Do Demand Curves for Stocks Slope Down in the Long Run?*

Clark Liu† and Baolian Wang‡

January 17, 2018

Abstract

The Split-Share Structure Reform in China mandated the conversion of non-tradable local A-shares to tradable status and increased A-share float but had no effect on 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 divergence of opinion is greater, consistent with the theory modeling investors with heterogeneous beliefs.

Keywords: long-term demand curve; 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, Zhi Da, Andrey Ermolov, Bill Francis, Pengjie Gao, Lifeng Gu, Zhiguo He, Shiyang Huang, Tse-Chun Lin, Abhiroop Mukherjee, 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, and seminar participants at Chinese University of Hong Kong, Shanghai Jiaotong University, Hong Kong University, Hong Kong University of Science and Technology, the 2017 Financial Intermediation Research Society (FIRS) Conference, the 2016 Financial Markets Workshop (Fordham, NYU and Imperial College), and Tsinghua University (PBC School of Finance and School of Economics and Management). All errors are the authors' responsibility. Wang acknowledges the summer research support from Fordham University.

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

‡ Gabelli School of Business, Fordham University. Email: bwang46@fordham.edu.

Do Demand Curves for Stocks Slope Down in the Long Run?

January 17, 2018

Abstract

The Split-Share Structure Reform in China mandated the conversion of non-tradable local A-shares to tradable status and increased A-share float but had no effect on 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 divergence of opinion is greater, consistent with the theory modeling investors with heterogeneous beliefs.

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

JEL codes: G02, G12, G15

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 flat: A change in a stock's share supply – even a large change relative to its own share base – should have very little effect on its price (Scholes, 1972). For example, Petajisto (2009) shows that, in a frictionless capital asset pricing model (CAPM) world, a stock's addition to the S&P 500 index should not affect its price by more than a few basis points.

The prevalent view contrary to the above perfect market view is the price pressure hypothesis, which asserts that, because of the stock market's limited risk absorptive capability and slow-moving capital, uninformed excess demand/supply can cause a stock's price to *temporarily* diverge from its fundamental value. 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 (see for example, Kraus and Stoll, 1972; Shleifer, 1986; Chang, Hong, and Liskovich, 2014).[1]

The second alternative is the *long-term* downward-sloping demand curve hypothesis. This hypothesis dates back at least 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, stock price should fall to induce shareholders to purchase the additional supply. 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", but we define them as "medium-term."

The shape of the long-term demand curves is much less studied perhaps due to methodological limitations. Most existing empirical studies investigate the shape of demand curves by analyzing price reactions to supply/demand shocks using the standard event study method, for example, 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; in addition, 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.

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

[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 for both stocks added to the S&P 500 and stocks deleted from the S&P 500.

Reform provides a suitable empirical setting.[3] 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 impact on the B-share supply. This event was a market-level event and largely 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 same fundamentals, one share's price works naturally as a benchmark for the other share. Empirically, in our sample period, A-share price and B-share price comove strongly with each other, with an average correlation coefficient of 0.875, and are cointegrated for most firms.[4] Therefore, we can circumvent the difficulty of limited statistical power and changing firm fundamentals by examining long-term A/B share premium dynamics.[5]

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

[3] We discuss more details on the Chinese stock markets and the Split-Share Structure Reform in Section 2.

[4] Albagli, Gao, and Wang (2013) document that, between 1992 and 2008, a typical A/B dual-listed firm's A-share price and B-share price comove less than its B-share price with the B-share index. We find that this result is unique for their sample period. In our sample period, the A-share price and B-share price of an AB dual-listed firm usually comove more than its B-share price with the B-share index. These different results may be due to the deeper integration of the Chinese financial market with the global financial market in more recent years. The results are available upon request.

[5] The existence of the B-shares may make the demand curves for A-shares less steep. A-share investors may learn from the B-share price and the existence of the B-share may reduce investors' divergence of opinion. It is also possible that A-share price impacts may spill over to B-shares, although we do not think the spillover effect is strong. Investors need to have foreign currency to invest in B-shares. Due to foreign currency regulation, 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.

tradable A-shares before the reform (which we refer to as "*ΔFloat*" hereafter) acts naturally as a measure of A-share supply increase. Consistent with downward-sloping demand curves, we see that *ΔFloat* adversely predicts the change in the A/B share premium. 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, 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 time 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 implies a negative relationship between *market* level supply and price, different from the stock level demand curves which the literature and this paper are interested in. 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 suggests that the negative relationship between *ΔFloat* and change in A/B share premium cannot be explained by the downward-sloping demand curves at the market level.

One plausible reason for downward-sloping demand curves is divergence of opinion. In the presence of short-sale constraints, 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 marginal effect of share supply is larger when 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 for which A-share turnover – our proxy for 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 this, we see that larger *ΔFloat* predicts a larger decrease in turnover and volatility.

After establishing the significant negative relationship between *ΔFloat* and change in premium, we test the role of a few other factors. 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. 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 differences in preference of state ownership (Karolyi, Li, and Liao, 2009). In the reform, tradable A-shareholders are compensated but B-shareholders are not. This also affects the two shares asymmetrically. We find that none of these factors can explain the relationship between *ΔFloat* and change in premium.

