Demand Curves for Stocks Slope Down in the Long Run: Evidence from the Chinese Split-Share Structure Reform*

Clark Liu† and Baolian Wang‡

February 18, 2021

Critical Finance Review forthcoming

Abstract

This paper uses China's Split-Share Structure Reform to study the slope of long-term demand curves. The reform increased local A-share float but did not affect foreign B-share float. Across firms, larger increases in A-share float lead to larger decreases in A-share price relative to B-share price, even up to around ten years after the reform, suggesting that demand curves slope down in the long run. Larger increases in float also lead to larger decreases in turnover and volatility, and demand curves are steeper when the divergence of opinion is greater, consistent with the theory modeling investors with heterogeneous beliefs.

Keywords: long-term demand curves; divergence of opinion; Split-Share Structure Reform; A/B share; lack of substitutes

JEL codes: G02, G12, G15

---

*The authors are grateful for the valuable comments received from Nicholas Barberis, Justin Birru, Si Cheng, Zhi Da, Andrey Ermolov, Bill Francis, Pengjie Gao, Lifeng Gu, Zhiguo He, Shiyang Huang, Tse-Chun Lin, Abhiroop Mukherjee, Nimesh Patel, Neil Pearson, Jay Ritter, Mark Seasholes, Andrei Shleifer, Dragon Yongjun Tang, Hao Wang, Tan Wang, John Kuo-Chiang Wei, Wei Xiong, Yu Xu, Hongjun Yan, Jialin Yu, Jianfeng Yu, Chu Zhang, Hong Zhang, Hao Zhou, seminar participants at Chinese University of Hong Kong, Shanghai Jiaotong University, the University of Hong Kong, Hong Kong University of Science and Technology, and Tsinghua University (PBC School of Finance and School of Economics and Management), and conference participants at the 2019 China International Conference in Finance (CICF), the 2017 Financial Intermediation Research Society (FIRS) Conference, the 2016 Financial Markets Workshop (Fordham, NYU and Imperial College), and the 2018 FMA conference. We are particularly grateful for the comments of the Editor Ivo Welch and an anonymous referee. Liu acknowledges financial support from the National Natural Science Foundation of China (Grant No. 71790605). All errors are the authors' responsibility.

† PBC School of Finance, Tsinghua University, China. Email: liuyue@pbcsf.tsinghua.edu.cn.

‡ Corresponding author. Warrington College of Business, University of Florida, USA. Email: baolian.wang@warrington.ufl.edu.

1. Introduction

This paper investigates the long-term stock price effect of uninformed supply changes. Our empirical design enables us to examine horizons up to around ten years. Traditional finance theory argues that stocks have many substitutes and hence their demand curves should be (nearly) flat: a change in a stock's share supply – even a large change relative to its own share base – should have minimal effect on its price (Scholes, 1972). However, several alternative theories have challenged this perfect market view.

The prevalent alternative view is the price pressure hypothesis, which asserts that uninformed excess supply can cause a stock's price to *temporarily* diverge from its fundamental value because of the stock market's limited risk absorptive capability and slow-moving capital. Under this hypothesis, demand curves do not slope down in the long term because the price deviation is temporary and eventually reverses. It is widely documented that both short-term (i.e., from a few minutes to a few hours) and medium-term (i.e., from a few days to a few months) demand curves for stocks are downward sloping (Kraus and Stoll, 1972; Shleifer, 1986; Chang, Hong, and Liskovich, 2014).[1]

The *long-term* downward-sloping demand curve hypothesis provides a second alternative to the perfect market view. This hypothesis dates back to Shleifer (1986), who conjectures that investors' heterogeneous valuations can lead to demand schedules (Miller, 1977). Under this hypothesis, when there is an increase in share supply, even if the fundamentals are unchanged, the stock price should fall to induce shareholders to purchase additional supplies. If heterogeneous valuations persist and short-sale constraints are binding, demand curves can be downward sloping in the long run.

[1] Some studies define a few weeks or a few months as "long-term", whereas we define them as "medium-term."

The shape of the long-term demand curves is much less studied, perhaps due to methodological limitations. Because of the coexistence of the short-term or medium-term price pressure effect and the long-term demand curve effect, we cannot infer the shape of long-term demand curves by examining the shorter-term price effect. We need to study the long-term price effect directly. Most existing empirical studies investigate the shape of demand curves by analyzing price reactions to supply/demand shocks using the standard event study method. These studies focus, for example, on stock addition to the S&P500 index. Reaching a conclusion about long-term demand curves requires an estimation window so long that the standard event study method's ability to pin down changes in a statistically meaningful way is hampered; also, firm fundamentals may change systematically in the long term.[2] In this paper, we circumvent these problems and develop an empirical strategy to investigate the shape of long-term demand curves for horizons up to around ten years.

Investigation of the shape of long-term demand curves is important for several reasons. First, it will help us understand the nature of financial market frictions. Are demand curves downward sloping in the long term? If so, why? Second, as Shleifer (1986) argues, if demand curves are downward sloping in the long term, some fundamental finance theories require reexamination; for example, the assumptions underlying the Modigliani and Miller (1958) theorem are violated. Firms may bypass positive-net-present-value projects in anticipation of a long-term price impact of equity issuance, even in the absence of managerial myopia. In comparison, the shape of short-term and medium-term demand curves may not matter as much.

---

[2] Wurgler and Zhuravskaya (2002, p. 586) state that "given no generally accepted way to adjust for risk, we do not investigate the long-run effect issue anew." Hau, Massa, and Peress (2010) have a similar argument in their paper (see p. 1714). There is some evidence on changing firm fundamentals after they are added or deleted from the S&P 500. Denis, McConnell, Ovtchinnikov, and Yu (2003) find that additions to the S&P 500 are associated with an increase in both analysts' forecasted earnings and realized earnings. Hegde and McDermott (2003) document an increase in the liquidity of stocks added to the S&P 500 index. Chan, Kot, and Tang (2013) find that institutional ownership and liquidity increase both for stocks added to the S&P 500 and for stocks deleted from the S&P 500.

To investigate the shape of long-term demand curves, we need to measure the long-term price effect of exogenous supply shocks. The Chinese A/B share market around the Split-Share Structure Reform provides a suitable empirical setting. Several dozen Chinese firms issued A-shares to domestic investors and B-shares to foreign investors. As a result of market segmentation, though the two shares have the same cash flow rights and voting rights, they are typically traded at different prices. The reform mandated the conversion of non-tradable A-shares – which accounted for around two-thirds of all A-shares – to tradable status. This reform increased the supply of A-shares but had no effect on the B-share supply. This event was a market-level event and beyond the control of any individual firm.

Examining A/B share premiums largely overcomes the methodological limitations faced by the standard event study on returns. Because A/B shares have the same fundamentals, one share's price serves naturally as a benchmark for the other share. The A/B share premium largely controls for the change in firm fundamentals. In the long term, the variance of a stock's returns (mainly the component driven by firm-specific news) can be so large that it hampers one's ability to pin down changes in a statistically meaningful way. Changes in A/B share premiums, approximately the differences in A/B share returns, are largely unaffected by firm-specific news and have a smaller variance than a single share's returns, especially in the long term. Empirically, in our sample period, the A-share price and B-share price comove strongly, with an average correlation coefficient of 0.875. By the end of our sample period, which is around ten years after the reform, the cross-sectional variance of change in premiums is only 6% of that of A-share returns. Therefore, we can circumvent the difficulty of limited statistical power and changing firm fundamentals by examining A/B share premium's long-term dynamics.[3]

[3] The existence of the B-shares may make the demand curves for A-shares less steep. Investors may take B-shares as substitutes for A-shares. If so, the A-share price effect may spillover to B-shares. However, we do not think the

In our empirical identification, we investigate how firms with different fractions of non-tradable shares react differently to the reform. All non-tradable A-shares are mandated to convert to tradable status after a lockup period. The ratio of the total number of A-shares to the number of tradable A-shares before the reform (which we refer to as "*ΔFloat*" hereafter) acts naturally as a measure of A-share supply increase (Firth, Lin, and Zou, 2010; Li, Wang, Cheung, and Jiang, 2011). Consistent with downward-sloping demand curves, we see that *ΔFloat* adversely predicts the change in the A/B share premium. A one-unit increase in *ΔFloat* is associated with a 2.6% to 7.9% decrease in the A/B share premium. Even up to December 2014, which marks the end of our sample period, a one-unit increase in *ΔFloat* is associated with a 3.5% decrease in the A/B share premium. The reform started in 2005, and the results suggest that demand curves are downward sloping even up to around ten years after supply shocks. These results are robust after controlling for a number of firm characteristics.

Our empirical analysis is designed to examine the demand curves at the individual stock level – how a stock's price reacts to its *own* supply shock. During the reform, a large number of stocks increased their share supply in a short period. Even in the absence of frictions, a market-level share supply increase can lead to a decrease in equity prices by increasing the market risk premium, leading to downward-sloping demand curves at the market level. This argument implies a negative relationship between *market-level* supply and price, different from the stock level demand curves. Downward-sloping market-level demand curves predict that a stock's price changes should be proportional to its covariance with the market portfolio, i.e., the market beta. Empirically, *ΔFloat* is uncorrelated with beta, and controlling for beta has little effect on the effect of *ΔFloat*. This

spillover effect is strong. Investors need to have foreign currency to invest in B-shares. Due to the strict foreign currency regulation in China, only a very small fraction of investors participates in the B-share market. If there is any spillover effect, examining the change in the A/B share premium will underestimate the true effect of demand curves.

finding suggests that the market-level downward-sloping demand curves cannot explain the negative relationship between *ΔFloat* and change in A/B share premium.

While our findings are consistent with downward-sloping demand curves, one may be concerned that *ΔFloat* is not randomly assigned and correlated with other factors that also affect change in premium. Our estimation is biased only if there are other factors that affect A/B shares asymmetrically *and* in a way that is correlated with *ΔFloat*. Factors that affect A/B shares symmetrically (e.g., cash flow changes) or factors that are uncorrelated with *ΔFloat* (e.g., market-level factors, including market sentiment) will not bias our results. Researchers have proposed explanations of the cross-section of the A/B share premium based on differences in systematic risk exposures (Bailey, 1994; Eun, Janakiramanan, and Lee, 2001), liquidity and information asymmetry (Chan, Menkveld, and Yang, 2008; Chen, Lee, and Rui, 2001), and preference of state ownership (Karolyi, Li, and Liao, 2009). In the reform, tradable A-shareholders are compensated, but B-shareholders are not. The compensation arrangement also affects the two shares asymmetrically. We find that none of these factors can explain the relationship between *ΔFloat* and change in premium. The results also hold if we instrument *ΔFloat* using the A-share market index return before the A-share IPO. Firms timed the market by issuing more A-shares to the public (and therefore more tradable shares) if the recent A-share market return was high. The exclusion criteria are likely to hold, as it is hard to think of any reason why A-share market return before a firm's A-share IPO, which was on average 11 years before the reform, could affect A/B share premium change after the reform through channels other than its effect on the fraction of non-tradable shares. Although we cannot completely rule out all possible confounding factors, the fact that none of the known factors can explain our results is comforting. We then provide further evidence on the mechanism of downward-sloping demand curves to corroborate our main findings.

One plausible reason for downward-sloping demand curves is the divergence of opinion. In the presence of short-sale constraints, the divergence of opinion leads to overvaluation of stocks, which is negatively correlated with share supply (Miller, 1977; Chen, Hong, and Stein, 2002; Scheinkman and Xiong, 2003; Hong, Scheinkman, and Xiong, 2006). Such models also predict that the share supply's marginal effect is larger when the divergence of opinion is larger. Consistent with these predictions, we show that the effect of *ΔFloat* on an A/B share premium change is more pronounced for stocks whose A-share turnover – our proxy for the divergence of opinion – was higher in the period before the reform. Scheinkman and Xiong (2003) and Hong, Scheinkman, and Xiong (2006) further predict that, in dynamic models, the share supply is also negatively correlated with the level of speculative trading. Consistent with these predictions, we find that a larger *ΔFloat* predicts a larger decrease in turnover and volatility.

What prevents demand curves from being flat? Demand curves should be flat either because perfect substitutes are available or because investors can "increase" supply by selling short. First, in the Chinese market we study, the short-sales constraint is binding, and thus pessimistic investors cannot sell short. Second, we find that the existence of close substitutes matters in the medium-term, but not in the long term. This is perhaps because even the closest related stocks do not provide a good substitute, especially in the long term, when idiosyncratic risk is high. Furthermore, long-term downward-sloping demand curves imply that price convergence, if any, is slow. Slow price convergence can itself discourage arbitrageurs.

Our study offers three principal contributions. First, we find strong evidence that demand curves are downward sloping in horizons up to around ten years. Most existing studies, including a few studies based on the Split-Share Structure Reform, have not investigated horizons longer than six months.[4] Second, we provide evidence that is consistent with the divergence of opinion interpretation of downward-sloping demand curves. This finding provides support for Shleifer's (1986) conjecture and the speculative trading hypothesis of Hong, Scheinkman, and Xiong (2006) and Mei, Scheinkman, and Xiong (2009).[5] Third, we also contribute to the literature on relative pricing between securities with identical cash flows. The studies most related to ours are Bailey and Jagtiani (1994), Stulz and Wasserfallen (1995), Domowitz, Glen, and Madhavan (1997), Bailey, Chung, and Kang (1999), and Sun and Tong (2000), which all find that the increases in foreign share supply lead to a drop in foreign shares' prices relative to domestic shares.[6] Downward-sloping demand curves for foreign shares can be an outcome of foreign investment barriers and institutional frictions, such as restrictions on capital mobility and mutual fund investment mandates (Stulz and Wasserfallen, 1995). Investigating the effect of the domestic A-shares' supply shocks is free of many of these frictions. In addition, the Split-Share Structure Reform also provides opportunities to pin down the causal relationships and rule out other possible interpretations.

The paper proceeds as follows. In Section 2, we develop hypotheses based on existing theoretical works and summarize them in less technical terms. In Section 3, we discuss the institutional background of the Chinese stock market and the Split-Share Structure Reform.

[4] See Table A1 in the Appendix for a summary of the literature.
[5] In our setting, the downward-sloping demand curve effect and the speculative trading effect are not two competing theories. In fact, the speculative trading hypothesis of Scheinkman and Xiong (2003) is one important reason that long-term demand curves are downward sloping. Miller (1977) predicts, in a model with divergence of opinion and short-sale constraints, demand curves are downward sloped. Scheinkman and Xiong (2003), in a dynamic model, also emphasize the resale option effect, which is also a function of asset supply. We find that larger increases in float also lead to larger decreases in turnover and volatility (Table 7), and demand curves are steeper when divergence of opinion is greater (Panel A of Table 8). These findings are consistent with Scheinkman and Xiong (2003).
[6] Liu, Wang, Wei and Zhong (2019) study the demand effect in the credit markets using a unique setup of Chinese enterprice bonds that are simultaneously traded in two partially-separated markets. They show that Chinese enterprise bonds with higher demand of retail investors are traded at significantly higher prices in the exchange market than the same bonds traded by institutional investors in the interbank market.

Section 4 presents our data. The main results are in Section 5. In Section 6, we provide evidence on the mechanism behind downward-sloping demand curves. In Section 7, we test how tradable shareholders are compensated for downward-sloping demand curves. Concluding remarks are presented in Section 8.

2. Hypotheses development

Demand curves can be downward sloping in the long term if investors have persistent heterogeneous valuations and face short-sales constraints (Miller, 1977). Heterogeneous valuations can result from various sources, such as divergence of opinion (Miller, 1977) and background risk (e.g., capital gains tax lock-in; Bagwell, 1991). Fully disentangling the importance of each source of heterogeneous valuations is beyond the scope of this paper. Instead, we focus on factors for which the existing literature has developed clear and testable implications. Specifically, we focus on investigating the implications of theories based on the divergence of opinions (Miller, 1977; Harrison and Kreps, 1978; Scheinkman and Xiong, 2003; Hong, Scheinkman, and Xiong, 2006).

Theoretical works have shown that when short sales are prohibited, the stock price only reflects the beliefs of optimistic investors since pessimistic investors cannot sell short (Miller, 1977). Diether, Malloy, and Scherbina (2002) and Xiong and Yu (2011), among others, report consistent evidence. In equilibrium, the marginal investor is indifferent between buying versus not buying the stock. For a given distribution of investor beliefs, when the float increases, investors that are less optimistic than the current marginal investor would need to buy to clear the market, leading to a lower equilibrium price.

In dynamic models (Harrison and Kreps, 1978; Scheinkman and Xiong, 2003; Hong, Scheinkman, and Xiong, 2006), investors can pay an even higher price on the premise that they will find other investors willing to pay even more in the future. Investors can agree to disagree if they are overconfident (i.e., if each one thinks that his/her information is more accurate than it really is; Scheinkman and Xiong, 2003; Hong, Scheinkman, and Xiong, 2006). The resale option's value is smaller for a larger asset float because, under a larger float, a greater divergence of opinion is needed in the future for investors to resell their shares.

