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A Liberalization Spillover: From Equities to Loans
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ABSTRACT

The opening of equity markets to foreign investment appears to generate an enormously large positive growth effect (see Bekaert, Harvey, and Lundblad, 2005) in spite of a relatively small role of such markets for financing investment in most economies. We propose a possible spillover channel from equity market opening to lower costs of bank loans, which helps to explain this puzzle. From analyzing bank loan data associated with China's introduction of the Qualified Foreign Institutional Investors (QFII) program, we find significant support for this channel. Furthermore, we show that a reduction in the risk premium is an important mechanism.

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1 Introduction

The empirical literature on capital account liberalization suggests that it is generally hard to find robustly positive evidence that opening up a country's capital account leads to higher growth rates (e.g., Kose, Prasad, Rogoff, and Wei, 2004). However, Bekaert, Harvey, and Lundblad (2005) show that, opening up a country's equity market to foreign investment, which is a component of capital account liberalization, does raise a country's subsequent economic growth by about one percentage point a year in their sample of 95 countries.[1] This is a very large effect since the pre-liberalization growth rate was only 1.6% per year in the three years preceding the liberalization. This result is surprising since funds raised from the stock market tend to be a small part of the overall funding for investment in most countries, particularly because the sample used by Bekaert, Harvey, and Lundblad (2005) consists largely of developing countries, whose financial systems are heavily dominated by banks. For example, the largest developing country in the world, China, relies on bank financing for over 90% of its investment. Even for publicly listed firms, equity financing accounts for only 60% of the overall financing. For many developed countries with a mature stock market, bank financing also tends to be an important source of investment funding.

Bekaert, Harvey, and Lundblad (2005) consider the possibility that the timing of a country's equity market opening may coincide with other pro-growth policy reforms, including macroeconomic reforms, other policies that promote financial market development, and institutional reforms. After developing proxies for these other pro-growth policy changes and controlling for them in the regressions, they still find a very large effect of equity market liberalization on economic growth (on the order of 90 basis points per year). In the end, they do not provide a mechanism for the large pro−growth effect of equity market opening.

In this paper, we propose and investigate a possible spillover effect from equity market liberalization to the domestic loan market. If equity market liberalization triggers a reduction in the costs of bank loans, then it becomes less surprising that such liberalization can spur investment in ways that go beyond the role of the stock market in an economy. As far as we know, this is the first paper that empirically investigates this spillover channel.

There are reasons to expect the presence of such a spillover. Since there are common risk factors affecting the returns on both equity and fixed income products (see, for example,

[1] Levine and Zervos (1996, 1998), Chari and Henry (2008), Gupta and Yuan (2009), Li (2012), and Mitton (2006) also report a positive effect of equity market liberalizations on growth using alternative methodologies. Kim and Singal (2000), Henry (2000), Chari and Henry (2004) and Bekaert and Harvey (2000) report evidence that stock market liberalization causes the domestic stock prices to rise and the cost of equity capital to fall.

Keim and Stambaugh, 1986; Fama and French, 1993), it is reasonable to deduce that, if the equity market liberalization reduces the required risk premium on equities, it also reduces the risk premium on bank loans. However, the literature that documents common factors in the equity and bond markets has not looked for or provided evidence on a spillover from equity market liberalization to loan (or bond) costs.

There are also reasons to doubt the relevance of the spillover effect. First, we live in a world with many market and regulatory frictions, and the segmentation of loan and equity markets is plausible, especially outside a small set of rich countries with well-developed financial systems. Second, banks in many developing countries are state owned and may not be responsive to market forces, such as repricing of the equities following an equity market opening. For example, state-owned banks dominate local banking sectors in the four largest emerging market economies: China, India, Russia, and Brazil. Third, equity market liberalization can sometimes lead to more capital outflows than inflows, in which case the cost of capital can go up rather than down. It is therefore an open empirical question as to whether equity market liberalization in practice generates the spillover that leads to a significant reduction in the cost of bank loans.

In this paper, we study the spillover channel by analyzing bank loan data around the time of China's first reform that exposes all listed domestic stocks (known as A shares) to foreign investment – the introduction of the Qualified Foreign Institutional Investors (QFII) program. Our setting has some economically important features not seen in the existing literature. First, by combining data on loans, firms, and equities, we can examine possible spillover to the loan market from equity market liberalization, in addition to the direct effect on equity prices. Second, because the QFII reform is one-directional (i.e., it permits foreign investors to come to the Chinese market without a corresponding liberalization of allowing Chinese households to invest abroad), we can rule out capital outflow *ex ante* as a possible consequence of the QFII program. Third, by utilizing lender information, we can also check whether bank ownership (e.g., state-owned or foreign-owned banks) plays any special role in the spillover story.

We report four sets of results. First, confirm that the equity prices do increase following the introduction of the QFII program. Moreover, those firms that the asset pricing theory predicts to have a greater increase in equity prices indeed exhibit a greater increase. Second, we document the existence of a spillover from equity price changes to loan price changes. We highlight that a reduction in the risk premium is a key channel for the spillover effect. This exercise explores a particular pattern of cross-firm heterogeneity as predicted by the asset pricing theory. Third, we find that foreign or state ownership of banks does not play a special role in the spillover story. Fourth, we examine the effect of the spillover to the real economy: whether the QFII program has resulted in more investment and more hiring by firms that the theory predicts to experience a greater reduction in loan costs. In an appendix, we present some evidence that the loan costs for nonlisted firms also decline after the introduction of the QFII program.

We make several contributions to the literature. First, the spillover effect that we propose and document partially explains the puzzle of a large estimated effect of equity market liberalization on economic growth as documented by Bekaert, Harvey, and Lundblad (2005). As bank loans are substantially more important than equity financing for overall investment in most countries, a significant spillover effect would make it less surprising to observe a large pro-growth effect of equity market liberalization. We supply the first empirical evidence in the literature for the spillover effect and also show that a reduction in risk premium is likely to be a key channel. Second, there is a large literature on how the presence of international banks affects the costs of bank loans in emerging market economies. This literature is too extensive to be comprehensively cited here. As a recent example, Cetorelli and Goldberg (2011) show that during the global financial crisis of 2007-2009, the liquidity crunch in the US banking system caused a reduction in loan supply in many developing countries through three channels: (i) a direct reduction in cross-border lending, (ii) a reduction in lending by US bank affiliates in developing countries, and (iii) a negative shock to the funding costs of local banks in the developing countries. Schnabl (2012) documents that international banks exposed to the 1999 Russian default reduced their lending to Peruvian banks, which in turn reduced their lending to Peruvian firms. The effect is stronger for local banks with stronger international ties. While our research question is not about international transmission of shocks, we do examine the role of international banks in the spillover from an equity market liberalization to local loan costs.

The remainder of the paper is organized as follows. In Section 2, we provide some institutional background on the QFII program and explain our data sources. We also show evidence that the introduction of the QFII program has induced a repricing of the equities in a way that is consistent with the prediction of the asset pricing theory. In Section 3, we provide evidence that the introduction of the QFII program has produced a reduction in the costs of loans to firms listed on the Chinese stock exchanges and highlight the importance of risk premium reduction as a key channel of the spillover effect. In Section 4, we investigate the real effects of the spillover in terms of firm investment and hiring. In Section 5, we document that there is a general decline is loan costs for China-listed firms as compared to the loans to firms operating in China but listed outside the country. Furthermore, the reduction in risk premium as predicted by the asset pricing model appears to account for most of the observed interest rate reduction. Finally, in Section 6, we offer some concluding remarks.

2. Background and Data

2.1 Institutional Background of the QFII Reform

Since its inception in the early 1990s, the Chinese stock market has grown substantially. At the end of 2017, the Shanghai and Shenzhen stock exchanges jointly host 3,567 stocks with a total market capitalization of 56.7 trillion in RMB, equivalent to 68.3% of China's GDP in 2017. However, up to 2003, the shares on these exchanges - known as A shares - had been shielded from foreign investors with both a direct prohibition on foreign investment in the A-share market and binding foreign exchange controls that prevented any unauthorized conversion of capital gains or dividend payment from RMB to foreign currencies.

While foreign investors could invest in so-called B shares, such shares were not available to domestic investors. This segmentation reduces the liquidity of the B share market, which in turn reduced international investors' interest in them. In any case, no Chinese company has showed any interest in B-share IPOs after 2001.[2]

We study the introduction of the QFII program in China in 2002. This was the first time that all A-share stocks on the Shanghai and Shenzhen stock exchanges became available for investment by foreign investors. Importantly, capital gains and dividend payments accrued to QFIIs can be legally converted to US dollars and remitted abroad. The QFII program was first announced by Zhou Xiaochuan, the then head of the China Securities Regulatory Commission (CSRC), on June 10, 2002, and application procedures were published shortly afterwards. The first set of licenses were granted to UBS and Nomura Securities in May 2003. Within a few months after the program's formal inception, Morgan Stanley, Goldman Sachs, Citigroup, Deutsche Bank, Credit Suisse, JP Morgan Chase, all obtained a QFII license and started trading in the A-share market. With the license, they could trade on behalf of their clients as well as for their own proprietary accounts. They could also invest outside the A-share market, such as in private equity transactions.

[2] Some Chinese companies are listed on the Hong Kong Stock Exchange, and are available to international investors. However, the Chinese domestic A-share market and the Hong Kong market were segmented due to binding capital controls until November 2014, when the Shanghai-Hong Kong Stock Connect program was introduced. Evidence on the segmentation of these two markets and its implications is documented in Jia, Wang, and Xiong (2017) and Deng, Liu, and Wei (2018), among others.

The QFII program as a type of equity market liberalization is not unique to mainland China. Korea, Taiwan, and Brazil are some of the other economies that have had a similar program. The list of QFII license holders in China grew over time. By April 2019, 214 international institutional investors had obtained a QFII license. In September 2019, the Chinese government removed a ceiling on the amount of investment, meaning that a QFII license holder can invest any amount it deems desirable.

2.2 Data

Loan data is obtained from Thomson Reuters LPC DealScan and China Stock Market and Accounting Research (CSMAR). Only large- and medium-sized loans taken out by publicly listed companies are captured by these two databases. Given the sparsity of data, we have to adopt a relatively long sample period from 1996 to 2010 in order to ensure enough observations both before and after the QFII introduction. We conduct robustness checks to make sure that our key conclusions are not driven by compounding factors during the long sample period.

All loans originated in China and reported in DealScan and CSMAR are included in our sample. Loans in our sample can be broadly categorized into two types: term loans and revolvers. A term loan is one for which the borrower receives the full committed amount from the lender at the origination date and makes subsequent repayment(s). A revolver, or credit line, is one for which the borrower has the right, but not the obligation, to draw any amount of money, up to the committed amount.

Following a large body of literature that utilizes DealScan (e.g., Lin, Ma, Malatesta, and Xuan, 2011; Lim, Minton, and Weisbach, 2014; Houston, Jiang, Lin, and Ma, 2014), we adopt all-in-spread-drawn (AISD) as our first measure of the loan cost. AISD is a measure of spread over the base rate (e.g., LIBOR) plus any facility fee, and is payable on the drawn amount. This is the most conventional way of measuring cost of bank loans. (In comparison, what is called "interest rate" in a loan contract may exclude various fees.)

The AISD does not capture option features of some loans, especially credit lines and revolvers. For instance, a borrower has the option to cancel a loan after paying a cancellation fee. A borrower on a revolver contract may incur a utilization fee if the utilization ratio exceeds a preset threshold (either 30% or 50% is a common threshold). Recognizing these features, Berg, Saunders, and Steffen (2016) suggest a comprehensive measure of loan costs, the total cost of borrowing (TCB), that accounts for the option features embedded in loan contracts. They find that, for their sample (mostly loans in the United States), while the AISD contributes

92 percent of the TCB for term loans, it only contributes 53 percent of the TCB for revolvers. To take into account the option features in many loan contracts, we use TCB as our second measure of the cost of loans.

Let PDD denote the probability of a drawdown (which is set to one for term loans). The true cost of a loan depends on the total fees when there is a drawdown, total fees when there is partial drawdown, the probability of a drawdown, and upfront and cancellation fees. More precisely, the TCB for a loan is calculated as

$$\begin{aligned} \text{TCB} = {} & \text{Upfront Fee} \,/\, \text{Expected Maturity (Years)} + \text{PDD} \times (\text{Facility Fee} + \text{Spread}) \\ & + (1 - \text{PDD}) \times (\text{Facility Fee} + \text{Commitment Fee}) \\ & + \text{PDD} \times \text{Pr}\,(\text{Utilization} > \text{Utilization Threshold}) \times \text{Utilization Fee} \\ & + \text{Pr}(\text{Cancellation}) \times \text{Cancellation Fee} \qquad (1) \end{aligned}$$

where the expected maturity is defined as the number of years from the loan start date to the end date. The first term of equation (1) annualizes any one-off upfront fees. The second and third terms are a weighted average of AISD (= facility fee + spread) and all-in-spread-undrawn (AISU = facility fee + commitment fee).[3] The fourth term applies to revolvers, as a utilization fee (payable on the entire committed amount) is sometimes specified when usage exceeds a certain threshold. The final term specifies any cancellation fee that is payable if the loan facility is cancelled by the borrower. The probabilities of drawdown, utilization, and cancellation are estimated as per the methodology of Berg, Saunders, and Steffen (2016).[4] As the CSMAR database does not include certain loan features necessary for computing TCB, we can only compute TCB for loans covered in DealScan. For our research questions, it turns out that our key conclusions are unchanged with TCB as the alternative measure of loan costs.

To facilitate appropriate comparison among loans with different base rates, we standardize and adjust each loan's base rate to LIBOR. For fixed-rate loans, the spread over the corresponding period's LIBOR is calculated. For non-LIBOR denominated loans, the spread is adjusted to account for the difference between LIBOR and its original base rate (e.g., prime). All loans not already in RMB are standardized to RMB using the spot exchange rate at the time of loan origination.

[3] Facility fee is payable on *entire* committed loan amount regardless of usage. Commitment fee is payable on the *unused* portion of the loan amount.
[4] Additional details of the TCB measure can be found in Section III and the Internet Appendix of Berg, Saunders, and Steffen (2016).

Daily equity returns, firm-level financial data, and Fama-French factors for China are obtained from CSMAR, CRSP, and Compustat. We use a composite index that value-weights all A shares listed on the Shanghai and Shenzhen stock exchanges as our proxy for the Chinese market, the MSCI World index as a proxy for global equity market, the Chinese one-year treasury bill rate as a proxy for the Chinese risk-free rate, and the US one-year treasury bill rate as a proxy for the world risk-free rate.[5]

2.3 Higher Equity Prices as Predicted by the CAPM

How would equity market liberalization, such as the introduction of the QFII program, affect the required risk premium? Chari and Henry (2004) offer a clear exposition as well as some cross-country evidence. Assuming that the Capital Asset Pricing Model (CAPM) is the right model for thinking about firm-level risk premium, then in financial autarky, we have

$$E[\tilde{R}_i] = r_f + \beta_{iM}(E[\tilde{R}_M] - r_f), \tag{2}$$

where $E[\tilde{R}_i]$ is firm *i*'s stock's required rate of expected return, r_f is the domestic risk-free rate, β_{iM} is firm *i*'s beta with the domestic market portfolio before liberalization, and $E[\tilde{R}_M]$ is the expected return of the domestic market portfolio. We can rewrite equation (2) as

$$E[\tilde{R}_i] = r_f + \beta_{iM}\gamma\sigma_M^2, \tag{3}$$

where γ is the coefficient of risk aversion under the assumption that all investors have the same constant relative risk aversion, and σ_M^2 is the domestic market portfolio's return variance.