What prevents the demand curves from being flat? First, the short-sales constraint is binding and pessimistic investors cannot sell short. Second, we find that the lack of substitutes matters in the short-term, but not in the long term. One possible interpretation is that some investors form firm-specific opinions and do not regard even similar stocks as good substitutes. Third, 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.[6] The results also suggest that some limits to arbitrage are binding even in the long run. Second, we provide evidence that is consistent with the divergence of opinion-based interpretation of downward-sloping demand curves. This provides support for Shleifer's (1986) conjecture and the speculative trading hypothesis of Hong, Scheinkman, and Xiong (2006) and Mei, Scheinkman, and Xiong (2009). 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 find that the foreign share supply decreases foreign shares' prices relative to domestic shares. 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 causality and rule out other possible interpretations.

The paper proceeds as follows. In Section 2, we develop our hypotheses. In Section 3, we discuss the institutional background of the Chinese stock market and the Split-Share Structure Reform. Section 4 presents our data. The main results are in Section 5. In Section 6, we provide

[6] See Table A1 in the Internet Appendix for a summary of the literature.

evidence of why demand curves are downward sloping. 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 factors (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 divergence of investors' 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, as pessimistic investors simply sit out of the market because they 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's view is such that he is indifferent between buying versus not buying the stock. For a given distribution of investor beliefs, when 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 his information is more accurate than it really is; Scheinkman and Xiong, 2003; Hong, Scheinkman, and Xiong, 2006). The value of the resale option 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 the share supply will change turnover and return volatility. Trading will occur when some existing long investors become less optimistic than other investors. Turnover in a period is determined by the fraction of existing long investors who become less optimistic than other investors in that period. This is more likely to be larger when a smaller fraction of investors is long and, equivalently, when the share base is smaller. Price is determined by the belief of the marginal investor. 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 have

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 investors. An increase in the share supply needs to be cleared by additional long investors who are less optimistic than the current marginal investors. Therefore, price elasticity with respect to supply change is determined by the change in 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 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 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. However, A-shares and B-shares were traded by different groups of investors. 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 Chinese local currency (Chinese *yuan*), whereas Shanghai (Shenzhen) B-shares are quoted and traded in US (Hong Kong) dollars.

A-shares and B-share are not fungible. One cannot buy A-shares of a firm and sell them in the B-share market or vice versa. Despite of the restriction being lifted in 2001, only a small fraction of domestic investors participates in the B-share market (Chan, Wang, and Yang, 2015). The A-

[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 $1\text{-}\Phi(Z_s) = s$. 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.

share market and the B-share market are still partially segmented. Although the two share types have the same fundamentals, on average, A-shares are traded at a premium, 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] 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).

Non-tradable shareholders lack incentives to improve stock price and concentrated non-tradable share ownership also tremendously hinders development of the market for corporate control (Allen, Qian, and Qian, 2005; Li, Wang, Cheung, and Jiang, 2011; Liao, Liu, and Wang, 2014). 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 withdrawn because the market crashed due to concerns over a flood of new share supply.

In 2005, the Chinese government introduced the Split-Share Structure Reform. In contrast to the previous two trials, this time the government explicitly stated that tradable A-share investors must be compensated based on a mutual agreement between tradable and non-tradable

[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.

shareholders. B-share investors did not participate in the compensation plan because the reform did not affect the share supply of B-shares. 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 a trial 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 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 and third year combined. By the end of the third year after the reform, most lockups have expired.[10]

Several issues should be mentioned here. First, the reform may affect Chinese firms' fundamentals (Campello, Ribas, and Wang, 2014; Liao, Liu, and Wang, 2014). However, if there are any changes, both A- and B-shares are affected equally. Therefore, the change in the A/B share premium is largely unaffected by any change in firm fundamentals. Second, the transferred shares in the compensation plan are immediately tradable after the reform completion date t_3. Therefore, at t_3, A-share float increases immediately, and there is also an expectation that future A-share float will further increase due to lockup expirations.

4. Data and summary statistics

Our primary data source is the CSMAR database, from which we collect the list of dual-listed A/B share companies, stock trading data (e.g., stock price, returns, trading volume, total number of shares outstanding, number of tradable shares), and firm accounting data. 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, as well as another seven which took more than one year to complete the reform. We delete

[10] We report the detailed lockup expiration schedule in Table IA1 of the Internet Appendix.

these seven firms because their event windows are significantly longer than those of other firms. Our results for the long-term effects are robust if we include them in 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.[11] 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 returns across all the A-share and B-share stocks, respectively. We use the market capitalization of tradable shares as the weights. Using total market capitalization as the weights will yield market returns almost perfectly correlated with the one calculated based on tradable shares.

[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 average characteristics for the firms in each group. *ΔFloat* is defined as the total number of A-shares divided by the total number of tradable A-shares. We also conduct a *t*-test and Wilcoxon test to examine whether the difference between the high *ΔFloat* and low *ΔFloat* is significant. The average *ΔFloat* for the low *ΔFloat* group is 2.929, suggesting that in this group, on average, float will increase by 192.9%

[11] 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 very minimal effect on our results.

when all non-tradable shares become tradable. For the high *ΔFloat* group, the average *ΔFloat* is 9.733, suggesting that, on average, 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 that the firm paid dividends in the year before the reform. Premium is the A/B share price premium and is equal to (Price of A-share)/(Price of B-share), measured at the last trading day before the announcement. B-share prices are converted into Chinese *yuan* using the exchange rate from CSMAR. 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, 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 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. 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) is significantly higher than that of the U.S., and Spread (B) is also significantly higher than that of the U.S. Premium, Volatility (A), Turnover (A), and Spread (A) are 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 $\Delta Float$ and change in premium

