***	-0.044***	-0.018***	0.016***	-0.075***	-0.003**	0.009**	-0.004***	-0.007**	0.289***
	(0.018)	(0.013)	(0.003)	(0.004)	(0.017)	(0.001)	(0.004)	(0.001)	(0.004)	(0.107)
Size	0.119***	0.008	0.013***	-0.010***	0.006	0.000	0.041***	0.001	0.003**	-0.124**
	(0.010)	(0.008)	(0.001)	(0.002)	(0.010)	(0.001)	(0.013)	(0.000)	(0.001)	(0.055)
Tobin's Q	-0.044***	0.006*	-0.000	0.002	0.152***	0.000	0.009***	-0.001*	0.001	0.012
	(0.010)	(0.003)	(0.001)	(0.001)	(0.011)	(0.000)	(0.003)	(0.000)	(0.001)	(0.031)
Cash flow	-1.328***	-0.529**	-0.361***	0.120**	-0.514	-0.040***	-0.033	-0.005	-0.041	-2.085*
	(0.361)	(0.221)	(0.041)	(0.054)	(0.398)	(0.013)	(0.066)	(0.018)	(0.041)	(1.095)
Sales growth	0.069***	0.025***	0.016***	-0.013***	0.096***	0.001	-0.004	0.002**	0.003	0.065
	(0.019)	(0.006)	(0.004)	(0.004)	(0.023)	(0.001)	(0.003)	(0.001)	(0.002)	(0.078)
$\beta_i^{GDP} *$ GDP growth	-0.003***	-0.001*	-0.001***	0.000	0.004***	0.000**	-0.000	0.000***	0.000	-0.013***
	(0.001)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)	(0.003)
Constant	1.030***	-0.434**	-0.268***	0.214***	-0.385	0.024**	-0.020**	-0.013	-0.019	3.251**
	(0.241)	(0.174)	(0.025)	(0.048)	(0.238)	(0.011)	(0.008)	(0.011)	(0.031)	(1.251)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	13567	12790	13567	13567	13567	13567	13567	13565	13567	13567
Adjusted R^2	0.171	0.062	0.050	0.011	0.132	0.033	0.028	0.014	0.048	0.005

NOTE. The dependent variables are quarterly corporate outcomes, 8 quarters after the China Connect in Nov 2014, including the cost of debt in column (1), change of log(Dividend to price) in column (2), leverage ratio (debt to book assets) in column (3), seasoned equity offering in column (4), stocks pledged in column (5), bank loans in column (6), # of foreign analysts in column (7), measures of tunneling in column (8), related party transactions in column (9) and percentage of independent directors in column (10). All quarterly corporate outcomes are adjusted by the pre-liberalization average. We also include industry and time-fixed effects in all specifications. All standard errors are clustered at both industry and time levels and reported in parentheses. *, ** and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

Table E9 SAMPLE SELECTION: ROBUSTNESS

	OLS	Adding control variable: X*Time FE					$\frac{\text{Unobservable}}{\text{Observables}}(\delta)$
		X=Industry	ROA	Tobin's Q	Cash flow	SOE	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Panel A: Stock price adjustment around the Connect (Nov 2014)							
Connect	0.134***	0.119***	0.117***	0.082***	0.117***	0.107***	10.068
	(0.010)	(0.009)	(0.010)	(0.009)	(0.010)	(0.010)	
Observations	2006	2006	1681	1681	1681	2004	
Adjusted R^2	0.285	0.368	0.215	0.348	0.214	0.331	
Panel B: Price informativeness measure adjustment after the China Connect (2014 Q4)							
Connect	0.026***	0.029***	0.026***	0.026***	0.026***	0.019***	2.490
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	
Observations	13559	13559	13559	13559	13559	13538	
Adjusted R^2	0.046	0.034	0.048	0.045	0.046	0.069	
Panel C: Investment adjustment after the China Connect (2014 Q4)							
Connect	0.002**	0.002**	0.002**	0.002**	0.002**	0.000	6.458
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	
Observations	13567	13567	13298	13298	13298	13284	
Adjusted R^2	0.141	0.134	0.145	0.146	0.147	0.158	
Panel D: Learning channel for investment adjustment							
Connect*Q*Price informativeness	0.027***	0.030***	0.027***	0.027***	0.026***	0.028***	N.A.
	(0.010)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	
Observations	12801	12801	12553	12553	12553	12541	
Adjusted R^2	0.156	0.149	0.152	0.154	0.153	0.161	
Panel E: Funding cost channel for investment adjustment							
Connect*ΔP/B	0.092***	0.085***	0.097***	0.100***	0.100***	0.089***	N.A.
	(0.025)	(0.024)	(0.026)	(0.027)	(0.027)	(0.026)	
Observations	12295	12295	12055	12055	12055	12041	
Adjusted R^2	0.151	0.144	0.154	0.155	0.155	0.164	

NOTE. Column (1) includes our OLS regression results as in Table 8. Columns (2)-(6) add the regression of an interaction term between X*Time FE to control for the differential trend among observables, with X equal to the Industry dummy, ROA, Tobin's Q, cash flow, and SOE dummy respectively. Column (7) calculates the ratio of unobservable relative to observables under the null hypothesis that the treatment effect equals 0 following Altonji, Elder, and Taber (2005) and Oster (2019). The standard errors reported in parentheses are clustered in the same way as in Table 8. *, ** and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

Table E10 STOCK PRICE AND INVESTMENT SENSITIVITY TO GLOBAL SHOCKS: ROBUSTNESS

Panel A: Stock price sensitivity to global shocks				
	U.S. monetary policy	VIX	Global financial cycle	Risk aversion
	(1)	(2)	(3)	(4)
Global Shock$_t$ ∗ Connect$_{it}$	-0.005***	-0.001**	0.010***	-0.022***
	(0.002)	(0.001)	(0.002)	(0.002)
Global Shock$_t$ ∗ MSCI$_{it}$	0.035***	0.032***	0.031***	0.029***
	(0.009)	(0.009)	(0.008)	(0.009)
Firm FE	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes
Observations	276564	276564	276564	276564
Adjusted R^2	0.171	0.171	0.172	0.172
Panel B: Investment sensitivity to global shocks				
	U.S. monetary policy	VIX	Global financial cycle	Risk aversion
	(1)	(2)	(3)	(4)
Global Shock$_{t-1}$ ∗ Connect$_{it-1}$	-0.002***	-0.001***	0.003***	-0.003**
	(0.001)	(0.000)	(0.001)	(0.001)
Global Shock$_{t-1}$ ∗ MSCI$_{it-1}$	-0.001	-0.000	-0.001	-0.002
	(0.002)	(0.000)	(0.002)	(0.003)
Firm FE	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes
Observations	89383	89383	87723	89383
Adjusted R^2	0.453	0.453	0.455	0.453

