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A Liberalization Spillover: From Equities to Loans

Xin Liu
College of Business and Economics, Research School of Finance, Actuarial Studies and Statistics, Australian National University
xin.liu@anu.edu.au

Shang-Jin Wei
Columbia Business School, FISF, ANU, NBER, and CEPR
shangjin.wei@columbia.edu

Yifan Zhou
Fudan University Fanhai International School of Finance
yifanzhou@fudan.edu.cn (corresponding author)

Abstract

The opening of equity markets to foreign investment by developing countries appears to generate an enormously large positive growth effect (see Bekaert, Harvey, and Lundblad (2005), *Journal of Financial Economics* 77, 3–55) in spite of a relatively small role of such markets for financing investment in most economies. We propose a 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 program, we find significant support for this channel. Furthermore, we show that a reduction in the risk premium in loans is an important mechanism.

I. 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 (2009)). 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, raises a country's subsequent economic growth by approximately 1 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 3 years preceding the liberalization. This result is surprising since funds raised from the

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[1]Bekaert and Harvey (2000), Henry (2000), Kim and Singal (2000), and Chari and Henry (2004) report evidence that stock market liberalization causes the domestic stock prices to rise and the cost of equity capital to fall.

stock market tend to be a small part of the overall funding for investment in most countries, particularly because the sample used by Bekaert et al. (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 more than 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 et al. (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 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 article, we propose and investigate a possible spillover effect from equity market liberalization to the domestic loan market. In particular, we analyze bank loan data around the time of China's first equity market opening that exposes all listed domestic stocks (known as A shares) to foreign investment (the introduction of the Qualified Foreign Institutional Investors (QFII) program). 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 article that investigates this spillover channel. Our setting has some economically important advantages 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 1-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 plays any special role in the spillover story.

The literature examining linkages between equity market liberalization and economic growth is extensive. The findings of Bekaert et al. (2005) are echoed by many other studies, including Levine and Zervos (1996), (1998), Mitton (2006), Chari and Henry (2008), Gupta and Kathy (2009), and Li (2012), using various alternative methodologies. For instance, Mitton (2006) and Gupta and Kathy (2009) confirm the investment effects of equity market liberalization using micro-level data. However, Henry (2003), (2007) argues that a pure investment channel cannot convincingly explain the magnitudes of the aggregate growth response to equity market liberalization. Bonfiglioli (2008) documents a positive effect of liberalization on productivity, but not on capital accumulation. Bekaert, Campbell, and Lundblad (2011) confirm the findings of Bonfiglioli (2008) and contend that liberalization brings about an improvement in overall institutional development, and indirect evidence of higher post-liberalization investment efficiency. Bae, Bailey, and Mao (2006) suggest that liberalization is associated with an improved information environment in emerging stock markets, as well as increases in firm-specific information. More recently, Moshirian, Tian, Zhang, and Zhang (2021) show that economies exhibit higher levels of innovation output after liberalization and that this effect is disproportionately stronger in more innovative industries. Since equity market financing is a small part of the overall financing for investment in the vast majority of developing countries and some developed countries, it remains a puzzle for why equity market liberalization can generate a very large pro-growth effect.

The spillover from equity market liberalization to the domestic loan market can provide a new complementary channel to the existing literature linking equity market liberalization to economic growth. It occurs naturally when there are no frictions on capital flows between the equity and the loan markets. As many risk factors affect the returns on both equity and fixed-income products (see, e.g., Keim and Stambaugh (1986); Fama and French (1993)), it is reasonable to deduce that any reduction in risk premium induced by an equity market liberalization will also reduce 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, especially for emerging market economies.

With many market and regulatory frictions, the loan and equity markets are at least partially segmented, especially in emerging market economies. Furthermore, banks in many developing countries are state-owned and may not work hard enough to respond to market signals, 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. As another complication, 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. Yet, we are not aware of any article in the literature that has examined the possible spillover from equity market opening to loan market reactions.

In order for an equity market liberalization to generate a spillover effect to the bank lending market, we do not need the loans to be priced by a global asset-pricing model such as a World CAPM.[2] Instead, we only need the loan prices to be affected by a permanent change in the equity price for the same underlying company. In Merton (1974), the price per unit of risk in an equity claim on a firm is identical to the price per unit of risk in a debt claim on the same firm. In such a model, if the QFII program reduces the risk premium on equity, it will also reduce the risk premium on debt.[3]

We report three sets of empirical results. First, we show that the domestic equity prices increase following the introduction of the QFII program. Importantly,

[2]The World CAPM refers to the scenario in which the benchmark portfolio is the world market portfolio. We find that firms' reductions in loan costs are positively associated with CAPM-predicted reductions in equity costs. Details are discussed in Sections II and III.

[3]The reduction is not necessarily one for one, as we will explain later.

there is interesting cross-firm heterogeneity: Those firms that are predicted by asset-pricing models to have a greater decline in equity risk premia indeed exhibit a greater increase in their equity prices. Note that, for the presence of foreign institutional investors to have a strong price effect, their actual dollar amount of trading is not crucial. Equity price changes can take place even without a large quantity of investment by foreign investors, as long as "domestic smart money" (domestic mutual funds, pension funds, and hedge funds) anticipates that foreign investors will use a different asset-pricing model to identify possible "mispricing" and compete to take advantage of the "mispricing."[4] Second, we document the existence of a spillover from equity price changes to loan price changes. In particular, those firms with a greater model-predicted decline in equity risk premia also exhibit a larger reduction in their costs of loans. This suggests that the segmentation forces are not strong enough to prevent a correlated assessment of the risk premia in the loan and equity markets. Third, 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 risk premia.

One limitation of the empirical analysis is a relatively small number of firms for which we can obtain individual loan information both before and after the introduction of the QFII program. This problem reduces the power of the statistical tests, making it harder for us to find a spillover effect. In other words, if we fail to find a statistically significant spillover effect, one reason could be the low power caused by the limited sample size. On the other hand, if we still find a significant spillover effect (i.e., rejecting the null of a zero effect), the inference would be valid. To further substantiate our conclusion, we also examine a larger sample of firms that includes nonlisted firms. While the measure of interest rate is noisier, our evidence nonetheless shows that the loan costs for nonlisted firms have also declined after the introduction of the QFII program. (From a lender's viewpoint, loans to listed and nonlisted firms are imperfect substitutes. A change in the interested rate on a loan to one firm should be linked to a change in the interest rate on another firm.)

We make several contributions to the literature. First, we provide the first formal evidence on the spillover effect, and it partially explains the puzzle of a large estimated effect of equity market opening on economic growth as documented in the literature. As bank loans are substantially more important than equity financing for most countries, a significant spillover effect would make it less surprising to observe a large pro-growth effect of equity market liberalization. Second, we show that a reduction in risk premium is likely to be a key channel for the spillover effect. Across firms, those with a bigger reduction in equity risk premium also experience a greater reduction in loan costs. Third, we document real effects of the reform. In particular, a reduction in risk premium as predicted by the asset-pricing model is positively associated with increases in investments, hiring, and improvements in financial performance.

[4]In Appendix A6 of the Supplementary Material, we provide some evidence that domestic smart money front runs QFII investors and makes investments in firms in a manner consistent with predictions of the difference in covariances (DIFCOV) framework (discussed in Section II.C).

The remainder of the article is organized as follows: In Section II, we provide some institutional background on the QFII program and explain our data sources. We also show evidence that the QFII program has induced a repricing of the equities in a way that is consistent with the asset-pricing models. In Section III, we provide evidence that the QFII program has produced a reduction in the costs of loans to publicly listed firms and highlight the importance of the risk premium channel for the spillover effect. In Section IV, we investigate the real effects of the spillover in terms of firm investment and hiring. In Section V, we document a general decline in loan costs for China-listed firms as compared with the loans to firms operating in China but listed outside the country. Finally, in Section VI, we offer concluding remarks.

II. Background and Data

A. 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.[5]

The QFII program, launched in 2002, 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 U.S. dollars and remitted abroad. The QFII program was first announced by Zhou Xiaochuan, the then head of the China Securities Regulatory Commission, on June 10, 2002, and application procedures were published shortly afterward. 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, and JPMorgan 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).

[5]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 Nov. 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), Deng, Liu, and Wei (2018), and Ma, Rogers, and Zhou (2021)), among others.

We focus on the QFII program as it marks the first occasion when China opened its entire domestic A-share market to foreign investors. It is followed by several other equity market liberalization policies, such as the Qualified Domestic Institutional Investor program (introduced in 2007 to allow domestic institutional investor to invest in some foreign assets), the RMB Qualified Foreign Institutional Investors program (introduced in 2011 to allow subsidiaries of Chinese fund management firms registered in Hong Kong to directly invest in mainland China's capital market), and the Shanghai- and Shenzhen-Hong Kong Stock Connect programs (respectively introduced in 2014 and 2016 to allow investors in each market to trade shares on the other market using their local brokers and clearing houses), implemented by the Chinese government.

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 Apr. 2019, 214 international institutional investors had obtained a QFII license. In Sept. 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.

B. Data

The loan data are 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 the data, we have to adopt a relatively long sample period in order to ensure enough observations both before and after the QFII reform. We conduct robustness checks to ensure that our conclusions are not driven by compounding factors during the long sample period.