Following stock market liberalization, the relevant source of systematic risk becomes the covariance with the world market. Thus, we have

$$E[\tilde{R}_i^*] = r_f^* + \beta_{iW}(E[\tilde{R}_W] - r_f^*), \tag{4}$$

[5] We cannot use monthly rates as a proxies for the risk-free rates as China does not have one-month treasury securities. Using the US one-month Treasury note as a proxy for the world risk-free rate does not materially impact our findings.

where $E[\widetilde{R}_i^*]$ is firm *i*'s stock's required rate of return following liberalization (i.e., integrated with the world market), r_f is the world risk-free rate, and β_{iW} is firm *i*'s beta with the world market portfolio. Applying the same transformation as above, from equation (4) we have

$$E[\widetilde{R}_i^*] = r_f^* + \beta_{iW}\gamma\sigma_W^2, \tag{5}$$

where σ_W^2 is the world market portfolio's return variance. The expected change in firm *i*'s log equity price following liberalization, $\Delta E[\widetilde{R}_i]$, is then the difference between equations (3) and (5):

$$\Delta E[\widetilde{R}_i] = E[\widetilde{R}_i] - E[\widetilde{R}_i^*] = (r_f - r_f^*) + \gamma \text{DIFCOV}, \tag{6}$$

where $\text{DIFCOV} = \text{cov}(\widetilde{R}_i, \widetilde{R}_M) - \text{cov}(\widetilde{R}_i, \widetilde{R}_W)$. Equation (6) indicates two channels through which stock market liberalization could affect firms' cost of equity. The first is a change in the risk-free rate that is common to all firms. The second is a change in the return covariance that is heterogenous across different firms.

It is likely that a given firm's return is more correlated with the local market portfolio than with the global market portfolio. If that is the case, we would expect DIFCOV to be positive for most firms. In other words, an equity market opening is likely to lead to a reduction in the required risk premium or an increase in the equity prices. This will be examined in our analysis.

A few additional comments are in order here. First, the interest rates inside and outside China before the QFII program's introduction were similar (both were slightly below 4%, with the Chinese rate marginally lower). Thus, the QFII reform is not expected to lead to much change in the risk-free rate. Second, Chari and Henri (2004) do not study the spillover from equity market liberalization to loan prices. Whether market frictions (segmentation) are serious enough to block the spillover needs to be examined empirically rather than assumed. Third, because actual equity market liberalization such as the introduction of the QFII program is often partial or limited in scope (i.e., not the same as removing all barriers for foreign investors to invest in the domestic market), whether the QFII introduction has the effect on equity prices as hypothesized also needs to be empirically investigated rather than assumed, as China is not part of Chari and Henry's (2004) sample. Fourth, there may be special institutional features that require a different way to model required risk premium than the CAPM in the Chinese stock market. For instance, Liu, Stambaugh, and Yuan (2019) suggest that the size premium and book-to-market premium need to be reformulated in a modified Fama-French model for the Chinese context.

We start by computing DIFCOV for A-share stocks. For every firm i, we compute the corresponding DIFCOV using the monthly returns of stock i, composite A-share index, and the MSCI global market index over the 36 months leading up to June 2002 (when the QFII program was announced). We then calculate the annualized DIFCOV and use annualized values throughout the paper. Figure 1 plots DIFCOV for all China-listed (A shares) firms. It appears to be approximately normally distributed with a mean value of 3.15. (The exact distribution does not matter for our purpose.) As expected, almost all firms have lower return covariance with the world market portfolio than they do with the domestic market portfolio. As a result, the DIFCOV variable does take on a positive value for an overwhelming majority of firms. In other words, the CAPM predicts a reduction in the required risk premium for most firms going from financial autarky to an equity market open to foreign investment.

We examine stock price reaction to the QFII announcement by the following specification:

$$\mathrm{AR_i} = \mathrm{b_0} + \mathrm{b_1 DIFCOV_i} + \delta' \mathrm{X_i} + \varepsilon_\mathrm{i}, \tag{7}$$

where AR_i is the abnormal return in percentage points of firm i, calculated as the raw return over the event window ([end May, end June] and [end May, end July]) minus the average return over the 12 months leading to the QFII announcement. This specification and variable construction follow the example of Chari and Henry (2004). X_i is a set of controls including: market capitalization averaged over the past twelve months (in log); the average monthly turnover over the past twelve months; a dummy that equals one for firms listed on the Shanghai Stock Exchange (as opposed to the Shenzhen Stock Exchange) and zero otherwise; market-to-book ratio; price-to-earnings (PE) ratio; profitability as measured by EBITDA over sales; leverage (defined by book value of debt over market value of assets); standard deviation of profitability over the previous twelve quarters; Altman Z-score (Altman, 1968), and interest coverage ratio (in log).

We compute the abnormal returns for all listed A shares around June 2002 when QFII was first announced. The results are plotted in Figure 2. The abnormal return approximately follows a normal distribution (although the exact distribution is not important for our analysis). On average, China-listed firms experience an increase in monthly returns of 14 percentage points in the month of the QFII announcement. In other words, the QFII event is associated with an increase in the equity price by an amount more than one would expect from the experience of the recent past.

To see whether the equity price increases are the result of the equity market liberalization, we use the asset pricing theory as a guide and exploit the cross-firm heterogeneity: do firms that experience a greater reduction in the required risk premium as predicted by the CAPM also exhibit a greater increase in the equity prices? Table 2 reports the regression results. The coefficients on DIFCOV are positive and significant throughout all columns. This confirms that stock prices rise more for firms that the CAPM predicts to have a greater reduction in the required risk premium. To illustrate the economic magnitude, we use the estimate in column 3 as an example: a firm moving from the 25^{th} to the 75^{th} percentile of the annualized DIFCOV distribution would see an increase in the stock price of about 149 bps (=1.25*1.19*100). In columns 4 and 8, we exclude the firms in the financial and utility sectors from the sample and find quantitatively similar results.

The results above are consistent with the finding of Chari and Henry (2004) that equity market liberalization leads to repricing of equities, and that the stock price changes differ across firms in a way that is consistent with the CAPM-predicted heterogenous reductions in firm-level risk premia.

3. Spillover from Equity Market Opening to Lower Loan Costs

3.1 Basic Idea and Plausibility

We now examine whether opening the equity market to international investors leads to lower costs of borrowing in the loan market for the Chinese firms. Under Merton's (1974) contingent claim framework, the risk premium on debt and the risk premium on equity are related since the debt and equity are claims on the payoff from the same underlying asset. Campello, Chen, and Zhang (2008) formulate the key insight of Merton (1974) in discrete time and show that the debt risk premium, $E[\widetilde{R}^d]$, can be expressed as a linear function of the equity risk premium:

$$E[\widetilde{R}_i^d] - r_f = h_i(E[\widetilde{R}_i] - r_f), \tag{8}$$

where the coefficient before the equity risk premium is the elasticity of debt to equity, $h = \frac{\partial D/D}{\partial E/E}$, which is also known as the hedge ratio. Therefore, if equity market opening reduces the equity risk premium for a firm, we would expect the debt risk premium for the firm to fall as well. This implies a reduction in the cost of bank loans.[6]

The contingent claim framework may not work perfectly in this context as there may be frictions that separate the loan and equity markets in our context. If the two markets are partially integrated, we may expect a tendency for the loan prices and equity prices to be linked but not necessarily as tightly as what Equation (8) predicts. We note, however, that even if the Merton model does not hold, a number of economic forces that we explain below can also cause the cost of loans to a firm to respond to a change in the equity price of that firm.

We first clarify that the Chinese interest rate regulation does not prevent banks from incorporating a risk premium in the interest rates that they charge on loans. The Chinese central bank (the People's Bank of China) typically sets a benchmark lending interest rate and allows the commercial banks to set an interest rate on a loan within a range of the benchmark interest rate. In any case, the interest rate on bank loans were progressively liberalized since the 1990s.[7] In 2004, the year after the QFII program was implemented, the range was between 90% and 170% of the benchmark rate.[8] For example, if the benchmark rate is 8%, the feasible interest rates could be anywhere between 7.2% and 13.6%. The exact interest within the range depends on the riskiness of the loan as judged by the bank. If the perceived risk declines, presumably the lending interest rate will also be adjusted downwards.

In setting the risk premium on a loan, is it plausible for a bank to take into account changes in the borrower's stock prices? This can happen through four possible channels. First, major shareholders of publicly listed non-state-owned firms often obtain loans from banks by pledging their equity shares in the listed company as a collateral. These so-called stock-pledge loans started in 2000 and such loans are especially popular in times when equity prices are high. Some of the stock-pledge loans are re-lent to the firms by their shareholders to support business operation. For example, it is reported that Mr. Feng Xin, CEO and founder of Baofeng Group, a listed audio and video entertainment company, took out a series of stock-pledge loans worth RMB 100 million, and re-lent them to the company free of interest.[9] This case is not exceptional and Gao (2018) reports statistical evidence that, for many listed firms, stock-pledge loans act

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[6] Schaefer and Strebulaev (2008) derive the hedge ratio on risky debt as $\left(\frac{1}{\Delta}-1\right)\left(\frac{1}{L}-1\right)$, where Δ is the delta of the European call option on the firm value and L is the market leverage. Friewald, Wagner, and Zechner (2013) show that the hedge ratio can also be expressed as the ratio of the volatility of the equity to that of the debt.

[7] Yao, Xu, Lin, and Wang (2015) provide a summary of the policies regarding China's bank loan rates.

[8] Details can be found from Notice 251 of the People's Bank of China (2003) on Issues Concerning RMB Loan Interest Rates, via http://www.mofcom.gov.cn/aarticle/b/g/200401/20040100175550.html

[9] Sina Finance, "Four questions for Bao Feng's Feng Xin: 29 Stock Pledge Loans. Where's the money?" (in Chinese), July 22, 2018.

as a substitute for direct borrowing from banks. With more funding available through this channel (as loan amounts are based on the value of shares), the marginal cost of borrowing that the firm may face from the banks may also go down. To see this, imagine a firm with a high DIFCOV. From Table 2, we already know that a high value of DIFCOV leads to an increase in the stock price after the QFII program's introduction. The higher stock price raises the value of the collateral in a stock pledge loan and allows the firm's shareholders to borrow more from banks. As some of these funds are re-lent to the firm, its need for direct bank borrowing decreases. In equilibrium, banks would adjust down the interest rate on loans they do make to the firm (Ivashina, 2009; Houston, Jiang, Lin, Ma, 2014; Infante and Piazza, 2014).

Second, many Chinese commercial banks are a part of financial conglomerates that also have securities trading and/or investment banking businesses and are directly involved in the stock market. While the regulation on the book in 1993-1995[10] separates commercial banks from direct business in insurance, trust, and securities, many banks bypassed the restriction by setting up joint-venture subsidiaries. For example, in 1995, the China Construction Bank, together with Morgan Stanley, set up the China International Capital Corporation – an investment bank that is responsible for the successful IPOs of many Chinese firms. Similarly, Bank of China established Bank of China Securities in 2002 through its wholly-owned subsidiary, Bank of China International (BOCI), and successfully obtained a securities underwriting license in mainland China. In addition, the Bank of China Fund Management Company was established in 2004 as a joint venture between BOCI and Merrill Lynch. Smaller banks find their own ways to get into the security trading business. In 2002, the CITIC Group, the Ping'An Group, and the Everbright Group all obtained approval to establish financial holding companies. This means that CITIC Bank, Everbright Bank, and Ping'An Bank all have related companies under the same holding company that have security trading and/or investment banking businesses. In 2005, another program allowed commercial banks to set up fund management companies.[11] Conglomerates controlled by banking giants such as Industrial and Commercial Bank of China, China Construction Bank, and Bank of China, as well as that of smaller banks such as Minsheng Bank all established their own mutual funds, investment banking, and/or securities trading business. As such, changes in the risk premium of a firm in

[10] No. 91 [1993] of the State Council's Decision on Financial System Reform, available at http://www.reformdata.org/1993/1225/23288.shtml. Commercial Bank Law of China, May 1995, available at http://www.npc.gov.cn/wxzl/wxzl/2000-12/06/content_4640.htm

[11] Announcement by the People's Bank of China, the China Banking Regulatory Commission and the China Securities Regulatory Commission -Measures for the Administration of Pilot Establishment of Fund Management Companies by Commercial Banks, February 2005. Available at http://www.csrc.gov.cn/pub/newsite/flb/flfg/bmgf/jj/gszl/201012/t20101231_189590.html

the stock market will not be alien to these commercial banks, and may affect their assessment of the borrowers' riskiness in their loan decisions.

Third, many QFII license holders (e.g., UBS, HSBC, Deutsche Bank, JP Morgan Chase Bank, Credit Suisse, etc.) are themselves banks and participate in making loans to Chinese firms, especially to large- and medium-sized firms. If the security trading arm of a QFII bank sees a change in the required risk premium in the stock market, it may not be surprising that the commercial lending arm of the same bank would also take notice.

Fourth, Chinese firms, just like their US counterparts, tend to time their seasonal stock offering to take advantage of stock price appreciations, in spite of the added frictions they face from the regulatory approval process (Liu, Akbar, Shah, Zhang, and Pang, 2016). If the QFII opening leads to an increase in a company's stock price, then the company's bargaining power vis-à-vis a bank also increases. On the ground that borrowing from a bank and issuing seasonal stock offering are substitutes from the viewpoint of a listed firm, such firm should be able to persuade the bank to lower the cost of loans after an increase in its stock price.

Not all four channels need to operate for all firms. At the same time, the four channels are not mutually exclusively either. Taken together, these linkages provide concrete channels for the equity price of a firm to affect bank decisions on loans to the same firm even if the Merton (1974) model does not hold strictly.

3.2 Reduction in Risk Premium as a Channel for Spillover

To see if the QFII program has led to a reduction in the required risk premium on bank loans due to a reduction in the equity risk premium, we explore a particular type of heterogeneity across firms. In particular, we investigate whether those firms predicted by the CAPM to have a greater reduction in the required equity risk premium also exhibit a greater reduction in the cost of bank loans after liberalization. Based on equation (8), we can write the expected reduction in debt risk premium, $\Delta E[\tilde{R}^d]$, when moving from financial autarky to openness, as:

$$\begin{aligned}\Delta E[\tilde{R}_i^d] &= [h_i(E[\tilde{R}_i] - r_f) + r_f] - [h_i(E[\tilde{R}_i] - r_f^*) + r_f^*] \\ &= (r_f - r_f^*) + h_i[(\Delta E[\tilde{R}_i]) - (r_f - r_f^*)], \end{aligned} \tag{9}$$

From equation (6), we know that $\Delta E[\widetilde{R}_i] = (r_f - r_f^*) + \gamma DIFCOV$. Therefore, equation (9) can be expressed as:[12]

$$\Delta E[\widetilde{R}_i^d] = (r_f - r_f^*) + \gamma h_i DIFCOV_i. \quad (10)$$

As we have noted earlier, as the Chinese short-term government bond rate was similar to the US Treasury rate before the QFII introduction, we expect the first term, $r_f - r_f^*$, to be close to zero. In what follows, we will assume that the hedge ratio is the same for all firms. In Appendix A2, we will investigate how much additional explanatory power we gain by allowing the hedge ratio to vary by firm. We will first report simple cross-sectional regressions of the following form:

$$\Delta S_i = b_0 + b_1 DIFCOV_i + \delta' X_i + \varepsilon_i, \quad (11)$$

where ΔS_i is the change in AISD or TCB for firm *i* from the pre-QFII to the post-QFII periods, and X_i is a vector of firm characteristics, including total assets (in log), leverage ratio, market-to-book ratio, PE ratio, interest coverage, profitability, volatility of profitability, and an estimate of the probability of default as proxied by the Altman Z-score (Altman, 1968), all measured immediately prior to the liberalization. $DIFCOV_i$ is the annualized equity DIFCOV. The intercept b_0 captures the difference in risk-free rates before and after market liberalization (i.e., $r_f - r_f^*$), while the slope coefficient b_1 equals the product of risk aversion (γ) and hedge ratio (h). As a larger value of DIFCOV represents greater reduction in the required equity risk premium, and since the hedge ratio is positive and smaller than one, we would expect b_1 to be negative, and between minus one and zero, if our hypothesis is true.