NOTE. The dependent variables are monthly excess return in panel A and quarterly corporate investment in panel B. Global shocks include the U.S. monetary policy shock identified by Rogers et al. (2018) in column (1), changes in VIX index (in logs) in column (2), global financial cycle constructed by Miranda-Agrippino and Rey (2020) in column (3), and change in risk aversion index constructed by Bekaert et al. (2021b) in column (4). We standardize all the global shocks. MSCI$_{it}$ flags stocks selected into the MSCI index. Control variables are the same as in Table 9 and 10 respectively. We do not report all variables to save space. All standard errors are clustered at both firm and time levels and reported in parentheses. *, ** and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

Table E11 THE EFFECT OF THE CHINA CONNECT ON HONG KONG STOCKS

	CAR(-1, 0)			CAR(-1, 1)			CAR(-1, 3)			CAR(-1, 5)		
$\text{Connect}^{\text{Hong Kong}}$	0.011**	0.011*	0.010*	0.014***	0.012**	0.013***	0.018***	0.020***	0.022***	0.013**	0.016***	0.017***
	(0.004)	(0.005)	(0.005)	(0.004)	(0.004)	(0.004)	(0.006)	(0.006)	(0.006)	(0.005)	(0.005)	(0.005)
MV		-0.000**	-0.000**		-0.000	-0.000		-0.000	-0.000		0.000	0.000
		(0.000)	(0.000)		(0.000)	(0.000)		(0.000)	(0.000)		(0.000)	(0.000)
Volatility		-0.178	-0.125		-0.140	-0.148		0.437*	0.482*		1.060***	1.199***
		(0.113)	(0.123)		(0.145)	(0.153)		(0.250)	(0.276)		(0.254)	(0.281)
Amihud		-0.000***	-0.000***		-0.000***	-0.000***		-0.000***	-0.000***		-0.000**	-0.000*
		(0.000)	(0.000)		(0.000)	(0.000)		(0.000)	(0.000)		(0.000)	(0.000)
Age			-0.001			-0.004			-0.008			-0.014**
			(0.003)			(0.003)			(0.006)			(0.006)
BHR			-0.021**			0.008			-0.009			-0.067***
			(0.010)			(0.013)			(0.019)			(0.021)
Lev			0.015**			0.003			-0.004			-0.001
			(0.007)			(0.009)			(0.012)			(0.014)
Observations	1314	1308	1279	1306	1300	1272	1305	1299	1271	1307	1301	1273
Adjusted R^2	0.034	0.055	0.061	0.027	0.046	0.045	0.031	0.048	0.050	0.015	0.063	0.079

NOTE. The table estimates $\text{CAR}_i = \alpha_0 + \alpha_1 \text{Connect}_i^{\text{Hong Kong}} + \beta \mathbf{Z_i} + \varepsilon_i$, where CAR_i is the cumulative abnormal return of Hong Kong stock i based on a market model. $\text{Connect}_i^{\text{Hong Kong}}$ is a dummy variable for Hong Kong stocks eligible for mainland investors. Control variables include market capitalization (MV), volatility, Amihud illiquidity measure (Amihud), firm listing year (Age), buy and hold return (BHR), and leverage (Lev). We also add industry-fixed effects. Robust standard errors are clustered at the industry level and reported in parentheses. *, ** and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

F Further exploration of the negative common effects

In both the abnormal stock return regression and abnormal investment rate regression, there seems to be a negative overall effect on Chinese firms, as captured by the constant term in those regressions. As those regressions are estimated in the liberalization period, the constant term captures the average effect of the China Connect on all firms, similar to Chari and Henry (2004, 2008). In the monthly stock return adjustment regression, we find that the constant term in most specifications is significantly negative, consistent with the message from the announcement effect in Figure 2. Moreover, the economic magnitude of the negative constant term is large. For example, column (1) in Table 2 shows a negative common effect around 9.6%, larger than the positive differential effect at 3.3%. This suggests that the China Connect is likely to lower stock prices, rather than increase stock prices as in previous liberalization episodes (Chari and Henry 2004). However, connected firms fall less than unconnected firms due to more foreign capital. Similarly, there also exists a negative common effect on firms' abnormal investment, captured by the negative coefficient on the constant term in Table 5. As the regression is conducted a few quarters after the launch of the China Connect, the constant term thus captures the average effect of the Connect on all firm's investments. The magnitude is much larger than the positive Connect dummy, around -7%. This is suggestive evidence of an overall negative impact on investment in periods after the Connect, consistent with overall stock price decreases.

The negative constant term discussed above, although seen as a common shock in Chari and Henry (2004, 2008), should be interpreted with caution as it might pick up other contemporaneous factors unrelated to the Connect program. For example, Chinese stocks might fall in Nov 2014 simply because the GDP growth rate is lower or all global stocks are falling. Although those factors are orthogonal to the launch of China Connect, the constant term picks them up. To control for the confounding effect of macro-level variables, we run a cross-country regression that places the mainland Chinese market in a global setting and thus compares the performance of all Chinese firms with global markets. Specifically, we run a cross-sectional monthly regression for all listed firms in 46 economies similar to the regression (1) in the month before, of, and after Nov

2014.[3] Table F2 presents our estimation results. Compared with global markets, Chinese stocks experienced a lower monthly return of around 2.4% in the month of Nov 2014, controlling for both firm-level and macro-level variables. Moreover, this negative coefficient, as captured by the dummy variable for all Chinese listed firms, $\mathbb{1}^{\text{Mainland China}}$, is not significant in Month [-1] and Month [2]. This analysis thus suggests a non-negligible negative effect from the China Connect on all stock prices, consistent with results in the announcement analysis.

Like in the stock price specification, we also run a cross-country regression for all listed firms' investments in 46 economies and control for both firm- and country-level variables. We then include in the regression a dummy variable $\mathbb{1}^{\text{Mainland China}}$ that flags all mainland Chinese listed firms. The dummy variable thus indicates the performance of Chinese firm investment relative to other countries, controlling for other variables. We then estimate the regression year-by-year after the launch of the Connect. Table F3 presents the results. Chinese corporate investment was higher in 2014 when the Connect was launched in Nov. Afterward, annual investment fell by 0.1% in 2015, 1% in 2016, and 1.5% in 2017, much lower than the magnitude of the constant term in Table 5 for quarterly investment. This evidence is consistent with the hypothesis that the China Connect lowered the average corporate investment for all listed firms.

[3] We use internationally listed firms in Worldscope, dropping financial and utility firms (SIC code 6000-6999 and 4900-4999). We also drop Hong Kong-listed firms since the Connect could positively affect those firms. Our cross-country analysis includes 43251 firms in 46 economies. See Table F1 for summary statistics.