Both the static model (Miller, 1997) and the dynamic models (Harrison and Kreps, 1978; Scheinkman and Xiong, 2003; Hong, Scheinkman, and Xiong, 2006) share the same prediction regarding the relationship between share supply and price. Thus, we propose the following:

Hypothesis 1: An increase in share supply is associated with a decrease in price.

Scheinkman and Xiong (2003) and Hong, Scheinkman, and Xiong (2006) also predict that a change in share supply will change turnover and return volatility. Trading will occur when investors who have long positions become less optimistic than other investors who have no positions. Turnover in a period is determined by the fraction of existing long-position investors who become less optimistic than other investors in that period. Such a change is more likely when a smaller fraction of investors have long positions and, equivalently, when the share base is smaller. The belief of the marginal investor determines the price. Hence, volatility is determined by the volatility of the changes in the marginal investor's belief. When the share base becomes smaller, the marginal investor's belief becomes more extreme and more volatile, which leads to an increase in volatility. Therefore, we develop our second and third hypotheses.

Hypothesis 2: An increase in the share supply is associated with a decrease in turnover.

Hypothesis 3: An increase in the share supply is associated with a decrease in volatility.

Divergence of opinion moderates the negative relationship between share supply and price. Stock is priced based on the belief of the marginal investor, whose view is the least optimistic among the long-position investors. An increase in the share supply needs to be cleared by additional investors who are less optimistic than the current marginal investor. Therefore, price elasticity with respect to supply change is determined by the change in the optimism of the marginal investor. For a given supply change, a larger divergence of opinion is likely to be associated with a larger change in the optimism of the marginal investors, leading to a larger price movement.[7] Therefore, we propose the following:

Hypothesis 4: The elasticity of price to the share supply is higher when the divergence of opinion is larger.

3. Institutional background

3.1 The A/B shares in the Chinese stock market

A unique feature of the Chinese stock market is that several dozen companies issued "twin shares" – two classes of common shares (A/B shares) with identical voting rights and cash flow rights. A-shares were traded by domestic investors, whereas B-shares were restricted to foreign investors before February 2001; after that date, domestic individual investors who own foreign currencies have been allowed to participate in the B-share market.[8] A-shares are quoted and traded in the local Chinese currency (Chinese *yuan*), whereas Shanghai (Shenzhen) B-shares are quoted and traded in the US (Hong Kong) dollars. A-shares and B-shares are not fungible. One cannot buy A-shares of a firm and sell them in the B-share market or vice versa.

[7] For example, suppose that there is a continuum of investors of mass one whose beliefs follow a normal distribution $N(\mu,\sigma^2)$, and each investor can decide to either hold one share or sit out of the market. For a given level of share supply s, the marginal investor's belief is Z_s such that $1-\Phi(Z_s) = s$ where $\Phi(Z_s)$ is the cumulative distribution function. One can easily verify that $\partial Z_s/\partial s$ is an increasing function with respect to σ.

[8] Qualified domestic institutional investors (QDIIs) have approval from the Chinese authority to use domestic funds to invest in foreign assets. Also, some qualified foreign institutional investors (QFIIs) have approval to invest in the A-share market. However, during our sample period, the amounts of QDIIs and QFIIs are very small and have a negligible effect on the market.

Despite the restriction being lifted in 2001, only a small fraction of domestic investors participate in the B-share market (Chan, Wang, and Yang, 2019). Due to the difficulty of accessing foreign currency and other factors, the A-share market and the B-share market are still strongly segmented. Although the two share classes have the same fundamentals, A-shares are traded at a premium on average, and there are large cross-sectional and time-series variations in the A/B share premiums (Fernald and Rogers, 2002; Chan, Menkveld, and Yang, 2008).

3.2 The Split-Share Structure Reform

Before the reform, around two-thirds of the A-shares were non-tradable, and virtually all B-shares were tradable.[9] Tradable shares were mainly the shares that were issued to the public through initial or seasoned equity offerings. The ownership of non-tradable shares is typically highly concentrated among a very small number of investors, but the ownership of tradable shares is highly dispersed. The "tradability assignment" was determined according to interests within an intricate web of bureaucracies at a firm's IPO and could not be changed easily (Campello, Ribas, and Wang, 2014). We find that A-share market return before a firm's A-share IPO was an important determinant of the fraction of A-shares issued to the public and, therefore, tradable, consistent with the market timing effect. In addition, since our sample firms' IPOs were, on average, 11 years before the reform, it is hard to think of any other channel why A-share market return before a firm's A-share IPO could affect A/B share premium change after the reform. We, therefore, use it as an instrument in later analysis.

Non-tradable shareholders lack incentives to improve stock price, and concentrated non-tradable share ownership also tremendously hinders the development of the market for corporate

[9] For A/B share firms in our sample, all B-shares are tradable. There are some non-tradable B-shares for firms that are only listed in the B-share market. However, they are not in our sample.

control (Allen, Qian, and Qian, 2005; Li, Wang, Cheung, and Jiang, 2011). Not surprisingly, most individual tradable share investors, being unable to monitor, tend to be free riders and short-term speculators. Realizing the corporate governance problems associated with the split-share structure, the Chinese government has long planned for the conversion of non-tradable shares. The government conducted two trials in 1999 and 2001, both of which were followed by market crashes due to concerns over a flood of new share supply and soon withdrawn.

In 2005, the Chinese government introduced the Split-Share Structure Reform. In contrast to the previous two trials, the government explicitly stated that tradable A-share investors must be compensated based on a mutual agreement between tradable and non-tradable shareholders. B-share investors did not participate in the compensation plan because the reform did not affect B-shares' supply. Share transfers from non-tradable shareholders to tradable shareholders constituted the predominant form of compensation (Li, Wang, Cheung, and Jiang, 2011; Firth, Lin, and Zou, 2012).

To implement the reform, the China Securities Regulatory Commission (CSRC) selected two batches of firms for trials in April and June 2005. The trials were considered a success, so in August 2005, the reform was expanded to all listed firms. By the end of 2006, the reform was completed for companies representing more than 93% of the total Chinese A-share market capitalization. Most of our sample firms also completed their reforms by December 2006.

Figure 1 shows the timeline of a typical reform for a company. On day t_0, the company announces the start of its reform, and trading is suspended. The non-tradable shareholders, as represented by the board of directors, propose a compensation plan to the tradable shareholders, and then negotiations between non-tradable and tradable shareholders begin. In the event of any disagreement, the plan may be revised. Once both groups reach an agreement, the board announces the finalized reform plan on day t_1, and trading resumes on the same day. Trading is suspended again from the day after the shareholder registration day (day t_2) until the reform is completed (day t_3). Tradable investors also receive their compensation on day t_3. Voting takes place in the period between the registration day and the completion day. Trading resumes after the voting outcome is announced. On average, 81 days elapse from the announcement date to the completion date.

[Insert Figure 1 here]

According to the guidelines issued by the CSRC, a lockup period for the converted non-tradable shares is imposed after the reform. This lockup period has to be at least one year, and the length varies across different non-tradable investors. For investors who own less than 5% of the total number of a firm's shares, all shares will become tradable one year after reform completion. Investors who own more than 5% (typically strategic shareholders and very often the controlling shareholder) are allowed to sell no more than 5% of the total number of a firm's shares within the second year and no more than 10% in the second year and the third year combined. By the end of the third year after the reform, most lockups have expired.[10]

The reform may affect Chinese firms' fundamentals (Campello, Ribas, and Wang, 2014). However, if there are any changes, both A- and B-shares are affected equally. Therefore, change in firm fundamentals should have largely no effect on the A/B share premium. The transferred shares in the compensation plan are immediately tradable after the reform completion date t_3. Therefore, A-share float increases immediately at t_3, and there is also an expectation that future A-share float will further increase as the lockup period gradually expires. The lockup period has minimal effect on the results of the long-run effect, as the horizon we examine is much longer.

[10] We report the detailed lockup expiration schedule in Section 1 of the Internet Appendix.

4. Data and summary statistics

Our primary data source is the CSMAR database. We collect the list of dual-listed A/B share companies, stock trading data (e.g., stock price, returns, trading volume, the total number of shares outstanding, and the number of tradable shares), and firm accounting data.[11] CSMAR also provides detailed data on the reform, including reform announcement date, completion date, compensation details, and the schedule of lockup expirations of non-tradable shares. We also obtain intraday trading data from CSMAR to calculate the bid-ask spread.

We start with all 90 A/B dual-listed firms. We exclude four firms that were delisted before the reform and another seven firms that took more than one year to complete the reform because their event windows are significantly longer than those of the other firms. Our results for the long-term effects remain robust if we impose no filters on our sample. We also delete another three firms that changed their foreign share listing from the B-share market to the Hong Kong Stock Exchange.[12] Our final sample includes 76 A/B share firms. Among these firms, the earliest announcement of reform was made on October 10, 2005, and the last announcement was made on December 30, 2006. The earliest completion date was November 30, 2005, and the latest was August 27, 2007. A total of 69 firms completed their reforms by October 2006, and the remaining seven firms completed their reforms in 2007.

We calculate A-share and B-share market index returns using individual stock trading data from CSMAR. The A-share market return and the B-share market return are value-weighted

[11] We focus on A/B firms because this was the dominant type of dual-class Chinese firms. Dual-listing in the Hong Kong H share market is now more popular than dual-listing in the B share market. However, at the time of the Split-Share Structure Reform, the number of dual-listed A/H firms was only 28. Our results are robust if we include them into our sample. See Section 2 of the Internet Appendix for the results.

[12] These three firms are China International Marine Containers, Livzon Pharmaceutical Group, and China Vanke. They switched their foreign shares from the B-share market to the Hong Kong Stock Exchange in 2012, 2014, and 2014, respectively. Including them in our analysis and using their H-share price after they switched has minimal effect on our results.

returns across all the A-share and B-share stocks, respectively. We use the market capitalization of tradable shares as the weights. The results are almost identical if we use total market capitalization as the weights.

[Insert Table 1 here]

Table 1 reports the summary statistics for our sample firms. We first sort all the firms into two equal-sized groups based on the sample median *ΔFloat* and report the firms' average characteristics in each group. *ΔFloat* is defined as the total number of A-shares divided by the total number of tradable A-shares, measured before the reform announcement. We also conduct a *t*-test and a Wilcoxon test to examine whether the differences in characteristics between the high *ΔFloat* and low *ΔFloat* firms are statistically significant. The average *ΔFloat* for the low *ΔFloat* group is 2.929, suggesting that in this group, the float will increase by 192.9% when all non-tradable shares become tradable. For the high *ΔFloat* group, the average *ΔFloat* is 9.733, suggesting that the float will increase by 873.3%. The average *ΔFloat* is large, and there is also a large cross-sectional variation in *ΔFloat*.

We also compare several firm-level and share-level characteristics. Log(size) is the natural log of total book assets measured at the previous fiscal year-end before the announcement. Dividend payer is a dummy variable indicating whether the firm paid dividends in the year before the reform. Premium is the A/B share price premium and calculated as (Price of A-share)/(Price of B-share) on the last trading day before the announcement. B-share prices are converted into Chinese *yuan* using the exchange rate from CSMAR.

We measure systematic risks following Mei, Scheinkman, and Xiong (2009). Beta (A, A-index) measured A-shares' systematic risks – the covariance between A-share return and A-share market return divided by the variance of A-share market return. Similarly, we calculate two beta variables for B-shares: Beta (B, B-index) and Beta (B, MSCI). The MSCI index is the MSCI World Index, which is widely used as a standard benchmark for global stock returns. Beta (B, B-index) is more relevant to investors whose investment is concentrated in the B-share market, and Beta (B, MSCI) is more relevant to investors whose investment is diversified globally. Volatility (A) and Volatility (B) are, respectively, the standard deviation of daily returns of A-shares and B-shares in the past twelve months before the reform announcements, annualized by multiplying the square root of 252. Turnover (A) and Turnover (B) refer to the trading volume divided by the total number of tradable shares in the past twelve months before the reform announcements. Spread (A) and Spread (B) are, respectively, the proportional bid-ask spread of A-shares and B-shares, calculated over the twelve months before the reform announcement. The magnitudes of Volatility (A), Volatility (B), Spread (A), and Turnover (B) are comparable to that of the U.S. or other developed markets (Ang, Hodrick, Xing, and Zhang, 2009; Chordia and Swaminathan, 2000; Holden and Jacobsen, 2014), but Turnover (A) and Spread (B) are significantly higher than that of the US. Premium, Volatility (A), Turnover (A), and Spread (A) are all significantly correlated with *ΔFloat*, with the high *ΔFloat* group having a higher premium, higher A-share volatility, higher A-share turnover, and lower A-share spread. These correlations are consistent with our hypotheses. Other firm characteristics, including B-share volatility, turnover, and spread, are unrelated to *ΔFloat*.

5. Main results

5.1 *ΔFloat* and change in premium

We use the following model to test whether the demand curves are downward sloping and, if so, how the shape of the demand curves evolve in the long run. In this model, both the dependent variable and independent variable are measured in changes. Therefore, we can rule out the effects of any time-invariant factors.

$$\Delta Premium_{i,(t0,\ t3+N)} = \alpha_N + \beta_N\, \Delta Float_i + \varepsilon_{i,(t0,\ t3+N)}, \quad (1)$$

where i and t indicate firm and time, respectively. $Premium_i$ is the A/B share price premium for firm i and is defined as (Price of A-share)/(Price of B-share). B-share prices are converted into Chinese *yuan* using the exchange rate data from CSMAR. $\Delta Premium_{i,(t0,\ t3+N)}$ is the change in premium from the announcement date t_0 to N months after the completion date t_3. We examine various values of N from 0 to 72 and find our results significant at the 5% level for all these horizons. For brevity, we only report the results for N=0, 1, 12, 24, 36, 48, 60, and 72. We also investigate a specification where the dependent variable is the change in premium from t_0 to December 2014, the end of our sample period. In this specification, the horizon of each firm varies from seven to nine years, depending on its reform completion date.

$\Delta Float$ is the total number of A-shares divided by the total number of tradable A-shares, measured on the last trading day before the reform announcement. Since all non-tradable shares are mandated to convert to tradable status, $\Delta Float$ captures the increase of A-share float. It is important to note that $\Delta Float$ is not equivalent to the increase in supply because non-tradable shareholders may not sell all their holdings. We use $\Delta Float$ as an ex-ante proxy for the ex-post increase in supply. It is important to use an ex-ante measure of share supply change because ex-post measures can contain information. In Section 3 of the Internet Appendix, we show that $\Delta Float$ is highly correlated with the ex-post increase in supply. By December 2014, the share supply increased by 121.6% and 257.6% for the low $\Delta Float$ and high $\Delta Float$ groups, respectively.

If demand curves are downward sloping, we expect β_N to be negative. If demand curves are less steep in the long term than in the short term, we expect the magnitude (i.e., the absolute value) of β_N to decrease when N increases.

[Insert Table 2 here]

Table 2 reports the regression results. Across all the nine different horizons, β_N is negative and statistically significant at the 1% level, except that when N=1, it is significant at the 5% level. β_0 is -0.0277, suggesting that a one-unit increase in A-share float decreases the A/B share premium by 2.77% right after the reform completion. β_1 is -0.0264, which is about the same magnitude as β_0. The absolute magnitude of β_N increases when N=12 (β_{12}=-0.0680) and further increases when N=24 (β_{24}=-0.0786). Afterward, the absolute magnitude of β_N starts to decrease monotonically. The largest decrease in the absolute magnitude of β_N happens from N=24 to N=48. After that, β_N continues to decrease but at a much slower speed. In December 2014, β_N is -0.0349. In an unreported test, we find that the decrease in β_N from N=48 to December 2014 is not statistically significant. The initial increase in the absolute magnitude of β_N is consistent with the fact that most non-tradable shares gradually become tradable in the first few years due to the lockup arrangement. The following decrease in the absolute magnitude of β_N shows that the price impact of supply change partially reverses in the long term, suggesting that demand curves are less steep in the long term than in the short term.

[Insert Figure 2 here]

In Figure 2, we split the sample into two groups based on the median of $\Delta Float$ and plot their average premium from six months before the announcement date (t_0) to 84 months after the completion date (t_3). There is a clear comovement of the A/B share premiums between the two groups of firms, consistent with the well-documented fact that market factors affect the A/B share premium.[13] Before the announcement, the average premium of the high $\Delta Float$ group is around 0.70 higher than that of the low $\Delta Float$ group, consistent with the hypothesis that scarcity in the

[13] For example, the premium is the lowest two months after the reform and the highest around 36 months after the reform. The rise of premium in this period is mainly because the China's A-share market had a big boom while the B-share market price increased less.

share supply leads to a high price (Mei, Scheinkman, and Xiong, 2009). From t_0-6 to t_0, there is no detectable change in the differences between the two groups. Right after the completion date, the difference between the two groups drops to 0.37. Consistent with the pattern we documented in the regressions, the difference reaches its lowest at t_3+17 and gradually reverses afterward. At t_3+84, the difference is 0.27, which is still significantly lower than its pre-reform level.