Before we perform any regression analyses, we first check our sample's representativeness. Figure 3 plots the distribution of DIFCOV for a subsample of the China-listed firms that appear in our loan dataset both prior to and after the announcement of the QFII program. The basic patterns are similar to those in Figure 1: DIFCOV has a positive value, and there is a dispersion across the firms. The similarity between the two histograms also suggests that the firms whose loan data are captured by DealScan and CSMAR are not unusual relative to other listed firms in this regard.

[12] In deriving equation (8), Chari and Henry (2004) assume that all the moments of the firm profit distribution (such as the expected value and variance) are unaltered by the market liberalization event. Under the same assumption, the hedge ratio, which can be written as the ratio of the volatility of equity and the volatility of debt, is unaltered by the liberalization event.

Figure 4 plots the changes in loan costs against the CAPM-predicted changes in the cost of equity. We see a clear negative slope, indicating that those firms with a greater reduction in the cost of equity as predicted by the CAMP also enjoy a greater reduction in their loan costs. The top and bottom rows present the results for term loans and all loans, respectively. The left column reports changes in AISD on the vertical axis, whereas the right column reports changes in TCB. In all cases, the greater the theory-predicted reduction in a firm's risk premium, the greater the observed reduction in the loan costs. These plots also indicate that the negative relationship is a robust feature of the data and is unlikely to be driven by one or two outliers.

Regression results following equation (11) are reported in Table 3. In columns 1 to 3, we find that a larger DIFCOV (i.e., a greater reduction in the risk premium as predicted by the CAPM) leads to a greater reduction in loan spreads following the introduction of the QFII program. In columns 4 to 6, we obtain similar results with TCB as the measure of loan cost. Using the estimates in column 6, a one-unit increase in DIFCOV leads to a reduction in the total cost of borrowing by an average of 49 bps. Since our sample has a mean annualized DIFCOV of 2.7, this translates to a decline in the TCB of 130 bps for such a firm.[13] As a robustness check, we shorten our sample period to be between 1999 and 2007 at a cost of losing 23 firms from our sample. Untabulated results indicate that our findings remain similar.

For later comparisons with risk premia computed from other asset pricing models, it is convenient to replace DIFCOV in equation (11) with the model-predicted change in equity risk premium: $\Delta E\left[\widetilde{R}_i\right]$. This allows for a more straightforward interpretation of the coefficient. In Panel A of Table 4, we see that the AISD declines by between 23 and 24 bps for every percentage point decrease in the CAPM-implied equity risk premium following the QFII reform (columns 1 to 3).

We note that the average decrease in the loan costs is less than proportional to the reduction in equity risk premium. According to equation (8), the sensitivity of debt risk premium to equity risk premium equals the hedge ratio. Schaefer and Strebulaev (2008) simulate the sensitivity of debt return to equity return under the Merton model and find the hedge ratio to be between 0 and 0.25. This is consistent with the results in Panel A of Table 4, where we find the sensitivity to be between 0.19 and 0.24.

It is clear that the reduction in the total cost of capital for a firm is bigger when both the equity cost and the loan cost become lower, following an equity market opening, than when

[13] For our baseline results, our industry classification is based on Fama-French 17 industries. We have verified that the results are robust to using Fama-French 30, Fama-French 48, and CSRC's 2012 industry classifications.

only the equity cost changes. For listed firms, the average leverage ratio is 44%. For nonlisted firms (in the manufacturing sector; see Table A4), the average leverage ratio is 65%. This means that the effect is stronger for nonlisted firms (even though a lack of data about nonlisted firms makes it harder to examine the question).

As an extension, we also investigate whether a reduction in a firm's risk premium may affect the maturity feature of its bank loans and the relative reliance on term loans versus credit lines. These results are reported in Appendix Table A1. A key finding is that after the liberalization, firms with a greater reduction in risk premium also see a lengthening of their loan maturity and an increase in term loans as a proportion of the total loans.

3.3 Lender Types, Borrower Types, and Trade Intensity

Foreign banks, particularly those with a QFII license, may be participating in syndicated loans and could drive our results. For example, if the brokerage section of UBS decides to reprice the stock of a company, the commercial banking section of UBS may reduce the cost of lending to the same firm. This will provide a direct linkage between revaluation of the stock prices and revaluation of the loan costs since it is the same institution that is performing both evaluations. To check if this is an important channel for the spillover effect, we modify equation (11) by including an interaction term:

$$\Delta S_i = b_0 + b_1 \Delta E[\tilde{R}_i] + b_2' \Delta E[\tilde{R}_i] \times L + b_3' L + \delta' X_i + \varepsilon_i, \qquad (12)$$

where *L* is a set of dummies, including *FL* (standing for "foreign lender"), an indicator variable that equals one if any of the borrower's loans involves a foreign lead lender, and zero otherwise.[14]

Some of the domestic banks in China were publicly listed at the time of the QFII program's introduction. Accordingly, the equity market opening could mean an infusion of foreign investment to these banks. With a higher capital cushion, these listed banks may be in a better position to expand their lending than their nonlisted counterparts. As a result, they may play an outsized role in the spillover story.

We also wish to investigate whether state-owned banks behave differently in the spillover story. If state-owned banks act like a government bureau and do not respond to market

[14] Since there are not many loans in the database involving only QFII license holders as lenders, we look at loans involving any foreign lenders in order to ensure sufficient observations.

signals as much as private sector banks may, loans with a state-owned bank as a lead lender may not have their costs altered as much as loans led by a private-sector lender. On the other hand, as all state-owned banks in China have been pushed to pursue corporate governance reforms with efficiency and profitability as an important part of their objectives, it is also possible that they do not behave differently in the spillover story.

All of these possibilities can be investigated in the same regression. Let *DLL* (standing for "domestic listed lender") be an indicator variable that equals one if at least one of the borrower's loans involves a domestic listed bank as a lead lender, and let *Big 4* be another indicator variable that equals one if at least of one of the borrower's loans involves one of China's "big four" state-owned commercial banks as a lead lender.[15] If lender ownership plays a role in determining loan costs following the introduction of the QFII program, we would expect b_2 to be statistically significantly different from zero.

The results are presented in Panel B of Table 4. The coefficients of the interaction terms are always insignificant, suggesting that lender ownership, whether it be foreign lenders (potential QFII license holders), domestic listed lenders, or one of the "big four" state-owned banks, does not influence changes in loan costs following the announcement of the QFII program. At the same time, the coefficient on $\Delta E(r)$ is negative and statistically significant in all six columns, indicating that the spillover effect does not depend on lender ownership.

Now we turn to borrower features and their roles in the spillover story. It has been documented that the costs of capital are often different for state-owned firms and non-state-owned firms (Dollar and Wei, 2007). We want to determine whether the reductions in the loan costs are also different for the two types of borrowing firms. To do this, we create a dummy, *SOE*, that equals one if the borrowing firm is a state-owned enterprise (SOE) and zero otherwise. The results presented in Panel C of Table 4 show no statistically significant difference in the magnitude of loan cost reductions between SOEs and non-SOE borrowers.

The most significant shock to the Chinese economy that is close in timing to the QFII program's introduction was China's accession to the World Trade Organization (WTO) in December 2001. We examine whether the change in loan costs that we have attributed to the QFII program could instead be an outcome of China's newly acquired WTO membership. The WTO membership has increased access to the world market for Chinese exporting firms, raising their growth potential and possibly reducing the risk premium on their bank loans

[15] The "big four" are the Bank of China, the China Construction Bank, the Industrial and Commercial Bank of China, and the Agricultural Bank of China.

(although it could also go in the opposite direction). At the same time, the WTO membership also obligated China to slash tariffs and non-tariff barriers across a large number of imported products. This means that those Chinese firms that use imported inputs intensively should have experienced a more favourable input cost shock, which might induce their lenders to reduce the cost of loans to these firms. In other words, if the WTO accession is important for bank loan costs, we may expect the effect to be particularly important for these two types of firms.

We create a dummy, *XI*, that takes the value of one if a firm belongs to a sector whose export-to-output ratio exceeds the median value across all sectors according to the 2000 China Input-Output Table, and zero otherwise. We create another dummy, *MI*, that takes the value of one if a firm belongs to a sector whose total imports as a share of the total material cost exceed the median value across all sectors according to the same input-output table, and zero otherwise.

In Panel D of Table 4, we include two new interaction terms to determine whether the loan cost reductions are bigger for export-intensive or import-intensive firms. Three findings emerge from this table. First, across all columns, the coefficients for the triple interaction term involving export-oriented firms are generally negative, suggesting that export-oriented firms that experience an improvement in growth potential also experience a greater reduction in loan costs than non-export-oriented firms. However, the estimates for this coefficient are only statistically significant in column 3. Second, the coefficients for the interaction term involving import-intensive firms are often positive, and sometimes are statistically significant, but not consistently so across the columns. The evidence does not support the idea that import-intensive firms experience a greater reduction in loan costs than an average firm even though the former experience a favourable cost shock following China's WTO membership. Third, most importantly for us, after controlling for differential export intensity and import intensity across firms, we still find a negative and statistically significant coefficient for $\Delta E(r)$. This suggests that the loan cost reduction that we have documented and attributed to the equity market liberalization associated with the QFII program is unlikely to be driven by China's WTO accession.

3.4 Beyond the CAPM

The CAPM may not be the best framework to measure required risk premium. The empirical asset pricing literature often uses the Fama-French three-factor model (FF3) as an extension of the CAPM model. Instead of sorting firms by CAPM-predicted changes in the risk premium, we can sort them by FF3-predicted changes in the risk premium. Comparing the predicted changes in risk premium from FF3 and from CAPM (reported in Panel A of Table 4), we see that they are positively correlated, but the correlation is far from perfect.

We now investigate whether the heterogenous changes in loan costs across the firms are related to the FF3-predicted reductions in risk premium. First, we plot the changes in loan costs against the FF3-predicted changes in the cost of equity. The four graphs in the top panel of Figure 5 are similar to their counterparts in Figure 4, with two noticeable differences: the reduced dispersion of data points around the fitted line (i.e., better goodness of fit) and the steeper slope of the fitted line. These are consistent with higher R^2 values and larger coefficients as shown in our regression results. In Panel A of Table 5, we observe that the relationship between the change in loan cost and the reduction in risk premium is negative and statistically significant. For instance, AISD and TCB decrease by 31 and 28 bps, respectively (columns 3 and 6 of Panel A), for every percentage point increase in $\Delta E(r)$ (i.e., decrease in risk premium).

Liu, Stambaugh, and Yuan (2019) suggest that FF3 needs to be modified given China's unique market characteristics. First, because the IPO approval process is long and challenging, some nonperforming small-cap firms that otherwise would have been delisted may be desirable takeover targets for some nonlisted firms eager to be listed. Second, they show that the P/E ratio as a "risk factor" performs better empirically than the price-to-book value ratio. We will use this modified model (LSY3) to predict the change in the required risk premium. We will ask whether the improved predictions for risk premium reductions by LSY3 lead to improved predictions for the relative decline in loan costs across firms.

The bottom panel of Figure 5 plots the changes in loan costs against the LSY3-predicted changes in cost of equity. The graphs are similar to those in Figure 4 and the top panel of Figure 5. The regression results are presented in Panel B of Table 5. Under the LSY model, the decreases in AISD and TCB are 39 and 38 bps, respectively, for every percentage point reduction in the cost of equity (columns 3 and 6 of Panel B).

We note that the adjusted R^2 values in Panel B of Table 5 are generally higher than those in Panel A of Table 4. For example, for the TCB results in column 6 in both tables, the adjusted R-square in the LSY3 model is 0.44, which is higher than 0.34 in the CAPM model. In other words, with better predictions for changes in cross-firm risk premia (by LSY-3 as opposed to CAMP or FF-3), we indeed achieve better predictions for cross-firm loan cost reductions. This bolsters further the confidence in the interpretation that reductions in the risk premium following the QFII introduction as predicted by the asset pricing model are an important reason for the observed reductions in the cost of loans.

Overall, our results strongly suggest that there is spillover from equity market liberalization to reductions in loan costs, and reductions in the risk premia are an important source of the spillover. As reported in Appendix Table A1, these firms with a bigger reduction in risk premium also see a greater increase in the average maturity of the loans, and they utilize more term loans in the years following liberalization. These results are consistent with the notion that firms view debt and equity as substitutes, and banks respond to reductions in risk premium that are made possible by the equity market opening.

4 Effects on Firm Investment, Employment, and Performance

We now investigate the real effects of the QFII program. In particular, we investigate whether those firms that the asset pricing theory predicts to have a greater reduction in risk premium also increase their investment and hiring by a greater amount and see more improvement in their performance.

We first examine whether the QFII program increased firms' real investment. Our sample contains all listed A-shares firms at the time that the QFII program was first announced in 2002. We also require all sample firms to have at least one observation before and one after 2002. Then, we run regressions using the estimation window [2000, 2002 + *t*], where *t* takes the value of 2 and 4. The QFII program was announced in June 2002, and so we exclude observations in 2002 throughout our estimation. The specification is

$$\frac{\mathrm{Capex}_{i,t}}{\mathrm{Asset}_{i,t-1}} = b_0 + b_1\mathrm{DIFCOV}_i + b_2\mathrm{DIFCOV}_i \times \mathrm{Post}_t + b_3\mathrm{Post}_t + \delta' X_{i,t-1} + \mathrm{IndustryYear\ FE} + \varepsilon_{i,t}, \quad (13)$$

where the dependent variable captures a firm's investment (Capex scaled by previous year's assets), expressed in percentage points. We define *Post* as a dummy for years after 2002. We include the interaction term between *DIFCOV* and *Post* in the regression. *X* is a set of control variables including Tobin's Q, cash flow, sales growth, leverage, and total assets.[16] We also include industry-year fixed effects, and cluster standard errors at the firm level.

Table 6 presents the results. The coefficient of interest is the one for the interaction term between *DIFCOV* and *Post*. We find that the point estimates for this coefficient are positive and significant throughout all columns. That is, firms do raise investment after the QFII

[16] Consistent with the literature (see, for example, Peters and Taylor, 2017), we use contemporaneous cash flow as our control variable. Using lagged cash flow does not alter our findings.

program was announced. Most interestingly, those that the CAPM predicts to have a greater reduction in the risk premium exhibit a greater increase in their investment. According to column 2, a firm moving from the 25^{th} to the 75^{th} percentile of the annualized DIFCOV distribution would experience an increase in firm investment of about one percentage point (=1.25*0.79) in the post-event period. In column 3, we drop financial and utility firms from the sample but obtain similar results. We repeat the estimation in columns 4 to 6 by extending the post-event window to 2006. The coefficient on the interaction term is still positive and significant in all specifications. The point estimates become larger (unsurprisingly) than the previous three columns.