Table F1 SUMMARY STATISTICS FOR INTERNATIONAL FIRM-LEVEL DATA

Panel A: Variables used in the monthly stock price regressions (Oct 2014 - Jan 2015)						
	Obs	Mean	Std	P25	Median	P75
	(1)	(2)	(3)	(4)	(5)	(6)
Return	118,964	0.02	9.22	-0.11	-0.01	0.07
Log(Assets)	118,040	18.62	2.54	17.17	18.72	20.24
Tobin's Q	118,049	3.04	8.23	0.92	1.26	2.14
Sales growth	109,052	1.17	0.89	0.94	1.05	1.17
Leverage	115,358	0.32	0.62	0.03	0.19	0.38
Panel B: Variables used in the annual corporate investment regressions (2010-2017)						
	Obs	Mean	Std	P25	Median	P75
	(1)	(2)	(3)	(4)	(5)	(6)
Investment	200,432	0.06	0.11	0.01	0.03	0.07
Log(Assets)	209,863	18.62	2.51	17.17	18.71	20.22
Tobin's Q	209,873	3.03	8.24	0.92	1.26	2.12
Sales growth	193,648	1.19	0.92	0.94	1.05	1.19
Leverage	204,124	0.32	0.63	0.03	0.19	0.38

NOTE. Summary statistics for international firm-level data. Panel A is for the variables used in the monthly stock price regressions in Table F2 (Oct 2014-Jan 2015), including returns, Log(Assets), Tobin's Q, sales growth, and leverage. Panel B is for variables used in the annual corporate investment regressions in Table F3 (2010-2017), including investment, Log(Assets), Tobin's Q, sales growth, and leverage. Detailed definitions can be found in Appendix A. All continuous variables are winsorized at the top and bottom 1%.

Table F2 CHINESE STOCK PRICE REVALUATION COMPARED TO INTERNATIONAL MARKETS AROUND THE CONNECT: NOV 2014

	Monthly return			
	Month [-1]	Month [0]	Month [1]	Month [2]
	(1)	(2)	(3)	(4)
$\mathbb{1}^{j=\text{Mainland China}}$	0.438	-0.024***	-0.089***	0.425
	(0.472)	(0.008)	(0.008)	(0.453)
Lag return	-1.730	-0.000***	-0.047**	-0.409
	(1.668)	(0.000)	(0.021)	(0.484)
Log (Assets)	-0.131	0.003**	0.006***	-0.003
	(0.135)	(0.001)	(0.001)	(0.002)
Tobin's Q	-0.081	-0.000	0.001	-0.011
	(0.079)	(0.001)	(0.001)	(0.010)
Sales growth	-0.022	-0.009***	-0.006*	-0.047
	(0.030)	(0.003)	(0.003)	(0.044)
Leverage	1.858	0.001	-0.013	0.129
	(1.832)	(0.008)	(0.009)	(0.089)
GDP growth	-0.002	-0.007***	-0.001	-0.004
	(0.006)	(0.001)	(0.001)	(0.003)
Trade (% GDP)	0.018	-0.002	-0.017***	-0.008
	(0.027)	(0.004)	(0.004)	(0.007)
Domestic credit (% GDP)	-0.214	0.015**	0.011*	0.045***
	(0.206)	(0.007)	(0.006)	(0.008)
Log (population)	0.055	0.003*	-0.004**	-0.015**
	(0.058)	(0.002)	(0.002)	(0.006)
Log (GDP per capita)	0.116	-0.009***	0.004*	-0.011**
	(0.120)	(0.002)	(0.003)	(0.005)
Constant	0.277	-0.018	-0.113***	0.409***
	(0.332)	(0.047)	(0.044)	(0.134)
Industry FE	Yes	Yes	Yes	Yes
Observations	22667	22648	22618	21740
R^2	0.004	0.013	0.027	0.001

NOTE. This table estimates the following equation $y_{ij} = \alpha + \beta_1 \mathbb{1}^{j=\text{Mainland China}} + \beta_2 Z_{ij} + \varepsilon_{ij}$. The dependent variable y_{ij} is the monthly stock log return around the China Connect at the first wave in Nov 2014 for firm i located in the country (economy) j. We adjust the dependent variables by their pre-liberalization level. $\mathbb{1}^{j=\text{Mainland China}}$ is a dummy variable for all listed firms in mainland China. Other independent variables include lagged return, log (assets), Tobin's Q, sales growth, leverage, GDP growth, trade (% GDP), domestic credit (% GDP), log(population), and log(GDP per capita). We add industry-fixed effect and cluster standard errors at the firm level. *, ** and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively. All the variable constructions and summary statistics tables are reported in Appendix A and Table F1.

Table F3 CHINESE INVESTMENT ADJUSTMENT COMPARED TO INTERNATIONAL MARKETS AFTER THE CHINA CONNECT (2014 Q4)

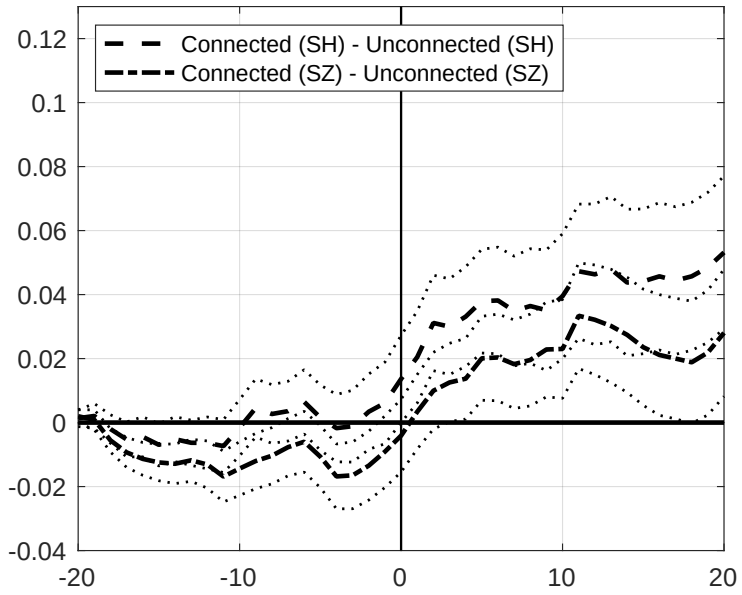
	Annual Investment			
	2014	2015	2016	2017
	(1)	(2)	(3)	(4)
$\mathbb{1}^{j=\text{Mainland China}}$	0.008***	-0.001	-0.010***	-0.015***
	(0.003)	(0.003)	(0.004)	(0.004)
Lag investment	-0.279***	-0.028	0.095***	0.161***
	(0.016)	(0.018)	(0.022)	(0.020)
Log (Assets)	0.000	0.001*	-0.000	-0.001***
	(0.000)	(0.000)	(0.000)	(0.000)
Tobin's Q	-0.001**	0.000	-0.001	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Sales growth	0.006***	0.003*	0.012***	0.011***
	(0.002)	(0.002)	(0.002)	(0.002)
Leverage	0.019***	0.013***	0.018***	0.016***
	(0.003)	(0.004)	(0.004)	(0.004)
GDP growth	-0.002***	-0.002***	-0.003***	-0.002***
	(0.000)	(0.000)	(0.000)	(0.001)
Trade (% GDP)	0.003**	0.001	-0.002	-0.000
	(0.001)	(0.002)	(0.002)	(0.002)
Domestic credit (% GDP)	-0.008***	-0.002	0.006***	0.003
	(0.002)	(0.002)	(0.002)	(0.002)
Log (population)	-0.002**	-0.003***	-0.002***	-0.002**
	(0.001)	(0.001)	(0.001)	(0.001)
Log (GDP per capita)	-0.000	0.001	-0.002*	0.004***
	(0.001)	(0.001)	(0.001)	(0.001)
Constant	0.022	0.019	0.013	-0.028
	(0.016)	(0.018)	(0.019)	(0.019)
Industry FE	Yes	Yes	Yes	Yes
Observations	22105	21175	20156	19430
R^2	0.127	0.050	0.075	0.066