We use the following model to test whether the demand curves are downward sloping and, if so, how demand curves evolve in the long run:

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

where i and t indicate firm and time, respectively. $Premium_i$ is the A/B share price premium for firm i and is equal to (Price of A-share)/(Price of B-share).[12] 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. Our results are significant at the 5% level for all these N values. For brevity, we only report the results when N=0, 1, 12, 24, 36, 48, 60, and 72. We also investigate a specification where $\Delta Premium_{i,(t0,\ t3+N)}$ is defined as the change in premium from t_0 to December 2014, the end of our sample period. Different firms have different completion dates. The length from the completion date to December 2014 varies from seven to nine years. $\Delta Float$ is the total number of A-shares divided by the total number of tradable A-shares, measured before the reform announcement. All non-tradable shares are mandated to convert to tradable status, thus $\Delta Float$ captures the increase of A-share float. It is important to use an ex ante measure of share supply change because ex post measures can contain information. If demand curves are downward sloping, we expect β_N to be negative. If demand curves are less downward sloping 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]

[12] The premium is affected by market-level factors. Our results are robust if we adjust the premium by the average premium of all firms.

Table 2 reports the results. For the nine different horizons, β_N is statistically significant at the 1% level, except in the case of N=1, where it is only significant at the 5% level. β_0 is -0.0277, suggesting that one unit increase in A-share float decreases the A/B share premium by 2.77%. β_1 is -0.0264, which is similar to 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 when N=24 to when N=48. After that, β_N continues to decrease but very slowly. In December 2014, β_N is -0.0349. 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, due to the lockup arrangement, most non-tradable shares become tradable in the first few years.

[Insert Figure 2 here]

In Figure 2, we plot the average premium for two groups of firms by *ΔFloat*: one group of firms with *ΔFloat* above the sample median and the other group with *ΔFloat* below the sample median, from six months before the announcement date (t_0) to 84 months after the completion date (t_3). There is strong comovement of the A/B share premium between the two groups of firms, consistent with the well-documented fact that market factors affect the A/B share premium. Before the announcement, the average premium of the high *ΔFloat* group is around 0.70 higher than that of the low *ΔFloat* group, consistent with the hypothesis that scarcity in the share supply leads to a high price (Mei, Scheinkman, and Xiong, 2009). The difference indicates no detectable change from t_0-6 to t_0. Right after the completion date, the difference between these two groups drops to 0.37. Consistent with the pattern we documented in the regressions, the difference reaches the lowest at t_3+17, which is about zero. At t_3+84, the difference is 0.27, still significantly lower than its pre-reform level.[13]

[Insert Figure 3 here]

Our sample is relatively small. To ensure that our results are not driven by outliers, in Figure 3, 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 the nine horizons. We also find a few very large *ΔFloat* values. If we exclude the four firms whose *ΔFloat* is larger than 15, 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 economic 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 this possibility. 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. Second, we conduct a placebo test by assigning fake reform completion dates 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 the main

[13] The average premium for both groups shows strong time series variations which may not be related to the supply changes. For example, the premium is lowest two to three months after the reform and highest around 36 months after the reform. This is because in this period the China's A-share market had a big boom while the B-share market price increased less.

sample period (Figure 2). If we regress the change of premium from the fake completion date to December 31, 2004, on *ΔFloat*, we show that the coefficient of *ΔFloat* is 0.002 with a *t*-value of 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 provide support for Hypothesis 1 suggesting 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 examine how non-tradable shareholders sell their shares. Second, we test 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 *ΔFloat* and non-tradable shareholders' trading

ΔFloat measures the increase in tradable shares. However, if non-tradable shareholders, especially the large strategic shareholders, do not sell, the supply to the public will not increase. In this subsection, we collect data and examine whether and how much they sell their shares in our sample period and how it is related to *ΔFloat*.

We manually collect data on nontradable shareholders' holdings to validate this assumption. 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 track their holdings. On average, right before the reform, these non-tradable shareholders hold

81% of the non-tradable shares and cover all the strategic shareholders. For a non-tradable shareholder who later disappears from the ten largest shareholder list, we assume its ownership becomes zero. The average (highest) ownership of the tenth largest shareholder of our sample firms is 0.39% (1.41%). The results are very similar if we assume the ownership of the disappearing non-tradable shareholder is equal to the ownership of the tenth largest shareholder

[Insert Figure 4 here]

Figure 4 presents the aggregate holdings of these non-tradable shareholders. To be consistent with the way we measure *ΔFloat*, we scale holdings by the initial number of tradable shares. In the year before the reform, these non-tradable shareholders' aggregate holdings is 4.76 times of the initial tradable shares. This ratio becomes 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. The speed of selling becomes much slower after that.

[Insert Table 3 here]

In Table 3, we investigate whether *ΔFloat* is correlated with the decrease in non-tradable shareholders' holdings. The coefficients of *ΔFloat* is positive for all the horizons. It increases in the first few years and becomes flat from year five. This is consistent with the pattern in Figure 4. The coefficient of *ΔFloat* is 0.20 and the intercept is 0.63 at December 2014. As shown in Table 1, the average *ΔFloat* of the two *ΔFloat* groups is 2.93 and 9.73. This implies that, by December 2014, the share supply increase 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 *ΔFloat* is a good measure of A-share supply increase.