All RMB-denominated loans from a domestic lender that 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), Houston, Jiang, Lin, and Ma (2014), and Lim, Minton, and Weisbach (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 cancelation 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 more 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), although the AISD contributes 92% of the TCB for term loans, it only contributes 53% 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 1 for term loans). The true cost of a loan depends on the total fees when there is a drawdown, total fees when there is a partial drawdown, the probability of a drawdown, and upfront and cancelation fees. More precisely, the TCB for a loan is calculated as

$$\begin{aligned}(1)\quad \text{TCB} = {} & \text{UpfrontFee}/\text{Expected Maturity (Years)} + \text{PDD} \times (\text{FacilityFee} + \text{Spread}) \\ & + (1 - \text{PDD}) \times (\text{FacilityFee} + \text{CommitmentFee}) \\ & + \text{PDD} \times \Pr(\text{Utilization} > \text{Utilization Threshold}) \times \text{UtilizationFee} \\ & + \Pr(\text{Cancelation}) \times \text{CancelationFee},\end{aligned}$$

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).[6] 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 cancelation fee that is payable if the loan facility is canceled by the borrower. The probabilities of drawdown, utilization, and cancelation are estimated as per the methodology of Berg et al. (2016).[7] 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.

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,[8] the MSCI World index as a proxy for global equity market, the Chinese 1-year treasury bill rate as a proxy for the Chinese risk-free rate, and the U.S. 1-year treasury bill rate as a proxy for the world risk-free rate.[9]

[6]Facility fee is payable on *entire* committed loan amount regardless of usage. Commitment fee is payable on the *unused* portion of the loan amount.

[7]Additional details of the TCB measure can be found in Section III and the Appendix of Berg et al. (2016).

[8]We acknowledge Roll's (1977) critique that the true market portfolio is unobservable. Our choice of using the equity market as a proxy follows the common practice in the literature (e.g., Fama and French (1993); Hou, Xue, and Lu (2015); Liu, Stambaugh, and Yuan (2019)).

[9]We cannot use monthly rates as a proxy for the risk-free rates as China does not have 1-month treasury securities. Using the U.S. 1-month Treasury note as a proxy for the world risk-free rate does not materially impact our findings.

TABLE 1
Summary Statistics

Table 1 reports the descriptive statistics of 79 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	Std. Dev.	25th Percentile	Median	75th Percentile
ΔAISD	79	−36.72	56.11	−75.00	−34.00	4.00
AISD_PRE_QFII	79	243.61	60.61	199.01	241.75	291.21
AISD_POST_QFII	79	206.89	50.32	182.49	208.71	227.85
ΔTCB	79	−34.95	50.96	−72.00	−38.00	3.00
TCB_PRE_QFII	79	218.61	52.47	179.00	217.00	262.00
TCB_POST_QFII	79	183.65	38.89	171.92	184.00	203.00
DIFCOV	79	2.72	0.43	2.41	2.69	3.05
Δ*E*(*r*)	79	5.06	1.07	4.29	4.98	5.90
M/B	79	4.09	3.33	2.49	3.14	4.42
PROFITABILITY	79	0.03	0.08	0.00	0.00	0.02
ASSETS (RMB billion)	79	21.60	22.09	9.03	13.81	26.30
INTEREST_COVERAGE	79	7.07	36.18	1.00	1.00	3.43
P/E	79	95.92	187.54	27.34	42.98	82.21
LEVERAGE	79	0.44	0.17	0.33	0.42	0.55
SD_OF_PROFITABILITY	79	0.09	0.38	0.00	0.02	0.07
ALTMAN_Z_SCORE	79	4.77	3.22	2.70	3.95	6.39

C. Liberalization and Equity Prices

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 CAPM is the right model for thinking about firm-level risk premium, then in financial autarky, we have

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

where $E\left[\tilde{R}_i\right]$ 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 $E\left[\tilde{R}_M\right]$ is the expected return of the domestic market portfolio. We can rewrite equation (2) as

$$(3) \qquad E\left[\tilde{R}_i\right] = r_f + \beta_{iM}\gamma\sigma_M^2,$$

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

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

where $E\left[\tilde{R}_i^*\right]$ 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

$$(5) \qquad E\left[\tilde{R}_i^*\right] = r_f^* + \beta_{iW}\gamma\sigma_W^2,$$

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

$$(6) \qquad \Delta E\left[\tilde{R}_i\right] = E\left[\tilde{R}_i\right] - E\left[\tilde{R}_i^*\right] = \left(r_f - r_f^*\right) + \gamma\text{DIFCOV},$$

where $\text{DIFCOV} = \text{cov}\left(\tilde{R}_i, \tilde{R}_M\right) - \text{cov}\left(\tilde{R}_i, \tilde{R}_W\right)$. 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 heterogeneous 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. In that 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.

Note that the CAPM may not be the best model for describing firm-level risk premium (as it may ignore other risk factors). In addition, a value-weighted portfolio of all listed stocks in the data may not be the best representation of the market portfolio in theory (as it ignores nonlisted stocks in the asset universe). Nonetheless, the results in Chari and Henry (2004) suggest that the CAPM, and especially DIFCOV in equation (6) that is derived from the CAPM under some assumptions, provides a useful and empirically verifiable prediction for how equity prices would change following financial opening. The predicted changes are firm-specific, statistically different from 0, and economically plausible and meaningful.

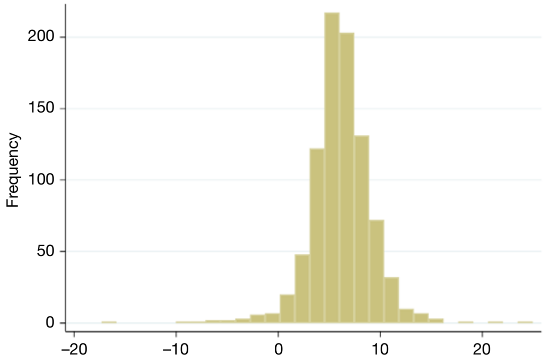
A few additional comments are in order here. First, the interest rates inside and outside China before the QFII program's introduction were similar (both were slightly below 4%, with the Chinese rate marginally lower). Thus, the QFII reform is not expected to lead to much change in the risk-free rate. Second, Chari and Henry (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. In fact, 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 et al. (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

FIGURE 1

ΔE(r) Distribution of All A-Share Firms

Figure 1 shows the $\Delta E(r)$ distribution of all China-listed (A-share) firms prior to the announcement of the QFII program. $\Delta E(r)$ is the CAPM-implied change in equity risk premium due to market liberalization and is calculated following equation (6).



up to June 2002 (when the QFII program was announced). We then calculate the annualized DIFCOV and follow equation (6) to compute the annualized changes in expected return $\Delta E[r]$.[10] Figure 1 plots $\Delta E[r]$ for all China-listed (A-share) firms estimated immediately before June 2002. It is approximately normally distributed with a mean value of 6.16 percentage points. 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, DIFCOV and $\Delta E[r]$ 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:

$$\text{AR}_i = b_0 + b_1 \Delta E[r_i] + \delta' \mathbf{X}_i + \varepsilon_i, \quad (7)$$

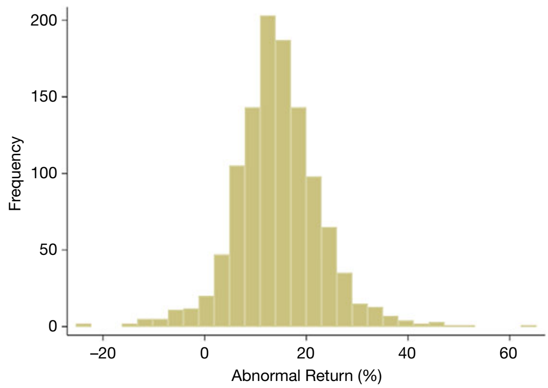
where AR_i is the abnormal return in percentage points of firm i, over the event window [end May, end June] of 2002. We calculate the abnormal return as the raw return over the event window minus the average return over the 12 months leading to the QFII announcement. This specification and variable construction follow the example of Chari and Henry (2004). $\mathbf{X}_i$ is a set of controls including: market capitalization averaged over the past 12 months (in logarithm); the average monthly turnover over the past 12 months; a dummy that equals 1 for firms listed on the Shanghai Stock Exchange (as opposed to the Shenzhen Stock Exchange) and 0 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 12 quarters; Altman Z-score (Altman (1968)); and interest coverage ratio (in logarithm).

[10]Note that DIFCOV and $\Delta E(r)$ contain the same information. We adopt the $\Delta E(r)$ representation for easier interpretation of regression coefficients.

FIGURE 2

Abnormal Return Distribution of All A-Share Firms

Figure 2 shows the abnormal return distribution of all China-listed (A-share) 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.



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 follows approximately a normal distribution. On average, the Chinese firms experience an increase in monthly returns by 14 percentage points (statistically different from 0 based on a bootstrapped t-test, with p-value < 0.001) in the month of the QFII announcement. In other words, the QFII event is associated with an increase in equity price by an amount more than what one would expect from the experience of the recent past.

We use the CAPM as a guide and exploit 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? Panel A of Table 2 reports the regression results. The coefficient of $\Delta E(r)$ is positive and significant across 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 25th to the 75th percentile of the annualized $\Delta E(r)$ distribution would see an increase in the stock price of approximately 150 bps (= $3.12 \times 0.48 \times 100$). In column 4, we exclude the firms in the financial and utility sectors from the sample and find quantitatively similar results.

It is possible that other firm characteristics also matter for the size of equity price change around the time of the QFII introduction. In particular, state-owned firms may enjoy an increase in stock prices if there was a concurrent (but unobserved) government program favoring them; exporting firms or firms that rely on imported inputs may benefit from China's accession to the WTO at the end of 2001; and firms in government-designated "high-tech" industries may enjoy an improvement in their financial performance due to government's pro-innovation subsidy programs. In addition, those firms that are cross-listed outside mainland China could be different from those only listed on a Mainland Chinese stock exchange, as foreign investors could invest in these firms even before the QFII introduction.