NOTE. This table estimates the equation $y_{ij} = \alpha + \beta_1 \mathbb{1}^{j=\text{Mainland China}} + \beta_2 Z_{ij} + \varepsilon_{ij}$. The dependent variable y_{ij} is the annual investment after the China Connect in 2014 for firm i located in the country (economy) j. We adjust the dependent variables by their pre-liberalization level. $\mathbb{1}^{j=\text{Mainland China}}$ is a dummy variable for all listed firms in mainland China. Other independent variables include lagged investment, log (assets), Tobin's Q, sales growth, leverage, GDP growth, trade (% GDP), domestic credit (% GDP), log(population), and log(GDP per capita). We add industry-fixed effect and cluster standard errors at the firm level. *, ** and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively. All the variable constructions and summary statistics tables are reported in Appendix A and Table F1.

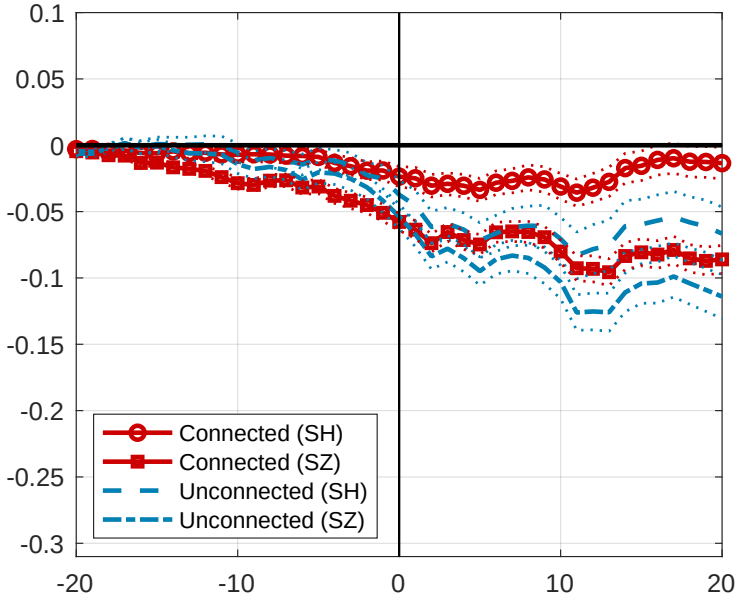
G The Shenzhen-HK Connect in 2016

Figure G1 ANNOUNCEMENT EFFECTS OF THE CHINA CONNECT: NOV 25, 2016

Panel A: Differential effects



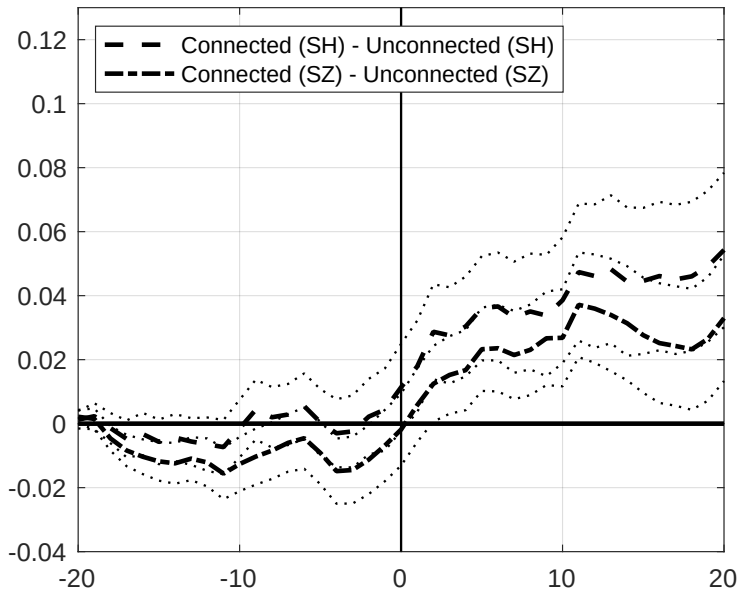
Panel B: Overall Effect



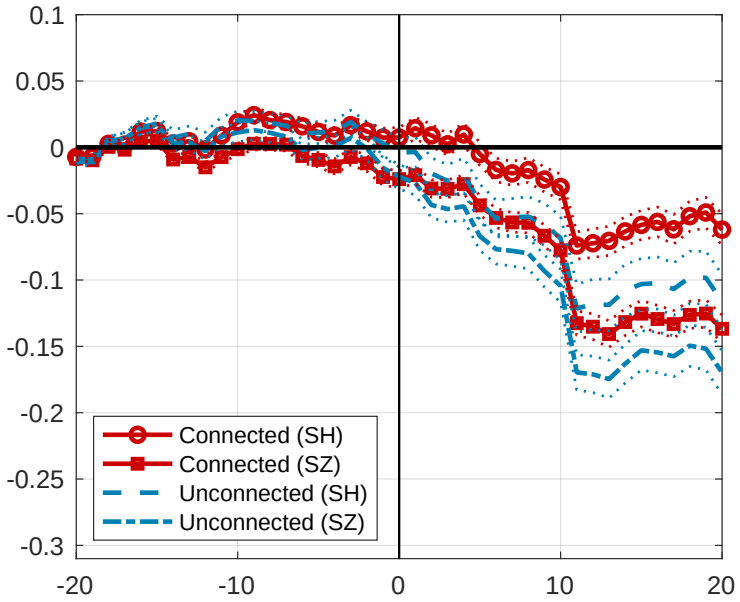
NOTE. Cumulative abnormal return (CAR) based on a market model centered on Nov 25, 2016 (with 95% c.i.). The estimation window is [-300, -30] and we restrict firms to have at least 100 trading days at the estimation window. Panel A plots the differences between connected stocks (SH) and unconnected stocks in Shanghai (SH) and between connected stocks (SH) and unconnected stocks in Shenzhen (SZ). Panel B plots the CAR for different groups of stocks based on whether connected to the program and their trading markets. As seen in Panel A, connected stocks rise relative to unconnected stocks, with stocks in Shanghai experiencing more price evaluation than in Shenzhen. Compared with the first wave, the magnitude of the positive differential effect on connected stocks is smaller.