Our sample is relatively small. To ensure that outliers do not drive our results, in Section 4 of the Internet Appendix, we virtualize each of the nine cross-sections in Table 2 with scatter plots. An inverse relationship is evident between *ΔFloat* and *ΔPremium* for all nine horizons. We also find a few very large *ΔFloat* values. If we exclude the firm whose *ΔFloat* is the largest, the inverse relation becomes even stronger.

One concern is that the premium of high *ΔFloat* firms would have dropped more than low *ΔFloat* firms, even in the absence of the Split-Share Structure Reform. One possibility is that China has been undertaking reforms toward a more business-friendly economy over the last 30 years. If this provides more benefits for B-shares investors of higher *ΔFloat* firms, in the long run, we may also observe a relatively larger reduction in the premium for firms with higher *ΔFloat*. Although we cannot rule out this possibility completely, we provide two sets of evidence inconsistent with it. First, as seen from Figure 2, after the first 36 "turbulent" months, the premiums for high *ΔFloat* and low *ΔFloat* firms move together. If anything, high *ΔFloat* firms' premiums become slightly larger (though not statistically significant) relative to low *ΔFloat* firms. This is inconsistent with the concern put forward at the beginning of this paragraph. Second, we conduct a placebo test by assigning a pseudo reform completion date for all the firms back to December 31, 1996. Coincidentally, from December 31, 1996, to December 31, 2004 (which is the last December before the reform started), the average premium across all the A/B share firms decreased by around

0.50, which is very similar to the average premium decrease in our main sample period (Figure 2). If we regress the change in premium from the pseudo completion date to December 31, 2004, on *ΔFloat*, we show that the coefficient of *ΔFloat* is 0.002 (t=0.14). Both tests show no evidence that different *ΔFloat* firms' premiums change differently in the long run in the absence of the Split-Share Structure Reform.

Overall, these results support Hypothesis 1 that demand curves are downward sloping, even up to around ten years after supply shocks.

5.2 Additional tests

In this section, we provide further evidence supporting our hypothesis and test a few alternative interpretations. First, we conduct analysis using an instrumental variable approach. Second, we examine a few other factors which may also explain our results. Our estimation is biased only if there are other factors that affect A/B shares asymmetrically *and* in a way that is correlated with *ΔFloat*. Factors that affect A/B share symmetrically (e.g., cash flow changes) or factors that are uncorrelated with *ΔFloat* (e.g., market-level factors) will not bias our results. We also investigate how the compensation arrangement affects our results.

5.2.1 An instrumental variable approach

[Insert Table 3 here]

ΔFloat, the ratio between the total number of A-share and the total number of tradable A-shares measured right before the reform, might not be randomly determined. Before the Split-Share Structure Reform, the government had two unsuccessful trials to convert non-tradable shares to tradable status. Given this, it is possible that firms, in anticipation of the ultimate reform, have adopted strategies endogenously. To mitigate this concern, we use the same ratio but measured at a firm's A-share IPO as an instrumental variable for *ΔFloat*. If there were no change in the "tradability assignment" from a firm's IPO to the reform, the ratio would equal to *ΔFloat*. Empirically, in the first stage regression, when we regress *ΔFloat* on the instrumental variable, we get a coefficient of 0.420 (t=10.86, R^2=60.9%), suggesting that the tradable share assignment is strongly persistent. Moreover, the F-statistic equals 107.94 and exceeds the threshold of F=10, which suggests that the instrument is strong (Bound, Baker, and Jaeger, 1995; Staiger and Stock, 1997). Panel A of Table 3 shows that the second stage regressions' coefficients are slightly larger than the estimates from Table 2.

On average, at the time of the reform, our sample firms had been listed for 11 years. It is unlikely that these firms had taken into account what might happen so long in the future when they decided the fraction of non-tradable shares at IPO. Although the major reason for creating non-tradable shares was to keep the government's control of these firms, other considerations may have also played a role. To further mitigate the concerns on omitted variables, we use the A-share market return shortly before their IPO listing date as our second instrumental variable, based on the presumption that these firms might have timed the market. We find that the A-share market return measured from 16 months to four months before a firm's A-share listing is a strong predictor of how many shares were issued to the public and therefore became tradable. This finding is consistent with market timing. We skip three months to reflect the fact that firms' IPO decisions were made a few months before their exchange listings. In the first stage regression, the coefficient on the instrumental variable is 1.96 (t=3.68; R^2=14.5%). The F-statistic equals 13.54 and exceeds the threshold of F=10, which suggests that the instrument is strong. The exclusion criteria are likely to hold, as it is hard to think of any reasons why A-share market return before a firm's A-share IPO, which was on average 11 years before the Split-Share Structure Reform, could affect

A/B share premium change after the reform through channels other than its effect on the fraction of non-tradable shares. Panel B of Table 3 shows that the second stage regressions' coefficients are generally statistically significant, although somewhat weaker than the OLS regression results in Table 2.

5.2.2 *ΔFloat* and the change in systematic risks

[Insert Table 4 here]

Though A-shares and B-shares have the same fundamentals, they may contribute different risks to their investors' portfolios. A-share investors and B-share investors face different investment opportunities: A-share investors mainly invest in China, and B-share investors mainly invest outside mainland China. In Panel A of Table 4, we examine whether the reform changes A-shares' and B-shares' systematic risks and, if so, whether the change of systematic risks is related to *ΔFloat* in a way that can potentially explain the change in the A/B share premium.

We construct three measures of systematic risks following Mei, Scheinkman, and Xiong (2009): Beta (A, A-index), Beta (B, B-index), and Beta (B, MSCI). Each of these three measures is calculated as the covariance between a stock's return and the corresponding index return divided by the variance of index return, just as in Table 1. Our results are similar if we take the possible effects of non-synchronous trading into consideration and estimate betas as the sum of the slopes in a regression of the stock's excess return of the current and prior market excess returns (Dimson, 1979; Fama and French, 1992). The results from Panel A of Table 4 show no evidence that a change in these three systematic risk measures is significantly related to *ΔFloat*, indicating that the negative relationship between premium change and *ΔFloat* is not a manifestation of the change in systematic risks.

5.2.3 *ΔFloat* and the change in liquidity

The change in float may affect liquidity. Searching models predict that matching buyers and sellers is easier when the float is larger (Duffie, Garleanu, and Pedersen, 2005; Vayanos and Wang, 2007; Weill, 2008). In these models, illiquidity is negatively correlated with the float. We investigate whether *ΔFloat* is correlated with liquidity change in Panel B of Table 4. We use proportional bid-ask spread to measure illiquidity. The results show that the A-share spread decrease is negatively correlated with *ΔFloat* and significant (though mostly marginally so) at the 10% level for six of the eight horizons, but the B-share spread change is uncorrelated with *ΔFloat*. These results are consistent with the above searching models.

Liquidity is positively correlated with stock prices (Amihud and Mendelson, 1986). Keeping other factors unchanged, a decrease in the A-share spread should increase the A-share price. Therefore, a liquidity change predicts that the A-share price should increase more for firms with higher *ΔFloat*. Our finding in Table 4 shows the opposite of this prediction and suggests that, in our setting, the demand curve effect dominates the liquidity effect.

5.2.4 *ΔFloat* and the change in corporate governance

Another concern stems from the corporate governance perspective. The reform's stated purpose was to align the incentives of small tradable shareholders with those of controlling non-tradable shareholders. Foreign investors may care more about corporate governance than domestic investors do (Leuz, Lins, and Warnock, 2010). If this is also true for A- and B-share investors, and if corporate governance improves due to the reform, we should expect B-share prices to increase more than A-share prices, leading to a reduction in the A/B share premium. If corporate governance improves more for firms with higher *ΔFloat*, we should expect the A/B share premium to decrease more for firms with higher *ΔFloat* than firms with lower *ΔFloat*. This interpretation is also consistent with our findings shown in Table 2.

This corporate-governance-based explanation predicts that, in the short-term period around the reform, both A-share prices and B-share prices should increase, but B-share prices should increase more than A-share prices. The demand-curve-based explanation predicts that A-share prices should decrease and B-share prices should stay unchanged. In untabulated results, we find that in the reform period (from t_0 to t_3), the A-shares experience a cumulative abnormal return of -24.70% (*t*=-7.50) relative to the contemporaneous A-share market index. In contrast, B-shares experience a cumulative abnormal return of -4.54% (*t*=1.29) relative to the contemporaneous B-share market index.[14] In the cross-section, we find that *ΔFloat* is negatively correlated with the A-share cumulative abnormal return but insignificantly correlated with the B-share cumulative abnormal return. If we regress the A-share cumulative abnormal return around the reform period on *ΔFloat*, the coefficient of *ΔFloat* is -0.0129 (*t*=-2.13). However, if we regress the B-share cumulative abnormal return around the reform period on *ΔFloat*, the coefficient of *ΔFloat* is -0.0047 (*t*=-0.71). These results are inconsistent with the prediction of the corporate-governance-based interpretation but consistent with the demand-curve-based interpretation.

5.2.5 The heterogeneity of non-tradable shareholders

Domestic and foreign investors may have different preferences for government ownership or different preferences for large shareholders. A significant fraction of the non-tradable shares are owned by the government and controlling shareholders. The existence of the government as a shareholder may lead to more government subsidies or bailouts when a firm runs into distress. The

[14] There are 24 B-shares that do not have A-shares and did not conduct the Split-Share Structure Reform. We find similar results whether we include them in the calculation of B-share market index or not.

existence of controlling shareholders may also benefit a firm. Suppose domestic A-share investors are more likely to enjoy these benefits than foreign B-share investors or perceived to be so. In that case, the A-share price can react more negatively than the B-share price in anticipation that state shareholders or controlling shareholders may sell their holdings. We investigate this by examining whether different types of non-tradable shares have different effects.

We obtain detailed ownership data from CSMAR. Two-thirds of the non-tradable shares are owned by the government (stated-owned shares). The remaining one third is owned by other non-state-owned firms (i.e., legal persons). We also classify investors into large non-tradable shareholders and small non-tradable shareholders. Large non-tradable shareholders are those with more than 5% ownership, and small non-tradable shareholders are those with less than 5% ownership. On average, large non-tradable shareholders own 81% of all the non-tradable shares. We define four different changes in float variables: (1) $\Delta Float_i^{SOE}$: the number of state-owned non-tradable shares divided by the number of tradable shares, (2) $\Delta Float_i^{non-SOE}$: the number of non-state-owned non-tradable shares divided by the number of tradable shares, (3) $\Delta Float_i^{Large}$: the number of non-tradable shares owned by shareholders with more than 5% ownership divided by the number of tradable shares, and (4) $\Delta Float_i^{Small}$: the number of non-tradable shares owned by shareholders with less than 5% ownership divided by the number of tradable shares. Across firms, $\Delta Float_i^{SOE}$ is slightly negatively correlated with $\Delta Float_i^{non-SOE}$, with a correlation coefficient of -0.08 and a p-value of 0.50; $\Delta Float_i^{Large}$ and $\Delta Float_i^{Small}$ are slightly positively correlated with a correlation coefficient of 0.15 and a p-value of 0.20. $\Delta Float_i^{SOE}$ and $\Delta Float_i^{Large}$ are highly positively correlated, with a correlation coefficient of 0.88 and a p-value less than 0.001. $\Delta Float_i^{non-SOE}$ and $\Delta Float_i^{Small}$ are also highly positively correlated with a correlation coefficient of 0.54 and a p-value less than 0.001. These results suggest that state shareholders typically own large blocks, while non-state legal persons tend to have small ownership.

[Insert Table 5 here]

Table 5 reports the results. The results show that both $\Delta Float_i^{SOE}$ and $\Delta Float_i^{non-SOE}$ have a statistically significant long-term effect on the A/B share premium. In terms of the statistical significance, the effect of $\Delta Float_i^{SOE}$ is more stable and statistically significant at the 5% level for all of the nine horizons. The absolute value of the coefficients of $\Delta Float_i^{non-SOE}$ is similar to that of $\Delta Float_i^{SOE}$, suggesting that one unit of non-state-owned shares has a similar price impact as one unit of state-owned shares. Given the high correlation between $\Delta Float_i^{SOE}$ and $\Delta Float_i^{Large}$ and between $\Delta Float_i^{non-SOE}$ and$\Delta Float_i^{Small}$, not surprisingly, the results based on $\Delta Float_i^{Large}$ and $\Delta Float_i^{Small}$ are similar.

Overall, these results suggest that both large state-owned shares and small legal person shares have a similar long-term effect on the A/B share premium. These results are inconsistent with the alternative explanation outlined at the beginning of this subsection.

5.2.6 The role of the compensation arrangement

In the reform, tradable A-shareholders are compensated, but the B-shareholders are not. In this subsection, we examine whether our results are affected by this asymmetric compensation arrangement. The compensation is a wealth transfer from non-tradable shareholders to tradable A-shareholders and does not directly impact the firm value or the B-share value. To the tradable A-shareholders, the compensation can be considered an embedded right and may affect A-share prices. A-share investors will receive compensation on the reform completion day, which is also the ex-rights day after which A-share prices will no longer contain the embedded rights. Before the reform completion date, one tradable A-share did not have the same rights as one B-share. If

A-share investors expected this, the A-share price should have increased more than the B-share price in anticipation of the reform and drop more than the B-share at the reform completion date; therefore, the change in premium from t_0 to t_3 may partially reflect the effect of the embedded rights.

The asymmetric compensation arrangement will bias our estimation in Table 2 if firms with higher *ΔFloat* have higher compensation. If this is true, the A/B share premium of higher *ΔFloat* firms would have increased more than that of lower *ΔFloat* firms due to the embedded rights. However, as we can see from Figure 2, there is little evidence that the A/B share premium change is related to *ΔFloat* in the period before the reform announcement. In Section 7, we find that the compensation is too insensitive to *ΔFloat* to explain our finding.

[Insert Table 6 here]

Nevertheless, to further mitigate this concern, we re-run equation (1) by choosing a "clean" pre-event date when the compensation arrangement was not expected and measure the change in premium from this date to months after reform completion. Allowing non-tradable shareholders to compensate tradable shareholders is the key innovation of the Split-Share Structure Reform compared to the two failed trials in 1999 and 2001. Before the reform details were laid out, there was little anticipation that tradable shareholders would receive any compensation. A-share price back then was free of the effect of the compensation and should have been perceived to have the same rights as B-shares. A-shares also have the same rights after the ex-rights date, i.e., the reform completion date. Calculating the change in premium from this "clean" pre-event day will circumvent the effect of the compensation arrangement.

We choose August 15, 2005, as the "pre-event date" because the two official documents governing the operational procedures of the Split-Share Structure Reform were soon to be issued:

Guidance Notes on the Split Share Structure Reform of Listed Companies was issued on August 23, 2005, and *Administrative Measures on the Split Share Structure Reform of Listed Companies* was issued on September 4, 2005. These two documents launched the full-scale reform. Before this, there were two pilot batches. Our results are similar if we set the pre-event day to be May 31, 2005, when the second pilot batch was announced, or March 31, 2005, the last month-end before the first pilot batch was announced. Panel A of Table 6 reports the results. Comparing these results to those presented in Table 2, the absolute magnitude of the coefficients of *ΔFloat* actually increases slightly, suggesting our main findings in Table 2 cannot be explained by the compensation arrangement.

5.2.7 Endogeneity of the timing of the reform

Firms had the freedom to choose the timing of the reform. If firms with different *ΔFloat* have different incentives or the ability to minimize the effect of price impact by timing their reform, this may lead to endogeneity. To evaluate the importance of this possibility, we measure the change in premium from August 15, 2005 (the same as in subsection 5.2.6) to *N* months after December 31, 2007, rather than *N* months after each firm's completion date. In this specification, we avoid using firms' own announcement date or completion date; hence, we also avoid the possible endogeneity of the timing of reform. The market-level factors are also automatically controlled because changes in premiums are calculated over the same period. We find robust results in Panel B of Table 6, indicating that our results are not affected by market-level factors or the potential endogeneity of the timing of firm reforms.[15]

[15] For the last column, the results are exactly the same as those in the last column in Panel A because the premium change is calculated over the same period. Results in other columns differ from the results in Panel A, especially for the first two columns. In Table 2 and Panel A of Table 6, the coefficients of *ΔFloat* show an inverse U-shape when the horizon increases. However, in Panel B of Table 6, the coefficients decrease almost monotonically when the horizon increases. This is because horizon=0 in Panel B is December 2007. Most firms completed their reforms before October 2006. On average, 18 months elapse from reform completion to December 2007. Therefore, horizon=0 in

5.2.8 Controlling for other factors

Next, we draw on the literature and control for a battery of firm characteristics that may influence a firm's change in A/B share premium, including the natural logarithm of total book assets, A-share turnover, and A-share liquidity, a dummy variable indicating whether the firm is a dividend payer, and A-share's market beta, i.e., beta(A, A-index). Total book assets are measured at the latest available year-end before the reform announcement. A-share turnover, A-share liquidity, and beta are calculated over the twelve months before the reform announcement. We report the results in Panel C of Table 6 and find the coefficients on *ΔFloat* to be similar to those in the baseline regression without any controls as in Table 2.