TABLE 2

Equity Price Reactions to the QFII Program Announcement

Our sample in Table 2 contains all the Chinese A shares at the time of the QFII announcement in 2002. Event window is [end May, end June] of 2002. The dependent variable is abnormal return in percentage points for the event window, and the independent variable is $\Delta E(r)$, the expected change in equity price from equity market liberalization. In Panels A–E, the dependent variable is calculated as the raw return over the event window minus the average return over the 12 months leading to the QFII announcement. As a robustness test, in Panel F, the dependent variable is calculated as the market-model cumulative abnormal return (CAR) over the event window, using the world portfolio as a proxy for the market portfolio. World market beta is estimated with daily returns from Feb. to Apr. 2002. In Panels B–E, we interact a set of firm characteristics variables, including dummies indicating SOE, import- and export-intensive (MI and XI), high-tech firms, and cross-listing in mainland China and overseas (mainly in Hong Kong as H share), respectively, with $\Delta E(r)$. Column 4 of each panel excludes utility and financial firms. Robust standard errors are shown in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

	Dependent Variable: Abnormal Return (%)			
	1	2	3	4
Panel A. Past 12 Months Adjusted				
$\Delta E(r)$	0.26***	0.48***	0.48***	0.47***
	(0.09)	(0.10)	(0.10)	(0.10)
log(MARKET_CAP)		4.16***	3.21***	3.32***
		(0.53)	(0.55)	(0.54)
TURNOVER		−8.73***	−8.72**	−7.54**
		(3.30)	(3.86)	(3.77)
SSE		−1.60***	−1.28**	−1.25**
		(0.57)	(0.59)	(0.59)
PROFITABILITY			1.04	0.75
			(1.22)	(1.19)
M/B			−0.01*	−0.01*
			(0.01)	(0.01)
log(INT_COVERAGE)			−0.27	−0.22
			(0.22)	(0.23)
P/E			−0.07**	−0.08**
			(0.03)	(0.03)
LEVERAGE			−1.5	−1.05
			(2.25)	(2.25)
SD_OF_PROFITABILITY			−1.00***	−0.98***
			(0.15)	(0.14)
ALTMAN_Z_SCORE			−0.10	−0.09
			(0.07)	(0.07)
R^2	0.01	0.09	0.10	0.10
Panel B. SOE				
$\Delta E(r)$	0.31**	0.52***	0.54***	0.54***
	(0.19)	(0.15)	(0.16)	(0.17)
$\Delta E(r) \times$ SOE	−0.01	−0.03	−0.05	−0.05
	(0.18)	(0.19)	(0.20)	(0.21)
R^2	0.02	0.10	0.11	0.11
Panel C. Trade Intensive				
$\Delta E(r)$	0.20	0.36**	0.33*	0.33*
	(0.18)	(0.18)	(0.19)	(0.19)
$\Delta E(r) \times$ MI	0.07	0.08	0.12	0.12
	(0.22)	(0.23)	(0.23)	(0.23)
$\Delta E(r) \times$ XI	0.001	0.08	0.15	0.15
	(0.23)	(0.24)	(0.24)	(0.24)
R^2	0.01	0.09	0.10	0.10
Panel D. High-Tech				
$\Delta E(r)$	0.30***	0.55***	0.53***	0.53***
	(0.11)	(0.12)	(0.12)	(0.12)
$\Delta E(r) \times$ HIGH_TECH	−0.12	−0.21	−0.18	−0.17
	(0.19)	(0.19)	(0.21)	(0.21)
R^2	0.01	0.09	0.10	0.10

(continued on next page)

TABLE 2 (continued)

Equity Price Reactions to the QFII Program Announcement

Panel E. Cross-Listed				
Δ*E*(*r*)	0.29***	0.50***	0.48***	0.48***
	(0.09)	(0.10)	(0.10)	(0.10)
Δ*E*(*r*) × CROSS_LISTED	−1.19**	−0.85*	−0.71	−0.72
	(0.60)	(0.47)	(1.08)	(1.07)
R^2	0.01	0.09	0.10	0.10
Panel F. CAR				
Δ*E*(*r*)	0.15*	0.38***	0.39***	0.39***
	(0.08)	(0.09)	(0.09)	(0.09)
R^2	0.002	0.10	0.10	0.10
No. of obs.	891	891	746	725
Firm controls		Yes	Yes	Yes

We investigate these possibilities by creating an indicator variable for each of these types of firms.[11]

We modify equation (7) by interacting $\Delta E(r)$ with four sets of indicator variables that capture variations in firm characteristics: i) whether a firm is a state-owned enterprise (SOE) (indicated by the SOE dummy); ii) whether a firm is in trade-intensive industries (indicated by MI (import) and XI (export) dummies), iii) whether a firm is in high-tech industries (indicated by the HIGH_TECH dummy), and iv) whether a firm listed in both mainland China and overseas (indicated by the CROSS_LIST dummy). Panels B–E of Table 2 provide the results. Coefficients of aforementioned interaction terms are almost always not significant at the 10% level, suggesting that these characteristics are not the dominant force driving the equity price adjustment following the introduction of the QFII program.

As a robustness check, we construct a second measure of the abnormal return adjust for the world market risk exposure. We estimate firm *i*'s world market beta using daily return from Feb. 1 to Apr. 30, 2002. Then we calculate the risk-adjusted abnormal return (CAR) over the same event window. The results are presented in Panel F of Table 2. The results are quantitatively similar to Panel A, and the economic magnitude (column 3) is approximately 122 bps (= $3.12 \times 0.39 \times 100$), which is slightly smaller than that under our baseline abnormal return measure.[12]

The results above are consistent with the finding of Chari and Henry (2004) that equity market liberalization leads to a repricing of equities. Importantly, the prices increase more for those firms for which DIFCOV (and thus $\Delta E(r)$) predicts a greater reduction in risk premia.

[11]We revisit these firm characteristics, in conjunction with loan pricing, in Section III.C. Cross-listed firms are not examined in Section III.C as our subsample in that section, where we require at least one loan observation both prior to and after the introduction of the QFII program, contains no cross-listed firms.

[12]To avoid a potential overlap in the estimation window of DIFCOV and world market beta, in the specification with the second measure of abnormal return, we reconstruct DIFCOV by using monthly returns in the [−36, −5] months leading to the QFII announcement in June 2002, before calculating the corresponding $\Delta E(r)$. The results are qualitatively similar when using this alternative measure of $\Delta E(r)$.

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III. Spillover from Equity Market Opening to Lower Loan Costs

A. 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. In a frictionless world, Merton's (1974) contingent claim framework suggests a connection between the risk premia on debt and equity. If the price per unit of risk is reduced on the equity claim, then the price per unit of risk on the debt claim should decline as well. More precisely, Campello, Chen, and Zhang (2008) formulate the key insight of Merton (1974) in discrete time and show that the debt risk premium, $E\left[\tilde{R}^D\right]$, can be expressed as a linear function of the equity risk premium:

$$E\left[\tilde{R}_i^D\right] - r_f = h_i\left(E\left[\tilde{R}_i\right] - r_f\right), \tag{8}$$

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, there would be a spillover to the loan market in the form of a lower cost of bank loans.[13]

As we have stressed, market frictions could prevent the contingent claim framework from working perfectly. 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. However, segmentation between the two markets biases against us finding significant results.

It is important to note 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 rates on bank loans have been progressively liberalized since the 1990s.[14] In 2004, the year after the QFII program was implemented, the range was between 90% and 170% of the benchmark rate.[15] For example, if the benchmark rate is 8%, the feasible interest rates could be anywhere between 7.2% and 13.6%. A bank can charge any interest rate within the range, depending on its judgment of the riskiness of the loan and the competition from other lenders. If the perceived risk declines, presumably the lending interest rate will also be adjusted downward.

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? There are more than 100 banks in

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[13] 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 (2014) show that the hedge ratio can also be expressed as the ratio of the volatility of the equity to that of the debt.

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

[15] 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.

the country, with the top four banks accounting for approximately 80% of the total deposit and 70% of the total lending in 2003.[16] This quasi-oligopolistic structure suggests the existence of rent and a positive markup. Most banks indeed report a high profit margin. In other words, there is room for an interest rate reduction if a changing circumstance calls for it. For example, competition from other banks may compel a bank to adjust its interest rates on loans if something causes the assessed risk premium on a borrower to go down. The presence of foreign banks including those holding a QFII license adds additional pressure on banks to respond to changes in a borrowing firm's risk characteristics. Consistent with such conjecture, the average profit margin of the 3 listed banks dropped from 27% in 2000 to 15% in 2004.[17]

Recall that the Merton (1974) model implies a tight relationship between the expected equity return on a firm and the cost of loans to the same firm. This establishes a no-friction benchmark. However, various frictions between the loan and equity markets could prevent the prediction of the Merton model from holding strictly. Nonetheless, we discuss a number of other channels through which a change in the equity price can induce a change in the cost of bank loans. Importantly, we will let the data to speak for themselves as to whether a spillover effect is empirically relevant and how strong it actually is. It is worth noting that any segregation between the equity and loan markets works against us, discovering a spillover effect.

If the Merton model does not hold strictly, three other forces could also produce a spillover from a repricing of an equity of a firm to a repricing of a loan to the same firm. First, major shareholders of publicly listed nonstate-owned firms often obtain loans from banks by pledging their equity shares in the listed company as a collateral.[18] These so-called stock-pledge loans started in 2000 and are especially popular both when equity prices are high and when firms face financial constraints.[19] Some of the stock-pledge loans are relent 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 relent them to the company free of interest.[20] This case is not exceptional. According to the evidence in Gao (2018), stock-pledge loans act as a substitute for direct borrowing from banks for many listed companies. 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 face from the banks may go

[16] China Financial Yearbook, 2003.

[17] In 2000, Shenzhen Development Bank, Shanghai Pudong Development Bank, and China Minsheng Banking Corporation were the only publicly listed banks.