Figure G2 ANNOUNCEMENT EFFECTS (GLOBAL CAPM) OF THE CHINA CONNECT: NOV 25, 2016

Panel A: Differential effects



Panel B: Overall Effect



NOTE. Cumulative abnormal return (CAR) based on a global market model centered on Nov 25, 2016 (with 95% c.i.). The estimation window is [-300, -30] and we restrict firms to have at least 100 trading days at the estimation window. Panel A plots the differences between connected stocks (SH) and unconnected stocks in Shanghai (SH) and between connected stocks (SH) and unconnected stocks in Shenzhen (SZ). Panel B plots the CAR for different groups of stocks based on whether connected to the program and their trading markets.

Table G1 STOCK PRICE REVALUATION AROUND THE CONNECT: NOV 2016

	Month [0]				Month [0, 1]			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Connect	0.010**	0.008*	0.008	0.005	-0.004	-0.007	-0.019*	-0.010
	(0.005)	(0.005)	(0.007)	(0.008)	(0.008)	(0.008)	(0.011)	(0.011)
$\sigma^{i,C}$		-0.030***	-0.029***	-0.030***		-0.068***	-0.074***	-0.068***
		(0.005)	(0.005)	(0.005)		(0.011)	(0.011)	(0.011)
Connect*$\sigma^{i,W}$		-0.007	-0.007	-0.008		-0.007	0.001	-0.007
		(0.009)	(0.010)	(0.009)		(0.020)	(0.021)	(0.020)
$\sigma^{i,HK}$		0.027***	0.026***	0.027***		0.051***	0.053***	0.051***
		(0.006)	(0.006)	(0.006)		(0.014)	(0.014)	(0.014)
$\sigma^{i,W}$		-0.009	-0.010	-0.009		-0.037***	-0.043***	-0.037***
		(0.006)	(0.006)	(0.006)		(0.013)	(0.014)	(0.013)
Market cap*Connect			0.041***				0.008	
			(0.014)				(0.026)	
Market cap*Unconnect			0.026				-0.146	
			(0.084)				(0.117)	
Turnover*Connect				-0.201				4.586***
				(0.388)				(0.721)
Turnover*Unconnect				-0.513*				4.317***
				(0.276)				(0.591)
Market cap	0.038**	0.037**			0.025	0.012		
	(0.015)	(0.015)			(0.027)	(0.026)		
Turnover	-0.297	-0.377			4.864***	4.406***		
	(0.251)	(0.243)			(0.512)	(0.519)		
Volatility	3.651***	3.793***	3.399***	3.808***	-0.962	-0.000	4.737***	0.007
	(0.389)	(0.385)	(0.312)	(0.386)	(0.813)	(0.829)	(0.654)	(0.828)
Domestic fund share	-0.003***	-0.003***	-0.003***	-0.003***	-0.006***	-0.006***	-0.006***	-0.006***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)
QFII share	0.002	0.001	0.001	0.002	0.007*	0.004	0.005	0.004
	(0.002)	(0.002)	(0.002)	(0.002)	(0.004)	(0.003)	(0.003)	(0.003)
Sales growth [+1]	-0.010*	-0.009*	-0.009*	-0.009*	-0.004	-0.002	-0.002	-0.002
	(0.005)	(0.005)	(0.005)	(0.005)	(0.008)	(0.008)	(0.008)	(0.008)
Constant	-0.076***	-0.079***	-0.079***	-0.074***	-0.137***	-0.154***	-0.189***	-0.152***
	(0.007)	(0.007)	(0.009)	(0.007)	(0.016)	(0.016)	(0.018)	(0.017)
Observations	1596	1596	1596	1596	1573	1573	1573	1573
Adjusted R^2	0.177	0.213	0.211	0.212	0.192	0.268	0.195	0.268

NOTE. The dependent variable is the cumulative log stock return (adjusted for pre-liberalization mean) around the China Connect in Nov 2016. We focus on firms listed in the Shenzhen market only. Time 0 is Nov 2016. Columns (1)-(4) use the month 0 while Columns (5)-(8) use the month of Nov and Dec. The independent variables are a connect (unconnect) dummy variable for those (in)eligible stocks for foreign investors, $\sigma^{i,HK}$ (covariance term with Hong Kong eligible stocks for domestic investors), $\sigma^{i,W}$ (covariance term with world market), $\sigma^{i,C}$ (covariance term with domestic connected stocks), market cap, turnover, volatility, domestic fund share, QFII share and future sales growth (adjusted for pre-liberalization average). We standardize all the covariance terms. Robust standard errors clustered at the firm level are reported in parentheses. *, ** and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively. All variable constructions are reported in Appendix A. We find a positive effect on connected firms relative to unconnected firms due to more foreign capital. However, the economic magnitude is much smaller than in the 2014 wave. Similar to the Shanghai wave, we do not find evidence of the negative effect on stock prices from locals' increased diversification opportunities in Hong Kong. The launch of the China Connect again likely brought about a negative common effect on stock prices, as proxied by the negative constant term.

Table G2 INVESTMENT ADJUSTMENT AFTER THE CONNECT: 2016 Q4

	All firms			Small	Large	Private	State
	1-4 Q	1-8 Q	1-12 Q	1-8 Q		1-8 Q	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Connect	0.003**	0.001	0.001	-0.001	-0.001	0.003**	-0.003*
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Size	0.001	0.001**	0.001***	0.004***	0.001***	0.002***	0.000
	(0.001)	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)	(0.000)
Tobin's Q	0.001***	0.002***	0.002***	0.002***	0.001	0.002***	0.002***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)
Cash flow	0.043***	0.062***	0.065***	0.020	0.113***	0.087***	0.023
	(0.016)	(0.011)	(0.009)	(0.014)	(0.020)	(0.015)	(0.014)
Sales growth	0.004***	0.004***	0.005***	0.004***	0.004***	0.003***	0.004***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
β_i^{GDP} * GDP growth	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***	0.002***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Constant	-0.055***	-0.064***	-0.063***	-0.127***	-0.073***	-0.091***	-0.040***
	(0.015)	(0.010)	(0.008)	(0.027)	(0.013)	(0.016)	(0.011)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	6902	13775	20612	6612	7163	7911	5841
Adjusted R^2	0.163	0.159	0.155	0.168	0.182	0.175	0.208

NOTE. The dependent variable is the quarterly abnormal corporate investment rate, defined as the difference between the investment rate and its pre-liberalization average. The independent variables are a connect dummy variable for those stocks eligible to foreign investors, Tobin's Q, cash flows, sales growth, and the interaction term between GDP growth beta (β_i^{GDP}) and GDP growth rate. We also include industry-fixed effects and time-fixed effects. As the Shenzhen-HK Connect is conducted after the Shanghai-HK Connect, we also add a stock exchange fixed effect. We analyze all firms (columns 1-3), small vs. large firms (columns 4-5), and private vs. state-owned firms (columns 6-7). All standard errors are clustered at both industry and time and reported in parentheses. *, ** and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

H Larger sensitive to U.S. monetary policy shocks

In this section, we explore the larger spillover effects of the China Connect and focus on one specific shock, the U.S. monetary policy shock. As the U.S. monetary policy shock is well identified by extant literature, we can improve identification. Moreover, we can also explore the transmission of the U.S. monetary policy shock post-liberalization in light of our model in Section C.