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 of 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 measure A-shares' systematic risk using Beta (A, A-index), which is calculated as the covariance between A-share return and A-share market return divided by the variance of A-share market return. We calculate two beta variables for B-shares: Beta (B, B-index) and Beta (B, MSCI). The definitions of these two beta variables are similar to Beta (A, A-index). The B-index return is calculated using all the B-shares. The MSCI index is the MSCI World Index, which is widely used as a common 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 (Mei, Scheinkman, and Xiong, 2009). 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*, ruling out the possibility that the negative relationship between premium change and *ΔFloat* is a reflection of change in systematic risks.

5.2.3 ***ΔFloat* and the change in liquidity**

A change in float may change liquidity. Searching models predict that matching between buyers and sellers is easier when float is larger (Duffie, Garleanu, and Pedersen, 2005; Vayanos and Wang, 2007; Weill, 2008). In these models, illiquidity is negatively correlated with float. In

Panel B of Table 4, we see that *ΔFloat* is indeed negatively correlated with a change in illiquidity, where illiquidity is measured by the proportional bid-ask spread. 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. However, there is no evidence that *ΔFloat* is significantly correlated with a B-share spread change.

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 is opposite to this prediction, suggesting 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 main purpose of the reform was to align the incentives of small tradable shareholders and controlling non-tradable shareholders (Liao, Liu, and Wang, 2014). Foreign investors may care more about corporate governance than domestic investors (Leuz, Lins, and Warnock, 2010). If this is also true for A- and B-share investors, and if corporate governance improves as a result of 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 those with higher *ΔFloat* than those 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 and B-share prices should increase more than A-share prices. However, the demand-curve-based explanation predicts that A-share prices should decrease and B-share prices should stay unchanged. Empirically, we find that, in untabulated results, on average, in the reform period (from t_0 to t_3), the A-share price decreases by 22.61% relative to the contemporaneous A-share market index, with t value of -6.87, which is statistically significant. However, the B-share price increases by 1.99% relative to the contemporaneous B-share market index, with a t-value of 1.02, which is statistically insignificant.[14] In the cross section, we also 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 -0.0122 with a t-value of -2.01. However, if we regress the B-share cumulative abnormal return around the reform period on *ΔFloat*, the coefficient of *ΔFloat* is -0.0015 with a t-value of -0.40. These results are inconsistent with the prediction of the corporate-governance-based interpretation but consistent with the demand-curve-based interpretation.

We also examine how *ΔFloat* is related to A-share and B-share cumulative abnormal returns for longer horizons. We regress A-share cumulative abnormal returns or B-share cumulative abnormal returns on *ΔFloat*. The coefficient of *ΔFloat* is never statistically significant when the dependent variable is B-share cumulative abnormal returns. However, it is statistically significant when the dependent variable is A-share cumulative abnormal returns for horizons up to 24 months. The statistical significance disappears for longer horizons, which echoes the weakness of the long-run event study on returns we discussed in the introduction. Our method of examining the change in premium circumvents this weakness and can detect the long-term effect with statistical power.

[14] There are 24 B-shares that do not have A-shares. They do not conduct the Split-Share Structure Reform. Even if we use them as a benchmark, we find similar results. Cumulative abnormal returns are calculated based on the buy-and-hold returns following Barber and Lyon (1997).

5.2.5 The heterogeneity of nontradable shareholders

Investors may also 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 existence of controlling shareholders may also benefit a firm. If domestic A-share investors are more likely to enjoy these benefits than foreign B-share investors or it is perceived to be so, 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.

Two thirds of the non-tradable shares are owned by the government (stated-owned shares). The remaining one third is virtually all 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 have 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) $\Delta Float_i^{SOE}$: number of state-owned non-tradable shares divided by number of tradable shares, (2) $\Delta Float_i^{non-SOE}$: number of non-state-owned non-tradable shares divided by number of tradable shares, (3) $\Delta Float_i^{Large}$: number of non-tradable shares owned by shareholders with more than 5% ownership divided by number of tradable shares, and (4) $\Delta Float_i^{Small}$: number of non-tradable shares owned by shareholders with less than 5% ownership divided by 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. This suggests that state shareholders typically own large blocks, while non-state legal persons tend to have a 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 is statistically significant at the 5% level for all the nine horizons reported in Table 6. 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. This is inconsistent with the alternative explanation outlined at the beginning of this section.

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 have direct impact on the firms or the B-share value. To the tradable A-shareholders, the compensation can be considered an embedded right and may affect A-share prices. The reform completion date can therefore be considered as the ex-rights date – investors will receive the compensation on that day and A-share prices will not contain the embedded rights any more. 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 before the reform, the A-share price should have increased more than the B-share price in anticipation of the reform and drop more than B-share at the reform completion date; the change in premium from t_0 to t_3 may partially reflect the effect of embedded rights. If investors also expected the compensation to be positively correlated with $\Delta Float$, our estimation in Table 2 may be biased. However, there is little evidence, as we can see from Figure 2, that the A/B share premium change is related to $\Delta Float$ in the six months before the reform was announced. In Section 7, we find that the compensation tradable shareholders received is too insensitive to explain the effect of $\Delta Float$ on the change in A/B share premium.