[18] In stock-pledged loan, banks typical lend at a steep discount to the pledged shares value (loans are 30%–50% of market value). In addition, there often has a pre-set liquidation line of the share price and banks liquidate these shares in case of stock price crashes to prevent themselves from any loss.

[19] For example, when the Shanghai Composite Index rose 60% in the first 6 months of 2015, the volume of stock-pledge loans increased by 88%, according to data from Wind. As these loan amounts are a function of market value of stocks, higher stock prices allow for larger loans. Li, Qian, Wang, and Zhu (2020) find that large shareholders also turn to stock-pledge loans to relax financial constraints.

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

down. To see this, imagine a firm with a high value $\Delta E[r]$ (i.e., a large reduction in risk premium after equity market opening). From Table 2, we already know that a high value of $\Delta E[r]$ leads to a greater increase in the stock price after the QFII's introduction. The higher stock price raises the value of the collateral in a stock pledge loan and allows the firm's major shareholders to borrow more from banks. As such money is relent 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 et al. (2014), and Infante and Piazza (2014)).[21]

Second, Chinese firms, just like their U.S. counterparts, tend to time their seasonal stock offering to take advantage of stock price appreciations, in spite of the added frictions they face in the regulatory approval process (Huang, Uchida, and Zha (2016), Liu, Akbar, Ali Shah, Zhang, and Pang (2016)). When the QFII opening leads to an increase in a company's stock price, then the company's bargaining power vis-à-vis banks also increases. As borrowing from a bank and issuing seasonal stock offering are substitutes from the viewpoint of the firm, firms should be able to persuade the bank to lower the cost of loans after an increase in its stock price. In addition, when the stock price of a firm rises, it is further away from bankruptcy. This may also induce the lender to reduce the risk premium charged on a loan.

Third, 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. This provides a connection between how the risk of a borrowing firm is viewed by such a bank and the firm's equity price. Although the regulations introduced in 1993–1995[22] 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

[21]When a main shareholder makes a loan to the company, that loan can in principle be either more or less senior than other debt, depending on how the loan contract is written. In practice, however, if the main shareholder wishes to help the company in its negotiation with banks, it makes to make his loan subordinated to bank loans. In addition, in the event of bankruptcy, the court often assigns a lower level of senior to the debt owed to main shareholders than to bank loans if the main shareholders are somewhat responsible for the demise of the firm. This happens in the case of Guohua Properties liquidation (when the company's debt to its main shareholder Chen Zhongli was assigned a lower priority) and the case of Sichuan Changhong Electronics (when its debt to its main shareholder Huaxia Securities was also assigned a lower priority). This is similar to the "equitable subordination doctrine" in the U.S. bankruptcy code.

[22]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.

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.[23] 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 the stock market will not be alien to these commercial banks, and may affect their assessment of the borrowers' riskiness in their loan decisions. In other words, information about a change in the equity market valuation of a borrowing firm could lead to a reassessment of the riskiness of the borrower by the loan department.

In sum, the risk premia in loans and equity prices can be connected in a number of ways without a strict version of the Merton model. Ultimately, we will let the data speak for themselves as to whether the QFII program has generated any spillover effect to the cost of bank loans. We will not seek to tease out the relative importance of the channels discussed above. We note further that the three channels are not mutually exclusive.

Before we examine the effects of the QFII program, let us first investigate if a firm's ability to borrow is in general linked to its stock price. This exercise is not tied to the QFII introduction per se. We measure a firm's ability to borrow in several different ways, including change in debt from $t-1$ to t scaled by the asset value in $t-1$, and change in log debt from $t-1$ to t. We relate these measures of ability to borrow to an increase in the firm's Tobin's Q. The results are reported in Appendix A1 of the Supplementary Material. In all cases, the results are consistent with the interpretation that a firm's ability to borrow increases as its stock price increases. However, as stock prices are forward looking, it is difficult to ascertain the direction of causality in these regressions. Therefore, such evidence should be considered as suggestive only.

B. Reduction in Risk Premium as a Channel for the Spillover

To see if the QFII program has led to a reduction in the required risk premium on bank loans, 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, $\Delta E\left[\tilde{R}^D\right]$, when moving from financial autarky to openness, as

[23]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, Feb. 2005, available at http://www.csrc.gov.cn/pub/newsite/flb/flfg/bmgf/jj/gszl/201012/t20101231_189590.html.

$$(9) \qquad \Delta E\left[\tilde{R}_i^D\right] = \left[h_i\left(E\left[\tilde{R}_i\right] - r_f\right) + r_f\right] - \left[h_i\left(E\left[\tilde{R}_i\right] - r_f^*\right) + r_f^*\right]$$
$$= \left(r_f - r_f^*\right) + h_i\left[\left(\Delta E\left[\tilde{R}_i\right]\right) - \left(r_f - r_f^*\right)\right].$$

From equation (6), we know that $\Delta E\left[\tilde{R}_i\right] = \left(r_f - r_f^*\right) + \gamma\text{DIFCOV}$. Therefore, equation (9) can be expressed as[24]

$$(10) \qquad \Delta E\left[\tilde{R}_i^D\right] = \left(r_f - r_f^*\right) + \gamma h_i \text{DIFCOV}_i.$$

As we have noted earlier, as the Chinese short-term government bond rate was similar to the U.S. Treasury rate before the QFII introduction, we expect the first term, $r_f - r_f^*$, to be close to 0. In what follows, we will assume that the hedge ratio is the same for all firms. In Appendix A3 of the Supplementary Material, we will investigate how much additional explanatory power can be gained by allowing the hedge ratio to vary by firm. We will first report simple cross-sectional regressions of the following form:

$$(11) \qquad \Delta S_i = b_0 + b_1 \Delta E(r_i) + \delta' \mathbf{X}_i + \varepsilon_i,$$

where ΔS_i is the change in AISD or TCB for firm i from the last loan in the pre-QFII period to the first loan in the post-QFII period.[25] $\mathbf{X}_i$ is a vector of firm characteristics, including total assets (in logarithm), 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. $\Delta E(r)$ is the predicted change in expected equity return calculated from equation (6) and contains the same information as DIFCOV. We replace DIFCOV in equation (10) with the model-predicted change in equity risk premium to allow for a more straightforward interpretation of the coefficient. The intercept b_0 captures the difference in risk-free rates before and after market liberalization (i.e., $r_f - r_f^*$), whereas the slope coefficient b_1 equals the hedge ratio (h). As a larger value of $\Delta E(r)$ represents greater reduction in the required equity risk premium, and since the hedge ratio is positive and smaller than 1, we would expect b_1 to be negative, and between -1 and 0 (or -100 and 0 in our case, as our dependent variable is in bps and $\Delta E(r_i)$ is in percentage points), if our hypothesis is true.

Before we perform any regression analyses, we first check our sample's representativeness. Figure 3 plots the distribution of $\Delta E(r)$ for a subsample of the China-listed firms that appear in our loan data set both prior to and after the announcement of the QFII program. The basic patterns are similar to those in Figure 1: $\Delta E(r)$ has a positive value, and there is a dispersion across the firms.

[24]In deriving equation (10), 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.

[25]Our results remain largely unchanged if we instead measure the change in loan costs by the difference between a value-weighted average of all loans in the pre- and the post-QFII periods.

FIGURE 3

ΔE(r) Distribution of A-Share Firms with Loan Data

Figure 3 shows the $\Delta E(r)$ distribution of China-listed firms with loan data in both pre- and post-QFII periods. $\Delta E(r)$ is the CAPM-implied change in equity risk premium due to market liberalization and is calculated following equation (6).

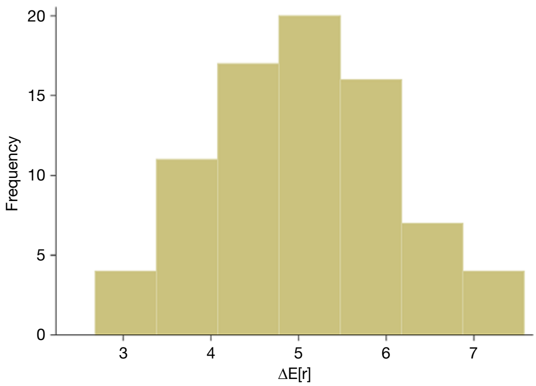

FIGURE 4

Changes in Loan Cost Versus Changes in Equity Return (CAPM)

Figure 4 shows changes in mean AISD (Graph A) and TCB (Graph B) against difference in individual stocks' theoretical difference in stock return, under the CAPM, following the announcement of the QFII program. The top (bottom) panel of each graph includes term loans (all loans).