Stock price sensitivity to U.S. monetary policy shock

We investigate the effect of U.S. monetary policy shocks on connected stocks relative to unconnected stocks using difference-in-differences centered on FOMC announcement days,

$$r_{it} = \alpha_i + \alpha_t + \beta * \text{MPS}_t^{\text{US}} \times \text{Connect}_{it} + \Gamma Z_{it} + \varepsilon_{it} \tag{H1}$$

where r_{it} is the cumulative excess return on FOMC date t, $\text{Connect}_{it} = 1$ when the stock i is in the Connect program at time t, MPS_t^{US} is the U.S. monetary policy shock constructed by Rogers et al. (2018), and Z_{it} includes standard firm-level controls for stock price regressions such as firm size, leverage, and return on assets. Our specifications include 137 FOMC meetings from 2003 to 2019.[4] We include both the FOMC time and firm fixed effects, which also absorb MPS_t^{US} in the regression. Standard errors are clustered at both the firm and time levels.

Table H1 presents results. Our variable of interest is the interaction term between MPS_t^{US} and Connect_{it}, which captures the differential effect of U.S. monetary policy shocks on connected firms relative to unconnected firms after the launch of the Connect. A one standard deviation U.S. monetary policy shock (0.14) lowers the excess return for connected firms by around 0.42% (=0.14*3%) on FOMC announcement days, relative to unconnected stocks. This is both statistically and economically significant. We also find evidence that the reaction of connected stocks to U.S. monetary policy shocks depends on the covariance term with the global market (columns (3) and (6)), con-

[4]There are 144 FOMC meetings from 2003 to 2019. We dropped 7 meetings because they were scheduled on public holidays, typically Chinese New Year.

sistent with our theory and the notion that foreign investors rebalance their portfolios according to covariance risk. Such a differential effect on $\sigma^{i,W}$ gets larger in the two-day horizon. The effect is economically significant: for connected firms with one unit of standardized $\sigma^{i,W}$, their return falls by 0.7% (3%) on the first day (two days).

The relative importance of the common effect and differential effect from U.S. monetary policy shocks also helps us understand the importance of risk-free rate and risk aversion channels. According to our theory, the interest rate shock affects connected stocks homogeneously while only a global risk aversion shock affects connected stocks differently. As we find both a common effect and a differential effect on connected stocks, it suggests that the U.S. monetary policy shock affects both the global risk-free rate and risk aversion. Based on column (3), we can then estimate the relative importance of these two shocks. The part that can be attributed to the global risk-free rate shock on connected stocks is captured by -0.029 while the part due to global risk aversion shocks is captured by $-0.007 * \sigma^{i,W}$. As we standardized all covariance terms, the importance of risk-aversion shocks needs to be multiplied by their standard deviation. We find that the importance of the risk aversion shock is small compared to the risk-free shock.[5] This finding is different from Chari et al. (2021) who find that global risk aversion shocks are relatively more important, at least in the unconventional monetary policy period. Our results, however, suggest that the global risk-free shock is more important for the transmission of U.S. monetary policy to China.[6] This is reasonable because China is still mostly closed to global markets and its stocks have a rather low covariance with the rest of the world. Therefore, the first-order effect of investing in China is more on the common component as opposed to the firm-specific risk-premium part.

We also find that global trading on connected stocks spills over to unconnected stocks, as captured by $\sigma^{i,C}$. For unconnected firms with different $\sigma^{i,C}$, this effect is on average 0.6% for one

[5] Column (3) in Table H1 estimates the equation $r_{it} = \alpha + \beta_1 * \text{Connect}_{it} * \text{MPS}_t^{\text{US}} + \beta_2 * \text{MPS}_t^{\text{US}} * \text{Connect}_{it} * \sigma^{i,W} + \beta_3 * \text{MPS}_t^{\text{US}} * \sigma^{i,C} + \beta_4 Z_{it} + \varepsilon_{it}$. Therefore, the effect of U.S. monetary policy shocks on connected firm returns is given by $\beta_1 + \beta_2 * \sigma^{i,W}$. As we standardize the covariance term, the quantitative effect of $\beta_2 * \sigma^{i,W}$ is given by $-0.007 * 0.07\% = -0.00049\%$ because the standard deviation of $\sigma^{i,W}$ for connected firms is 0.07%. This is small compared with the estimates of β_1, -0.029. The message is similar in column (6).

[6] This result is consistent with Bekaert et al. (2021b), who find that monetary policy effects through a persistent interest rate shock rather than a risk premium effect.

Table H1 STOCK PRICE SENSITIVITY TO U.S. MONETARY POLICY SHOCKS

	Cumulative excess return [0]			Cumulative excess return [0, 1]		
	(1)	(2)	(3)	(4)	(5)	(6)
$MPS_t^{US} * Connect_{it}$	-0.028***	-0.024***	-0.029***	-0.032***	-0.029***	-0.039***
	(0.007)	(0.006)	(0.007)	(0.012)	(0.011)	(0.013)
$MPS_t^{US} * Connect_{it} * \sigma^{i,W}$			-0.007			-0.030**
			(0.008)			(0.012)
$MPS_t^{US} * \sigma^{i,W}$			-0.001			-0.004
			(0.002)			(0.003)
$MPS_t^{US} * \sigma^{i,C}$			-0.006**			-0.008**
			(0.003)			(0.003)
$\sigma^{i,W}$			-0.000			-0.000
			(0.000)			(0.000)
$\sigma^{i,C}$			0.000			-0.000
			(0.000)			(0.000)
$Connect_{it}^{US} * \sigma^{i,W}$			0.000			0.001
			(0.000)			(0.001)
Ln(TA)		-0.001***	-0.001**		-0.001***	-0.001***
		(0.000)	(0.000)		(0.000)	(0.000)
Leverage		0.003***	0.003**		0.003**	0.002*
		(0.001)	(0.001)		(0.001)	(0.001)
ROA		0.007**	0.006		0.006*	0.005
		(0.003)	(0.004)		(0.004)	(0.005)
$Connect_{it}$	-0.001	0.000	0.001	-0.001	0.000	0.001
	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.001)
Constant	0.001	0.018***	0.017**	0.001	0.026***	0.016*
	(0.001)	(0.006)	(0.009)	(0.001)	(0.007)	(0.010)
FOMC FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
# of FOMC meetings	137	137	137	137	137	137
Observations	305277	297044	247716	294696	286789	242711
Adjusted R^2	0.022	0.033	0.035	0.030	0.042	0.044

NOTE. The dependent variable is cumulative excess return on FOMC announcement days (days 0 and 1). The independent variables include MPS_t^{US} (U.S. monetary policy shock), $Connect_{it}$ (a connect dummy for eligible stocks), $\sigma^{i,W}$ (covariance term with world market), $\sigma^{i,C}$ (covariance term with domestic connected stocks), Ln(TA) (natural log of market cap), leverage, and ROA (return over asset). We standardize all covariance terms. All standard errors are clustered at both firm and time levels and reported in parentheses. *, ** and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively. Variable construction is described in Appendix A.

unit of standardized $\sigma^{i,C}$. This average effect is small because the standard deviation of $\sigma^{i,C}$ is only 0.24% for unconnected stocks, much smaller than the direct effect on connected stocks (2.9% based on the interaction term between Connect and the monetary policy shock in column (3)).