How do firms finance the incremental investment? Besides obtaining more bank loans, they may choose to issue more equities. However, as the Chinese security market regulator needs to approve seasonal equity offering, and stories abound about the long and uncertain delays in the getting the approval, it is not at all clear that the seasonal equity offering responds to theory-predicted changes in the risk premium.

We perform two types of estimation. The first is a probit regression with the dependent variable equalling one if there is any seasonal offering within the estimation window and zero otherwise. The results are shown in Panel A of Table 7. The second is a linear regression where the dependent variable is the firm-year-level monetary value of the seasonal offering relative to the previous year's assets. It turns out that, regardless of the specification or estimation window, the coefficient for the interaction term between DIFCOV and Post is insignificant in 11 out of 12 regressions. Our interpretation is that the Chinese security market regulator does not systematically look at changes in risk premium in making approval decisions on seasonal equity offerings. Because the channel of seasonal offering does not work effectively, it makes the spillover from equity market liberalization to loan costs even more important economically.

The third exercise we do is to investigate the effect of the QFII program on firm employment. With a specification similar to equation (13), we use as the dependent variable firm *i*'s employment in year *t* scaled by its total assets (in millions RMB) in year *t*-1. Table 8 presents the results. We find that the coefficient of the interaction term is positive and significant in four of six columns. This provides some support for a positive but heterogenous effect on employment in line with CAPM-predicted differential changes in risk premium across firms. According to column 3, a firm moving from the 25^{th} to the 75^{th} percentile of the annualized DIFCOV distribution would increase its employment over assets ratio relative to the pre-event mean by 4% (=1.25*0.07/2.04) following the announcement of the QFII program.

Finally, we examine the effect of the QFII program on firm performance. We follow the same model as in equation (13) but replace the dependent variable with return on assets (ROA). The results are presented in Table 9. We find a positive and significant coefficient for the interaction term in all columns. This suggests that the equity market opening helps to raise firms' return on assets. Moreover, those firms with a greater reduction in their risk premia as predicted by the asset pricing theory also exhibit a greater improvement in their financial performance. To illustrate the economic magnitude of the effect, we use the estimates in column 2 of Table 9: a firm moving from the 25th to the 75th percentile of the annualized DIFCOV distribution would see an increase in ROA of approximately one percentage point (=1.25*0.69) in the two years following the QFII program (i.e., 2003 and 2004).

In summary, the evidence suggests that the equity market opening is associated with more investment, more employment, and better financial performance. More importantly, these effects are heterogeneous across firms: those that the asset pricing theory predicts to experience a greater reduction in their risk premia do better in relative terms.

5 A Difference-in-Differences Exercise

5.1 Basic Idea and Specification

The introduction of the QFII program is a policy shock; all firms listed on the Chinese stock exchanges are in the treatment group since QFII license holders can trade on any A-share stock. The approach in Section 3 is to use the asset pricing theory as a guide and explore heterogeneous reductions in the loan costs across the treatment firms. In this section, we pursue a complementary approach by which we compare changes in the loan costs experienced by firms in the treatment group with those experienced by firms in a control group. In other words, we will perform a difference-in-differences (DID) exercise.

The control group is difficult to construct since all listed firms in China have been made exposed to potential QFII investment. We have searched for Chinese firms that are listed only outside China without a dual listing in China. Unfortunately, there were very few such companies before 2005, thus making this exercise difficult. As an alternative, we define the control group as all loans in Dealscan that are made to the China operations of multinational firms that are listed outside China. An example is a loan made to the China subsidiary of Caterpillar Inc. The idea is that the QFII policy shock does not alter the underlying investor pool (or the equity prices) for those firms in the control group but enlarges the underlying investor pool for the firms in the treatment group. To perform the DID exercise, we stress that we do not look at all loans to the firms in the control group, but rather only a subset of the loans that the Dealscan specifies are for the China operation of these firms.

We note that the DID design is imperfect in our context. In particular, the firms in the control and treatment groups are different along several dimensions. Most notably, the firms in the control group tend to be much larger than their counterparts in the treatment group, and the two groups of firms could face substantially different borrowing costs. To account for these heterogeneities, in our regressions we control for firm characteristics such as firm size as measured by total assets (in log), leverage ratio, market-to-book ratio, PE ratio, interest coverage, profitability, volatility of profitability, and an estimate of the probability of default as proxied by the Altman Z-score (Altman, 1968). In other words, in comparing the relative interest rates of the firms in the treatment and control groups, we purge the influences of these firm characteristics on the cost of borrowing.

Another challenge is sparsity of loan data. Because only relatively large loans to large and medium sized firms are recorded in the DealScan and CSMAR databases, we have to work with a relatively wide time window in order to achieve a sufficient number of observations. In our baseline case, we use the 1996-2002 period as the pre-event window, and the 2003-2010 period as the post-event window. (As a robustness check, we will also look at a narrower window with fewer firms/loans.) Given these limitations, we regard the results from the DID exercise as a suggestive complement to the results reported in Section 3.

Figure 6 plots the mean loan cost for our treatment and control groups from 1996 to 2010. Because the firms in the control group are larger, they face a lower borrowing cost. The average loan cost in the treatment group exhibits a decline around the time of the QFII program's introduction, but the same is not true for our control group. The bottom left panel plots the difference in loan cost between our treatment and control groups. We see that the gap between the two loan costs is relatively stable both pre- and post-QFII. However, there is a clear narrowing of the gap from the pre-QFII period to the post-QFII period. To check whether the narrowing of the gap between the borrowing costs is statistically significant, especially after controlling for various firm characteristics, we turn to a regression analysis.

Using the AISD or TCB as our dependent variables, we conduct the following conditional difference-in-differences regression:

$$\mathrm{S}_{i,t} = \mathrm{b}_0 + \mathrm{b}_1 \mathrm{Treat}_i \times \mathrm{Post}_t + \delta' \mathrm{X}_{i,t-1} + \text{Year FE} + \text{Firm FE} + \mathrm{PreTrend}_{i,t} + \varepsilon_{i,t}, \quad (14)$$

where *i* and *t* denote firm and year, respectively. *S* is either AISD or TCB. *Treat* is an indicator variable that equals one for firms in the treatment group (i.e., one that is listed on one of China's stock exchanges) and zero otherwise. *Post* is an indicator variable that equals one for periods after the announcement of the QFII program (i.e., June 10, 2002) and zero otherwise. *X* is vector of firm characteristics as described earlier. As an extension to our baseline model, we will add the interaction between *DIFCOV* and *Post* to equation (14). This allows us to assess the relative importance of the risk reduction channel in explaining the overall reduction in the loan costs.

If, relative to the loans to the control group firms, the loan costs for the treatment firms were declining even before the event, then we may observe a relative reduction in the borrowing costs by the treatment firms even if the QFII program makes no contribution to this. To guard against such a "false positive", we will control for "pre trend." Specifically, using the time series data on AISD or TCB prior to the announcement of the QFII program, we estimate a set of industry-specific linear trends for the firms in the treatment group, and another set of industry-specific linear trends for the firms in the control group.

$$S_{i,k,t} = \sum_{k} b_{1,k}\,\text{Industry}_k + \sum_{k} b_{2,k}\,\text{Industry}_k \times \text{Year}_t + \sum_{k} b_{3,k}\,\text{Industry}_k \times \text{Treat}_i + \sum_{k} b_{4,k}\,\text{Industry}_k \times \text{Year}_t \times \text{Treat}_i + \varepsilon_{i,k,t} \qquad (15)$$

where *k* denotes industry dummies. Based on the results of equation (15), and assuming that the coefficient estimates hold for the post-event period, we use the fitted values of *S* (and projected values in the post-event period) to construct the variable *Pre Trend.*

5.2 Statistical Results

The regression results following equation (14) are presented in Columns 1 and 7 of Table 10. For term loans, in column 1, the AISD decreases by approximately 99 bps following the introduction of the QFII program. In column 7, for all loans and credit lines, the AISD declines by 83 bps. After controlling for firm characteristics, for which the results are reported in columns 3 and 9, we continue to find significantly negative coefficients of similar economic magnitude. The regressions that control for pre-QFII trends of the interest rates are reported in columns 5 and 11. If the negative coefficients on the interaction term in other columns are solely driven by the existence of different trends in the interest rates for the treatment and control groups, then the interaction term would become insignificant once those trends are controlled. We find that neither the statistical significance nor the economic significance of the estimates on the interaction term is materially affected by controlling for the interest rate pre-trends. In particular, we continue to find that loan costs become lower after the QFII program's introduction.

The even-numbered columns in Table 10 include the interaction term between *DIFCOV* and *Post* as an additional regressor.[17] The DIFCOV measures the risk reduction channel and is a part of the overall effect of the QFII liberalization. We see from Columns 2, 4, 6, 8, 10, and 12 that, once *DIFCOV**Post* is accounted for, *Treat**Post*, loses statistical significance. Note that the adjusted R^2 for each column with *DIFCOV**Post* is also higher than its preceding column. We interpret these patterns as evidence that the reduction in the risk premium is the primary source of the overall reduction in the interest rate on the loans to Chinese firms.

While the DID results in Columns 1 and 7 can conceivably be affect by other events that coincide with the timing of the QFII program, the significant coefficients associated with the term, DIFCOV*Post, are unlikely to be caused by other events since DIFCOV captures the theory-predicted changes in risk premium that vary by firm from financial autarky to exposure to international investors.

We replace AISD with TCB in Table 11. Our findings are unchanged. In particular, the interaction term between *Treat* and *Post* loses significance in the presence of *DIFCOV**Post* and adjusted R^2 is higher in the presence of the latter. This again corroborates our interpretation that reductions in the risk premium following the QFII program's introduction are able to explain almost all observed reductions in the loan costs.

5.3 Additional Extensions and Placebo Tests

As in Section 3, we can determine whether the connection between loan costs and the change in required risk premium depends on whether the lender is a foreign lender, a publicly listed domestic bank, or one of the four leading state-owned banks. We also investigate whether the risk premium effect depends on the ownership of the borrowing firm, as well as on import and export intensities of the firm.

The results turn out to be similar to Panels B to D of Table 4 (not reported to save space). First, lender type does not play a special role in our setting. This means that the adjustment of

[17] DIFCOV is zero for the firms in the control group as the Chinese QFII program does not affect their stock prices.

the loan costs in response to a reduction in risk premium is performed by all types of banks. Domestic banks, including nonlisted banks, do as much adjustment as foreign banks. State-owned banks are as responsive as others, suggesting that they had become sufficiently profit-driven by the time of the QFII program's introduction.

Second, we find that the risk premium channel applies equally to SOE borrowers as well as to non-SOE borrowers. Third, neither export intensity nor import intensity seems to play a role in the relationship between changes in loan costs and changes in the required risk premium. This reaffirms our interpretation that the observed loan cost reductions are a result of the equity market liberalization, and not a direct consequence of the tariff reductions or other trade reforms that are embedded in the country's accession to the WTO.

As additional robustness checks, we perform some placebo tests by using fake event dates. To avoid any overlaps between our fake and actual pre-/post-event years, we restrict our sample period to years prior to the introduction of the QFII program (i.e., 1996 to 2001) and years after the program's introduction (i.e., 2002 to 2010). In particular, we perform the difference-in-differences regressions on two fake event years, 1999 and 2007, respectively, instead of the true event year 2002. For instance, for pre-QFII years, we use 1996 to 1998 as our (fake) pre-event period and 1999 to 2001 as our (fake) post-event period. If our findings are indeed due to the introduction of the QFII program, then we should not expect to observe significant b_2 from equation (14) for the fake event years. On the other hand, if the true event year 2002 is not that special, we might find similarly significant effects and comparable point estimates even with the fake event years.

Panels A and B of Table 12 report the results with 1999 and 2007 as the fake event years, respectively. When shifting our event year to 1999, the key coefficient on the interaction term is not statistically significant in any of the four columns (Panel A). When using 2007 as the fake event year, the coefficient on the interaction term is not statistically different from zero in three of the four specifications (Panel B), and only at significant at 10% in the fourth column. In other words, when we use a fake event year, we do not find the same kind of consistently significant results as when we use the actual event year.

To summarize, all the extensions and robustness checks have bolstered our confidence in the interpretation that the equity market liberalization has indeed led to a reduction in the cost of bank loans for Chinese firms. The spillover effect is not driven by foreign banks or domestic listed banks. We can also rule out China's accession to the WTO as a confounding factor based on the observation that the loan cost reductions are not systematically different for export-oriented or import-intensive firms relative to other firms.

6 Conclusion

We propose a new spillover story that equity market liberalization may trigger a reduction in costs of bank loans. Because bank loans are more important than equity market financing for a majority of countries, this spillover effect is economically important.

We empirically evaluate the spillover effect by analyzing loan data in China following its introduction of the QFII program in 2002, which was the first time when all Chinese A-share stocks became available for foreign investment. We document a substantial reduction in the cost of bank loans for Chinese companies, on the order of between 75 and 83 bps. Guided by the asset pricing theory, we show that a reduction in the required risk premium is an economically significant channel for the spillover, capable of explaining almost all observed reductions in the interest rates. In particular, those firms with a greater reduction in the required risk premium as predicted by the CAPM also exhibit a greater reduction in the cost of bank loans. Moreover, improved predictions on the changes in the required risk premium using a modified Fama-French model, as proposed by Liu, Stambaugh, and Yuan (2019), also lead to improved predictions for which firms will experience a greater reduction in loan costs. We also show that equity market liberalization leads to more corporate investment, more hiring, and better firm performance, in ways that are proportional to the theory-predicted reductions in the risk premium.

The spillover effect suggests that the economic significance of equity market liberalization goes beyond stock price revaluation. This helps to understand how investment and economic growth may respond to equity market liberalization even in countries where bank loans are much more important as a funding source for corporate investment than the equity market.

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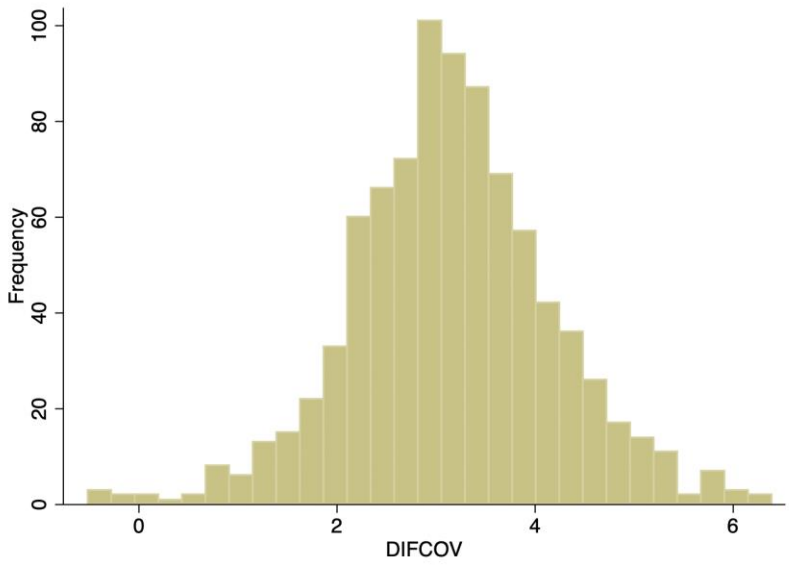


Fig. 1: DIFCOV distribution of all China-listed (A shares) firms prior to the announcement of the QFII program. DIFCOV is defined as the difference in the firm's stock returns covariance with returns of the domestic market portfolio and that with the returns of the global market portfolio.