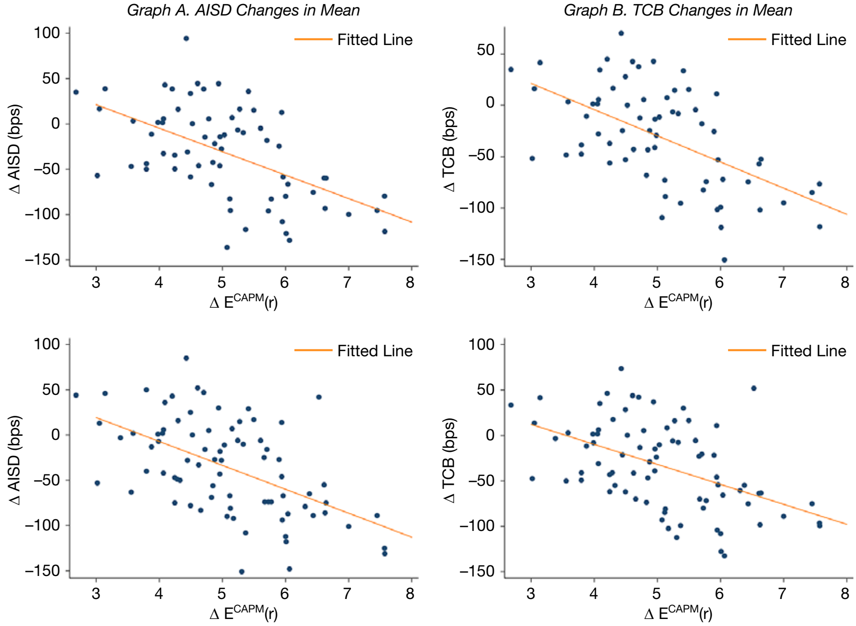

TABLE 3

Changes in Risk Premia and Changes in Loan Costs

Dependent variables in Table 3 are changes in AISD (columns 1–3) and TCB (columns 4–6) between the two loans closest to the QFII program's announcement (one pre- and one post-QFII). Change in expected return ($\Delta E(r)$) is based on the CAPM and calculated from equation (6). 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 statistical significance at the 1%, 5%, and 10% levels, respectively.

	Dependent Variable					
	ΔAISD			ΔTCB		
	1	2	3	4	5	6
Δ*E*(*r*)	−27.60*** (3.98)	−27.66*** (4.94)	−27.07*** (5.36)	−23.43*** (3.70)	−22.94*** (4.73)	−22.02*** (5.33)
M/B		−0.26 (2.03)	−0.25 (2.00)		−0.45 (1.73)	−0.43 (1.74)
PROFITABILITY		−91.62 (89.68)	−83.4 (92.03)		−60.62 (82.59)	−47.83 (84.10)
log(ASSETS)		5.58 (10.10)	4.24 (9.64)		5.19 (9.32)	3.09 (8.49)
log(INT_COVERAGE)		10.45** (5.10)	12.28** (5.18)		8.58* (4.85)	11.42** (4.43)
P/E		−0.03** (0.01)	−0.02* (0.01)		−0.03* (0.02)	−0.02 (0.01)
LEVERAGE		−17.00 (79.99)	−11.86 (80.84)		4.17 (58.39)	12.16 (57.98)
SD_OF_PROFITABILITY		−1.15 (6.85)	−1.76 (6.84)		0.91 (5.50)	−0.04 (5.41)
ALTMAN_Z_SCORE		0.47 (3.41)	0.01 (3.33)		1.80 (2.18)	1.08 (2.05)
PRE_TREND			0.21 (0.18)			0.33* (0.19)
No. of obs.	79	79	79	79	79	79
R^2	0.28	0.35	0.36	0.24	0.30	0.33

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.

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 1–3, we find that a larger $\Delta E(r)$ (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 4–6, we obtain similar results with TCB as the measure of loan cost. Using the estimates in column 6, a 1 percentage point increase in $\Delta E(r)$, the CAPM-implied change in equity risk premium, leads to a reduction in the TCB by an average of 22 bps. Since our sample has a mean $\Delta E(r)$

of 5.06, this translates to a decline in the TCB of 111 bps for such a firm.[26] As a robustness check, we shorten our sample period to be between 1999 and 2007 at a cost of losing 21 firms from our sample. We find that our results remain similar (see Table A9 in the Supplementary Material).

We note that the average decrease in 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 columns 4–6 of Table 3, where we find the sensitivity to be between 0.22 and 0.23.

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 than when only the equity cost changes. For listed firms, the average leverage ratio is 44%. For nonlisted firms (in the manufacturing sector; see Table A5 in the Supplementary Material), 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 hard 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 Table A4 in the Supplementary Material. 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.

C. Lender Types, Borrower Types, Trade Intensity, and Policy Environment

Some of the Chinese banks were already 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. To check if this is an important channel for the spillover effect, we modify equation (11) by including an interaction term:

$$\Delta S_i = b_0 + b_1 \Delta E\left[\tilde{R}_i\right] + b_2' \Delta E\left[\tilde{R}_i\right] \times L + b_3' L + \delta' \mathbf{X}_i + \varepsilon_i, \tag{12}$$

where L is a set of dummies, including DLL (standing for "domestic listed lender"; an indicator variable that equals 1 if at least one of the borrower's loans involves a domestic listed bank as a lead lender).

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 signals as much as private sector banks may, loans with a state-

[26]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.

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 BIG4 be another indicator variable that equals 1 if at least one of the borrower's loans involves one of China's "big-4" state-owned commercial banks as a lead lender.[27] 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 A of Table 4. The coefficients of the interaction terms are always insignificant, suggesting that lender ownership, whether it be domestic listed lenders or one of the "big-4" state-owned banks, does not influence changes in loan costs following the announcement of the QFII program. At the same time, the coefficient of $\Delta E(r)$ is negative and statistically significant in all 6 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 nonstate-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 1 if the borrowing firm is an SOE, and 0 otherwise. The results presented in Panel B 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 Dec. 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 (although it could also go in the opposite direction). At the same time, the WTO membership also obligated China to slash tariffs and nontariff barriers across a large number of imported products. This means that those Chinese firms that use imported inputs intensively should have experienced a more favorable 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 1 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 0 otherwise. We create another dummy, MI, that takes the value of 1 if a firm belongs to a sector whose total imports as a

[27]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.

TABLE 4

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

Dependent variables in Table 4 are changes in AISD (columns 1–3) and TCB (columns 4–6) between the two loans closest to the QFII program's announcement (one pre- and one post-QFII). Change in expected return ($\Delta E(r)$) is based on the CAPM and calculated from equation (6). Panel A examines the impact of lender ownership. DLL and BIG4 are dummy variables that indicate domestic listed lender and big-4 Chinese state-owned banks, respectively. Panel B examines the impact of SOE borrowers. SOE is a dummy variable 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 dummy variables that indicate import- and export-intensive firms, respectively. Panel D examines the impact of borrowers in high-tech industries. HIGH_TECH is a dummy variable that indicates firms in high-tech industries as classified according to the *High-Tech Industry (Manufacturing) Classification (2017)* and the *High-Tech Industry (Services) Classification (2018).* 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 statistical significance at the 1%, 5%, and 10% levels, respectively.

	Dependent Variable					
	ΔAISD			ΔTCB		
	1	2	3	4	5	6
Panel A. Lender Ownership						
$\Delta E(r)$	−29.16***	−27.14***	−25.91***	−22.40***	−19.97***	−18.12*
	(5.53)	(6.16)	(7.82)	(5.84)	(7.15)	(9.39)
$\Delta E(r)$ × DLL	8.14	7.42	7.26	2.47	2.88	2.64
	(9.47)	(8.63)	(9.39)	(7.48)	(7.33)	(8.53)
$\Delta E(r)$ × BIG4	−5.34	−7.19	−8.09	−5.65	−8.05	−9.40
	(6.54)	(7.42)	(8.52)	(5.99)	(6.76)	(8.42)
No. of obs.	79	79	79	79	79	79
R^2	0.31	0.38	0.39	0.27	0.33	0.37
Panel B. SOE						
$\Delta E(r)$	−26.96***	−26.14***	−25.81***	−22.89***	−21.64***	−21.11***
	(1.89)	(3.63)	(3.78)	(1.79)	(3.51)	(3.67)
$\Delta E(r)$ × SOE	−2.18	−5.80	−4.94	−2.26	−5.31	−3.93
	(15.73)	(14.46)	(15.22)	(13.29)	(12.27)	(13.60)
No. of obs.	79	79	79	79	79	79
R^2	0.28	0.35	0.37	0.24	0.31	0.34
Panel C. Trade Intensive						
$\Delta E(r)$	−32.71***	−33.04***	−31.81***	−28.94***	−28.20***	−26.56***
	(5.03)	(6.56)	(6.97)	(5.06)	(6.87)	(7.53)
$\Delta E(r)$ × MI	22.08**	21.14*	24.45*	10.89	7.37	11.77
	(8.38)	(10.98)	(12.50)	(8.09)	(7.11)	(10.56)
$\Delta E(r)$ × XI	−5.40	−5.58	−9.58	4.70	6.24	0.93
	(8.66)	(11.66)	(14.07)	(8.10)	(7.93)	(11.86)
No. of obs.	79	79	79	79	79	79
R^2	0.31	0.38	0.39	0.27	0.33	0.36
Panel D. High-Tech						
$\Delta E(r)$	−28.09***	−28.50***	−27.56***	−22.86***	−22.54***	−21.10***
	(3.90)	(5.52)	(6.03)	(4.19)	(5.48)	(6.26)
$\Delta E(r)$ × HIGH_TECH	10.5	10.09	9.00	2.97	1.85	0.17
	(8.29)	(8.64)	(8.91)	(8.36)	(8.04)	(8.22)
No. of obs.	79	79	79	79	79	79
R^2	0.32	0.37	0.38	0.27	0.31	0.35
Firm controls		Yes	Yes		Yes	Yes
Pre-trend			Yes			Yes

share of the total material cost exceed the median value across all sectors according to the same input–output table, and 0 otherwise.

In Panel C 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

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coefficients for the 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 nonexport-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 favorable 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.

Finally, we explore whether policy favoritism toward technology firms plays a role in our findings. In particular, the Chinese industrial policy aiming at promoting high-tech firms, introduced in 1995 and strengthened several times later, could imply a reduced cost of capital for these firms.[28] Some of the subsidies to high-tech firms take the form of a reduced tax rate, which improves their after-tax cash flows. We do not have a strong reason to suspect that the change in the expected return calculated as the difference between the global and local CAPM should be correlated with the high-tech sector, but it is a possibility. As such, we created a dummy, HIGH_TECH, that indicates whether a firm belong to a high-tech industry as classified according to China's *High-Tech Industry (Manufacturing) Classification (2017)* and *High-Tech Industry (Services) Classification (2018).* Regression results after replacing L with HIGH_TECH in equation (12) are reported in Panel D of Table 4. The coefficient of the interaction term is not statistically significant at the 10% level across all columns, suggesting that any policy favoritism toward high-tech firms do not explain changes in their loan costs around the introduction of the QFII program. As an extension of this finding, we believe that improving economic environment (as in the case of high-tech firms) is not likely to be a key contributor to changes in loan costs around the introduction of the QFII program.