6. Why are demand curves downward sloping?

6.1 Divergence of opinion

The results in Section 5 support Hypothesis 1. We turn to test the other three hypotheses in this section. First, we examine whether *ΔFloat* predicts change in turnover and volatility (Hypotheses 2 and 3). We use the model specification of equation (1) but replace change in premium with either change in turnover or change in volatility. Premium is measured at a time point, but turnover and volatility are calculated over a period. We calculate turnover and volatility for eight periods, which are over the 12-month period centered around the time points when we measure the premium, except for the first period and the last period, which are the first six months after reform completion and from January 2014 to December 2014, respectively.

[Insert Table 7 here]

Panel B of Table 6 is roughly between horizon=12 and horizon=24 in Table 3. Therefore, results in both tables show that the absolute magnitude of *ΔFloat* is highest in the second year after completion.

Table 7 reports the results on Turnover (A), Turnover (B), Volatility (A), and Volatility (B) in four panels, respectively. For Turnover (A), the coefficients of *ΔFloat* are negative except for the [0, 6] period and are significant at the 10% level for six of the eight horizons. For Volatility (A), the coefficients of *ΔFloat* are all negative and significant at the 10% level for five of the eight horizons. The insignificant results for the [0, 6] period for both Turnover (A) and Volatility (A) may result from irregular trading in the period shortly after the reform. *ΔFloat* is uncorrelated with the change of Volatility (B) and Turnover (B). These results are consistent with Hypothesis 2 and Hypothesis 3.

Second, we test the moderating role of divergence of opinion (Hypothesis 4). The theory on the divergence of opinion predicts that demand curves are more downward sloping when the divergence of opinion is larger (Miller, 1977; Chen, Hong, and Stein, 2002; Scheinkman and Xiong, 2003; Hong, Scheinkman, and Xiong, 2006). Following the existing literature (Varian, 1989; Harris and Raviv, 1993; Kandel and Pearson, 1995; Chen, Hong, and Stein, 2001; Garfinkel, 2009), we use turnover to proxy for the divergence of opinion. Turnover is calculated in the 12-month period before the reform.[16]

[Insert Table 8 here]

Panel A of Table 8 reports the results. We sort our sample firms independently by *ΔFloat* and turnover. For each group, we report the average change in premium. For each turnover group, we also report the difference between the high *ΔFloat* group and the low *ΔFloat* group. For both turnover groups, high *ΔFloat* firms are associated with a larger decrease in premium, though in the low turnover group, the difference between the low *ΔFloat* group and the high *ΔFloat* group is not

[16] As we report in Table 1, *ΔFloat* is positively correlated with Turnover (A). Our results are robust if we instead conduct the double sorts by *ΔFloat* and the residuals from the following regression: $Turnover_i(A) = a + \omega\Delta Float_i + e_i$.

statistically significant. In the high turnover group, the high *ΔFloat* group's premium decrease is significantly larger than in the low *ΔFloat* group. Twenty-four months after the completion, the high *ΔFloat* firms' premium decreases by 108.1% more than that of the low *ΔFloat* group. This difference drops to 34.8% by December 2014. In the low turnover group, the high *ΔFloat* group's premium decrease is larger than that of the low *ΔFloat* group except when N=72, but the difference is never statistically significant. A difference-in-difference test shows that the difference between high *ΔFloat* firms and low *ΔFloat* firms is significantly different at the 10% level between the two turnover groups for six of the nine horizons. These results support Hypothesis 4.

6.2 Limits to arbitrage

What prevents demand curves from being flat? In this section, we discuss the role of short-sale constraints and the lack of substitutes. The finding that demand curves are downward sloping in the long run implies that price convergence, if any, is slow. Slow price convergence can itself discourage arbitrageurs. We will demonstrate that the price-level effects that we document are, though economically meaningful, of little interest to an arbitrageur.[17]

6.2.1 Short-sale constraints

The short-sale constraint is an important factor in that if pessimistic investors can sell short, the divergence of opinion may not inflate a stock's price (Miller, 1977). In China, short selling was prohibited until March 31, 2010, when short selling was allowed for a designated list of stocks. None of the B-shares were shortable, and only A-shares of ten firms in our sample were shortable in the latter half of our sample period. Even for these shortable stocks, short selling was not active

[17] In Section 5 of the Internet Appendix, we provide a trading strategy to show how much an arbitrageur can earn even without the short-sale constraint or any other constraint.

due to high lending fees. Short-sale constraints prevent pessimistic investors from expressing their views and arbitrageurs from correcting the mispricing.

6.2.2 Lack of substitutes

If perfect substitutes are available, investors facing supply shocks can easily rebalance their portfolios by trading other substitute stocks. Their rebalancing activities will make demand curves flatter (Wurgler and Zhuravskaya, 2002), and supply shocks should have a spillover effect on substitute stocks (Greenwood, 2005; Greenwood, Hanson, and Liao, 2017).

However, the most natural substitutes for A-shares – their B-shares – are not readily available to most A-share investors due to foreign currency regulation. Available substitutes are other A-shares, including the A-shares of around 1,000 firms that did not issue B-shares. We construct our measure of the availability of substitutes for an A-share following Wurgler and Zhuravskaya (2002). *Lack of Substitutes* is defined as the mean squared error from the regression of a stock's daily returns on the returns of its three closest substitute stocks over the past year. We select the three closest substitute stocks following Wurgler and Zhuravskaya (2002). For an A-share, we place all other A-shares in the same industry into quintiles by the absolute difference between their market capitalization and that of the subject A-share and the difference between their book-to-market ratio and that of the subject A-share's book-to-market ratio. Industries are defined based on the first digit of the CSRC industry classification code, which classifies all firms into 19 industries comparable to the Fama-French 17 industry classification. On average, the three closest substitutes explain 72% of a subject A-share's daily return variation.[18]

[18] This is significantly higher than that in the US market. For a sample of stocks added to the S&P 500 index, Wurgler and Zhuravskaya (2002) find that the three closest substitutes explain around 20% of the firm return variation. The higher return comovement in our Chinese sample is consistent with the high return synchronicity documented by Morck, Yeung, and Yu (2000).

We examine the role of lack of substitutes in two ways. First, we investigate whether there is a spillover effect of the share supply increase. We estimate equation (1) by adding the average *ΔFloat* of firm *i*'s three closest substitute A-shares ("*ΔFloat of Substitutes*") in the equation. The coefficients of *ΔFloat of Substitutes* are all negative and only significant when *N*=12 (coefficient=-0.0302 and *t*-value=-2.30). These results show that the spillover effect is weak.

Second, we investigate whether a lack of substitutes moderates the relationship between share supply and price. Panel B of Table 8 reports the results. Like Panel A, we report the average change of premium for four groups of firms independently sorted by *ΔFloat* and *Lack of Substitutes*.

When A-shares have close substitutes (i.e., when the value of our *Lack of Substitutes* variable is low), the differences in premium changes between the high *ΔFloat* firms and low *ΔFloat* firms are statistically insignificant. On the other hand, when A-shares do not have close substitutes (i.e., when the *Lack of Substitutes* is high), the differences in premium changes between the two *ΔFloat* groups are larger than those when *Lack of Substitutes* is low. The differences are also statistically significant for the first two years after reform (except when *N*=1). These results are consistent with Wurgler and Zhuravskaya (2002). However, the moderating role of *Lack of Substitutes* is small and never statistically significant for horizons longer than 24 months.

Overall, we find that the price pressure of increased float spills over to similar stocks and that the lack of substitutes moderates the relationship between *ΔFloat* and change in premium up to 24 months after the reform completion. However, for longer horizons, both the spillover effect and the moderating effect become weak and generally insignificant. This result is perhaps because even the closest related stocks do not provide a close substitute, especially in the long term, when idiosyncratic risk cumulates. Another possible interpretation is that some investors form their firm-specific opinions and do not regard even similar stocks as adequate substitutes. See Scholes (1972, p181) for a summary of this view.

7. Are downward-sloping demand curves priced ex-ante?

Given that *ΔFloat* is inversely related to the A-share price change, did tradable shareholders expect this, and did they ask for proper compensation? If so, were they compensated based on the short-term or long-term price impact?

On average, tradable shareholders receive 0.337 additional shares from non-tradable shareholders for each tradable share held. The average *ΔFloat* is 6.331. Tradable shareholders will break even if the price impact per unit increase of *ΔFloat* is 6.323% (0.337/(6.331-1)). This is larger than the price elasticity of *ΔFloat* in the long term and larger than that of the very short term, but it is smaller than the price elasticity from 12 months to 36 months after the reform. This suggests that the average compensation received by tradable shareholders cannot fully compensate them when the price impact is largest (when horizon=24), but the compensation is more than enough to compensate an average tradable shareholder if he/she is patient enough to wait for seven to nine years.

[Insert Table 9 here]

The above discussion refers to an average firm. Does compensation vary with respect to *ΔFloat*? If so, does it vary enough to neutralize the different price impacts across firms? We examine these questions by conducting the following regression:

$$Compensation_i = a + b\,\Delta Float_i + \varepsilon_i\,, \quad (2)$$

where $Compensation_i$ is the compensation ratio for firm *i.* Following Firth, Lin, and Zou (2012) and Li, Wang, Cheung, and Jiang (2011), we measure compensation as the number of additional shares received by tradable shareholders from non-tradable shareholders for each tradable share held.[19] Table 9 reports the results. The coefficient of *ΔFloat* is 0.00842, with a *t*-value of 3.20, and is significant at the 1% level. The estimate shows that compensation indeed varies with respect to *ΔFloat*. However, the coefficient suggests that a one-unit increase in float only increases the compensation ratio by 0.842% (about 1.5% if we measure it as the fraction of the B-share prices). In Table 2, we see that a one-unit increase in float reduces the A/B share premium by 7.86% two years after the reform and 3.49% by December 2014. This suggests that, relative to tradable shareholders of firms with low *ΔFloat*, tradable shareholders of firms with high *ΔFloat* are less well compensated for the price impact of increased float. In other words, across firms, the compensation is too insensitive to *ΔFloat*.[20]

8. Conclusions

In this paper, we examine the shape of long-term demand curves for stocks. Specifically, we investigate how the share supply induced by the Split-Share Structure Reform affected Chinese A/B share premiums. The reform increased A-share float but did not affect B-share float. Since A-shares and B-shares have the same fundamentals, investigating A/B share premium dynamics enables us to circumvent two methodological problems of the standard event study analysis on returns. First, reaching a conclusion about long-term demand curves requires an estimation window so long that the ability of the standard event study method to pin down changes in a statistically meaningful way is hampered; second, in the long term, changing firm fundamentals may cloud the inferences that one can draw regarding the shape of demand curves.

[19] For seven firms in our sample, non-tradable shareholders also paid cash to tradable shareholders. We find that paying cash or not is unrelated to *ΔFloat*. We obtain similar results if we define compensation as (total number of additional shares received by tradable shareholders for each tradable share held + cash payment / price per share), where price per share is measured before the announcement date.

[20] Another possibility is that the tradable shareholders are compensated based on even longer term demand curves. However, this seems unlikely given that, on average, investors hold a stock for less than half a year as indicated by the high turnover from Table 1.

We find that, across different firms, a larger increase in A-share float leads to a larger decrease in A/B share premium, even up to around ten years after the supply change. This suggests that demand curves for stocks slope down in the long run, and factors unrelated to systematic risk can have a first-order effect on stock pricing. We also find that an increase in A-share float reduces turnover and return volatility and that prices are more sensitive to supply change when the divergence of opinion is larger. All the evidence is consistent with models based on the divergence of opinion (Scheinkman and Xiong, 2003; Hong, Scheinkman, and Xiong, 2006).

Our results have both asset pricing and corporate finance implications. First, that demand curves slope down in the long run suggests that some frictions can be effective in the long term. Second, this also urges us to rethink the optimal design of corporate financing policies. Existing studies have mainly focus on examining how firms respond to medium-term downward-sloping demand curves (Bagwell, 1992; Hodrick, 1999; Baker, Coval, and Stein, 2007; Gao and Ritter, 2010). The implications of long-term downward-sloping demand curves can be very different. For example, if equity issuance exerts long-term downward pressure on stock prices, firms may choose to bypass positive-net-present-value projects in anticipation of a long-term price impact of equity issuance, even in the absence of managerial myopia. A better developed financial market where demand curves are less downward sloping should improve firms' investment opportunities and, at the aggregate level, stimulate economic growth.

References

Albagli, Elias, Pengjie Gao, and Yongxiang Wang, 2013, Property Rights Protection, Information Acquisition, and Asset Prices: Theory and Evidence, Working Paper.

Allen, Franklin, Jun Qian, and Meijun Qian, 2005, Law, Finance, and Economic Growth in China, *Journal of Financial Economics* 77 (1): 57-116.

Amihud, Yakov, and Haim Mendelson, 1986, Asset Pricing and the Bid-Ask Spread, *Journal of Financial Economics* 17 (2): 223-249.

Ang, Andrew, Robert Hodrick, Yuhang Xing, and Xiaoyan Zhang, 2009, High Idiosyncratic Volatility and Low Returns: International and Further U.S. Evidence, *Journal of Financial Economics* 91 (1): 1-23.

Bagwell, Laurie, 1991, Shareholder Heterogeneity: Evidence and Implications, *American Economic Review* 81 (2): 218-221.

Bagwell, Laurie, 1992, Dutch Auction Repurchases: An Analysis of Shareholder Heterogeneity, *Journal of Finance* 47 (1): 71-105.

Bailey, Warren, 1994, Risk and Return on China's New Stock Markets: Some Preliminary Evidence, *Pacific-Basin Finance Journal* 2 (2-3): 243-260.

Bailey, Warren, Y. Peter Chung, and Jun-Koo Kang, 1999, Foreign Ownership Restrictions and Equity Price Premiums: What Drives the Demand for Cross-Border Investments? *Journal of Financial and Quantitative Analysis* 34 (4): 480-511.

Bailey, Warren, and Julapa Jagtiani, 1994, Foreign Ownership Restrictions and Stock Prices in the Thai Capital Market, *Journal of Financial Economics* 36 (1): 57-87.

Baker, Malcolm, Joshua Coval, and Jeremy Stein, 2007, Corporate Financing Decisions when Investors Take the Path of Least Resistance, *Journal of Financial Economics* 84 (2): 266-298.

Barber, Brad, and John Lyon, 1997, Detecting Long-Run Abnormal Stock Returns: The Empirical Power and Specification of Test Statistics, *Journal of Financial Economics* 43 (3): 341-372.

Beneish, Messod, and Robert Whaley, 1996, An Anatomy of the "S&P Game": The Effects of Changing the Rules, *Journal of Finance* 51 (5): 1909-1930.

Bound, John, David Jaeger, and Regina Baker, 1995, Problems with Instrumental Variables Estimation when the Correlation between the Instruments and the Endogenous Explanatory Variable is Weak, *Journal of the American Statistical Association* 90 (434): 443-450.

Campello, Murillo, Rafael Ribas, and Albert Wang, 2014, Is the Stock Market Just a Side Show? Evidence from a Structural Reform, *Review of Corporate Finance Study* 3 (1-2): 1-38.

Chakrabarti, Rajesh, Wei Huang, Narayanan Jayaraman, and Jinsoo Lee, 2005, Price and Volume Effects of Changes in MSCI Indices – Nature and Causes, *Journal of Banking and Finance* 29 (2): 1237-1264.

Chan, Kalok, Hung Wan Kot, and Gordon Y.N. Tang, 2013, A Comprehensive Long-Term Analysis of S&P 500 Index Additions and Deletions, *Journal of Banking and Finance* 37 (12): 4920-4930.

Chan, Kalok, Albert Menkveld, and Zhishu Yang, 2008, Information Asymmetry and Asset Prices, *Journal of Finance* 63 (1): 159-196.

Chan, Kalok, Baolian Wang, and Zhishu Yang, 2019, Why Investors Do Not Buy Cheaper Securities? An Analysis of Trading by Individual Investors in Chinese Stock Market, *Journal of Banking and Finance* 101: 59-76.

Chang, Yen-Cheng, Harrison Hong, and Inessa Liskovich, 2014, Regression Discontinuity and the Price Effects of Stock Market Indexing, *Review of Financial Studies* 28 (1): 212-246.

Chen, G. M., Bong-Soo Lee, and Oliver Rui, 2001, Foreign Ownership Restrictions and Market Segmentation in China's Stock Market, *Journal of Financial Research* 24 (1): 133-155.

Chen, Joseph, Harrison Hong, and Jeremy Stein, 2001, Forecasting Crashes: Trading Volume, Past Returns, and Conditional Skewness in Stock Prices, *Journal of Financial Economics* 61 (3): 345-381.