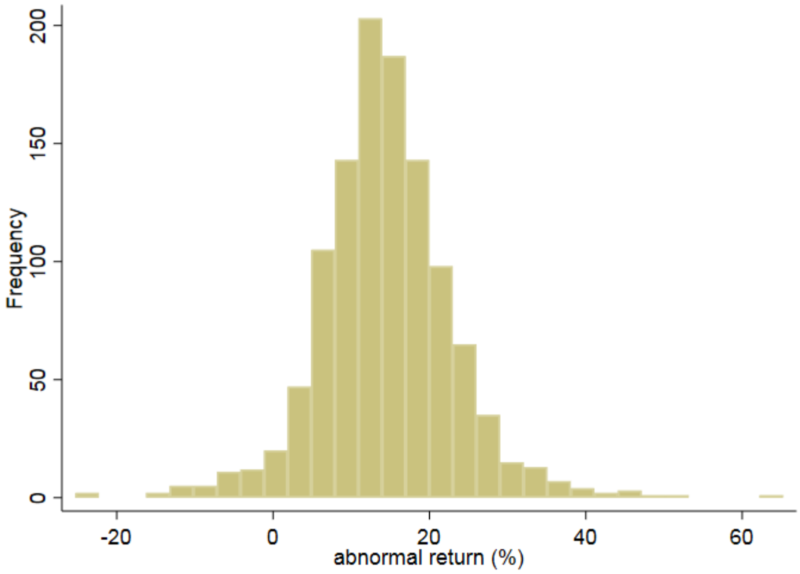


Fig. 2: Abnormal return distribution of all China-listed (A shares) firms in June 2002 when QFII was first announced. Abnormal return is in percentage points and calculated as monthly return minus the past 12-month average monthly return.

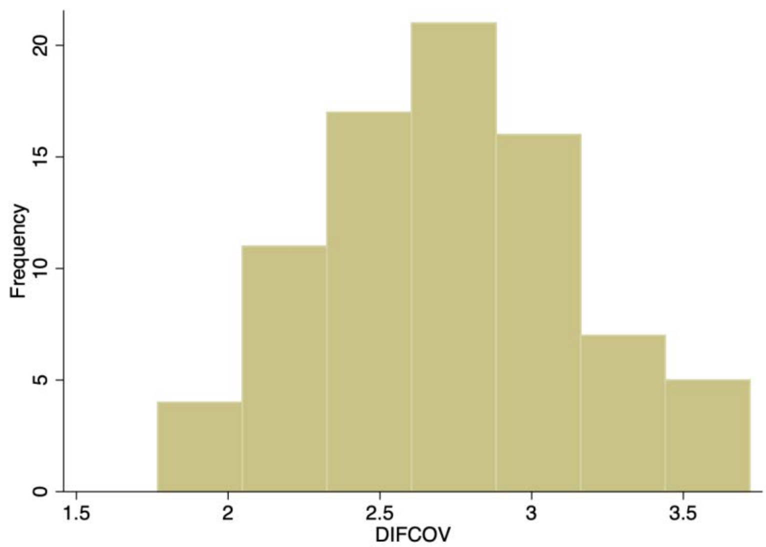


Fig. 3: DIFCOV distribution of China-listed firms with loan data in both pre- and post-QFII periods. DIFCOV is defined as the difference in the firm's stock returns covariance with returns of the domestic market portfolio and that with the returns of the global market portfolio.

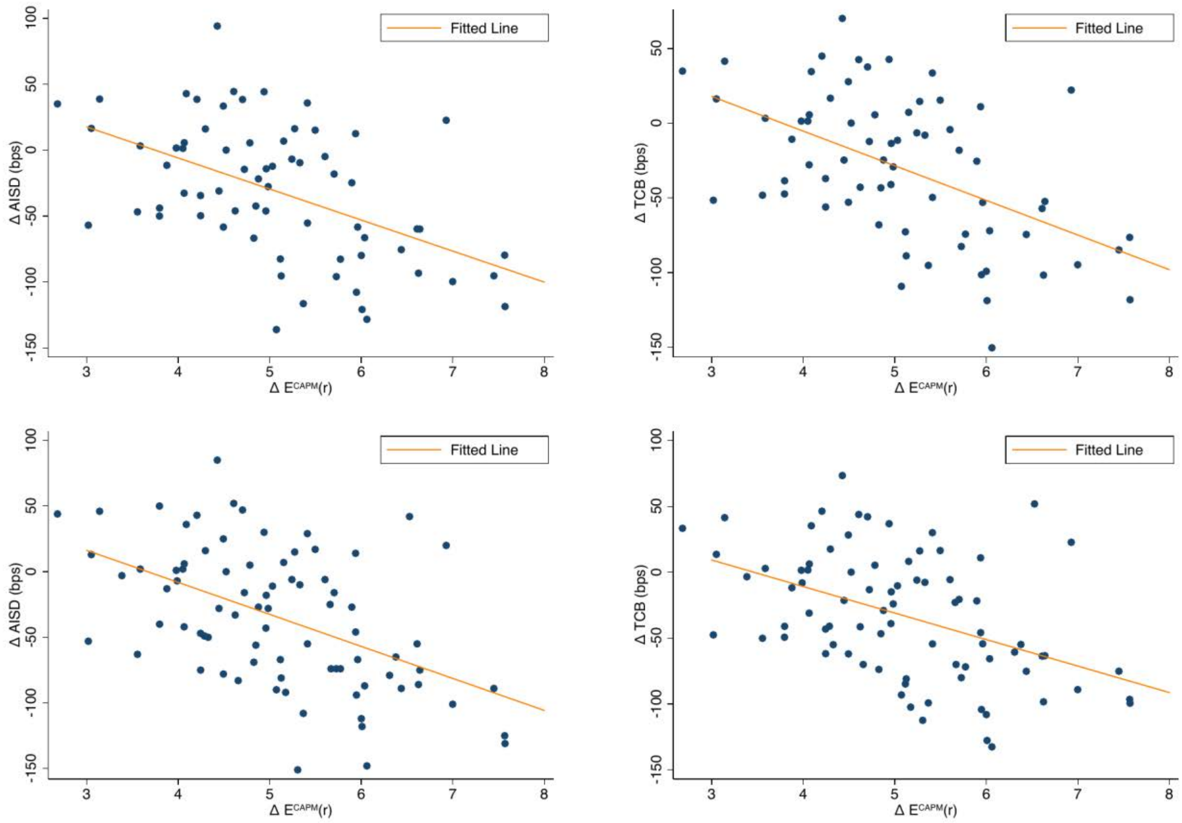


Fig. 4: Changes in mean AISD (left) and TCB (right) against difference in individual stocks' theoretical difference in stock return, under the CAPM, following the announcement of the QFII program. Top and bottom rows include term loans and all loans, respectively.

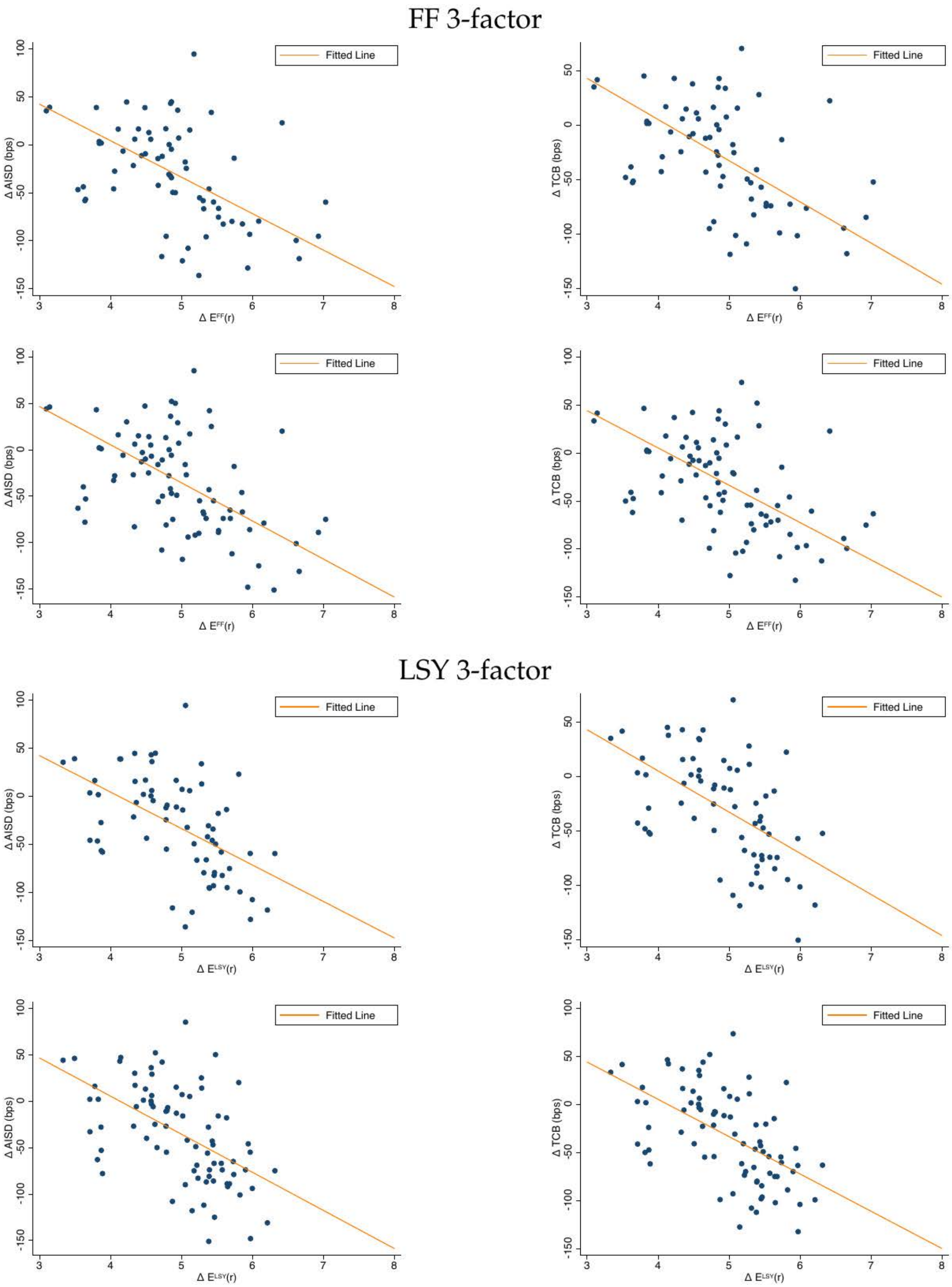


Fig. 5: Changes in mean AISD (left) and TCB (right) against difference in individual stocks' theoretical difference in stock return, under the FF 3-factor and LSY 3-factor models, following the announcement of the QFII program. Top and bottom rows of each panel include term loans and all loans, respectively.

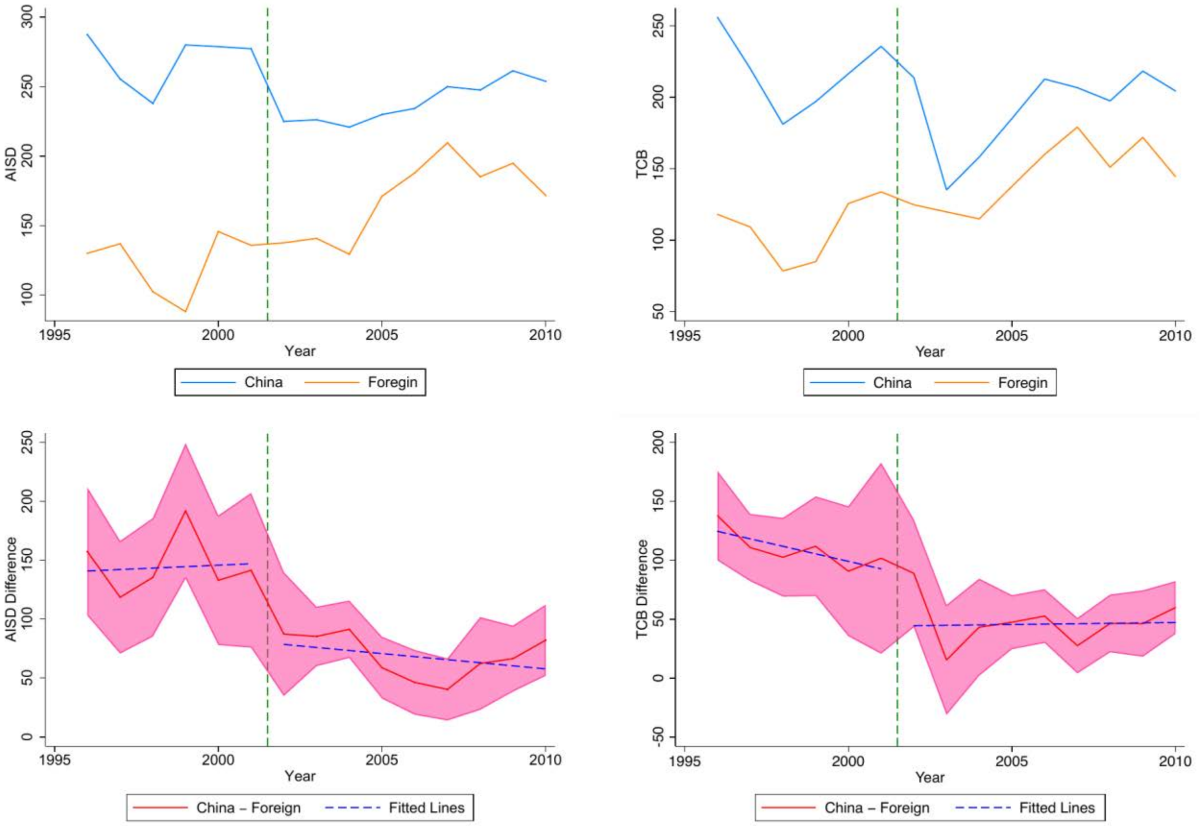


Fig. 6: AISD (left) and TCB (right) of loans of China- and foreign-listed firms. The green dashed lines represent the announcement of the QFII program in June 2002 that liberalizes China's stock market. The shaded region represents the 95% confidence interval.

Table 1: Summary Statistics.

Descriptive statistics of 81 Chinese-listed firms with loans both prior to and after the introduction of the QFII program. Changes in AISD and TCB are calculated as the difference between value-weighted pre- and post-QFII mean values. Firm observables are measured as of the end of 2001 (i.e., the year-end prior to the introduction of QFII).

	N	Mean	Median	S.D.
Δ AISD (bps)	81	-34.67	-33.00	52.47
Δ TCB (bps)	81	-32.76	-39.02	47.89
DFICOV	81	2.73	2.71	0.43
M/B	81	4.05	3.14	3.30
Profitability	81	0.03	0.00	0.08
Assets (RMB Bn)	81	21.81	13.81	22.13
Interest Coverage	81	6.92	1.00	35.74
P/E	81	95.78	42.98	185.50
Leverage	81	0.44	0.42	0.17
S.D. of Profitability	81	0.09	0.02	0.38
Altman Z-score	81	4.75	3.95	3.18

Table 2: Equity Price Reactions to the QFII Program Announcement

Our sample contains all the Chinese A-shares at the time of the QFII announcement in 2002. Two event windows are used, namely [end May, end June] and [end May, end July] of 2002. The dependent variable is abnormal return in percentage points for each event window, defined as the raw return over the event window minus the average return over the 12 months leading to the QFII announcement. *DIFCOV* is constructed following Chari and Henry (2004). Columns 4 and 8 exclude utility and financial firms. Robust standard errors are shown in parentheses. ***, **, and * indicate statistically significant at the 1%, 5%, and 10% level, respectively.