D. 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 3-factor model (FF3) as an extension of the CAPM. 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 Table 3), we see that they are positively correlated, but the correlation is far from perfect.

We now investigate whether the heterogeneous changes in loan costs across the firms are related to the FF3-predicted reductions in risk premium, calculated as

[28] See Fisman, Shi, Wang, and Xu (2018) and Li, Xu, and Zhou (2021) for a discussion of China's expenditure on R&D.

the difference in expected returns estimated from a 3-factor model with standard local market, size, and value factors and that from an FF3 model with corresponding global factors. First, we plot the changes in loan costs against the FF3-predicted changes in the cost of equity. Graphs A and B 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 33 and 30 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 et al. (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 (Liu–Stambaugh–Yuan 3-factor (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.[29] To calculate the LSY3-predicted change in risk premium, we take the difference between the expected returns estimated from a 3-factor model with local market, LSY-adjusted size, and LSY-adjusted value factors and that from an FF3 model with corresponding global factors.

Graphs C and D of Figure 5 plot the changes in loan costs against the LSY3-predicted changes in cost of equity. The graphs are similar to those of Figure 4 and Graphs A and B 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 42 and 41 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^2 in the LSY3 model is 0.44, which is higher than 0.34 in the CAPM. In other words, with better predictions for changes in cross-firm risk premia (by LSY3 as opposed to CAMP or FF3), 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

[29]In Table A8 in the Supplementary Material, we show the risk premium reductions from the market, size, and value factor separately. We show positive coefficients for DIFCOVs of LSY3 factors, and particularly DIFCOV(HML) is positive and significant at the 5% level, indicating that factors other than the market play a role in reducing firms' risk premia.

FIGURE 5

Changes in Loan Cost Versus Changes in Equity Return (FF 3-Factor and LSY 3-Factor Models)

Figure 5 shows changes in mean AISD (Graphs A and C) and TCB (Graphs B and D) 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. Each graph includes term loans (top) and all loans (bottom).

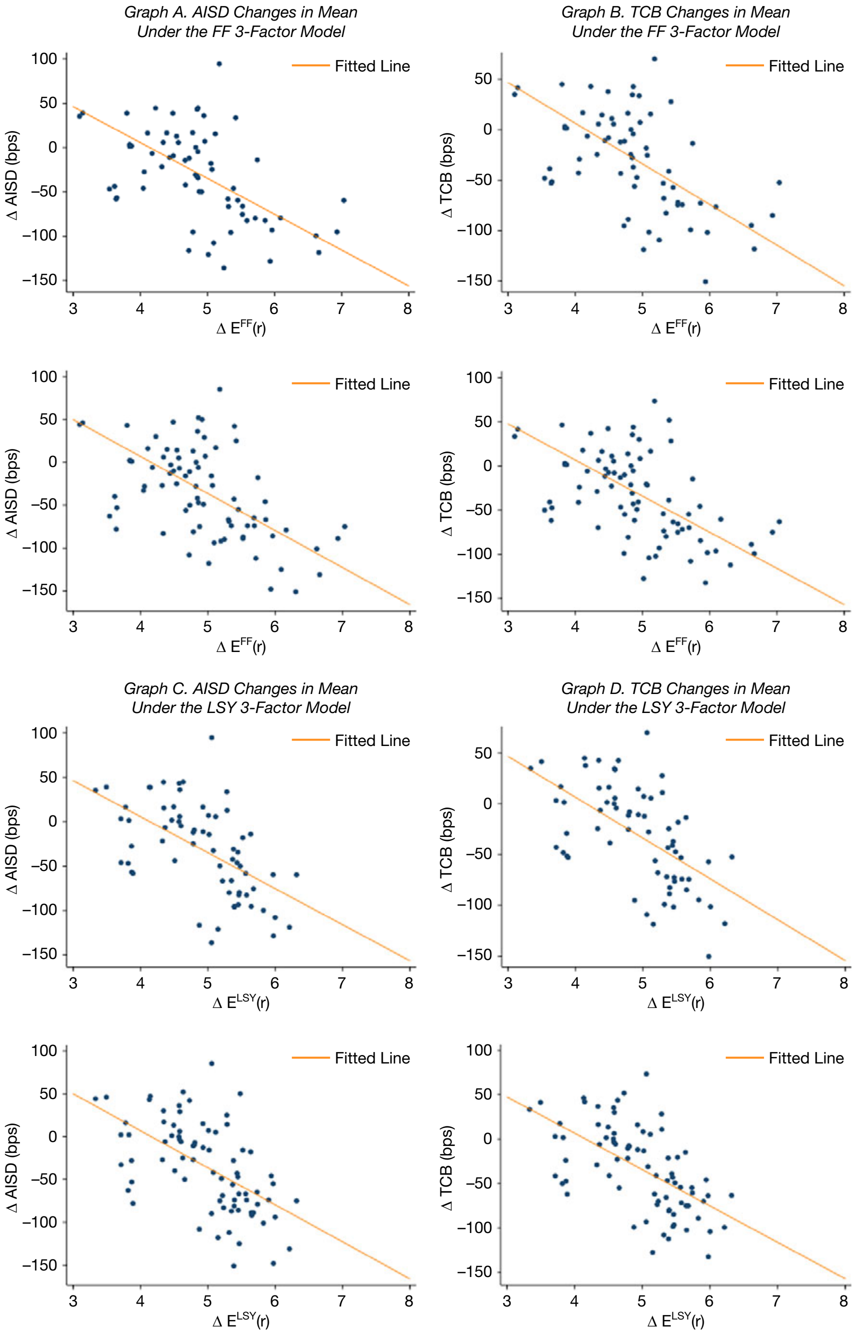

TABLE 5

Improvements in the Models of Risk Premia

In Table 5, dependent variables are changes in AISD (columns 1–3) and TCB (columns 4–6) between the two loans closest to the QFII program's announcement (one pre- and one post-QFII). Change in expected return ($\Delta E(r)$) is based on the Fama–French 3-factor (Panel A) and Liu–Stambaugh–Yuan 3-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 statistical significance at the 1%, 5%, and 10% levels, respectively.

	Dependent Variable					
	ΔAISD			ΔTCB		
	1	2	3	4	5	6
Panel A. FF 3-Factor						
Δ*E*(*r*)	−35.31***	−33.84***	−33.77***	−31.29***	−30.45***	−30.36***
	(5.78)	(6.24)	(6.48)	(5.47)	(6.27)	(6.56)
No. of obs.	79	79	79	79	79	79
R^2	0.268	0.344	0.366	0.255	0.325	0.374
Panel B. LSY 3-Factor						
Δ*E*(*r*)	−44.35***	−42.73***	−42.18***	−43.35***	−42.07***	−41.29***
	(6.78)	(6.99)	(7.00)	(6.70)	(6.80)	(6.69)
No. of obs.	79	79	79	79	79	79
R^2	0.30	0.37	0.39	0.34	0.40	0.44
Firm controls		Yes	Yes		Yes	Yes
Pre-trend			Yes			Yes

important source of the spillover. As reported in Table A4 in the Supplementary Material, 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.

IV. Effects on Firm Investment, Employment, and Performance

We now investigate the real effects of the reform. In particular, we examine whether the reduction in CAPM-predicted risk premium is positively associated with increases in investments, hiring, and improvements in financial performance.

We first examine whether the QFII program increased firms' real investment. Our sample contains all listed A-share 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 observation 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, so we exclude observations in 2002 throughout our estimation. The specification is

$$(13)\quad \frac{\text{CAPEX}_{i,t}}{\text{ASSET}_{i,t-1}} = b_0 + b_1\Delta E(r_i) + b_2\Delta E(r_i) \times \text{POST}_t + b_3\text{POST}_t + \delta'\mathbf{X}_{i,t-1} + \text{Industry Year FE} + \varepsilon_{i,t},$$

where the dependent variable captures a firm's investment (Capex scaled by the previous year's assets), expressed in percentage points. We define POST as a

TABLE 6

The QFII Effect on Firm Investment

The dependent variable in Table 6 is firm investment, calculated as capital expenditure in year t over total assets in year $t-1$, and expressed in percentage points. Change in expected return ($\Delta E(r)$) is based on the CAPM and calculated from equation (6). POST is a dummy variable that equals 1 for years after 2002, and 0 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 statistical significance at the 1%, 5%, and 10% levels, respectively.

	Dependent Variable: $CAPEX_t/ASSET_{t-1}$ (%)					
Sample Period	2000–2004 (Excl. 2002)			2000–2006 (Excl. 2002)		
	1	2	3	4	5	6
$\Delta E(r) \times$ POST	0.32***	0.31**	0.32**	0.35***	0.36***	0.36***
	(0.13)	(0.13)	(0.13)	(0.12)	(0.12)	(0.12)
$\Delta E(r)$	−0.51***	−0.45***	−0.47***	−0.51***	−0.43***	−0.45***
	(0.11)	(0.12)	(0.12)	(0.11)	(0.11)	(0.12)
TOBIN_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	Yes	Yes	Yes	Yes	Yes	Yes
No. of obs.	3,513	3,407	3,277	5,220	5,093	4,897
R^2	0.06	0.10	0.10	0.07	0.12	0.12

dummy for years after 2002. We include the interaction term between $\Delta E(r)$ and POST in the regression. $\mathbf{X}$ is a set of control variables including Tobin's Q, cash flow, sales growth, leverage, and total assets.[30] 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 $\Delta E(r)$ 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 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 25th to the 75th percentile of the annualized $\Delta E(r)$ distribution would experience an increase in firm investment of approximately 1 percentage point ($= 3.12 \times 0.32$) 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 4–6 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 3 columns.