[Insert Table 6 here]

Nevertheless, to further mitigate this concern, we re-run equation (1) by choosing a "pre-event date" when the compensation arrangement was not expected, and measure the pre-period premium on that date. Allowing non-tradable shareholders to compensate tradable shareholders is the key innovation of the Split-Share Structure Reform in comparison 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. Comparing the change of premium between these days will not be affected by 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 choose May 31, 2005, when the second pilot batch was announced or March 31, 2005, when was 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.

In another test, we link the change in premium in the December 1999 failed trial to the change in premium around the Split-Share Structure Reform. On December 2, 1999, the CSRC hand-picked ten listed companies to pilot the non-tradable share sales. Sales were quickly suspended in 25 days after two companies practiced this and the stock market dropped by more than 7%. If the A/B share premium change in this period and the Split-Share Structure Reform period is driven by the same concern regarding the downward-sloping demand curves, we should expect the change in premium in both periods to be positively correlated. Since there is no compensation arrangement in the 1999 trial, firms' change in premium in December 1999 is not contaminated by anticipation of receiving compensation. We replace *ΔFloat* in equation (1) by the change in premium from December 1, 1999 to December 31, 1999. In untabultaed results, we see that the coefficient for the change in premium from December 1, 1999, to December 31, 1999, ranges from 0.256 to 0.458 and is statistically significant at the 5% level except when N=24 where the coefficient is 0.275 and *t*-value is 1.47.[15] This provides further evidence that the results in Table 2 are not driven by the compensation arrangement.

5.2.7 Endogeneity of timing of the reform

Firms had the freedom to choose the timing of the reform. If firms with different *ΔFloat* have different incentives or ability to minimize the effect of price impact by timing, this may lead to endogeneity. To exclude this possibility, we measure the pre-period premium at August 15, 2005 (the same as in the previous subsection) and the post-period premium *N* months after December 31, 2007 (instead of each firm's own 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.

Panel B of Table 6 reports the results. 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 3 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 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

[15] We also link the premium change in the second failed trial period to the change of premium in the Split-Share Structure Reform period. The second failed trial started in June 2001 and was withdrawn in June 2002. We do not find any statistical significance here, perhaps because the 2001-2002 trial lasted too long and the change of premium in that period is too noisy.

magnitude of *ΔFloat* is highest in the second year after completion. Overall, the results in Panel B of Table 6 indicate that our results are not affected by market-level factors or the potential endogeneity of timing of firm reforms.

5.2.8 Controlling for other factors

In Panel C of Table 6, we add several control variables to equation (1). We control for firm-level characteristics, 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 is 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 prior to the reform announcement. The coefficients of *ΔFloat* are similar to those in Table 2 where we do not have any controls.

A-share turnover is significant in most of the specifications. In the existing literature (e.g., Varian, 1989; Harris and Raviv, 1993; Kandel and Pearson, 1995; Chen, Hong, and Stein, 2001), turnover is used as a measure of divergence of opinion. A negative coefficient for A-share turnover suggests that the firms whose A-share investors have a larger divergence of opinion before the reform have a larger decrease in the A/B share premium. This is consistent with the models of Miller (1977), Scheinkman and Xiong (2003), and Hong, Scheinkman, and Xiong (2006).

6. Why demand curves are downward sloping?

6.1 Divergence of opinion

The results in Section 5 support Hypothesis 1. We test the other three hypotheses here. First, we examine whether *ΔFloat* predicts change in turnover and volatility. We use the model specification of equation (1) but replace premium change with either turnover change or volatility change. Premium is measured at a time point, but turnover and volatility are calculated over a period. We calculate both turnover and volatility over twelve-month periods. To align with the horizons of Table 3, the 12-month periods are centered on the time points when we measure the premium. For example, we calculate the premium at *t*+12, and we calculate turnover and volatility from *t*+7 to *t*+18. We also report the change in turnover and volatility for the first six months.

[Insert Table 7 here]

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. The theory on divergence of opinion predicts that demand curves are more downward sloping when divergence of opinion is larger (Miller, 1977; Chen, Hong, and Stein, 2002; Scheinkman and Xiong, 2003; Hong, Scheinkman, and Xiong, 2006). In Table 8, we test Hypothesis 4 on whether divergence of opinion moderates the relationship between *ΔFloat* and change in premium. 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 divergence of opinion. Turnover is calculated in the 12-month period before the reform.[16]

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

[Insert Table 8 here]

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 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 decreases 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 we examine. These results provide support for Hypothesis 4.

6.2 Limits to arbitrage

What prevents the demand curves from being flat? In this section, we discuss the role of short-sale constraints and 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. In the end, we provide a trading strategy to show how much an arbitrageur can earn even without the short-sale constraint or any other constraint.

6.2.1 Short-sale constraints

The short-sale constraint is an important factor. If pessimistic investors can sell short, divergence of opinion may not inflate the stock price (Miller, 1977). In China, short sales were completely prohibited until March 31, 2010, when they were allowed for a designated list of stocks. None of the B-shares were shortable and only around ten of our A-shares were shortable in the latter half of our sample period. Even for these shortable stocks, short selling was not active 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, facing supply shocks, investors can easily rebalance their portfolios to 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).