Dep. Variable:	Abnormal Return (%)							
Window:	[end May, end June]				[end May, end July]			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
DIFCOV	0.65***	1.21***	1.19***	1.18***	0.47*	0.90***	0.81***	0.78***
	(0.22)	(0.24)	(0.25)	(0.25)	(0.24)	(0.27)	(0.28)	(0.28)
Log(Market Cap.)		4.16***	3.21***	3.32***		2.80***	1.85***	1.78***
		(0.53)	(0.55)	(0.54)		(0.62)	(0.64)	(0.61)
Turnover		-8.73***	-8.72**	-7.54**		-10.77***	-12.67***	-11.69***
		(3.30)	(3.86)	(3.77)		(3.85)	(4.26)	(4.19)
SSE		-1.60***	-1.28**	-1.25**		-0.85	-0.69	-0.56
		(0.57)	(0.59)	(0.59)		(0.62)	(0.65)	(0.65)
Profitability			1.04	0.75			0.72	0.42
			(1.22)	(1.19)			(1.86)	(1.88)
M/B			-0.01*	-0.01*			-0.02***	-0.02***
			(0.01)	(0.01)			(0.01)	(0.01)
Log(Int. Coverage)			-0.27	-0.22			-0.38	-0.30
			(0.22)	(0.23)			(0.23)	(0.24)
P/E			-0.07**	-0.08**			-0.04	-0.04
			(0.03)	(0.03)			(0.03)	(0.03)
Leverage			-1.50	-1.05			0.15	0.30
			(2.25)	(2.25)			(2.31)	(2.33)
S.D. of Profitability			-1.00***	-0.98***			-0.83	-0.79
			(0.15)	(0.14)			(0.86)	(0.88)
Altman Z-score			-0.10	-0.09			-0.07	-0.07
			(0.07)	(0.07)			(0.07)	(0.06)
N	891	891	746	725	891	891	746	725
R-squared	0.007	0.091	0.100	0.098	0.003	0.044	0.044	0.039

Table 3: Changes in Risk Premia and Changes in Loan Costs

Dependent variables are changes in value-weighted AISD (columns 1 to 3) and TCB (columns 4 to 6) of all loans both prior to and after the announcement of the QFII program. *DIFCOV* is constructed following Chari and Henry (2004). Sample is restricted to China-listed firms with loans both prior to and after the announcement of the QFII program. Standard errors are shown in parentheses and clustered by industry. ***, **, and * indicate statistically significant at the 1%, 5%, and 10% level, respectively.

Dep. Variable:	Δ AISD			Δ TCB		
	(1)	(2)	(3)	(4)	(5)	(6)
DIFCOV	-61.14***	-59.00***	-59.66***	-50.43***	-48.32***	-49.08***
	(11.72)	(15.93)	(15.18)	(11.48)	(14.69)	(14.07)
M/B		-0.36	-0.28		-0.39	-0.29
		(2.16)	(2.15)		(1.87)	(1.88)
Profitability		-106.70	-84.39		-100.52	-74.97
		(68.42)	(60.47)		(64.25)	(56.08)
Log(Assets)		3.44	2.09		2.21	0.66
		(6.83)	(6.86)		(7.19)	(7.25)
Log(Int. Coverage)		7.69	11.30**		7.53	11.67**
		(4.87)	(4.59)		(4.77)	(4.36)
P/E		-0.03	-0.02		-0.03	-0.02
		(0.02)	(0.02)		(0.02)	(0.02)
Leverage		-40.74	-25.85		-17.34	-0.29
		(77.34)	(77.63)		(65.26)	(64.10)
S.D. of Profitability		-1.51	-2.16		-0.33	-1.07
		(4.76)	(4.45)		(4.63)	(4.42)
Altman Z-score		-0.16	-0.79		0.96	0.25
		(4.11)	(3.81)		(2.99)	(2.68)
Pre Trend			0.33**			0.38***
			(0.12)			(0.11)
N	81	81	81	81	81	81
R-squared	0.252	0.32	0.362	0.205	0.271	0.337

Table 4: Lender Types, Borrower Types, Trade Intensity, and the Loan Cost Response to Changes in Risk Premia

Dependent variables are changes in value-weighted AISD (columns 1 to 3) and TCB (columns 4 to 6) of all loans both prior to and after the announcement of the QFII program. Change in expected return (*Δ E(r)*) is based on the CAPM and calculated from equation (6). Panel A examines the impact of lender ownership. *FL, DLL,* and *Big 4* are dummies that indicate foreign lender, domestic listed lender, and Big 4 Chinese state-owned banks, respectively. Panel B examines the impact of SOE borrowers. *SOE* is a dummy that indicates state-owned enterprise. Panel C examines the impact of borrowers in trade-intensive sectors due to China's accession to the WTO. *MI* and *XI* are dummies that indicate import- and export-intensive firms, respectively. Sample is restricted to China-listed firms with loans both prior to and after the announcement of the QFII program. Standard errors are shown in parentheses and clustered by industry. ***, **, and * indicate statistically significant at the 1%, 5%, and 10% level, respectively.

Dep. Variable:		Δ AISD			Δ TCB	
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: No Interaction						
Δ E(r)	-24.40***	-23.54***	-23.81***	-20.12***	-19.28***	-19.59***
	(4.68)	(6.36)	(6.06)	(4.58)	(5.86)	(5.61)
N	81	81	81	81	81	81
R-squared	0.252	0.320	0.362	0.205	0.271	0.337
Panel B: Lender Ownership						
Δ E(r)	-25.45***	-22.55**	-21.71**	-20.14***	-18.01**	-17.00*
	(6.93)	(7.86)	(9.59)	(6.13)	(7.52)	(9.53)
Δ E(r) * FL	4.39	9.65	6.85	-0.46	3.00	-0.37
	(11.43)	(10.50)	(11.38)	(9.70)	(9.26)	(10.15)
Δ E(r) * DLL	1.89	-1.00	0.80	-1.58	-3.28	-1.11
	(9.24)	(9.66)	(9.14)	(8.06)	(9.50)	(8.76)
Δ E(r) * Big 4	-2.80	-6.36	-8.07	0.12	-2.45	-4.51
	(7.74)	(7.77)	(8.58)	(6.79)	(7.27)	(8.54)
N	81	81	81	81	81	81
R-squared	0.317	0.389	0.423	0.261	0.322	0.382
Panel C: SOE						
Δ E(r)	-26.77***	-25.86***	-25.36***	-22.26***	-21.55***	-20.99***
	(2.19)	(4.29)	(4.53)	(1.72)	(3.87)	(4.03)
Δ E(r) * SOE	7.97	6.70	4.58	6.69	6.17	3.74
	(10.18)	(10.33)	(7.96)	(10.47)	(11.10)	(8.34)
N	81	81	81	81	81	81
R-squared	0.261	0.324	0.364	0.21	0.276	0.339
Panel D: Trade Intensive						
Δ E(r)	-30.92***	-30.81***	-30.24***	-25.67***	-24.82***	-24.14***
	(5.16)	(5.74)	(5.45)	(5.20)	(5.77)	(5.54)
Δ E(r) * MI	29.02**	30.79**	28.98***	18.01	18.79	16.63
	(10.82)	(11.27)	(7.14)	(12.40)	(13.18)	(9.77)
Δ E(r) * XI	-10.06	-12.2	-12.44*	-2.09	-4.29	-4.57
	(8.50)	(9.15)	(6.33)	(9.34)	(10.32)	(8.40)
N	81	81	81	81	81	81
R-squared	0.320	0.378	0.412	0.255	0.310	0.370
Firm Controls		Y	Y		Y	Y
Pre Trend			Y			Y

Table 5: Improvements in the Models of Risk Premia

Dependent variables are changes in value-weighted AISD (columns 1 to 3) and TCB (columns 4 to 6) of all loans both prior to and after the announcement of the QFII program. Change in expected return (*Δ E(r)*) is based on the Fama-French three-factor (Panel A) and Liu-Stambaugh-Yuan three-factor (Panel B) models. Sample is restricted to China-listed firms with loans both prior to and after the announcement of the QFII program. Standard errors are shown in parentheses and clustered by industry. ***, **, and * indicate statistically significant at the 1%, 5%, and 10% level, respectively.

Dep. Variable:	Δ AISD			Δ TCB		
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: FF 3-factor						
Δ E(r)	-31.61***	-29.04***	-30.74***	-27.56***	-25.92***	-27.81***
	(6.81)	(8.54)	(8.35)	(5.72)	(7.39)	(7.13)
N	81	81	81	81	81	81
R-squared	0.250	0.320	0.378	0.228	0.298	0.384
Panel B: LSY 3-factor						
Δ E(r)	-41.01***	-38.86***	-39.33***	-38.81***	-37.40***	-37.95***
	(6.79)	(7.91)	(8.02)	(5.33)	(6.20)	(6.12)
N	81	81	81	81	81	81
R-squared	0.287	0.362	0.405	0.308	0.374	0.443
Firm Controls		Y	Y		Y	Y
Pre Trend			Y			Y

Table 6: The QFII Effect on Firm Investment

The dependent variable is firm investment, calculated as capital expenditure in year *t* over total assets in year *t-1*, and expressed in percentage points. *DIFCOV* is constructed following Chari and Henry (2004). *Post* is a dummy variable that equals one for years after 2002 and zero otherwise. Sample contains the Chinese firms with A-shares at the time of the QFII announcement in 2002. Two windows are used, namely [2000, 2004] and [2000, 2006]. We exclude observations in 2002 and further restrict the sample to only those firms with observations available both before and after 2002 within our sample period. All controls are lagged by one period, except for cash flow. Columns 3 and 6 exclude utility and financial firms. Robust standard errors are clustered by firm and shown in parentheses. ***, **, and * indicate statistically significant at the 1%, 5%, and 10% level, respectively.

Dep. Variable:	$Capex_t/Asset_{t-1}$ (%)					
Sample Period:	2000-2004 (excl. 2002)			2000-2006 (excl. 2002)		
	(1)	(2)	(3)	(4)	(5)	(6)
DIFCOV * Post	0.81***	0.79**	0.80**	0.88***	0.89***	0.91***
	(0.31)	(0.32)	(0.32)	(0.30)	(0.30)	(0.30)
DIFCOV	-1.27***	-1.13***	-1.18***	-1.27***	-1.08***	-1.13***
	(0.28)	(0.29)	(0.30)	(0.28)	(0.29)	(0.30)
Tobin's Q		0.35	0.35		0.54***	0.55***
		(0.23)	(0.24)		(0.20)	(0.21)
Cash flow		19.86***	20.67***		18.41***	19.21***
		(2.78)	(2.78)		(2.31)	(2.32)
Sales growth		0.75**	0.85***		0.85***	0.87***
		(0.30)	(0.31)		(0.24)	(0.25)
Leverage		-5.19***	-5.11***		-5.54***	-5.38***
		(1.12)	(1.16)		(0.79)	(0.81)
Log(Assets)		0.37	0.34		0.87***	0.88***
		(0.31)	(0.32)		(0.25)	(0.26)
Industry-Year FE	Y	Y	Y	Y	Y	Y
N	3,513	3,407	3,277	5,220	5,093	4,897
R-squared	0.060	0.100	0.101	0.073	0.117	0.119

Table 7: The QFII Effect on Seasonal Equity Offerings (SEOs)

Panel A presents the results of a probit model where the dependent variable, *SOE (dummy)*, equals one if there is at least one SEO in the given year, and zero otherwise. Panel B presents the results of a linear probability (OLS) model with the dependent variable equal to the total monetary value of SEOs divided by lagged assets. *DIFCOV* is constructed following Chari and Henry (2004). *Post* is a dummy variable that equals one for years after 2002 and zero otherwise. Sample contains the Chinese firms with A-shares at the time of QFII announcement in 2002. Two windows are used, namely [2000, 2004] and [2000, 2006]. We exclude observations in 2002 and further restrict the sample to only those firms with observations available both before and after 2002 within our sample period. Unreported controls include DIFCOV, Tobin's Q, cash flow, sales growth, leverage, and assets (in log). All controls are lagged by one period, except for cash flow. Columns 3 and 6 exclude utility and financial firms. Robust standard errors are clustered by firm and shown in parentheses. ***, **, and * indicate statistically significant at the 1%, 5%, and 10% level, respectively.

Sample Period:	2000-2004 (excl. 2002)			2000-2006 (excl. 2002)		
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Probit	Dep. Variable: SEO (dummy)					
DIFCOV * Post	-0.02	0.03	0.09	0.02	0.09	0.16*
	(0.10)	(0.10)	(0.10)	(0.08)	(0.09)	(0.09)
N	1,519	1,458	1,408	1,942	1,872	1,797
Pseudo R-squared	0.062	0.141	0.139	0.053	0.144	0.140
Panel B: OLS	Dep. Variable: $SEO_t/Asset_{t-1}$ (%)					
DIFCOV * Post	0.17	0.24	0.33	0.30	0.38	0.47
	(0.27)	(0.31)	(0.32)	(0.27)	(0.31)	(0.32)
N	3,527	3,421	3,277	5,240	5,113	4,897
R-squared	0.033	0.037	0.037	0.034	0.038	0.038
Firm Controls		Y	Y		Y	Y
Industry-Year FE	Y	Y	Y	Y	Y	Y

Table 8: The QFII Effect on Employment

The dependent variable measures firm employment calculated as the ratio of the number of employees over lagged total assets in RMB millions. *DIFCOV* is constructed following Chari and Henry (2004). *Post* is a dummy variable that equals one for years after 2002 and zero otherwise. Sample contains all Chinese firms with A-shares at the time of QFII announcement in 2002. Two windows are used, namely [2000, 2004] and [2000, 2006]. We exclude observations in 2002 and further restrict the sample to only those firms with observations available both before and after 2002 within our sample period. Unreported controls include DIFCOV, Tobin's Q, cash flow, sales growth, leverage, and assets (in log). All controls are lagged by one period, except for cash flow. Columns 3 and 6 exclude utility and financial firms. Robust standard errors are clustered by firm and shown in parentheses. ***, **, and * indicate statistically significant at the 1%, 5%, and 10% level, respectively.

Dep. Variable:	$Employment_t/Asset_{t-1}$					
Sample Period:	2000-2004 (excl. 2002)			2000-2006 (excl. 2002)		
	(1)	(2)	(3)	(4)	(5)	(6)
DIFCOV * Post	0.06*	0.05	0.07**	0.06*	0.06	0.08**
	(0.03)	(0.03)	(0.03)	(0.03)	(0.04)	(0.04)
N	3,494	3,395	3,252	5,193	5,076	4,862
R-squared	0.080	0.155	0.152	0.098	0.153	0.151
Firm Controls		Y	Y		Y	Y
Industry-Year FE	Y	Y	Y	Y	Y	Y

Table 9: The QFII Effect on Firm Performance

The dependent variable is a firm's contemporaneous return on assets (ROA) in percentage points. *DIFCOV* is constructed following Chari and Henry (2004). *Post* is a dummy variable that equals one for years after 2002 and zero otherwise. Sample contains the Chinese firms with A-shares at the time of QFII announcement in 2002. Two windows are used, namely [2000, 2004] and [2000, 2006]. We exclude observations in 2002 and further restrict the sample to only those firms with observations available both before and after 2002 within our sample period. Unreported controls include DIFCOV, Tobin's Q, cash flow, sales growth, leverage, and assets (in log). All controls are lagged by one period, except for cash flow. Columns 3 and 6 exclude utility and financial firms. Robust standard errors are clustered by firm and shown in parentheses. ***, **, and * indicate statistically significant at the 1%, 5%, and 10% level, respectively.