The second 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

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

TABLE 7

The QFII Effect on Employment

The dependent variable in Table 7 measures firm employment calculated as the ratio of the number of employees over lagged total assets in RMB millions. Change in expected return ($\Delta E(r)$) is based on the CAPM and calculated from equation (6). POST is a dummy variable that equals 1 for years after 2002, and 0 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 Tobin's Q, cash flow, sales growth, leverage, and assets (in logarithm). 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 statistical significance at the 1%, 5%, and 10% levels, respectively.

	Dependent Variable: $\text{EMPLOYMENT}_t/\text{ASSET}_{t-1}$					
Sample Period	2000–2004 (Excl. 2002)			2000–2006 (Excl. 2002)		
	1	2	3	4	5	6
$\Delta E(r) \times$ POST	0.02*	0.02	0.03**	0.02*	0.02	0.03**
	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)
$\Delta E(r)$	0.003	−0.030*	−0.030**	0.003	−0.020	−0.030
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
No. of obs.	3,494	3,395	3,252	5,193	5,076	4,862
R^2	0.08	0.16	0.15	0.10	0.15	0.15
Firm controls		Yes	Yes		Yes	Yes
Industry-year FE	Yes	Yes	Yes	Yes	Yes	Yes

the dependent variable firm i's employment in year t scaled by its total assets (in millions RMB) in year $t-1$. Table 7 presents the results. We find that the coefficient of the interaction term is positive and significant in 4 of 6 columns. This provides some support for a positive but heterogeneous effect on employment in line with CAPM-predicted differential changes in risk premium across firms. According to column 3, a firm moving from the 25th to the 75th percentile of the annualized $\Delta E(r)$ distribution would increase its employment over assets ratio relative to the pre-event mean by 5% ($= 3.12 \times 0.03/2.04$) 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 8. 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 asset-pricing models 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 8: A firm moving from the 25th to the 75th percentile of the annualized $\Delta E(r)$ distribution would see an increase in ROA of approximately 1 percentage point ($= 3.12 \times 0.27$) in the 2 years following the QFII program's introduction (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.[31] More importantly, these effects are heterogeneous across firms: Those that the

[31] We do not claim that all the real effects are necessarily consequences of lower borrowing costs *per se*. Rather, our results demonstrate that equity market liberalization has played a role in these results. Given the centrality of bank lending in China's domestic economy, a reduction in loan costs have likely contributed to these real effects.

TABLE 8

The QFII Effect on Firm Performance

In Table 8, the dependent variable is a firm's contemporaneous return on assets (ROA) in percentage points. Change in expected return ($\Delta E(r)$) is based on the CAPM and calculated from equation (6). POST is a dummy variable that equals 1 for years after 2002, and 0 otherwise. Sample contains the Chinese firms with A shares at the time of Qualified Foreign Institutional Investors 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 logarithm). 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 statistical significance at the 1%, 5%, and 10% levels, respectively.

	Dependent Variable: ROA_t (%)					
Sample Period	2000–2004 (Excl. 2002)			2000–2006 (Excl. 2002)		
	1	2	3	4	5	6
$\Delta E(r) \times$ POST	0.22**	0.28***	0.27**	0.23**	0.29***	0.29***
	(0.10)	(0.10)	(0.11)	(0.09)	(0.09)	(0.09)
$\Delta E(r)$	−0.34***	−0.25***	−0.22***	−0.34***	−0.24***	−0.21***
	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)
No. of obs.	3,527	3,421	3,277	5,240	5,113	4,897
R^2	0.06	0.22	0.22	0.06	0.23	0.24
Firm controls		Yes	Yes		Yes	Yes
Industry-year FE	Yes	Yes	Yes	Yes	Yes	Yes

asset-pricing theory predicts to experience a greater reduction in their risk premia do better in relative terms.

V. A Difference-in-Differences Exercise

A. 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 III is to use asset-pricing models 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.

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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 logarithm), 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 III.

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. Graph C 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 DID regression:

$$S_{i,t} = a_i + b_1 \text{TREAT}_i \times \text{POSt}_t + \delta' \mathbf{X}_{i,t-1} + \delta_t + \text{PRE\_TREND}_{i,t} + \varepsilon_{i,t}, \quad (14)$$

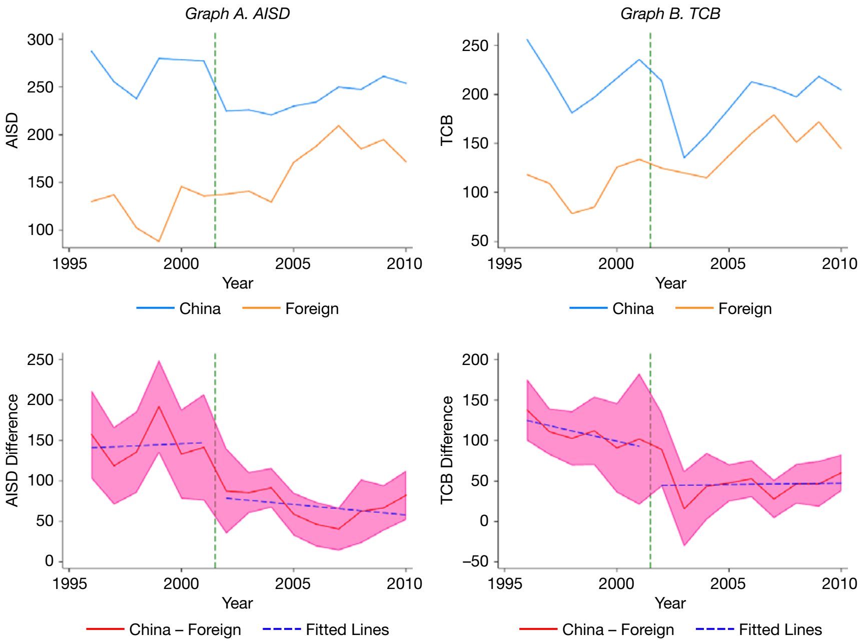
where i and t denote firm and year, respectively. S is either AISD or TCB. TREAT is an indicator variable that equals 1 for firms in the treatment group (i.e., one that is listed on one of China's stock exchanges), and 0 otherwise. POST is an indicator variable that equals 1 for periods after the announcement of the QFII program (i.e., June 10, 2002), and 0 otherwise. $\mathbf{X}$ is a vector of firm characteristics as described earlier. As an extension to our baseline model, we add the interaction between $\Delta E(r)$ and POST to equation (14). This allows us to assess the relative importance of the risk reduction channel in 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

FIGURE 6

Loan Costs of Chinese and Foreign Firms (time-series)

Figure 6 shows AISD (Graph A) and TCB (Graph B) of loans of China- and foreign-listed firms. The dashed green 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.



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.

$$(15)\qquad S_{i,k,t} = \sum_k b_{1,k}\text{INDUSTRY}_k + \sum_k b_{2,k}\text{INDUSTRY}_k \times \text{YEAR}_t + \sum_k b_{3,k}\text{INDUSTRY}_k \times \text{TREAT}_i + \sum_k b_{4,k}\text{INDUSTRY}_k \times \text{YEAR}_t \times \text{TREAT}_i + \varepsilon_{i,k,t},$$

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.

B. Statistical Results

The regression results following equation (14) are presented in columns 1 and 7 of Table 9. For term loans, in column 1, the AISD decreases by approximately

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TABLE 9

Loan Cost (AISD) Response to the QFII Program Announcement

In Table 9, TREAT is a dummy variable that equals 1 for China-listed firms, and 0 otherwise. POST is a dummy variable that equals 1 the period after the announcement of the Qualified Foreign Institutional Investors program on June 10, 2002, and 0 otherwise. Change in expected return ($\Delta E(r)$) is based on the CAPM and calculated from equation (6). All columns include year and firm fixed effects. Standard errors are shown in parentheses and clustered by industry. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