The most natural substitutes for A-shares – their B-shares – are, however, not readily available to most A-share investors due to foreign currency regulation. Available substitutes are other A-shares, including around 1,000 A-shares that did not issue B-shares. We construct our measure of 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 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 also by 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 code. This classifies all firms into 19 industries which are similar to the 17 Fama-French industry classification. On average, the three closest substitutes explain 72% of a subject A-share's daily return variation.

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 is -0.0302 and t-value=-2.30). This shows that the spillover effect is weak.

[Insert Table 9 here]

Second, we investigate whether lack of substitutes moderates the relationship between share supply and price. Table 9 reports the results. Similar to Table 8, we report the average change of premium for four groups of firms independently sorted by *ΔFloat* and *Lack of Substitutes*.

When A-shares have good substitutes (i.e., when the value of our *Lack of Substitutes* variable is low), the differences in premium change between the high *ΔFloat* firms and low *ΔFloat* firms are statistically insignificant. On the other hand, when A-shares do not have good substitutes (i.e., when the *Lack of Substitutes* is high), the differences in premium change between the two *ΔFloat* groups are larger than 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 price pressure of increased float spillovers to similar stocks and 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 are weak and generally insignificant. One possible interpretation is that some investors form their firm-specific opinions and do not regard even similar stocks as adequate substitutes.

6.2.3 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 $\Delta Float$ and short the A-shares with low $\Delta Float$. If he buys the A-shares with $\Delta Float$ above the sample median and shorts the A-shares with $\Delta Float$ below the sample median, from the month after the reform completion (t_3) to December 2014, the average monthly equally-weighted portfolio alpha is -0.14%, with a t-value of -0.44. If he hedges his positions in A-shares with opposite positions in B-shares, his portfolio alpha would be -0.11%, with a t-value of -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%, with a t-value of 1.79 (0.30% if he hedged with trading B-shares, with a t-value of 0.90). However, it is unlikely that someone will have perfect foresight.

These results are not surprising because the demand curves become flatter 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.

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 also 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 is patient enough to wait for seven to nine years.

[Insert Table 10 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 use the following equation to test this:

$$Compensation_i = a + b\,\Delta Float_i + \varepsilon_i\,, \tag{2}$$

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.[17] Table 10 reports the results. The coefficient of *ΔFloat* is 0.00842, with a *t*-value of 3.20, and is significant at the 1% level. This 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%. In Table 2, we see that 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.[18]

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 had no effect on 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 inference one can draw regarding the shape of demand curves.

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

[17] 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.

[18] 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.

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 divergence of opinion is larger. All the evidence is consistent with models based on 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. Exisiting studies have mainly focus on examining how firms responds 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 have very different implications. 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, 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.

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, 2015, Why Investors Do Not Buy Cheaper Securities? An Analysis of Trading by Individual Investors in Chinese Stock Market, Working Paper.

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.

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.

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, 1010, 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, 2993, 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.

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

Lou, Dong, Hongjun Yan, 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.

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.

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

Petajisto, Antti, 2009, Why Do Demand Curves for Stocks Slope Down? *Journal of Financial and Quantitative Analysis* 44 (5): 1013-1044.

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.

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.

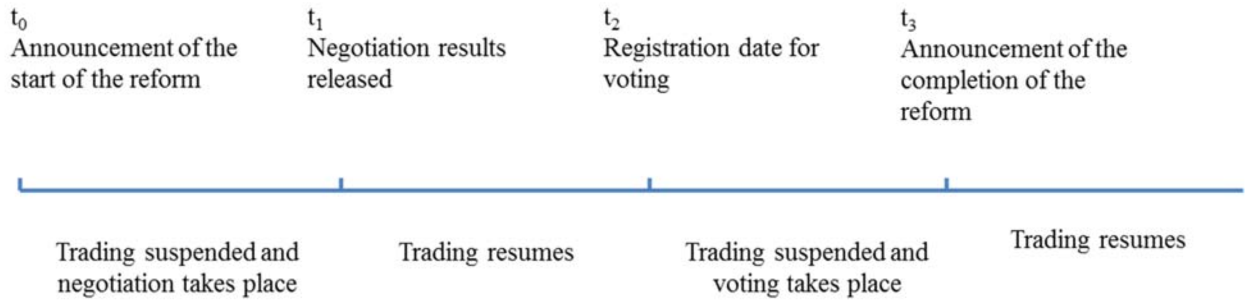

Figure 1. Timeline of a typical firm doing the Split-Share Structure Reform
This figure is from Li, Wang, Cheung, and Jiang (2011, p. 2503).