Investment sensitivity to U.S. monetary policy shock

We also investigate whether corporate investment is more sensitive to U.S. monetary policy shocks. We utilize the following augmented version of the standard investment-Q specification,

$$I_{it} = \alpha_i + \alpha_t + \beta * \text{MPS}_t^{\text{US}} \times \text{Connect}_{it} + \Gamma Z_{it} + \varepsilon_{it} \quad \text{(H2)}$$

where i indexes the firm and t is a time index (quarterly frequency). The dependent variable is corporate investment I_{it}. The controls Z_{it} include lagged Tobin's Q, cash flows, sales growth, and firm size to control for firm heterogeneity. To control for the effect of GDP growth on investment, we add an interaction term between the GDP growth beta (β_i^{GDP}) and the overall GDP growth rate as a control variable. We add both firm and time-fixed effects to control for unobserved individual and time effects. Standard errors are clustered at both firm and time levels (Petersen 2009).

Column (1) in Table H2 displays our baseline estimates as in Table 10. Connected firms' investment is more sensitive to U.S. monetary policy shocks than unconnected firms after the launch of the Connect. In column (2), we allow the investment sensitivity to U.S. monetary policy shocks for connected firms to depend on the covariance term with the global market $\sigma^{i,W}$. We also allow a spillover effect from global investors' trading on connected stocks to unconnected stocks depending on the covariance term with connected stocks, $\sigma^{i,C}$. We do not find that connected stocks with a higher covariance term with the global market have a higher investment sensitivity to U.S. monetary policy shocks. This evidence suggests that the transmission mechanism of U.S. monetary policy shocks on Chinese firm investment is through the risk-free rate channel rather than the risk-aversion channel. Meanwhile, we do not find a negative spillover effect from U.S. monetary policy shocks to unconnected stocks.

Columns (3)-(8) control for important firm-level heterogeneity that might potentially contaminate our results. In column (3), we control for the fact that large firms might have a different investment sensitivity to U.S. monetary policy shocks. In column (4), we add an interaction of MPS_t^{US} and firm-level QFII holdings to control for the effect of QFII, the other important channel for foreign investors to trade domestic Chinese stocks. Column (5)-(8) adds an interaction term between MPS_t^{US} and firm-level domestic fund shares, foreign sales, leverage, and sales growth respectively to control for firms' exposure to U.S. monetary policy through other channels. Our results are robust to all specifications.

The spillover effect from U.S. monetary policy shocks to Chinese corporate investment is highly robust. Table H3 presents a horse race between U.S. monetary policy shocks and other important macro shocks. Columns (1) to (3) add those used in the main text such as the VIX, the global financial cycle, and the change in global risk aversion. Only the VIX weakens the effect of the U.S. monetary policy shock by half. Global risk aversion loses its significance compared with the U.S. monetary policy shock.

Columns (4)-(6) add the dollar index, the term premium of 10-year bonds identified by Kim and Wright (2005) and the Ted rate, measured as the difference between interest rates on interbank loans and short-term U.S. government debt. Again, our U.S. monetary policy shock result is robust.

Columns (7)-(9) add the RMB/USD bilateral exchange rate, a Chinese monetary policy shock to M2 growth identified by Chen et al. (2018), and the Chinese Economic Policy Uncertainty index identified by Baker et al. (2016). Only the bilateral exchange rate creates a differential effect on connected firms, possibly through the trade channel. Our U.S. monetary policy shock result is still robust, but with a smaller magnitude when horse racing with the bilateral exchange rate.

Columns (10)-(12) include different uncertainty measures, such as a U.S. monetary policy uncertainty index constructed by Husted et al. (2019), a news-based economic policy uncertainty index (EPU) from Baker et al. (2016), and a GDP-weighted average of national EPU indices for 16 countries that account for two-thirds of global output from Davis (2016). None of those shocks leads to a differential investment response between connected and unconnected firms. Moreover, the U.S. monetary policy shock results are still present.

We perform additional robustness tests in Table H4. In Panel A, we explore alternative specifications. Column (1) eliminates periodic adjustments to the eligible stocks and focuses only on the initially connected stocks in Shanghai and Shenzhen. Column (2) drops dual-listed stocks that are arguably already exposed to global shocks before the China Connect. Column (3) adds an industry-specific time trend. In all specifications, our results on the interaction term between Connect and U.S. monetary policy shocks are robust. In Panel B, we control for other factors. We add into column (1) various interactions between firm size and other potentially important macro factors, to

take into account different firms' sensitivity to those macro variables. Those variables include U.S. monetary policy shocks, the VIX index, the dollar index, global financial cycles, risk aversion, Chinese monetary policy shocks, and the bilateral RMB/USD exchange rate. Our primary result remains significant. Column (2) 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. Column (3) introduces $\text{MPS}^{\text{US}}_{t-2}$ and its interaction with Connect. We find that there is a persistent investment response to U.S. monetary policy shocks for up to two quarters.

Table H2 INVESTMENT SENSITIVITY TO U.S. MONETARY POLICY SHOCKS

	Quarterly investment: 2003-2019							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$MPS^{US}_{t-1} * Connect_{it-1}$	-0.002***	-0.002**	-0.001***	-0.002***	-0.002***	-0.002***	-0.002***	-0.002***
	(0.001)	(0.001)	(0.001)	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)
$MPS^{US}_{t-1} * Connect_{it-1} * \sigma^{i,W}$		0.001						
		(0.001)						
$MPS^{US}_{t-1} * \sigma^{i,W}$		-0.001**						
		(0.000)						
$MPS^{US}_{t-1} * \sigma^{i,C}$		0.000						
		(0.000)						
$MPS^{US}_{t-1} * Size_{it-1}$			-0.000***					
			(0.000)					
$Size_{it-1}$			-0.000***					
			(0.000)					
$MPS^{US}_{t-1} * QFII\ share_{it-1}$				0.000**				
				(0.000)				
$QFII\ share_{it-1}$				0.000				
				(0.000)				
$MPS^{US}_{t-1} * Domestic\ fund\ share_{it-1}$					0.000***			
					(0.000)			
$Domestic\ fund\ share_{it-1}$					0.000			
					(0.000)			
$MPS^{US}_{t-1} * Foreign\ sales_{it-1}$						0.001***		
						(0.000)		
$Foreign\ sales_{it-1}$						0.001***		
						(0.000)		
$MPS^{US}_{t-1} * Leverage_{it-1}$							-0.003***	
							(0.001)	
$Leverage_{it-1}$							-0.002***	
							(0.001)	
$MPS^{US}_{t-1} * Sales\ growth_{it-1}$								-0.002***
								(0.000)
$Sales\ growth_{it-1}$								0.000
								(0.000)
$\sigma^{i,C}$		-0.001***						
		(0.000)						
$\sigma^{i,W}$		-0.001**						
		(0.000)						
$Connect_{it-1} * \sigma^{i,W}$		0.002**						
		(0.001)						
$Connect_{it-1}$	-0.001	-0.000	-0.001	-0.000	-0.000	-0.001	-0.001	-0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
$Connect_{it}$	0.001*	0.001*	0.001*	0.001**	0.002**	0.001*	0.001*	0.001*
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	89383	72348	89383	66986	66986	89383	89383	89383
Adjusted R^2	0.453	0.467	0.454	0.476	0.476	0.454	0.454	0.454