	Dependent Variable: AISD											
Sample	Term Loans						All Loans					
	1	2	3	4	5	6	7	8	9	10	11	12
TREAT × POST	−106.67***	−12.70	−95.90***	−18.88	−91.04**	−56.92	−97.40***	−39.04	−91.22**	−68.59	−84.28***	−109.38*
	(27.17)	(61.70)	(27.22)	(35.99)	(35.07)	(53.02)	(30.95)	(62.31)	(35.83)	(54.55)	(28.09)	(59.18)
$\Delta E(r)$ × POST		−12.97***		−12.25***		−8.25***		−9.92***		−8.42**		−5.50
		(3.88)		(2.36)		(2.64)		(2.30)		(3.19)		(4.26)
M/B			−0.02	−0.02	−0.01	−0.02*			−0.02	−0.02**	0.00	−0.02**
			(0.02)	(0.01)	(0.01)	(0.01)			(0.01)	(0.01)	(0.01)	(0.01)
PROFITABILITY			−133.38	−137.21*	−122.46	−149.89			−129.06	−219.10**	−128.81	−217.06**
			(95.47)	(79.43)	(106.41)	(95.59)			(87.29)	(87.99)	(106.91)	(103.51)
log(ASSETS)			16.00	9.98	22.53	24.05			−4.80	−3.79	1.57	6.83
			(18.86)	(24.86)	(18.21)	(21.71)			(16.69)	(20.01)	(15.82)	(21.54)
log(INT_COVERAGE)			−2.26*	−0.79	−1.96	−0.56			−1.47	1.29	−1.44	1.65
			(1.25)	(1.54)	(1.21)	(1.89)			(1.66)	(1.77)	(1.60)	(2.16)
P/E			−0.50	−0.54**	−0.61	−0.67**			−0.48**	−0.59	−0.54***	−0.67*
			(0.40)	(0.26)	(0.44)	(0.27)			(0.19)	(0.40)	(0.19)	(0.39)
LEVERAGE			64.54*	74.02**	68.75**	83.42**			75.22**	82.74***	73.34**	92.21***
			(31.73)	(33.82)	(30.77)	(35.01)			(29.07)	(26.50)	(28.69)	(25.40)
SD_OF_PROFITABILITY			28.84	−131.64	53.50	−96.16			177.81	79.04	134.15	91.83
			(160.29)	(258.99)	(146.01)	(264.09)			(182.52)	(199.88)	(190.21)	(194.00)
ALTMAN_Z_SCORE			0.99	−1.01	2.78	2.79			2.07	1.06	3.02	4.83
			(4.02)	(4.95)	(3.17)	(4.64)			(3.15)	(4.35)	(2.97)	(4.34)
PRE_TREND					0.28	0.38**					0.17	0.26
					(0.17)	(0.16)					(0.12)	(0.19)
No. of obs.	225	177	225	177	225	177	251	198	251	198	251	198
R^2	0.66	0.75	0.70	0.78	0.71	0.80	0.62	0.68	0.65	0.71	0.67	0.72

107 bps following the introduction of the QFII program. In column 7, for all loans and credit lines, the AISD declines by 97 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, loan costs become lower after the QFII program's introduction.

The even-numbered columns of Table 9 include the interaction term between $\Delta E(r)$ and POST as an additional regressor.[32] $\Delta E(r)$ 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 $\Delta E(r) \times$ POST is accounted for, TREAT $\times$ POST loses statistical significance. Note that the adjusted R^2 for each column with $\Delta E(r) \times$ 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 of Table 9 can conceivably be affected by other events that coincide with the timing of the QFII program, the significant coefficients associated with the term, $\Delta E(r) \times$ POST, are unlikely to be caused by other events since $\Delta E(r)$ 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 10. Our findings are unchanged. In particular, the interaction term between TREAT and POST loses significance in the presence of $\Delta E(r) \times$ 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.

C. Additional Extensions and Placebo Tests

As in Section III, we can determine whether the connection between loan costs and the change in required risk premium depends on whether the lender is a publicly listed domestic bank or 1 of the 4 leading state-owned banks. We also investigate whether the risk premium effect depends on the ownership of the borrowing firm, the import and export intensities of the firm, or the high-tech nature (and thus favorable policy environment) of the firm.

The results turn out to be similar to Panels A–D of Table 4 (see Tables A10–A13 in the Supplementary Material). First, lender type does not play a special role

[32] $\Delta E(r)$ is 0 for the firms in the control group as the QFII program does not affect their stock prices.

TABLE 10

Loan Cost (TCB) Response to the QFII Program Announcement

In Table 10, TREAT is a dummy variable that equals 1 for China-listed firms, and 0 otherwise. POST is a dummy variable that equals 1 in the period after the announcement of the Qualified Foreign Institutional Investors program on June 10, 2002, and 0 otherwise. Change in expected return ($\Delta E(r)$) is based on the CAPM and calculated from equation (6). All columns include year and firm fixed effects. Standard errors are shown in parentheses and clustered by industry. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

	Dependent Variable: TCB											
Sample	Term Loans						All Loans					
	1	2	3	4	5	6	7	8	9	10	11	12
TREAT × POST	−109.50***	−13.27	−100.59***	−21.66	−95.46***	−60.76	−70.81***	−10.60	−67.20***	−29.54	−61.07***	−60.62*
	(26.72)	(58.69)	(26.09)	(38.76)	(32.34)	(56.56)	(18.68)	(34.81)	(21.25)	(28.64)	(16.24)	(34.90)
$\Delta E(r)$ × POST		−13.46***		−12.60***		−8.42**		−10.02***		−9.03***		−6.70*
		(3.57)		(2.85)		(3.21)		(1.89)		(2.89)		(3.52)
M/B			−0.01	−0.02	−0.01	−0.02			−0.01	−0.02**	−0.01	−0.02**
			(0.02)	(0.01)	(0.02)	(0.01)			(0.01)	(0.01)	(0.01)	(0.01)
PROFITABILITY			−127.76	−120.29	−118.44	−136.92			−103.51*	−153.65***	−97.93	−145.59**
			(91.71)	(86.74)	(101.30)	(102.35)			(53.97)	(52.45)	(67.42)	(53.85)
log(ASSETS)			15.1	8.58	21.93	22.81			−7.31	−6.15	−1.60	2.94
			(17.98)	(23.49)	(17.74)	(20.86)			(12.70)	(14.67)	(12.25)	(15.47)
log(INT_COVERAGE)			−2.16	−0.53	−1.83	−0.31			−0.95	0.91	−0.89	1.18
			(1.27)	(1.58)	(1.23)	(1.97)			(1.26)	(0.91)	(1.13)	(1.23)
P/E			−0.48	−0.45	−0.59	−0.58**			−0.40***	−0.35	−0.45***	−0.42*
			(0.37)	(0.28)	(0.40)	(0.27)			(0.13)	(0.24)	(0.12)	(0.24)
LEVERAGE			59.08*	68.86*	63.95*	79.37**			52.50**	62.58***	51.82**	69.33***
			(32.81)	(35.63)	(31.97)	(37.92)			(19.53)	(19.44)	(20.60)	(18.03)
SD_OF_PROFITABILITY			73.96	−99.93	97.76	−65.65			155.54	69.95	125.35	75.57
			(162.31)	(247.69)	(145.38)	(254.30)			(112.06)	(148.74)	(113.70)	(150.07)
ALTMAN_Z_SCORE			−0.04	−2.43	1.85	1.51			1.12	0.25	2.14	3.47
			(4.04)	(4.75)	(3.13)	(4.58)			(2.01)	(3.05)	(1.72)	(3.15)
PRE_TREND					0.29*	0.38**					0.23*	0.31
					(0.16)	(0.16)					(0.12)	(0.20)
No. of obs.	225	177	225	177	225	177	251	198	251	198	251	198
R^2	0.66	0.75	0.69	0.77	0.70	0.79	0.63	0.71	0.66	0.75	0.69	0.76

in our setting. This means that the adjustment of the loan costs in response to a reduction in risk premium is performed by all types of banks. Domestic listed banks do as much adjustment as nonlisted 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. Finally, changes in the loan costs for the high-tech firms do not appear to materially differ from those of nonhigh-tech firms, despite favorable economic policies enjoyed by the former. This is consistent with our earlier finding in Panel D of Table 4 (that reduction in loan costs around the introduction of the QFII program does not appear to be a consequence of some firms' favorable economic environment that is not captured by a change in the risk premium).

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., 1996–2001) and years after the program's introduction (i.e., 2002–2010). In particular, we perform the DID regressions on 2 fake event years, 1999 and 2007, respectively, instead of the true event year 2002. For instance, for pre-QFII years, we use 1996–1998 as our (fake) pre-event period and 1999–2001 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 11 report the results with 1999 and 2007 as the fake event years, respectively. In both cases, the key coefficient on the interaction term is not statistically significant in any of the 4 columns. In other words, when we use a fake event year, we do not find the same kinds 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 domestic listed banks or the big-4 state-owned banks. Neither does the effect differ between SOEs and non-SOEs. 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. Furthermore, after examining high-tech firms, we infer that favorable economic environments for a subset of our treated firms also do not appear to drive our findings on decreases in loan costs due to a reduction in risk premium.

TABLE 11

Placebo Tests Using Fake Event Years

In Table 11, TREAT is a dummy variable that equals 1 for China-listed firms, and 0 otherwise. POST is a dummy variable that equals 1 the period after the fake event year, and 0 otherwise. Change in expected return ($\Delta E(r)$) is based on the CAPM and calculated from equation (6). Panel A restricts the sample period to between pre-QFII years (i.e., 1996–2001) and uses 1999 as the fake event year. Panel B restricts the sample period to between post-QFII years (i.e., 2003–2010) and uses 2007 as the fake event year. 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 statistical significance at the 1%, 5%, and 10% levels, respectively.

	Dependent Variable			
	AISD		TCB	
Sample	Term Loans	All Loans	Term Loans	All Loans
	1	2	3	4
Panel A. Fake Event Year = 1999				
TREAT × POST	−207.34	−231.38	−187.91	−161.81
	(322.83)	(409.22)	(344.41)	(257.28)
$\Delta E(r)$ × POST	12.58	18.57	9.74	14.44
	(36.83)	(44.40)	(39.32)	(30.74)
No. of obs.	45	47	45	47
R^2	0.61	0.59	0.60	0.70
Panel B. Fake Event Year = 2007				
TREAT × POST	76.59	57.53	62.92	9.22
	(129.18)	(75.74)	(132.00)	(56.04)
$\Delta E(r)$ × POST	−13.25	−10.76	−11.29	−6.19
	(13.64)	(7.98)	(14.21)	(4.94)
No. of obs.	119	134	119	134
R^2	0.57	0.43	0.56	0.48
Firm controls	Yes	Yes	Yes	Yes
Loan controls	Yes	Yes	Yes	Yes
Pre-QFII trend	Yes	Yes	Yes	Yes

VI. 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 61 and 109 bps. Guided by asset-pricing theories, 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 et al. (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.

Supplementary Material

To view supplementary material for this article, please visit http://doi.org/10.1017/S0022109022001466.

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