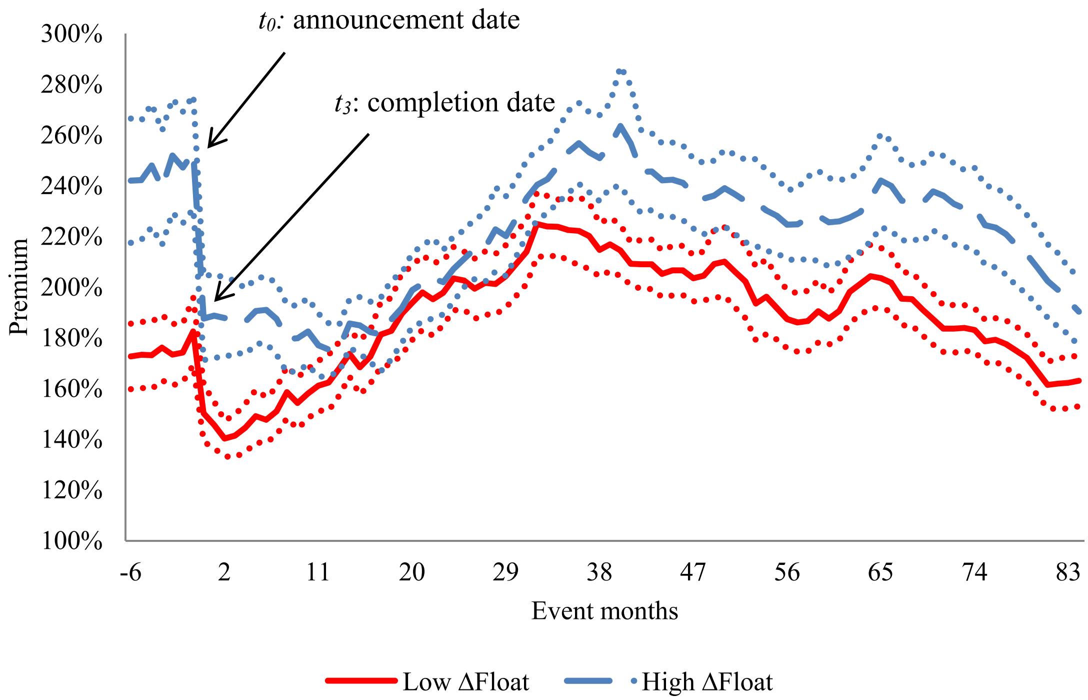

Figure 2. The average premium by *ΔFloat*

This figure shows the average A/B share premium for two groups of firms: one with *ΔFloat* higher than the sample median (high, the dashed line) and the other with *ΔFloat* lower than the sample median (low, 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). t_0 and t_3 are also indicated separately.

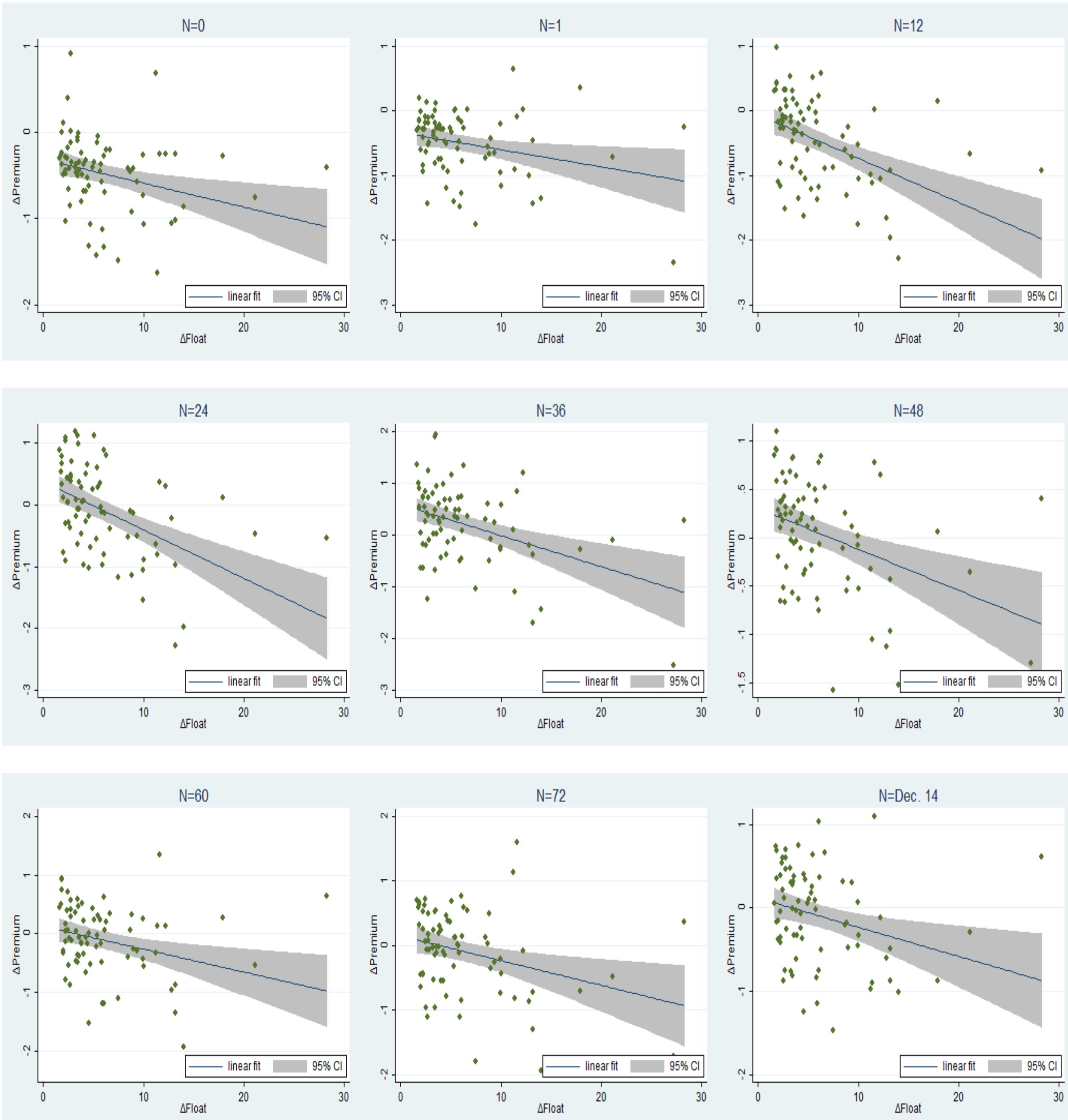

Figure 3. Virtualizing the main results

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.