NOTE. The dependent variable is the quarterly investment. MPS^{US}_t is the U.S. monetary policy shock of Rogers et al. (2018). $Connect_{it}$ is a dummy variable for connected stocks at quarter t. Firm-level controls are the same as in Table 10. We do not show them to save space. All standard errors are clustered at both firm and time levels and reported in parentheses. *, ** and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively. All variable constructions are in Appendix A.

Table H3 INVESTMENT SENSITIVITY TO U.S. MONETARY POLICY SHOCKS: OTHER MACRO FACTORS

	VIX	Global financial cycle	Risk aversion
	(1)	(2)	(3)
$MPS^{US}_{t-1} * Connect_{it-1}$	-0.001***	-0.002***	-0.002***
	(0.001)	(0.001)	(0.001)
Other $Shock_{t-1} * Connect_{it-1}$	-0.001***	0.003***	-0.002
	(0.000)	(0.001)	(0.001)
Observations	89383	87723	89383
Adjusted R^2	0.453	0.455	0.453
	Dollar index return	Term premium	Ted rate
	(4)	(5)	(6)
$MPS^{US}_{t-1} * Connect_{it-1}$	-0.002***	-0.002***	-0.002***
	(0.001)	(0.000)	(0.001)
Other $Shock_{t-1} * Connect_{it-1}$	0.000	-0.001*	-0.002
	(0.000)	(0.001)	(0.001)
Observations	89383	89383	89383
Adjusted R^2	0.453	0.453	0.453
	RMB/USD	MPS^{China}	Chinese economic uncertainty
	(7)	(8)	(9)
$MPS^{US}_{t-1} * Connect_{it-1}$	-0.001**	-0.002***	-0.002***
	(0.001)	(0.001)	(0.001)
Other $Shock_{t-1} * Connect_{it-1}$	0.001***	-0.001	-0.000
	(0.000)	(0.001)	(0.000)
Observations	89383	89383	89383
Adjusted R^2	0.453	0.453	0.453
	U.S. monetary policy uncertainty	Economic uncertainty index	EPU
	(10)	(11)	(12)
$MPS^{US}_{t-1} * Connect_{it-1}$	-0.002***	-0.002***	-0.002***
	(0.001)	(0.000)	(0.000)
Other $Shock_{t-1} * Connect_{it-1}$	0.000	-0.000	0.000
	(0.000)	(0.000)	(0.000)
Observations	89383	89383	89383
Adjusted R^2	0.453	0.453	0.453

NOTE. The dependent variable is the quarterly corporate investment. We horse race alternative macro factors with U.S. monetary policy shock, including the VIX index, global financial cycle factor constructed by Miranda-Agrippino and Rey (2020), a change in risk aversion constructed by Bekaert et al. (2021a), dollar index return, a change in term premium of 10-year bonds identified by Kim and Wright (2005), TED spread measured as the difference between interest rates on interbank loans and short-term U.S. government debt, the RMB/USD bilateral exchange rate, Chinese monetary policy shock to M2 growth rate identified by Chen et al. (2018), Chinese Economic policy uncertainty index from Baker et al. (2016), U.S. monetary policy uncertainty index constructed by Husted et al. (2019), a news-based economic uncertainty index (EPU) from Baker et al. (2016), a GDP-weighted average of national EPU indices for 16 countries that account for two-thirds of global output from Davis (2016). Firm-level controls are the same as in Table 10. We include firm and time-fixed effects. Standard errors are clustered at both firm and time levels and reported in parentheses. *, ** and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

Table H4 INVESTMENT SENSITIVITY TO U.S. MONETARY POLICY SHOCKS: ROBUSTNESS

Panel A: Alternative specifications			
	Two waves	Drop dual-listed stocks	Industry specific time trend
	(1)	(2)	(3)
$MPS^{US}_{t-1} * Connect_{it-1}$	-0.002***	-0.002***	-0.001***
	(0.001)	(0.001)	(0.001)
Observations	89383	82535	89383
Adjusted R^2	0.453	0.447	0.461

Panel B: Other factors			
	Size	Lag investment	MPS^{US}_{t-2}
	(1)	(2)	(3)
$MPS^{US}_{t-1} * Connect_{it-1}$	-0.001**	-0.002***	-0.002***
	(0.001)	(0.000)	(0.001)
$MPS^{US}_{t-2} * Connect_{it-2}$			-0.001*
			(0.001)
I_{it-1}		0.542***	
		(0.005)	
$Size_{it-1} * MPS^{US}_{t-1}$	-0.000***		
	(0.000)		
$Size_{it-1} * \Delta VIX_{t-1}$	0.000***		
	(0.000)		
$Size_{it-1} * \Delta Dollar_{t-1}$	-0.000***		
	(0.000)		
$Size_{it-1} * Global\ financial\ cycle_{t-1}$	0.000***		
	(0.000)		
$Size_{it-1} * \Delta Risk\ aversion_{t-1}$	-0.000		
	(0.000)		
$Size_{it-1} * MPS^{China}_{t-1}$	0.000		
	(0.000)		
$Size_{it-1} * \Delta \log(RMB/USD)_{t-1}$	0.001***		
	(0.000)		
$Size_{it-1}$	-0.008***		
	(0.002)		
Observations	87723	89383	85648
Adjusted R^2	0.457	0.620	0.455

NOTE. The dependent variable is the quarterly corporate investment. Panel A investigates alternative specifications, including focusing only on eligible stocks included in Nov 2014 and Nov 2016, dropping A-H and A-B dual-listed stocks, and controlling for industry-specific time trends. Panel B controls other factors, including firm size and its interaction with other macro variables, lagged corporate investment, and lagged monetary policy shock. Control variables are the same as in Table H2. We include both firm and time-fixed effects. All standard errors are clustered at both firm and time levels and reported in parentheses. *, ** and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

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