Chen, Joseph, Harrison Hong, and Jeremy Stein, 2002, Breadth of Ownership and Stock Returns, *Journal of Financial Economics* 66 (2-3): 171-205.

Chen, Honghui, Gregory Noronha, and Vijay Singal, 2004, The Price Response to S&P 500 Index Additions and Deletions: Evidence of Asymmetry and A New Explanation, *Journal of Finance* 59 (4): 1901-1929.

Chordia, Tarun, and Bhaskraran Swaminathan, 2000, Trading Volume and Cross-autocorrelations in Stock Returns, *Journal of Finance* 55 (2): 913-935.

Coval, Joshua, and Erik Stafford, 2007, Asset Fire Sales (and Purchases) in Equity Markets, *Journal of Financial Economics* 86 (2): 479-512.

Denis, Diane, John McConnell, Alexei Ovtchinnikov, and Yun Yu, 2003, S&P 500 Index Additions and Earnings Expectations, *Journal of Finance* 58 (5): 1821-1840.

Dhillon, Upinder, and Herb Johnson, 1991, Changes in the Standard and Poor's 500 List, *Journal of Business* 64 (1): 75-85.

Diether, Karl, Christopher Malloy, and Anna Scherbina, 2002, Differences of Opinion and the Cross Section of Stock Returns, *Journal of Finance* 57 (5): 2113-2141.

Dimson, Elroy, 1979, Risk Measurement when Shares are Subject to Infrequent Trading, *Journal of Financial Economics* 7 (2): 197-226.

Domowitz, Ian, Jack Glen, and Ananth Madhavan, 1997, Market Segmentation and Stock Prices: Evidence from an Emerging Market, *Journal of Finance* 52 (3): 1059-1085.

Duffie, Darrell, Nicolae Garleanu, and Lasse Heje Pedersen, 2005, Over-the-Counter Markets, *Econometrica* 73 (6): 1815-1847.

Eun, Choel, Sundaram Janakiramanan, and Bong-Soon Lee, 2001, The Chinese Discount Puzzle, Working Paper.

Fama, Eugene, and Kenneth French, 1992, The Cross-Section of Expected Stock Returns, *Journal of Finance* 47 (2): 427-465.

Fernald, John, and John Rogers, 2002, Puzzles in the Chinese Stock Market, *Review of Economics and Statistics* 84 (3): 416-432.

Field, Laura Casares, and Gordon Hanka, 2001, The Expiration of IPO Lockups, *Journal of Finance* 56 (2): 471-500.

Firth, Michael, Chen Lin, and Hong Zou, 2010, Friend or Foe? The Role of State and Mutual Fund Ownership in the Split Share Structure Reform in China, *Journal of Financial and Quantitative Analysis* 45 (3): 685-706.

Frazzini, Andrea, and Owen Lamont, 2008, Dumb Money: Mutual Fund Flows and the Cross-Section of Stock Returns, *Journal of Financial Economics* 88 (2): 299-322.

Gao, Xiaohui, and Jay Ritter, 2010, The Marketing of Seasoned Equity Offerings, *Journal of Financial Economics* 97 (1): 33-52.

Garfinkel, Jon, 2009, Measuring Investors' Opinion Divergence, *Journal of Accounting Research* 47 (5): 13171348.

Goetzmann, William, and Mark Garry, 1986, Does Delisting from the S&P 500 Affect Stock Price? *Financial Analysts Journal* 42 (2): 64-69.

Greenwood, Robin, 2005, Short- and Long-Term Demand Curves for Stocks: Theory and Evidence on the Dynamics of Arbitrage, *Journal of Financial Economics* 75 (3): 607-649.

Greenwood, Robin, 2009, Trading Restrictions and Stock Prices, *Review of Financial Studies* 22 (2): 509-539.

Greenwood, Robin, Samuel Hanson, and Gordon Liao, 2017, Asset Price Dynamics in Partially Segmented Markets, *Review of Financial Studies* Forthcoming.

Harris, Lawrence, and Eitan Gurel, 1986, Price and Volume Effects Associated with Changes in the S&P 500 List: New Evidence for the Existence of Price Pressure, *Journal of Finance* 41 (4): 815-829.

Harris, Milton, and Artur Raviv, 1993, Differences of Opinion Make a Horse Race, *Review of Financial Studies* 6 (3): 473-506.

Harrison, J. Michael, and David Kreps, 1978, Speculative Investor Behavior in a Stock Market with Heterogeneous Expectations, *Quarterly Journal of Economics* 92 (2): 323-336.

Hau, Harald, Massimo Massa, and Joel Peress, 2010, Do Demand Curves for Currencies Slope Down? Evidence from the MSCI Global Index Change, *Review of Financial Studies* 23 (4): 1681-1717.

Hegde, Shantaram, and John McDermott, 2003, The Liquidity Effects of Revisions to the S&P 500 Index: An Empirical Analysis, *Journal of Financial Markets* 6 (3): 413-459.

Hodrick, Laurie, 1999, Does Stock Price Elasticity Affect Corporate Financial Decisions? *Journal of Financial Economics* 52 (2): 225-256.

Holden, Craig, and Stacey Jacobsen, 2014, Liquidity Measurement Problems in Fast, Competitive Markets: Expensive and Cheap Solutions, *Journal of Finance* 69 (4): 1747-1785.

Hong, Harrison, Jose Schenkiman, and Wei Xiong, 2006, Asset Float and Speculative Bubbles, *Journal of Finance* 61 (3): 1073-1117.

Hwang, Chuan-Yang, Shaojun Zhang, and Yanjian Zhu, 2006, Float, Liquidity, Speculation, and Stock Prices: Evidence form the Share Structure Reform in China, Working Paper.

Kandel, Eugene, and Neil Pearson, 1995, Differential Interpretation of Public Signals and Trade in Speculative Markets, *Journal of Political Economy* 103 (4): 831-872.

Karolyi, Andrew, Lianfa Li, and Rose Liao, 2009, A (Partial) Resolution of the Chinese Discount Puzzle: the 2001 Deregulation of the B-Share Market, *Journal of Financial Economic Policy* 1(1): 80-106.

Kaul, Aditya, Vikas Mehrotra, and Randall Morck, 2000, Demand Curves for Stocks Do Slope Down: New Evidence from an Index Weights Adjustment, *Journal of Finance* 55 (2): 893-912.

Kraus, Alan, and Hans Stoll, 1972, Price Impacts of Block Trading on the New York Stock Exchange, *Journal of Finance* 27 (3): 569-588.

Leuz, Christian, Karl Lins, and Francis Warnock, 2010, Do Foreigners Invest Less in Poorly Governed Firms? *Review of Financial Studies* 23 (3): 3245-3285.

Li, Jinliang, Li Liao, and Hongbo Shen, 2013, Price Elasticity for Stocks: Evidence from China's Split-Share Structure Reform, Working Paper.

Li, Kai, Tan Wang, Yan-Leung Cheung, and Ping Jiang, 2011, Privatization and Risk Sharing: Evidence from the Split Share Structure Reform in China, *Review of Financial Studies* 24 (7): 2499-2525.

Liao, Li, Bibo Liu, and Hao Wang, 2014, China's Secondary Privatization: Perspectives from the Split-Share Structure Reform, *Journal of Financial Economics* 113 (3): 500-518.

Liu, Clark, Shujing Wang, and K.C. John Wei, 2021, Demand Shock, Speculative Beta, and Asset Prices: Evidence from the Shanghai-Hong Kong Stock Connect Program, Working Paper.

Liu, Clark, Shujing Wang, K.C. John Wei, and Ninghua Zhong, 2019, The Demand Effect of Yield-Chasing Retail Investors: Evidence from the Chinese Enterprise Bond Market, *Journal of Empirical Finance* 50: 57-77.

Lou, Dong, 2012, A Flow-Based Explanation for Return Predictability, *Review of Financial Studies* 25 (12): 3457-3489.

Lou, Dong, Hongjun Yan, and Jinfan Zhang, 2013, Anticipated and Repeated Shocks in Liquid Markets, *Review of Financial Studies* 26 (8): 1891-1912.

Lynch, Anthony, and Richard Mendenhall, 1997, New Evidence on Stock Price Effects Associated with Changes in the S&P 500 Index, *Journal of Business* 70 (3): 351-383.

Megginson, William, Robert Nash, Jeffry Netter and Annette Poulsen, 2005, The Choice of Private Versus Public Capital Markets: Evidence from Privatizations, *Journal of Finance* 59 (6): 2835-2870.

Mei, Jianping, Jose Scheinkman, and Wei Xiong, 2009, Speculative Trading and Stock Prices: Evidence from Chinese A-B Share Premia, *Annals of Economics and Finance* 10 (2): 225-255.

Miller, Edward, 1977, Risk, Uncertainty, and Divergence of Opinion, *Journal of Finance* 32 (4): 1151-1168.

Mitchell, Mark, Todd Pulvino, and Erik Stafford, 2004, Price Pressure around Mergers, *Journal of Finance* 59 (1): 31-63.

Modigliani, Franco, and Merton Miller, 1958, The Costs of Capital, Corporate Finance and the Theory of Investment, *American Economic Review* 48 (3): 261-297.

Morck, Randall, Bernard Yeung, and Wayne Yu, 2000, The Information Content of Stock Markets: Why Do Emerging Markets have Synchronous Stock Price Movements? *Journal of Financial Economics* 58 (1-2): 215-260.

Ofek, Eli, and Matthew Richardson, 2000, The IPO Lock-Up Period: Implications for Market Efficiency and Downward Sloping Demand Curves, NYU Working Paper.

Patel, Nimesh, and Ivo Welch, 2017, Extended Stock Returns in Response to S&P 500 Index Changes, *Review of Asset Pricing Studies* 7 (2): 172-208.

Scheinkman, Jose, and Wei Xiong, 2003, Overconfidence and Speculative Bubbles, *Journal of Political Economy* 111 (6): 1183-1220.

Scholes, Myron, 1972, The Market for Securities: Substitution Versus Price Pressure and the Effects of Information on Share Price, *Journal of Business* 45 (2): 179-211.

Shleifer, Andrei, 1986, Do Demand Curves for Stocks Slope Down, *Journal of Finance* 41 (3): 579-590.

Staiger, Douglas, and James Stock, 1997, Instrumental Variables Regression with Weak Instruments, *Econometric* 65 (3): 557-586.

Stulz, Rene, and Walter Wasserfallen, 1995, Foreign Equity Investment Restrictions, Capital Flight, and Shareholder Wealth Maximization: Theory and Evidence, *Review of Financial Studies* 8 (4): 1019-1057.

Sun, Qian, and Wilson Tong, 2000, The Effect of Market Segmentation on Stock Prices: The China Syndrome, *Journal of Banking and Finance* 24 (12): 1875-1902.

Varian, Hal, 1989, Differences of Opinion in Financial Markets. In: Stone, C. (Ed.), Financial Risk: Theory, Evidence and Implications: Proceedings of the 11th Annual Economic Policy Conference of the Federal Reserve of St. Louis. Kluwer Academic Publishers, Boston, pp. 3-37.

Vayanos, Dimitri, and Tan Wang, 2007, Search and Endogenous Concentration of Liquidity in Asset Markets, *Journal of Economic Theory* 136 (1): 66-104.

Weill, Pierre-Olivier, 2008, Liquidity Premia in Dynamic Bargaining Markets, *Journal of Economic Theory* 140 (1): 66-96.

Wurgler, Jeffrey, and Ekaterina Zhuravskaya, 2002, Does Arbitrage Flatten Demand Curves for Stocks, *Journal of Business* 75 (4): 583-608.

Xiong, Wei, and Jialin Yu, 2011, The Chinese Warrants Bubble, *American Economic Review* 101 (6): 2723-2753.

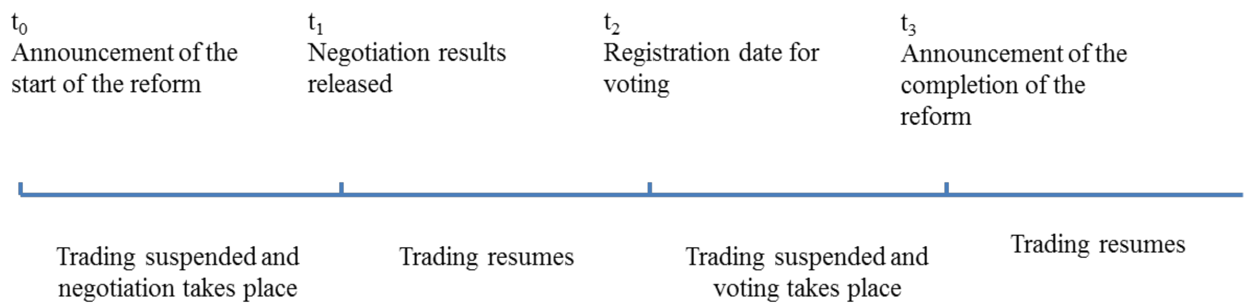

Figure 1. Timeline of a Typical Firm Doing the Split-Share Structure Reform.

Description: This figure is from Li, Wang, Cheung, and Jiang (2011, p. 2503).

Interpretation: On average, there are 81 days from the announcement date (t_0) to the completion date (t_3).

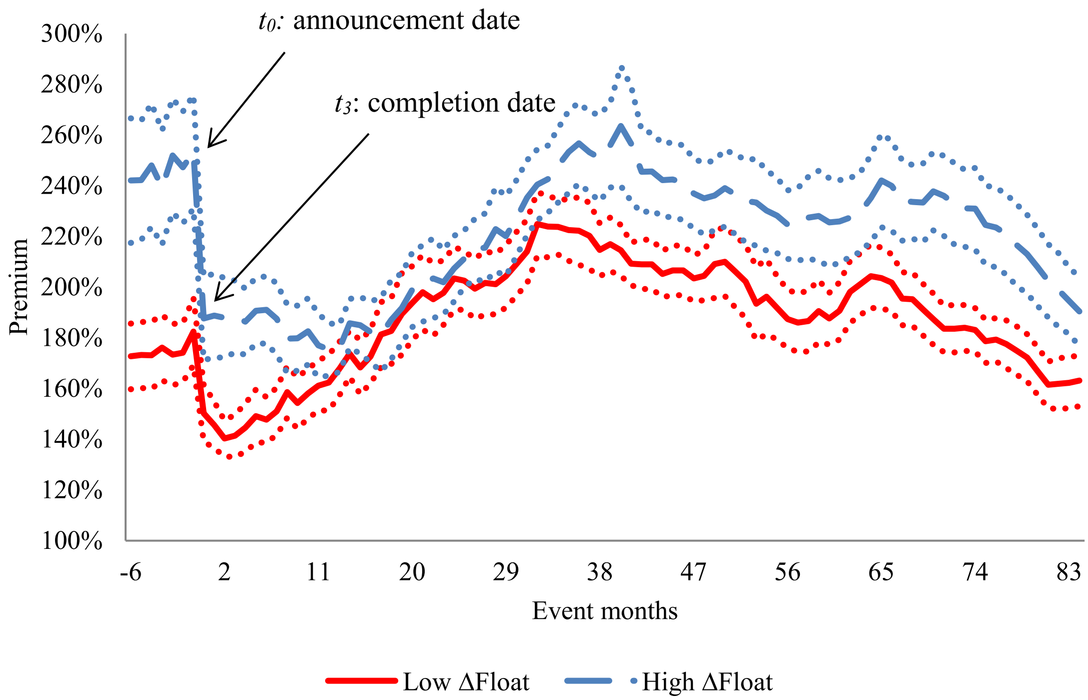

Figure 2. The Average Premium by *ΔFloat*.

Description: This figure shows the average A/B share premium for two groups of firms: one with *ΔFloat* higher than the sample median (the dashed line) and the other with *ΔFloat* lower than the sample median (the solid line). The dotted lines are the 95% confidence intervals. The x-axis shows event months: A negative number indicates the number of months before the announcement date (t_0), and a positive number indicates the number of months after the completion date (t_3). Sample firms have different announcement dates and completion dates and thus aligned using event months. t_0 and t_3 are also indicated separately.

Interpretation: This figure shows that the A/B share premium dropped more for firms with higher *ΔFloat*.

Variable	Low *ΔFloat*	High *ΔFloat*	High - Low	*t*-value	Wilcoxon *p*
ΔFloat	2.929	9.733	6.805	7.21	0.00
Premium	1.825	2.534	0.709	4.59	0.00
Log (size)	21.851	21.465	-0.386	-1.59	0.10
Dividend payer	0.184	0.079	-0.105	-1.36	0.18
Beta (A, A-index)	1.091	1.100	0.009	0.17	0.96
Beta (B, B-index)	0.977	1.076	0.098	1.55	0.23
Beta (B, MSCI)	0.073	0.147	0.074	1.02	0.10
Volatility (A)	0.410	0.498	0.089	2.19	0.04
Volatility (B)	0.396	0.433	0.037	1.26	0.33
Turnover (A)	0.318	0.393	0.076	2.02	0.08
Turnover (B)	0.079	0.078	0.000	-0.03	0.38
Spread (A) *100	0.304	0.376	0.071	2.97	0.00
Spread (B) *100	0.645	0.724	0.079	1.11	0.25

Table 1. Summary Statistics.