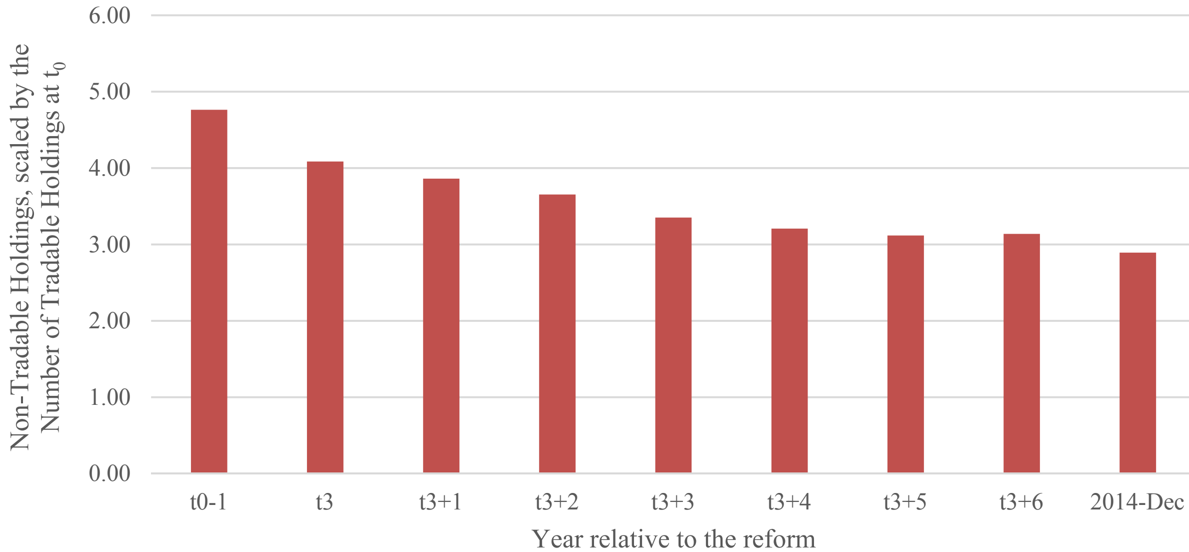

Figure 4. Holdings of non-tradable shareholders over time

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 at December 2014. The x-axis is the year relative to the reform. The y-axis is non-tradable shareholders' holdings divided by the number of tradable shares at t_0. For a non-tradable shareholder who later disappears from the ten largest shareholder list, we assume its ownership becomes zero.

Table 1. Summary statistics

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 its *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 return covariance between B-share and B-share market divided by the variance of B-share market return. Beta(B, MSCI) is 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 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.

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 2. *ΔFloat* and change in premium

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 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.

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 3. *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 at 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	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 4. *ΔFloat* and change in systematic risks and liquidity

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*. Our systematic risk measures are Beta (A, A-index), Beta (B, B-index), and Beta (B, MSCI). Beta (A, A-Index) is 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 of Beta (A, A-index) is the difference between Beta (A, A-index) in a post-completion period and that over the twelve-months before the reform announcement date. Change of Beta (B, B-index) and Beta (B, MSCI) are similarly defined. 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 horizons. [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.

Panel A. Change in systematic risks

Horizon	[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

Horizon	[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 5. *ΔFloat* and change in premium: Heterogeneity of non-tradable shareholders

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) $\Delta Float_i^{SOE}$: number of state-owned non-tradable shares divided by number of tradable shares, (2) $\Delta Float_i^{non-SOE}$: number of non-state-owned non-tradable shares divided by number of tradable shares, (3) $\Delta Float_i^{Large}$: number of non-tradable shares owned by shareholders with more than 5% ownership divided by number of tradable shares, and (4) $\Delta Float_i^{Small}$: number of non-tradable shares owned by shareholders with less than 5% ownership divided by 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.

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 nontradable shareholders and small nontradable 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 6. *ΔFloat* and change in premium: Additional robustness tests

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 monthly trading volume divided by 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.

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 7. *ΔFloat* and change in turnover and volatility

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 horizon [*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.

Horizon	[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 8. The moderating role of divergence of opinion

This table reports independent double-sorted group averages of the change in premium for various horizons. We sort our sample A/B stock pairs into 2*2 groups by Turnover (A) and *ΔFloat*. Turnover (A) is calculated as A-share trading volume divided by total number of tradable A-shares prior to the announcement. *ΔFloat* is defined as total number of A-shares divided by 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.

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

Table 9. The moderating role of lack of substitutes

This table reports independent double-sorted group averages of the change in premium for various horizons. We sort our sample A/B stock pairs into 2*2 groups by Lack of Substitutes and *ΔFloat*. 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.

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 10. Is the downward-sloping demand curve priced ex ante?

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.

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

Internet Appendix

Table A1. Summary of Related Studies

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

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
Krau, 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

Table A2. 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 forecasted, 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. Each period, we calculate the percentage of unlocked shares in this period over the total non-tradable shares at the start of the reform and take an average over all 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