Dep. Variable:	ROA_t (%)					
Sample Period:	2000-2004 (excl. 2002)			2000-2006 (excl. 2002)		
	(1)	(2)	(3)	(4)	(5)	(6)
DIFCOV * Post	0.54**	0.69***	0.67**	0.57**	0.73***	0.73***
	(0.26)	(0.26)	(0.26)	(0.23)	(0.22)	(0.22)
N	3,527	3,421	3,277	5,240	5,113	4,897
R-squared	0.063	0.217	0.223	0.060	0.230	0.236
Firm Controls		Y	Y		Y	Y
Industry-Year FE	Y	Y	Y	Y	Y	Y

Table 10: Loan Cost (AISD) Response to the QFII Program Announcement

Treat is a dummy variable that equals one for China-listed firms and zero otherwise. *Post* is a dummy variable that equals one the period after the announcement of the QFII program on 10 June 2002 and zero otherwise. *DIFCOV* is constructed following Chari and Henry (2004). Sample is restricted to loans originated in China between 1996 and 2010. All columns include year and firm fixed effects. Standard errors are shown in parentheses and clustered by industry. ***, **, and * indicate statistically significant at the 1%, 5%, and 10% level, respectively.

Dep. Variable:	AISD											
Sample:	Term Loans						All Loans					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Treat * Post	-99.08***	-1.10	-84.18***	-4.01	-90.87**	-59.54	-82.71***	-19.37	-70.60**	-48.56	-74.61**	-99.76
	(24.47)	(58.11)	(28.60)	(33.68)	(32.79)	(49.30)	(25.62)	(55.66)	(33.56)	(54.89)	(31.22)	(63.21)
DIFCOV * Post		-33.15***		-30.34***		-19.66***		-26.31***		-20.06**		-12.58
		(8.31)		(6.06)		(6.16)		(6.87)		(7.76)		(9.72)
M/B			-0.02	-0.02*	-0.01	-0.02*			-0.02	-0.03	-0.01	-0.03
			(0.01)	(0.01)	(0.01)	(0.01)			(0.01)	(0.02)	(0.01)	(0.01)
Profitability			-108.47	-98.44	-109.19	-136.01*			-127.03*	-183.21**	-125.04	-205.44**
			(80.55)	(75.04)	(82.39)	(74.58)			(66.10)	(71.92)	(76.37)	(79.28)
Log(Assets)			15.24	13.47	21.22	23.84			5.3	8.16	9.99	16.4
			(13.65)	(19.34)	(13.84)	(17.86)			(14.20)	(18.24)	(14.16)	(18.80)
Log(Int. Coverage)			-2.33**	-1.45	-1.81	-0.65			-1.89	-0.04	-1.69	0.54
			(1.07)	(1.23)	(1.13)	(1.28)			(1.32)	(1.46)	(1.37)	(1.66)
P/E			-0.51*	-0.49***	-0.58**	-0.56***			-0.54***	-0.61*	-0.57***	-0.68**
			(0.26)	(0.16)	(0.26)	(0.15)			(0.18)	(0.30)	(0.17)	(0.30)
Leverage			64.14**	76.49**	65.63**	76.07*			52.82*	60.23**	50.47*	66.04**
			(30.27)	(36.54)	(29.65)	(37.16)			(28.77)	(29.21)	(26.92)	(27.61)
S.D. of Profitability			112.37	-6.67	125.83	18.95			176.39	145.78	155.18	163
			(169.34)	(274.23)	(147.94)	(243.61)			(183.33)	(197.39)	(185.65)	(176.68)
Altman Z-score			1.04	-0.65	2.46	2.29			2.29	1.31	3.18	4.64
			(4.16)	(4.95)	(3.50)	(4.87)			(3.22)	(3.91)	(3.03)	(3.94)
Pre Trend					0.28	0.40***					0.18	0.27
					(0.17)	(0.14)					(0.13)	(0.18)
N	261	212	261	212	261	212	294	240	294	240	294	240
R-squared	0.700	0.772	0.735	0.801	0.746	0.819	0.671	0.714	0.695	0.739	0.709	0.750

Table 11: Loan Cost (TCB) Response to the QFII Program Announcement

Treat is a dummy variable that equals one for China-listed firms and zero otherwise. *Post* is a dummy variable that equals one the period after the announcement of the QFII program on 10 June 2002 and zero otherwise. *DIFCOV* is constructed following Chari and Henry (2004). Sample is restricted to loans originated in China between 1996 and 2010. All columns include year and firm fixed effects. Standard errors are shown in parentheses and clustered by industry. ***, **, and * indicate statistically significant at the 1%, 5%, and 10% level, respectively.

Dep. Variable:	TCB											
Sample:	Term Loans						All Loans					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Treat * Post	-100.51***	-0.08	-87.18***	-5.02	-93.99***	-61.54	-65.88***	-5.00	-56.96***	-22.99	-60.90***	-63.06
	(23.67)	(54.63)	(28.07)	(35.78)	(31.49)	(50.52)	(14.28)	(30.85)	(19.02)	(28.04)	(18.24)	(38.16)
DIFCOV * Post		-34.37***		-31.35***		-20.23**		-25.49***		-21.42***		-15.47**
		(7.42)		(7.41)		(7.40)		(5.02)		(6.05)		(7.49)
M/B			-0.01	-0.02	-0.01	-0.02			-0.02	-0.02**	-0.01	-0.02**
			(0.02)	(0.01)	(0.01)	(0.01)			(0.01)	(0.01)	(0.01)	(0.01)
Profitability			-105.74	-85.38	-107.66	-126.52			-101.93**	-130.66**	-97.46**	-142.73***
			(77.04)	(79.18)	(79.25)	(80.76)			(41.33)	(48.02)	(45.11)	(42.96)
Log(Assets)			14.83	12.70	20.79	22.85			-0.10	2.32	4.11	9.11
			(13.08)	(18.30)	(13.57)	(17.00)			(9.83)	(12.04)	(10.25)	(12.56)
Log(Int. Coverage)			-2.20*	-1.19	-1.65	-0.39			-1.20	0.09	-1.00	0.52
			(1.08)	(1.29)	(1.13)	(1.40)			(1.03)	(0.76)	(0.99)	(0.90)
P/E			-0.49*	-0.44**	-0.57**	-0.51***			-0.39***	-0.34*	-0.41***	-0.40**
			(0.25)	(0.18)	(0.25)	(0.16)			(0.10)	(0.17)	(0.10)	(0.17)
Leverage			59.21*	72.49*	61.79*	73.98*			37.51**	47.35**	36.37**	51.26***
			(31.12)	(38.35)	(30.47)	(38.94)			(16.99)	(18.98)	(15.74)	(17.94)
S.D. of Profitability			143	11.97	157.71	39.14			150.17	109.63	136.86	120.87
			(168.71)	(264.44)	(148.70)	(236.81)			(115.08)	(144.34)	(113.42)	(132.24)
Altman Z-score			0.12	-1.79	1.62	1.30			1.32	0.38	2.20	3.06
			(4.22)	(4.70)	(3.50)	(4.67)			(2.15)	(2.62)	(1.79)	(2.79)
Pre Trend					0.29*	0.40**					0.23*	0.31*
					(0.16)	(0.15)					(0.12)	(0.18)
N	261	212	261	212	261	212	294	240	294	240	294	240
R-squared	0.696	0.768	0.729	0.793	0.740	0.812	0.683	0.749	0.708	0.773	0.724	0.785

Table 12: Placebo Tests Using Fake Event Years

Treat is a dummy variable that equals one for China-listed firms and zero otherwise. *Post* is a dummy variable that equals one the period after the fake event year and zero otherwise. *DIFCOV* is constructed following Chari and Henry (2004). Panel A restricts the sample period to between pre-QFII years (i.e,. 1996 to 2001) and uses 1999 as the fake event year. Panel B restricts the sample period to between post-QFII years (i.e,. 2003 to 2010) and uses 2007 as the fake event year. Sample is restricted to loans originated in China. All columns include loan type, lead lender, currency, year, and firm fixed effects. Standard errors are shown in parentheses and clustered by industry. ***, **, and * indicate statistically significant at the 1%, 5%, and 10% level, respectively.

Dep. Variable:	AISD		TCB	
Sample:	Term Loans	All Loans	Term Loans	All Loans
	(1)	(2)	(3)	(4)
Panel A: Fake Event Year = 1999				
Treat * Post	-198.67	-119.92	-188.69	-73.07
	(281.45)	(361.26)	(294.74)	(242.25)
DIFCOV * Post	25.6	18.05	22.01	13.78
	(82.70)	(106.80)	(86.73)	(76.90)
N	53	55	53	55
R-squared	0.709	0.667	0.698	0.751
Panel B: Fake Event Year = 2007				
Treat * Post	48.23	71.99	33.84	20.78
	(112.12)	(71.88)	(112.40)	(47.20)
DIFCOV * Post	-24.88	-32.54	-19.99	-18.75*
	(26.04)	(19.53)	(27.48)	(10.33)
N	144	166	144	166
R-squared	0.821	0.756	0.814	0.775
Firm Controls	Y	Y	Y	Y
Loan Controls	Y	Y	Y	Y
Pre-QFII Trend	Y	Y	Y	Y

Internet Appendices

Appendix A1: Changes in Other Loan Features

Besides changes in the loan cost, we also investigate whether and how a reduction in a firm's risk premium may affect the maturity feature of its bank loans and the relative reliance on term loans versus credit lines. These results are presented in Figure A1 and Table A1.

The key finding is that after the liberalization, those firms with a greater reduction in the risk premium also see a lengthening of their average loan maturity and an increase in term loans as a proportion of their total loans.

Appendix A2: Predicting Changes in Loan Cost with Firm-specific Hedge Ratios

In this appendix, we explore whether firm-specific measures of the hedge ratio can improve our model's explanatory power for observed changes in the loan costs. In particular, we estimate the following specification, which is a counterpart to equation (11),

$$\Delta S_i = b_0 + b_1(h_i \times \mathrm{DIFCOV}_i) + \delta' X_i + \varepsilon_i, \tag{A1}$$

where h_i is an approximation of the firm-specific hedge ratio. We will experiment with a series of approximations that are motivated by the literature.

According to Schaefer and Strebulaev (2008), the hedge ratio h_i for firm i can be written as:

$$h_i = \left(\frac{1}{\Delta_i} - 1\right)\left(\frac{1}{L_i} - 1\right), \tag{A2}$$

where Δ_i is the delta of a European call option on the value of the firm and L_i is the market leverage. While L_i can be obtained from a firm's financial disclosure, Δ_i is, according to the option theory, a more complicated object, and can be calculated as

$$\Delta_i = N\left(\frac{\ln\left(\frac{V_i}{D_i}\right) + \left(r + \frac{\sigma_{Ai}^2}{2}\right) T_i}{\sigma_{Ai}\sqrt{T_i}}\right), \tag{A3}$$

where N is the cumulative distribution function of a standard normal distribution. V_i is the value of the firm, D_i is the value of its debt, σ_{Ai}^2 is the asset volatility, r is the risk-free rate, and T_i is the (average) time to maturity for the firm's debt. As typical financial disclosure has coarse information on the maturity structure of the debt, T_i has to be inferred with noise. To compute σ_{Ai}^2, we will have to make additional assumptions, which inevitably introduce more errors. For these reasons, our first approximation of h_i assumes that Δ is a constant that is the same for all firms, and let cross-firm variations in h be dictated entirely by variations in $(1/L_i - 1)$. In such a regression, the average value of $(1/L_i - 1)$ is absorbed into the regression coefficient, b_1.

As our second approximation of h, we make a best effort at estimating Δ_i. This will first involve making some assumptions to calculate σ_{Ai}. Following Bharath and Shumway (2008), we calculate asset volatility as:

$$\sigma_{Ai} = \sigma_{Ei} \times \frac{E_i}{E_i + K_i}, \tag{A4}$$

where σ_{Ei} is the standard deviation in the firm's daily equity return in the year preceding the announcement of the QFII program. E_i is the market value of firm *i*'s equity, and K_i is the sum of the book value of short-term debt and half of the book value of long-term debt.[18] The risk-free rate is proxied by the 10-year Chinese Treasury note rate just prior to the announcement of the QFII program. The average time to maturity is proxied by the value-weighted average time to maturity (in years) across each firm's pre-QFII loans. The combination of (A3) and (A4) gives the second approximation of $h_i = (1/\Delta_i - 1)(1/L_i - 1)$. Because the second approximation involves additional assumptions, there is no guarantee that it will empirically outperform the first approximation.

Friewald, Wagner, and Zechner (2013) show that the hedge ratio can also be expressed as the ratio of the volatility of equity to that of the debt, σ_{Ei}/σ_{Di}. As few Chinese firms issued corporate bonds during our sample period, and there is a scarcity of bank loans recorded in the database for any given firm, we are not able to reliably estimate a firm's debt volatility. Given these constraints, we propose as our third measure to let the variations in h be dictated by

[18] Vassalou and Xing (2004) outline two reasons for discounting long-term debt. First, firms need to service their long-term debt, and these interest payments are part of their short-term liabilities. Second, the size of the long-term debt affects the ability of a firm to roll over its short-term debt, and therefore reduces its risk of default. Replacing K_i with D_i (total debt) does not qualitatively change our results.

variations in σ_E. In other words, in the third specification, we use $(\sigma_{Ei} \times DIFCOV_i)$ to replace $(h_i \times DIFCOV_i)$ in equation (A1).

We report pairwise correlations among the three regressors in Table A2. The correlation between the first and the second measure is merely 0.26, and that between the first and the third one is -0.07. The correlation between the second and the third measures is 0.11.

For comparison, in column 1 of Panels A and B of Table A3, we first reproduce the regressions that assume h_i to be the same across all firms. The top panel uses change in AISD as the dependent variable, while the bottom panel uses TCB. They are the same regressions as in columns 3 and 6 of Table 3, with an identical list of control variables (though the coefficients on the control variables are not reported to save space). In columns 2 to 4, we replace the DIFCOV regressor with our first, second, and third proxies for firm-specific hedge ratio, respectively. Note that the coefficients on these regressors are not comparable given the construction of these variables. Instead, our focus is on the goodness of fit of the model, or the ability to predict cross-firm variations in the reduction in loan costs. The adjusted R^2 values in the baseline case (under the assumption of an identical h for all firms) are 0.365 and 0.342, respectively, when AISD and TCB are used as the dependent variable. In comparison, the adjusted R^2 values are between 0.179 and 0.320 when the proxies for the firm-specific hedge ratio are used. In other words, we find that none of the three proxies for firm-specific h delivers better performance than the baseline case that assumes the same h for all firms.

In column 5, we include both $(\sigma_{Ei} \times DIFCOV_i)$ and $(1/L_i - 1)$ in the regression, together with the same set of other firm controls. This yields a slightly better R^2, but it is still inferior to the baseline regression. In column 6, we include both $(\sigma_{Ei} \times DIFCOV_i)$ and $(1/\Delta_i - 1)(1/L_i - 1)$ in the regression, together with the other control variables. This also does not improve the predictive ability of the model.

To summarize, while in theory the Merton (1974) model implies a firm-specific hedge ratio, our best efforts at estimating the cross-firm variations in the hedge ratio do not result in any significant improvement in the predictive ability of the model for cross-firm variations in the loan cost reductions, relative to the simple baseline case that assumes the same hedge ratio for all firms.

Appendix A3: Spillover to Nonlisted Firms

In this appendix, we examine whether equity market liberalization also spills over to lower costs of bank loans for nonlisted firms. If the loan costs to listed firms decline after the equity market liberalization, lenders will compete to give more loans to nonlisted firms, since loans to listed and nonlisted firms are substitutes from the lenders' point of view. This provides a plausible reason for the costs of loans to nonlisted firms to decline as well.