Description: This table presents the summary statistics for our sample A/B share firms. We first sort all the firms into two equal-sized groups based on the sample median *ΔFloat* and then report the average characteristics for the firms in each group. We also report the difference between the two groups and associated *t*-value and Wilcoxon *p*-value. *ΔFloat* is defined as the total number of A-shares divided by the total number of tradable A-shares. *Premium* is defined as (Price of A-share)/(Price of B-share). *Premium* is calculated right before the announcement of the reform. Share prices are all denominated in RMB. Log(size) is the natural log of the total book assets in RMB. Dividend payer is a dummy variable indicating whether the firm has paid dividends in the last year before reform. Beta(A, A-index) is the return covariance between A-share and A-share market divided by the variance of A-share market return. Beta(B, B-index) is the return covariance between B-share and B-share market divided by the variance of B-share market return. Beta(B, MSCI) is the return covariance between B-share and the MSCI index return divided by the variance of the MSCI index return. Volatility (A) and Volatility (B) are, respectively, the standard deviation of daily returns of A-shares and B-shares in the past twelve months prior to the reform announcements, multiplied by the square root of 252. Turnover (A) and Turnover (B) are monthly trading volume divided by the total number of tradable shares in the past twelve months prior to the reform announcements. Spread (A) and Spread (B) are, respectively, the proportional bid-ask spread of A-shares and B-shares, calculated over the twelve months prior to the reform announcement.

Interpretation: These summary statistics show that the average *ΔFloat* is large, and there is also a large cross-sectional variation in *ΔFloat*.

Horizon	0	1	12	24	36	48	60	72	Dec-14
ΔFloat	-0.0277	-0.0264	-0.0680	-0.0786	-0.0600	-0.0425	-0.0388	-0.0382	-0.0349
	(-2.87)	(-2.46)	(-5.00)	(-5.36)	(-3.97)	(-3.57)	(-2.89)	(-2.78)	(-2.80)
Intercept	-0.314	-0.340	-0.0601	0.379	0.579	0.303	0.126	0.145	0.114
	(-3.95)	(-3.83)	(-0.54)	(3.13)	(4.64)	(3.08)	(1.14)	(1.28)	(1.11)
Adj. R^2	0.088	0.063	0.242	0.270	0.165	0.135	0.089	0.082	0.084

Table 2. *ΔFloat* and Change in Premium.

Description: This table shows cross-sectional regressions of change in the A/B share premium on *ΔFloat* for various horizons. Change in the A/B premium is the difference between the A/B share premium *t* months after the reform completion date (t_3) minus the premium right before the reform announcement date (t_0). We look at various horizons: *N* refers to *N* months after reform completion. In the last column, *t* is December 2014, which is the end of our sample period. *ΔFloat* is our measure of the change in float. *ΔFloat* is defined as the total number of A-shares divided by the total number of tradable A-shares, measured at the announcement date.

$$\Delta Premium_{i,(t0,\ t3+N)} = \alpha_N + \beta_N\, \Delta Float_i + \varepsilon_{i,(t0,\ t3+N)}.$$

The *t*-statistics are in parentheses.

Interpretation: A-share supply increases lead to a significant drop in the A/B share premium, even by December 2014, which is about ten years after the reform.

Panel A. Using *ΔFloat* measured at a firm's A-share IPO as the instrument

Horizon	0	1	12	24	36	48	60	72	Dec-14
ΔFloat	-0.0427	-0.0447	-0.0963	-0.0996	-0.0699	-0.0581	-0.0590	-0.0514	-0.0461
	(-3.46)	(-3.24)	(-5.47)	(-5.32)	(-3.67)	(-3.83)	(-3.44)	(-2.95)	(-2.93)
Intercept	-0.2196	-0.2242	0.1190	0.5122	0.6418	0.4017	0.2535	0.2280	0.1849
	(-2.35)	(-2.15)	(0.89)	(3.62)	(4.44)	(3.50)	(1.95)	(1.73)	(1.55)
Adj. R^2	0.058	0.026	0.198	0.250	0.160	0.115	0.062	0.071	0.074

Panel B. Using A-share market index return before IPO as the instrument

Horizon	0	1	12	24	36	48	60	72	Dec-14
ΔFloat	-0.0417	-0.0414	-0.0618	-0.0979	-0.0877	-0.0538	-0.0385	-0.0288	-0.0531
	(-1.70)	(-1.51)	(-1.83)	(-2.67)	(-2.30)	(-1.79)	(-1.14)	(-0.83)	(-1.67)
Intercept	-0.2231	-0.2415	-0.0875	0.5161	0.7703	0.3807	0.1286	0.0917	0.2331
	(-1.35)	(-1.31)	(-0.38)	(2.09)	(3.00)	(1.89)	(0.57)	(0.39)	(1.09)
Adj. R^2	0.064	0.042	0.253	0.271	0.148	0.131	0.092	0.080	0.060

Table 3. *ΔFloat* and Change in Premium – An Instrumental Variable Approach.

Description: This table shows cross-sectional regressions of change in the A/B share premium on *ΔFloat* for various horizons using an instrumental variable approach. In Panel A, we use the *ΔFloat* measured at a firm's A-share IPO as the instrument. In Panel B, we use the A-share market index return from 15 months to 4 months before a firm's A-share IPO as the instrument. Change in premium is the difference between the A/B share premium *t* months after the reform completion date (t_3) minus the premium right before the reform announcement date (t_0). We look at various horizons: *N* refers to *N* months after reform completion. In the last column, *t* is December 2014, which is the end of our sample period. *ΔFloat* is our measure of the change in float. *ΔFloat* is defined as the total number of A-shares divided by the total number of tradable A-shares, measured at the announcement date.

$$\Delta Premium_{i,(t0,\ t3+N)} = \alpha_N + \beta_N\, \Delta Float_i + \varepsilon_{i,(t0,\ t3+N)}.$$

The *t*-statistics, estimated using the generalized method of moments (GMM), are in parentheses.

Interpretation: Instrumental variable regressions show that A-share supply increases leads to a significant drop in the A/B share premium.

Panel A. Change in systematic risks

Windows	[0, 6]	[7, 18]	[19, 30]	[31, 42]	[43, 54]	[55, 66]	[67, 78]	[Jan-Dec, 2014]
Panel A1. Beta (A, A-index)								
ΔFloat	-0.007	-0.005	-0.003	-0.004	-0.002	0.004	0.001	-0.004
	(-1.45)	(-0.85)	(-0.50)	(-0.68)	(-0.26)	(0.49)	(0.14)	(-0.54)
Intercept	-0.026	-0.028	-0.055	-0.059	-0.010	0.000	0.068	0.051
	(-0.67)	(-0.56)	(-1.17)	(-1.19)	(-0.20)	(-0.01)	(1.23)	(0.73)
Adj. R^2	0.014	-0.004	-0.010	-0.007	-0.013	-0.010	-0.013	-0.010
Panel A2. Beta (B, B-index)								
ΔFloat	-0.005	0.002	0.003	0.000	-0.006	-0.005	-0.004	-0.020
	(-0.54)	(0.25)	(0.35)	(-0.01)	(-0.65)	(-0.49)	(-0.53)	(-1.88)
Intercept	0.013	-0.010	-0.049	-0.027	-0.004	-0.033	0.018	-0.079
	(0.19)	(-0.16)	(-0.80)	(-0.44)	(-0.06)	(-0.44)	(0.34)	(-1.15)
Adj. R^2	-0.012	-0.015	-0.014	-0.016	-0.009	-0.014	-0.011	0.038
Panel A3. Beta (B, MSCI)								
ΔFloat	-0.014	-0.001	-0.007	-0.005	-0.008	-0.012	-0.010	-0.009
	(-1.50)	(-0.15)	(-0.86)	(-0.71)	(-1.15)	(-1.65)	(-1.09)	(-1.13)
Intercept	0.232	0.239	0.062	0.168	0.289	0.170	0.170	0.032
	(3.09)	(3.46)	(0.93)	(2.82)	(5.19)	(2.90)	(2.36)	(0.49)
Adj. R^2	0.016	-0.014	-0.004	-0.007	0.004	0.023	0.003	0.004

Panel B. Change in liquidity

Windows	[0, 6]	[7, 18]	[19, 30]	[31, 42]	[43, 54]	[55, 66]	[67, 78]	[Jan-Dec, 2014]
Panel B1. Spread (A)								
ΔFloat	-0.500	-0.338	-0.192	-0.473	-0.466	-0.450	-0.519	-0.483
	(-3.01)	(-1.66)	(-0.85)	(-1.82)	(-1.63)	(-1.74)	(-1.81)	(-1.69)
Intercept	-3.774	-11.760	-10.610	-11.820	-15.160	-14.350	-10.300	-11.620
	(-2.75)	(-7.00)	(-5.65)	(-5.47)	(-6.39)	(-6.67)	(-4.35)	(-4.94)
Adj. R^2	0.097	0.023	-0.004	0.030	0.022	0.027	0.029	0.024
Panel B2. Spread (B)								
ΔFloat	-0.249	-0.631	-0.409	-0.126	-0.098	-0.442	-0.139	-0.320
	(-0.65)	(-1.08)	(-0.91)	(-0.21)	(-0.18)	(-0.82)	(-0.25)	(-0.60)
Intercept	-14.82	-27.33	-11.69	-22.77	-33.32	-27.80	-24.20	-34.05
	(-4.79)	(-5.82)	(-3.18)	(-4.73)	(-7.58)	(-6.37)	(-5.40)	(-7.99)
Adj. R^2	-0.008	0.002	-0.003	-0.013	-0.013	-0.005	-0.013	-0.009

Table 4. *ΔFloat* and Change in Systematic Risks and Liquidity.

Description: This table shows cross-sectional regressions of change in the A-share and B-share systematic risks (Panel A) and change in liquidity (Panel B) on *ΔFloat*. Beta (A, A-Index) is the return covariance between A-share return and A-share index return divided by the variance of A-share index return. Beta (B, B-index) and Beta (B, MSCI) are similarly defined. Change in beta is the difference between the beta in a post-completion period and that over the twelve-months before the reform announcement date. We measure liquidity based on the proportional bid-ask spread. Change of Spread (A) is the difference between Spread (A) in a post-completion period and that over the twelve-months before the reform announcement date. Change in Spread (B) is similarly defined. We look at various windows. [0, 6] is from the completion date to six months after the completion date. Other horizons are defined similarly. In the last column, the post-completion period is from January 2014 to December 2014. *ΔFloat* is defined as the total number of A-shares divided by the total number of tradable A-shares, measured at the announcement date. The *t*-statistics are in parentheses.

Interpretation: *ΔFloat* is uncorrelated with systematic risk changes and is associated with improved A-share liquidity.

Panel A. State-owned shareholders versus non-state-owned shareholders

Horizon	0	1	12	24	36	48	60	72	Dec-14
$\Delta Float^{SOE}$	-0.0299	-0.0339	-0.0695	-0.0786	-0.0503	-0.0314	-0.0412	-0.0408	-0.0299
	(-2.75)	(-2.83)	(-4.52)	(-4.75)	(-2.98)	(-2.39)	(-2.72)	(-2.63)	(-2.14)
$\Delta Float^{non-SOE}$	-0.0207	-0.00262	-0.0631	-0.0784	-0.0909	-0.0777	-0.0312	-0.0302	-0.0506
	(-1.12)	(-0.13)	(-2.41)	(-2.78)	(-3.16)	(-3.47)	(-1.21)	(-1.14)	(-2.13)
Intercept	-0.347	-0.383	-0.131	0.300	0.540	0.284	0.0818	0.101	0.0897
	(-4.71)	(-4.72)	(-1.26)	(2.68)	(4.72)	(3.20)	(0.80)	(0.96)	(0.95)
Adj. R^2	0.078	0.074	0.233	0.260	0.171	0.163	0.078	0.072	0.079

Panel B. Large non-tradable shareholders and small non-tradable shareholders

Horizon	0	1	12	24	36	48	60	72	Dec-14
$\Delta Float^{Large}$	-0.0273	-0.0311	-0.0752	-0.0767	-0.0477	-0.0371	-0.0412	-0.0272	-0.0226
	(-2.48)	(-2.54)	(-4.87)	(-4.58)	(-2.80)	(-2.74)	(-2.69)	(-1.76)	(-1.63)
$\Delta Float^{Small}$	-0.0294	-0.00230	-0.0306	-0.0884	-0.124	-0.0704	-0.0263	-0.0953	-0.0984
	(-1.03)	(-0.07)	(-0.76)	(-2.03)	(-2.80)	(-2.00)	(-0.66)	(-2.37)	(-2.72)
Intercept	-0.342	-0.371	-0.134	0.302	0.530	0.265	0.0848	0.116	0.0897
	(-4.68)	(-4.57)	(-1.31)	(2.72)	(4.70)	(2.95)	(0.83)	(1.13)	(0.97)
Adj. R^2	0.076	0.059	0.242	0.260	0.179	0.132	0.078	0.098	0.114

Table 5. *ΔFloat* and Change in Premium: Heterogeneity of Non-Tradable Shareholders.

Description: This table shows cross-sectional regressions of change in the A/B share premium on different components of change in float. In Panel A, we classify non-tradable shares into state-owned and non-state-owned; in Panel B, we classify non-tradable shares into shares owned by large shareholders (more than 5% ownership) and small shareholders. Specifically, we define four different changes in float variables: (1) $\Delta Float_i^{SOE}$: the number of state-owned non-tradable shares divided by the number of tradable shares, (2) $\Delta Float_i^{non-SOE}$: the number of non-state-owned non-tradable shares divided by the number of tradable shares, (3) $\Delta Float_i^{Large}$: number of non-tradable shares owned by shareholders with more than 5% ownership divided by the number of tradable shares, and (4) $\Delta Float_i^{Small}$: the number of non-tradable shares owned by shareholders with less than 5% ownership divided by the number of tradable shares. We investigate the change in premium for various horizons: *N* refers to *N* months after reform completion. In the last column, *t* is December 2014, which is the end of our sample period. The *t*-statistics are in parentheses.

Interpretation: Non-tradable shares owned by the state or others and non-tradable shares owned by small or large shareholders have a similar impact on the A/B share premium.

Panel A. The role the compensation arrangement

Horizon	0	1	12	24	36	48	60	72	Dec-14
ΔFloat	-0.0309	-0.0313	-0.0734	-0.0836	-0.0579	-0.0525	-0.0424	-0.0422	-0.0389
	(-3.97)	(-4.05)	(-6.06)	(-6.28)	(-4.79)	(-5.65)	(-3.89)	(-3.84)	(-3.41)
Intercept	-0.181	-0.203	0.068	0.514	0.703	0.475	0.245	0.286	0.251
	(-2.83)	(-3.19)	(0.68)	(4.70)	(7.09)	(6.23)	(2.74)	(3.16)	(2.68)
Adj. R^2	0.168	0.174	0.328	0.345	0.231	0.298	0.163	0.158	0.127

Panel B. Endogeneity of timing of the reform

Horizon	0	1	12	24	36	48	60	72	Dec-14
ΔFloat	-0.0914	-0.0909	-0.0637	-0.0442	-0.0511	-0.0471	-0.0468	-0.0531	-0.0389
	(-6.66)	(-6.82)	(-5.66)	(-4.49)	(-4.91)	(-3.84)	(-4.69)	(-5.95)	(-3.41)
Intercept	0.452	0.501	0.577	0.412	0.172	0.348	0.092	0.092	0.251
	(4.00)	(4.57)	(6.24)	(5.09)	(2.01)	(3.45)	(1.12)	(1.25)	(2.68)
Adj. R^2	0.379	0.384	0.298	0.208	0.240	0.159	0.223	0.320	0.127

Panel C. Controlling for other factors

Horizon	0	1	12	24	36	48	60	72	Dec-14
ΔFloat	-0.0227	-0.0210	-0.0610	-0.0675	-0.0430	-0.0288	-0.0300	-0.0245	-0.0202
	(-2.31)	(-1.87)	(-4.36)	(-4.58)	(-2.94)	(-2.58)	(-2.15)	(-1.85)	(-1.77)
Log (Size)	0.0023	0.0023	0.0986	0.1204	0.0820	0.0011	-0.0149	0.0173	0.0447
	(0.04)	(0.04)	(1.23)	(1.42)	(0.98)	(0.02)	(-0.19)	(0.23)	(0.68)
Dividend	-0.0215	-0.0211	0.0061	0.1431	0.1601	-0.0905	-0.0198	-0.2279	-0.2283
Payer	(-0.13)	(-0.11)	(0.03)	(0.58)	(0.65)	(-0.48)	(-0.08)	(-1.03)	(-1.20)
Turnover (A)	-0.2000	-0.3480	-0.3379	-0.6801	-0.9041	-0.8006	-0.6730	-0.9893	-0.9352
	(-0.94)	(-1.43)	(-1.12)	(-2.13)	(-2.85)	(-3.30)	(-2.23)	(-3.45)	(-3.79)
Spread (A)	-0.9934	-0.6508	-0.2217	0.1861	-1.5473	-2.3100	-0.9001	-1.9086	-2.2774
	(-1.60)	(-0.92)	(-0.25)	(0.20)	(-1.68)	(-3.27)	(-1.02)	(-2.28)	(-3.17)
Beta (A,	-0.4405	-0.3098	-0.5200	-0.3150	0.1413	0.1246	0.0597	-0.1435	0.0446
A-index)	(-1.88)	(-1.16)	(-1.56)	(-0.90)	(0.41)	(0.47)	(0.18)	(-0.45)	(0.16)
Intercept	0.4779	0.2636	-1.4600	-1.7382	-0.6241	1.1134	0.8907	0.8730	0.1262
	(0.35)	(0.17)	(-0.75)	(-0.85)	(-0.31)	(0.72)	(0.46)	(0.47)	(0.08)
adj. R^2	0.131	0.065	0.266	0.323	0.282	0.298	0.096	0.217	0.294

Table 6. *ΔFloat* and Change in Premium: Additional Robustness Tests.

Description: This table reports additional robustness tests of the main results in Table 2. In Panel A, the premium change is defined as the difference between the A/B share premium *N* months after the reform completion date minus the premium on August 15, 2005. In Panel B, the premium change is defined as the difference between the A/B share premium *N* months after December 31, 2007, minus the premium on August 15, 2005. In Panel C, we add a set of control variables to the regressions. Control variables include Log (Size), Turnover (A), Spread (A), a Dividend Payer dummy, and Beta (A, A-index). Log(size) is the natural log of total book assets in RMB. Dividend payer is a dummy variable indicating whether the firm paid dividends in the last year before reform. Turnover (A) is the monthly trading volume divided by the total number of tradable shares in the past twelve months prior to the reform announcements. Spread (A) is the proportional bid-ask spread of A-shares and B-shares, calculated over the twelve months prior to the reform announcement. Beta(A, A-index) is the return covariance between A-share and A-share market divided by the variance of A-share market return, calculated over the twelve months prior to the reform announcement. *ΔFloat* is defined as the total number of A-shares divided by the total number of tradable A-shares, measured at the announcement date. The *t*-statistics are in parenthesis.

Interpretation: This table reports three sets of robustness analyses of the main results.

Windows	[0, 6]	[7, 18]	[19, 30]	[31, 42]	[43, 54]	[55, 66]	[67, 78]	[Jan-Dec, 2014]
Panel A. Turnover (A)								
ΔFloat	0.002	-0.005	-0.011	-0.017	-0.025	-0.021	-0.014	-0.019
	(0.45)	(-0.83)	(-1.78)	(-2.08)	(-4.20)	(-3.97)	(-3.33)	(-4.25)
Intercept	0.206	0.554	0.291	0.501	0.357	0.217	0.013	0.160
	(2.87)	(6.44)	(3.52)	(4.64)	(4.37)	(3.01)	(0.24)	(2.70)
Adj. R^2	-0.011	-0.004	0.029	0.043	0.183	0.168	0.118	0.188
Panel B. Turnover (B)								
ΔFloat	-0.001	0.000	0.000	-0.001	0.000	0.001	0.000	-0.001
	(-0.42)	(0.19)	(0.48)	(-0.84)	(-0.09)	(0.72)	(-0.38)	(-0.88)
Intercept	0.067	0.171	0.017	0.087	0.040	0.002	-0.016	-0.009
	(5.91)	(7.92)	(2.12)	(6.67)	(3.45)	(0.20)	(-2.17)	(-1.06)
Adj. R^2	-0.011	-0.013	-0.011	-0.004	-0.014	-0.007	-0.012	-0.003
Panel C. Volatility (A)								
ΔFloat	-0.004	-0.011	-0.009	-0.006	-0.008	-0.007	-0.006	-0.007
	(-0.61)	(-2.79)	(-1.96)	(-1.36)	(-1.89)	(-1.73)	(-1.53)	(-1.56)
Intercept	0.182	0.276	0.301	0.157	0.073	0.031	-0.019	-0.008
	(1.92)	(5.45)	(5.02)	(2.71)	(1.31)	(0.56)	(-0.35)	(-0.14)
Adj. R^2	-0.008	0.085	0.037	0.011	0.034	0.026	0.017	0.019
Panel D. Volatility (B)								
ΔFloat	-0.002	-0.002	-0.003	-0.004	-0.003	-0.004	-0.004	-0.006
	(-0.74)	(-0.89)	(-0.84)	(-1.15)	(-1.01)	(-1.37)	(-1.29)	(-1.94)
Intercept	0.028	0.153	0.108	0.032	-0.079	-0.079	-0.109	-0.165
	(1.33)	(6.83)	(4.25)	(1.25)	(-3.35)	(-3.13)	(-4.90)	(-6.85)
Adj. R^2	-0.006	-0.003	-0.004	0.004	0.000	0.012	0.009	0.036

Table 7. *ΔFloat* and Change in Turnover and Volatility.

Description: This table shows cross-sectional regressions of change in Turnover (A), Turnover (B), Volatility (A), and Volatility (B) on *ΔFloat* for various horizons. Change in Turnover (A) is the difference between A-share turnover calculated in a post-completion period and A-share turnover calculated over the twelve-month period before the reform announcement. Change in Turnover (B), change in Volatility (A), and change in Volatility (B) are similarly defined. Various horizons, as listed in the first row of the table, are examined. The window [i, j] refers to the period from i months after the completion date to j months after the completion date. We also examine a period from January 2014 to December 2014 and report it in the last column. *ΔFloat* is defined as the total number of A-shares divided by the total number of tradable A-shares, measured at the announcement date. The t-statistics are in parentheses.

Interpretation: *ΔFloat* is associated with a decrease in A-share turnover and a decrease in A-share volatility.

Panel A. Divergence of opinion

Turnover (A)	*ΔFloat*	0	1	12	24	36	48	60	72	Dec-14
Low	Low	-0.347	-0.356	-0.269	0.217	0.391	0.270	-0.015	0.069	0.117
	High	-0.508	-0.491	-0.444	-0.030	0.338	0.010	-0.037	0.127	-0.034
	High-Low	-0.161	-0.134	-0.176	-0.247	-0.053	-0.260	-0.021	0.059	-0.151
	t-stat	-1.27	-0.96	-1.05	-1.26	-0.32	-1.51	-0.13	0.30	-0.84
	Wilcoxon p	0.17	0.29	0.39	0.24	0.65	0.24	0.94	0.55	0.53
High	Low	-0.295	-0.382	-0.126	0.232	0.424	0.195	0.124	-0.053	-0.077
	High	-0.791	-0.786	-1.081	-0.849	-0.320	-0.325	-0.519	-0.505	-0.424
	High-Low	-0.496	-0.404	-0.955	-1.081	-0.744	-0.520	-0.643	-0.452	-0.348
	t-stat	-3.28	-2.27	-4.04	-4.63	-2.65	-2.78	-2.79	-2.17	-1.80
	Wilcoxon p	0.02	0.07	0.00	0.00	0.02	0.02	0.02	0.05	0.09
	Diff-in-Diff	-0.334	-0.270	-0.779	-0.834	-0.691	-0.260	-0.622	-0.510	-0.196
	t-stat	-1.69	-1.19	-2.69	-2.73	-2.12	-1.02	-2.21	-1.78	-0.74

Panel B. Lack of substitutes

Lack of Substitutes	*ΔFloat*	0	1	12	24	36	48	60	72	Dec-14
Low	Low	-0.299	-0.302	-0.105	0.322	0.589	0.342	0.127	0.120	0.104
	High	-0.389	-0.365	-0.197	0.032	0.389	0.159	0.031	0.128	0.085
	High-Low	-0.090	-0.063	-0.092	-0.290	-0.200	-0.183	-0.096	0.008	-0.020
	t-stat	-0.95	-0.59	-0.54	-1.45	-0.97	-1.19	-0.56	0.04	-0.12
	Wilcoxon p	0.36	0.46	0.67	0.17	0.29	0.18	0.46	0.71	0.81
High	Low	-0.368	-0.496	-0.386	0.036	0.057	0.027	-0.095	-0.198	-0.127
	High	-0.796	-0.792	-1.083	-0.717	-0.215	-0.336	-0.458	-0.378	-0.408
	High-Low	-0.428	-0.296	-0.696	-0.753	-0.271	-0.362	-0.363	-0.181	-0.282
	t-stat	-2.39	-1.45	-3.00	-2.93	-1.02	-1.78	-1.50	-0.75	-1.30
	Wilcoxon p	0.07	0.20	0.01	0.01	0.36	0.12	0.23	0.63	0.17
	Diff-in-Diff	-0.338	-0.233	-0.605	-0.463	-0.071	-0.179	-0.267	-0.189	-0.262
	t-stat	-1.66	-1.01	-2.11	-1.42	-0.21	-0.70	-0.90	-0.62	-0.95

Table 8. The Moderating Role of the Divergence of Opinion and the Lack of Substitutes.

Description: This table reports independent double-sorted group averages of the change in premium for various horizons. In Panel A, we sort our sample A/B stock pairs into 2*2 groups by Turnover (A) and *ΔFloat*. In Panel B, we sort our sample A/B stock pairs into 2*2 groups by Lack of Substitutes and *ΔFloat*. Turnover (A) is calculated as A-share trading volume divided by the total number of tradable A-shares prior to the announcement. Lack of Substitutes is defined as the mean squared error from a daily regression of a stock's returns on returns of its three closest substitute stocks over the past one year, following Wurgler and Zhuravskaya (2002). *ΔFloat* is defined as the total number of A-shares divided by the total number of tradable A-shares, measured at the announcement date. We look at various horizons: *N* refers to *N* months after reform completion. In the last column, *t* is December 2014, which is the end of our sample period.

Interpretation: The effect of the A-share supply increase on the A/B share premium is stronger when the divergence of opinion is higher, but the effect of lack of substitutes is temporary.

	Compensation
ΔFloat	0.00842
	(3.20)
Intercept	0.284
	(12.92)
adj. R^2	0.115

Table 9. Are the Downward-Sloping Demand Curves Priced Ex-Ante?

Description: This table studies relations between the compensation ratio and *ΔFloat*. We conduct a cross-sectional regression of compensation ratio (λ) on *ΔFloat*. Compensation ratio (λ) is defined as the number of shares that tradable shareholders receive for each unit of shares they held before the reform. *ΔFloat* is defined as the total number of A-shares divided by the total number of tradable A-shares, measured at the announcement date.

$$\lambda_i = \alpha + \beta * \Delta Float_i + \varepsilon_i$$

The *t*-statistics are in parentheses.

Interpretation: Tradable shareholder compensation is positively related to the expected A-share supply increase.

Paper	Empirical Setting	Longest Horizon
Shleifer (1986)	S&P 500 additions	60 days
Harris and Gruel (1986)	S&P 500 additions	2 weeks
Goetzmann and Garry (1986)	S&P 500 deletions	1 month
Dhillon and Johnson (1991)	S&P 500 additions	60 days
Beneish and Whaley (1996)	S&P 500 additions	60 days
Lynch and Mendenhall (1997)	S&P 500 additions and deletions	10 days
Ofek and Richardson (2000)	IPO lockup expiration	20 days
Kaul, Mehrotra, and Morck (2000)	Redefinition of Toronto Stock Exchange index	6 weeks
Field and Hanka (2001)	IPO lockup expiration	50 days
Wurgler and Zhuravskaya (2002)	S&P 500 additions	20 days
Chen, Noronha, and Singal (2004)	S&P 500 additions and deletions	60 days
Mitchell, Pulvino, and Stafford (2004)	Acquirer stocks in mergers	1 month
Chakrabarti, Huang, Jayaraman, and Lee (2005)	Redefinitions of MSCI Global Equity Index	10 days
Greenwood (2005)	Redefinitions of Nikkei 225	20 weeks
Hwang, Zhang, and Zhu (2006)	The Split-Share Structure Reform	a few months
Coval and Stafford (2007)	Mutual fund flows	2 years
Frazzini and Lamont (2008)	Mutual fund flows	3 years
Greenwood (2009)	Selling restriction in stock splits	2 months
Hau, Massa, and Peress (2010)	Redefinitions of MSCI Global Equity Index	10 days
Lou (2012)	Mutual fund flows	3 years
Li, Liao, and Shen (2013)	The Split-Share Structure Reform	20 days
Lou, Yan, and Zhang (2013)	Treasury auctions	5 days
Chang, Hong, and Liskovich (2014)	Russell index additions and deletions	4 months
Patel and Welch (2017)	S&P 500 additions and deletions	6 months
Liu, Wang and Wei (2021)	Shanghai-Hong Kong Stock Connect Program	60 days

Table A1. Summary of Related Studies

Description: This table summarizes the empirical settings and the longest horizons studied by related papers. The papers are sorted based on the year of publication.

Interpretation: The existing studies on the shape of demand curves did not examine horizons longer than two years, which is significantly shorter than what we examine in this paper.

Internet Appendix for

"Demand Curves for Stocks Slope Down in the Long Run: Evidence from the Chinese Split-Share Structure Reform"

This appendix reports on extensions and robustness tests of the results reported in "Demand Curves for Stocks Slope Down in the Long Run: Evidence from the Chinese Split-Share Structure Reform." Section 1 reports the process of the lockup expiration of the non-tradable shares. Section 2 reports the regression results when we include the A/H shares. We also report the results if we only include the A/H shares. Section 3 reports the results on how *ΔFloat* is associated with the actual A-share supply increase as measured by non-tradable shareholders' selling. We find that firms with higher *ΔFloat* indeed experienced a higher A-share supply. Section 4 displays the relation between change in premium and *ΔFloat* using scatter plots. Section 5 reports the analysis of a trading strategy trying to exploit the predictable effect of the long-term demand curve.

Section 1. The process of lockup expiration

According to the guidelines issued by the CSRC, a lockup period for the converted non-tradable shares is imposed. This lockup period has to be at least one year, and the length varies across different non-tradable investors. For investors who own less than 5% of the total number of a firm's shares, all shares will become tradable one year after reform completion. Investors who own more than 5% (typically strategic shareholders and very often the controlling shareholder) are allowed to sell no more than 5% of the total number of a firm's shares within the second year and no more than 10% in the second year and the third year combined. By the end of the third year after the reform, most lockups have expired. We report the detailed lockup expiration schedule in Table IA1.

Section 2. *ΔFloat* and change in premium – including A/H firms

In Table IA2, we include the A/H firms into our sample. The paper focuses on A/B firms because this was the dominant type of dual-class Chinese firms. Dual-listing in the Hong Kong H share market is now more popular than dual-listing in the B share market. However, at the Split-Share Structure Reform, the number of dual-listed A/H firms was only 28. Our results are robust if we include them in our sample.

Section 3. *ΔFloat* and non-tradable shareholders' trading

Our identification relies on the assumption that *ΔFloat* is a good proxy for the increase in supply. The existing literature has made the same assumption (Firth, Lin, and Zou, 2010; Li, Wang, Cheung, and Jiang, 2011). Megginson, Nash, Netter, and Poulsen (2005), using a sample of 900 privatization cases around the world, also find that, on average, governments sell 35% of their ownership in state-owned enterprises. In this subsection, we collect data and examine whether *ΔFloat* is correlated with non-tradable shareholders' selling.[1]

We manually collect data on non-tradable shareholders' holdings from firms' annual reports. Firms are required to report their ten largest shareholders for each fiscal year-end. For each firm, we obtain the list of its non-tradable shareholders at the most recent year-end before the reform and collect their holdings for each year-end afterward. On average, these non-tradable shareholders hold 81% of the non-tradable shares in the year-end before the reform. We assume its ownership

[1] Firms can also conduct seasoned equity offerings to increase their share supply. In our sample period, firms were not allowed to issue additional B-shares. We therefore examine whether A-share issuance is related to *ΔFloat*. In Table IA4 of the Internet Appendix, we find that firms' issuance is unrelated to *ΔFloat*.

becomes zero for a non-tradable shareholder who later disappears from the ten largest shareholder list. The average (highest) ownership of our sample firms' tenth largest shareholder is 0.39% (1.41%). The results are very similar if we assume that the ownership of the disappeared non-tradable shareholder equals that of the tenth largest shareholder.

Figure IA1 presents the aggregate holdings of these non-tradable shareholders. The x-axis is the year relative to the reform. The y-axis is the ratio of non-tradable shareholders' aggregate holdings to the initial number of tradable shares, where the initial number of tradable shares is measured at t_0 and adjusted by stock splitting and new issuance. Non-tradable shareholders' aggregate holdings are 4.76 times of the initial tradable shares. The ratio decreases to 2.89 by the end of 2014. On average, non-tradable shareholders sell 40% of their holdings. They still control most of the firms, but their ownership significantly decreases from 70% to 42%. It is also evident that most of the change occurs in the first three years after the reform, and the speed of selling becomes much slower after that.