This is an intrinsically harder question to answer as data related to nonlisted firms, including information on bank loans, are much harder to obtain. For example, neither DealScan nor CSMAR covers any loans made to nonlisted firms in ways that are meaningful for our purposes. Moreover, without the corresponding stock prices by firm, we cannot compute DIFCOV and therefore cannot investigate the role of risk premium reduction as a spillover channel. These facts suggest that whatever we can do for nonlisted firms has to be at a much coarser level than for listed firms.

Our idea is to work with data on manufacturing firms covered in the Chinese Industrial Census. This census covers all manufacturing firms whose sales are above a threshold value (which is 5 million RMB in our sample period, or about 600,000 US dollars using the exchange rate at the end of 2002). We use annual data from 2000 to 2004 and restrict the sample to firms that are in the dataset both before and after 2002 (the year in which the QFII program was announced). We drop the observations in 2002 since the QFII program was announced in the middle of that year. A subset of the firms in our dataset are publicly listed firms, and we manually identify them by using a combination of information on firm names, industry, and locations of the firms' headquarters. (This is a fuzzy matching process as the names of a given firm in the listed firm database and in the industrial census may contain some variations.)

The industrial census data does not contain loan-level information (such as maturity of the loans or the interest rates). However, for each firm in a given year, it reports both total interest payments in that year as well as the monetary values of short-term and long-term debts. We will use interest payment in year *t* divided by the sum of short-term debt and long-term debt in the previous year as a proxy for the average interest rate for that firm in year *t*. This is clearly a noisy measure as both the interest payment and liability information reflect a mixture of debt obligations with potentially different costs of borrowing. For example, the interest rates on the short-term and long-term debt are likely to be different. Our proxy may be regarded as the true cost of borrowing plus an error term.

$$\frac{\text{Interest}_{i,t}}{(\text{ST Debt}_{i,t-1} + \text{LT Debt}_{i,t-1})} = \text{True borrowing cost}_{i,t} + \varepsilon_{i,t}, \tag{A5}$$

Since we use the proxy for the cost of borrowing as the dependent variable, the inference on the effect of the QFII program will be unbiased if the error term is a pure measurement error. We will run regressions that are variations of the following specification:

$$\frac{\text{Interest}_{i,t}}{(\text{ ST Debt}_{i,t-1} + \text{LT Debt}_{i,t-1})} = b_0 + b_1\text{Public}_i + b_2\text{Public}_i * \text{Post}_t + b_3\text{Post}_t + \delta' X_{i,t-1}$$
$$+\text{Industry (or Firm) FE} + \text{Province FE} + \varepsilon_{i,t}, \qquad \text{(A6)}$$

where *i* and *t* index firm and year, respectively. *Public* is a dummy that is equal ones if the firm is a publicly listed firm and zero otherwise; *Post* is a dummy denoting post-event years (i.e., 2003 and 2004); and *X* is a list of firm features that the industrial census captures, including asset (in log), leverage ratio, interest coverage ratio, sales growth, age, and dummies for state ownership (one if state-owned) and tangibility (one if in a sector with tangible assets above the median value). The interaction term between Public and Post captures any difference in interest rate change between listed and nonlisted firm. We include both industry fixed effects and location fixed effects. We cluster the standard errors at the firm level.

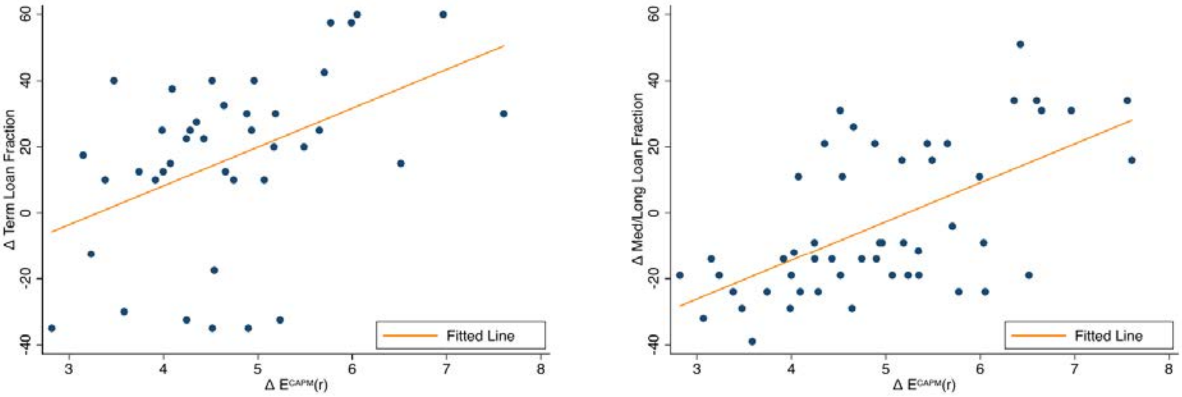
The assumption that the measurement error is purely random is not entirely innocuous. One source of the measurement error is different maturity structures across firms. For example, if Firm A happens to have more long-term debt than Firm B, and the long-term debt has a higher interest rate, then our measure would assign a higher cost of borrowing to Firm A even if it has identical interest rates for any given maturity. This *per se* does not matter for our inference as long as the distribution of maturity structure across firms is identical before and after the event. However, our previous evidence from the listed firms suggests that the average maturity of debt tends to rise after the QFII program's introduction (see Appendix A1). This means that without controlling for changes in the maturity structure, we may underestimate the true reduction in the interest rate after the QFII introduction. It may be useful to keep this possible bias in mind when interpreting our results below.

With 80,536 firms from the manufacturing census data, our sample is relatively large and contains 296,593 firm-year observations for our estimation window. To reduce the impact of outliers, we drop the observations for which the changes in the cost of debt are in both the top and bottom 5% of the sample.

Table A5 provides the results. From columns 1 to 3, we find negative and significant coefficients for *Post*, suggesting a reduction in average cost of debt in the periods after the financial opening. The magnitude of the estimate is economically significant. Column 1 shows an average decline of 32 bps in the borrowing cost after the QFII program's introduction. The magnitude becomes smaller when we include industry and province fixed effects in column 2. When we include further firm fixed effects in column 3, the magnitude becomes a 24 bps reduction in the interest rate.

We do not find a significant coefficient for the interaction terms between Public and Post. This suggests that the nonlisted firms experience almost the same amount of loan cost reduction as the listed firms.

To summarize, the evidence suggests that nonlisted manufacturing firms also share the benefit of lower costs of debt following an equity market liberalization.



Appendix Figure A1: Changes in firms' fraction of term loans (left) and short loans (right) as a percentage of total number of loans against changes in expected stock returns under the CAPM. Firms with larger reductions in risk following the introduction of the QFII program choose to increase their term loans.

Appendix Table A1: Changes in the Composition of Loans Following the QFII Announcement

Dependent variables are changes in long-maturity (> one year) loans (columns 1 to 3) and term loans (columns 4 to 6) as fractions of total number of loans f prior to and after the announcement of the QFII program. *DIFCOV* is constructed following Chari and Henry (2004). Sample is restricted to China-listed firms with loans both prior to and after the announcement of the QFII program. Standard errors are shown in parentheses and clustered by industry. ***, **, and * indicate statistically significant at the 1%, 5%, and 10% level, respectively.

Dep. Variable:	Δ Long Loan Fraction			Δ Term Loan Fraction		
	(1)	(2)	(3)	(4)	(5)	(6)
DIFCOV	25.27***	13.90**	10.04***	31.93***	29.59**	10.93**
	(5.19)	(5.58)	(1.94)	(9.35)	(13.48)	(5.06)
M/B		-0.21	0.01		1.16*	-0.65*
		(0.75)	(0.22)		(0.61)	(0.35)
Profitability		60.74	23.34**		-97.04	-7.46
		(36.57)	(8.40)		(64.70)	(12.80)
Log(Assets)		-5.34	-3.69***		8.39*	-2.1
		(3.52)	(1.22)		(4.31)	(1.75)
Log(Int. Coverage)		3.84	1.46*		1.79	1.57
		(3.02)	(0.75)		(3.95)	(1.18)
P/E		0.01	-0.01**		0.02***	0.01***
		(0.01)	0.00		(0.01)	0.00
Leverage		29.19	-11.99		-6.07	1.86
		(19.27)	(7.86)		(51.30)	(11.90)
S.D. of Profitability		-4.42**	-3.89***		4.69	-2.60**
		(1.86)	(0.96)		(3.77)	(0.97)
Altman Z-score		-2.31*	-1.67***		-0.61	0
		(1.30)	(0.39)		(2.35)	(0.69)
Pre Trend			0.82***			0.97***
			(0.06)			(0.06)
N	56	56	56	46	46	46
R-squared	0.273	0.395	0.857	0.256	0.409	0.926

Appendix Table A2: Correlation Matrix of Measures of the Hedge Ratio

L is the leverage ratio. Δ is the delta of a European call option on the value of the firm. Equity volatility (σ_E) is calculated as the annualized standard deviation of the firm's daily stock returns in the calendar year preceding the announcement of the QFII program. Sample is restricted to China-listed firms with loans both prior to and after the announcement of the QFII program.

	(1/L – 1)	(1/Δ – 1) (1/L – 1)	σ_E
(1/L – 1)	1.000		
(1/Δ – 1) (1/L – 1)	0.259	1.000	
σ_E	-0.066	0.109	1.000

Appendix Table A3: Change in Loan Costs and Risk Premia – Hedge Ratio

Dependent variables are changes in value-weighted AISD (Panel A) and TCB (Panel B) of all loans prior to and after the announcement of the QFII program. *DIFCOV* is constructed following Chari and Henry (2004). L is the leverage ratio. Δ is the delta of a European call option on the value of the firm. Equity volatility (σ_E) is calculated as the annualized standard deviation of the firm's daily stock returns in the calendar year leading up to the announcement of the QFII program. Sample is restricted to China-listed firms with loans both prior to and after the announcement of the QFII program. Standard errors are shown in parentheses and clustered by industry. ***, **, and * indicate statistically significant at the 1%, 5%, and 10% level, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Δ AISD						
DIFCOV	-59.66***					
	(15.18)					
DIFCOV * (1/L - 1)		-5.02*			1.63	
		(2.59)			(2.65)	
DIFCOV * h			-47.88			26.68
			(98.28)			(87.98)
DIFCOV * σ_E				-93.26***	-99.11***	-94.11***
				(30.49)	(32.89)	(31.27)
N	81	81	81	81	81	81
R-squared	0.362	0.198	0.175	0.334	0.336	0.335
Panel B: Δ TCB						
DIFCOV	-49.08***					
	(14.07)					
DIFCOV * (1/L - 1)		-4.87*			0.35	
		(2.55)			(2.78)	
DIFCOV * h			-67.44			-6.94
			(94.99)			(99.19)
DIFCOV * σ_E				-76.59**	-77.85**	-76.37**
				(26.74)	(28.69)	(27.14)
N	81	81	81	81	81	81
R-squared	0.337	0.211	0.187	0.314	0.314	0.314
Firm Controls	Y	Y	Y	Y	Y	Y
Pre Trend	Y	Y	Y	Y	Y	Y

Appendix Table A4: Additional Summary Statistics

Manufacturing Firms (2000-2001 and 2003-2004)

	N	Mean	SD	Min	Median	Max
Cost debt	250045	0.019	0.021	-0.002	0.012	0.089
Public	250045	0.007	0.084	0.000	0.000	1.000
Assets (in log)	250045	10.077	1.466	6.407	9.950	14.189
SOE	250045	0.178	0.383	0.000	0.000	1.000
Leverage	249209	0.646	0.303	0.034	0.641	1.779
Sales growth	248197	0.407	0.742	-0.929	0.205	3.705
Age	249866	15.473	13.751	1.000	10.000	58.000
Tangibility	249209	0.332	0.200	0.006	0.303	0.879
Log(Int. Coverage)	150882	1.462	1.508	-1.735	1.160	6.229

Appendix Table A5: The Cost of Debt for Non-listed Manufacturing Firms

This table provides the regression result of the QFII effect on the average cost of debt for manufacturing firms. The dependent variable is the average cost of debt calculated as the ratio of interest expenses over total debt in a given year. Data on manufacturing firms are obtained from the Industrial Census Database. The sample contains all Chinese manufacturing firms from 2000 to 2004. We exclude the observations in 2002 and require the sample firms to have observations both before and after 2002. *Post* is a dummy variable that equals one for years 2003 and 2004 and zero otherwise. *Public* is a dummy variable which equals one if a firm is publicly listed and zero otherwise. All controls are lagged by one period. Robust standard errors are shown in parentheses. ***, **, and * indicate statistically significant at the 1%, 5%, and 10% level, respectively.

Dep. Variable:	Cost of Debt (bps)		
	(1)	(2)	(3)
Public * Post	5.47	-1.08	-1.49
	(9.30)	(7.40)	(7.37)
Public	69.70***	41.82***	
	(6.75)	(7.21)	
Post	-31.71***	-7.29***	-23.54***
	(0.83)	(0.94)	(1.00)
Log(Assets)		-0.25	36.18***
		(0.46)	(1.80)
SOE		-71.39***	-3.39
		(2.02)	(3.45)
Leverage		-135.76***	-22.87***
		(2.60)	(4.14)
Sales growth		30.11***	30.08***
		(0.72)	(0.68)
Age		-1.02***	-0.15*
		(0.05)	(0.08)
Tangibility		51.92***	11.25**
		(3.34)	(5.31)
Log(Int. Coverage)		-60.11***	-54.93***
		(0.35)	(0.57)
N	250,045	150,488	135,047
R-squared	0.007	0.253	0.595
Industry FE		Y	
Province FE		Y	
Firm FE			Y
SE cluster		Firm	Firm

Appendix Table A6: Placebo Tests on Cost of Debt for Manufacturing Firms

The dependent variable is the average cost of debt calculated as the ratio of interest expenses over total debt in a given year. Data on manufacturing firms are obtained from the Industrial Census Database. We use the end of 2004 as our fake event time. The sample contains all Chinese manufacturing firms from 2003 to 2006. *Post* is a dummy variable that equals one for years 2005 and 2006 and zero otherwise. *Public* is a dummy variable which equals one if a firm is publicly listed and zero otherwise. All controls are lagged by one period. Robust standard errors are shown in parentheses. ***, **, and * indicate statistically significant at the 1%, 5%, and 10% level, respectively.

Dep. Variable:	Cost of Debt (bps)		
	(1)	(2)	(3)
Public * Post	20.25**	9.29	11.57*
	(8.80)	(5.99)	(6.06)
Public	73.79***	30.31***	
	(6.07)	(5.76)	
Post	-3.07***	6.11***	-6.48***
	(0.83)	(0.85)	(0.88)
Log(Assets)		2.85***	37.93***
		(0.46)	(2.07)
SOE		-61.20***	6.83
		(2.31)	(4.35)
Leverage		-127.25***	7.97*
		(2.59)	(4.47)
Sales growth		42.64***	37.06***
		(1.01)	(1.05)
Age		-0.82***	-0.02
		(0.05)	(0.09)
Tangibility		45.51***	0.63
		(3.43)	(5.80)
Log(Int. Coverage)		-54.49***	-48.37***
		(0.35)	(0.57)
N	214,313	124,021	104,759
R-squared	0.002	0.286	0.648
Industry FE		Y	
Province FE		Y	
Firm FE			Y
SE cluster		Firm	Firm