In Table IA3, we investigate whether *ΔFloat* is correlated with the decrease in non-tradable shareholders' holdings by regressing the decrease in non-tradable shareholders' holdings over different horizons on *ΔFloat*. The coefficients of *ΔFloat* are positive for all of the horizons. They increase in the first few years and become flat from year five onwards. This is consistent with the pattern in Figure IA1. In December 2014, the coefficient of *ΔFloat* is 0.20 (t=3.76), and the intercept is 0.63. Table 1 shows that the average *ΔFloat* of the low and high *ΔFloat* groups is 2.93 and 9.73. These estimates imply that, by December 2014, the share supply increased by 121.6% and 257.6% for the low *ΔFloat* and high *ΔFloat* groups, respectively. Overall, these results confirm that non-tradable shareholders do sell and that their selling is strongly positively correlated with *ΔFloat*, indicating that *ΔFloat* is a good proxy for A-share supply increase.

Section 4. Virtualizing the main results

Our sample is relatively small. To ensure that our results are not driven by outliers, in Figure IA2, we virtualize each of the nine cross-sections in Table 2 with scatter plots. A clear inverse relationship is evident between *ΔFloat* and *ΔPremium* for all nine horizons. We also find a few very large *ΔFloat* values. If we exclude the firm whose *ΔFloat* is the largest, the inverse relation becomes even stronger.

Section 5. A trading strategy

Considering a hypothetical world where short selling is allowed and foreign currency regulation is lifted, would an arbitrageur be able to profit from the pricing discrepancies across different A/B shares in our sample? To exploit the pricing discrepancies, an arbitrageur would have to buy the A-shares with high *ΔFloat* and short the A-shares with low *ΔFloat*. Suppose he buys the A-shares with ΔFloat above the sample median and shorts the A-shares with ΔFloat below the sample median, from the month after the reform completion (t3) to December 2014. In that case, the average monthly equally-weighted portfolio alpha is -0.14% (*t*=-0.44). If he hedges his positions in A-shares with opposite positions in B-shares, his portfolio alpha would be -0.11% (*t*=-0.36). Even if this arbitrageur had perfect foresight that the price impact would be the largest around two years after the reform and only started to implement the above trading strategy in January 2008, his alpha would be 0.42% (t=1.79) (0.30% if he hedged with trading B-shares (t=0.90)). However, it is unlikely that someone will have perfect foresight.

These results are not surprising because the demand curves become flattered very slowly. The price effects we document only translate into a very small expected return difference between various A-shares. This logic also sheds light on why arbitrage is unlikely to eliminate the price pressure effects caused by float change. Even if an arbitrageur can short sell and have free access to foreign currency, transaction costs such as commissions can easily eat all possible profits. Here we have a case with economically meaningful price-level effects, but little that would be of interest to an arbitrageur.

Table IA1. The process of lockup expiration

This table summarizes the schedule of lockup expiration in the Split-Share Structure Reform. Panel A reports the forecasted lockup expiration. The forecasted lockup expiration is based on the firms' disclosure right after the completion date. Panel B reports the actual lockup expiration. Because some investors make further promises, actual lockup expiration may take longer than forecast, but the difference is small. We define the periods as follows: [0, 6] includes the first six months after reform completion, i.e., t_3 to t_3+6. Other periods are defined similarly. The last column reports the percentage of shares that are still subject to lockup by the end of 2014. In each period, we calculate the percentage of unlocked shares this period over the total non-tradable shares at the start of the reform and take an average over our sample firms. The values reported are in percentages. Data on both forecasted and actual lockup expiration are available from the China Stock Market & Accounting Research (CSMAR) database.

Windows	[0,6]	[7,18]	[19,30]	[31,42]	[43,54]	[55,66]	[67,78]	[79,Dec-14]	Dec-14
Panel A. The forecasted lockup expiration									
Mean	10.291	18.807	13.039	46.423	5.563	4.664	1.212	0.000	0.000
Median	8.450	14.085	9.813	51.136	0.000	0.000	0.000	0.000	0.000
Panel B. The actual lockup expiration									
Mean	10.291	16.330	8.704	42.358	5.582	6.696	1.593	3.777	4.669
Median	8.450	11.422	6.920	44.233	0.000	0.000	0.000	0.000	0.000

Table IA2. *ΔFloat* and change in premium – including A/H firms

This table shows cross-sectional regressions of change in the A/B (or A/H) share premium on *ΔFloat* for various horizons. In Panel A, the sample includes both the A/B firms and the A/H firms. In Panel B, the sample only includes the A/H firms. Change in the A/B (A/H) premium is the difference between the A/B (A/H) share premium *t* months after the reform completion date (t_3) minus the premium right before the reform announcement date (t_0). A/B Dummy equals one for A/B firms and zero for A/H firms. We look at various horizons: *N* refers to *N* months after reform completion. In the last column, *t* is December 2014, which is the end of our sample period. *ΔFloat* is our measure of the change in float. *ΔFloat* is defined as the total number of A-shares divided by the total number of tradable A-shares, measured at the announcement date. AB Dummy is a dummy variable if the firm is dual-listed in the A- and B- markets, and 0 if dual-listed in the A- and H-markets.

$$\Delta Premium_{i,(t0,\ t3+N)} = \alpha_N + \beta_N\, \Delta Float_i + \gamma AB\ Dummy_i + \varepsilon_{i,(t0,\ t3+N)}.$$

The *t*-statistics are in parentheses.

Panel A. A/B firms and A/H firms

Horizon	0	1	12	24	36	48	60	72	Dec-14
ΔFloat	-0.0247	-0.0277	-0.0456	-0.0573	-0.0415	-0.0310	-0.0310	-0.0359	-0.0253
	(-2.44)	(-2.10)	(-2.89)	(-4.25)	(-3.00)	(-3.11)	(-2.96)	(-2.95)	(-2.41)
A/B	-0.3781	-0.6075	-1.0989	-1.1194	-0.7281	-0.4044	-0.4320	-0.5830	-0.0768
Dummy	(-3.01)	(-3.72)	(-5.61)	(-6.69)	(-4.24)	(-3.27)	(-3.32)	(-3.86)	(-0.59)
Intercept	0.0446	0.2755	0.8971	1.3636	1.1898	0.6347	0.5081	0.7129	0.1300
	(0.34)	(1.62)	(4.41)	(7.84)	(6.65)	(4.93)	(3.75)	(4.54)	(0.96)
Adj. R^2	0.103	0.127	0.255	0.354	0.182	0.140	0.136	0.161	0.037

Panel B. A/H firms

Horizon	0	1	12	24	36	48	60	72	14-Dec
ΔFloat	-0.0183	-0.0304	0.0019	-0.0120	-0.0021	-0.0067	-0.0143	-0.0308	-0.0094
	(-0.70)	(-0.81)	(0.04)	(-0.43)	(-0.07)	(-0.38)	(-0.95)	(-1.21)	(-0.41)
Intercept	-0.0029	0.2954	0.5447	1.0280	0.8978	0.4543	0.3846	0.6757	0.1755
	(-0.01)	(0.83)	(1.36)	(3.85)	(3.22)	(2.69)	(2.68)	(2.78)	(0.81)
Adj. R^2	-0.019	-0.013	-0.038	-0.031	-0.038	-0.033	-0.003	0.017	-0.032

Table IA3. *ΔFloat* and non-tradable shareholders' selling

This table reports how *ΔFloat* is related to non-tradable shareholders' selling. We measure their selling by tracking the change in ownership of the non-tradable shareholders who are on the ten largest shareholders list at the most recent year-end before the announcement of the reform (t_0). For a non-tradable shareholder who later disappears from the ten largest shareholder list, we assume its ownership becomes zero. To be consistent with the way we measure *ΔFloat*, we scale the non-tradable shareholders' holdings by the initial number of tradable shares at t_0. We track their aggregate holdings for the first six years after the completion of the reform (t_3) and also in December 2014. In the regressions, the dependent variable is the decrease in holdings from the most recent year-end before the reform announcement to *N* years after the reform completion. *ΔFloat* is defined as the total number of A-shares divided by the total number of tradable A-shares, measured at the announcement date. The *t*-statistics are in parentheses.

Horizon (years)	0	1	2	3	4	5	6	Dec-14
ΔFloat	0.0670	0.0915	0.1284	0.1502	0.1644	0.1917	0.1754	0.1959
	(2.66)	(3.23)	(2.95)	(3.08)	(3.27)	(3.66)	(3.46)	(3.76)
Intercept	0.2363	0.3232	0.2968	0.4607	0.5146	0.4332	0.5158	0.6298
	(1.09)	(1.38)	(0.83)	(1.15)	(1.24)	(1.00)	(1.23)	(1.47)
Adj. R^2	0.075	0.112	0.093	0.102	0.114	0.142	0.128	0.149

Table IA4. *ΔFloat* and share issuance

This table reports how *ΔFloat* is related to asymmetric share issuance in the A/B markets. The dependent variable is the change in the ratio between A/B shares outstanding. Change in the ratio between A/B shares outstanding is the difference between the ratio *N* years after the reform completion date (t_3) minus the premium right before the reform announcement date (t_0). We look at various horizons: from one to six years after the completion. In the last column, *t* is December 2014, which is the end of our sample period. *ΔFloat* is our measure of the change in float. *ΔFloat* is defined as the total number of A-shares divided by the total number of tradable A-shares, measured at the announcement date. The *t*-statistics are in parentheses.

Horizon (years)	0	1	2	3	4	5	6	Dec-14
ΔFloat	0.0236	0.0260	0.0217	0.0032	0.0175	0.0057	0.0032	0.0298
	(0.62)	(0.65)	(0.54)	(0.07)	(0.32)	(0.10)	(0.04)	(0.29)
Intercept	0.0242	0.0779	0.1372	0.4708	0.5533	0.7303	1.0474	1.5281
	(0.08)	(0.24)	(0.41)	(1.24)	(1.24)	(1.61)	(1.57)	(1.82)
Adj. R^2	-0.008	-0.008	-0.010	-0.013	-0.012	-0.013	-0.013	-0.012

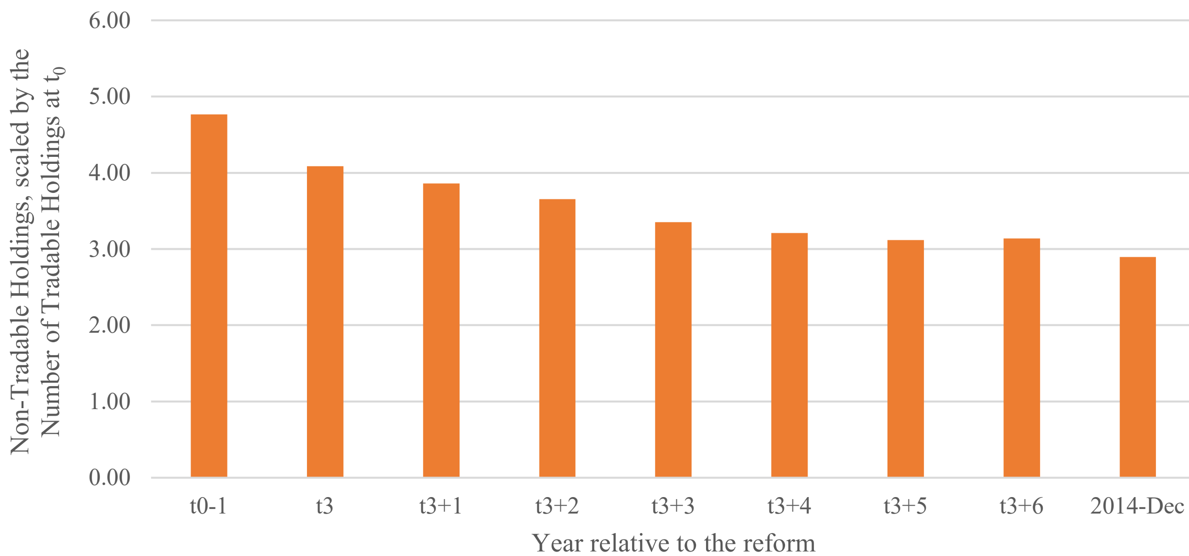

Figure IA1. Holdings of non-tradable shareholders over time

This figure reports the aggregate holdings of the non-tradable shareholders who are on the ten largest shareholders list at the most recent year-end before the announcement of the reform (t_0). We track their aggregate holdings for the first six years after the completion of the reform (t_3) and also in December 2014. The x-axis is the year relative to the reform. The y-axis is non-tradable shareholders' holdings divided by the initial number of tradable shares, where the initial number of tradable shares is measured at t_0 and adjusted by stock splitting and new issuance. For a non-tradable shareholder who later disappears from the ten largest shareholder list, we assume its ownership becomes zero.

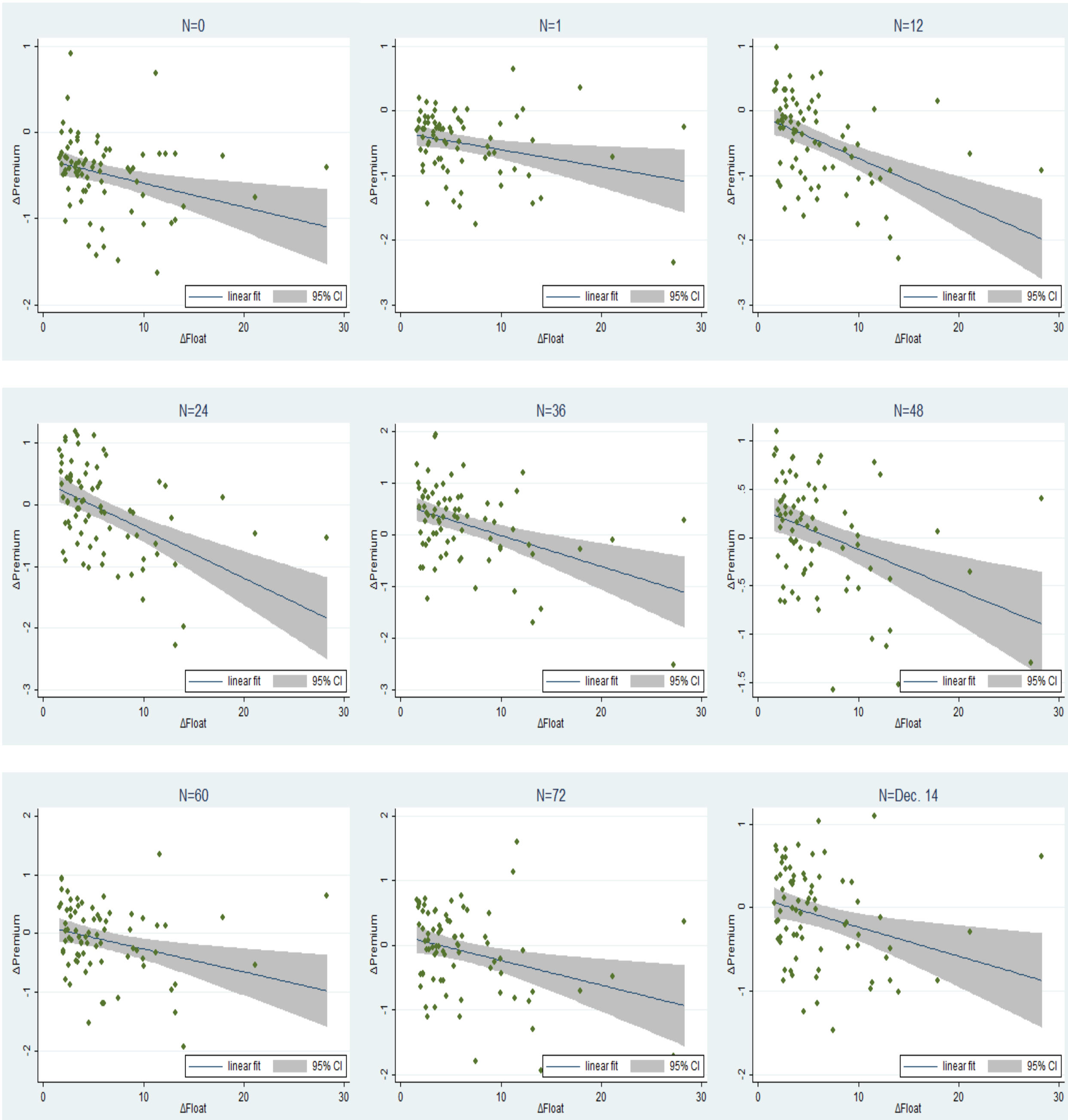

Figure IA2. Virtualizing the main results

This figure shows the scatter plots to virtualize the relationship between *ΔFloat* and *ΔPremium* for the same set of horizon choices as in Table 2. We also show the fitted values and the 95% confidence intervals based on linear regressions as in equation (1). *N* indicates the horizon.