

The Development of China's Stock Market and Stakes for the Global Economy*

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1 INTRODUCTION

China's financial system has evolved from a one-bank system under Mao to a four-bank system under Deng and is still dominated by its state-controlled bank sector, with over \$30 trillion of assets. Its modern stock market opened only in 1990, primarily as a platform for privatizing SOEs, and the selection of firms for listing has been tightly controlled by the government. Until 2005, only a third of equity shares were tradable, with the non-tradable remainder held by the state or state-backed entities, and its total market capitalization did not surpass \$1 trillion until 2006. During these early years, the stock market endured repeated scandals and gained a reputation as a casino manipulated by speculators. Because it was small, segmented from other global financial markets, and embedded in a financial system entirely different from that in the US, it was regarded as a specialized topic by the academic finance community, and little research on China's stock market made it into top journals.

A number of developments over the last decade have changed the picture and made China's stock market an important subject for mainstream research in financial economics. First, China's GDP has more than tripled to over \$11 trillion in 2016, making it an economic superpower on par with the US in purchasing power. Second, its stock market has grown more than five-fold to over \$7 trillion in market capitalization as of May 2017 to become the world's second largest. At the same time, the number of listings has more than doubled to over 3200, as the SME and ChiNext Boards introduced on the Shenzhen Stock Exchange in 2004 and 2009 have opened capital channels to smaller and more entrepreneurial firms, alongside the Main Boards of the Shanghai and Shenzhen Exchanges, where the larger, more mature firms list. In addition, the Split-Share Structure Reform of 2005 enabled the unlock of non-tradable shares, and the tradable fraction in 2016 represents over 75% of the total. Third, China has become the world's largest investor, with \$5 trillion of total fixed asset investment, compared with \$3.7 trillion in the US and \$1 trillion in Japan in 2016, making the efficiency of its capital allocation system a matter of global interest. Fourth, the explosion of debt used to finance China's post-crisis stimulus through the expansion of the banking and shadow banking sectors has raised concerns about the stability and efficiency of the financial system, making China's stock market an important alternative financing channel, as a source of equity capital for firms, investment opportunity for households, and aggregator of diffuse information about corporate prospects for use in managerial decision-making.

China's stock market became a focal point for global attention during the stock market run-up and crash of spring and summer 2015, stalling the US Federal Reserve's interest rate liftoff and creating turbulence throughout global financial markets. Nevertheless, MSCI

has continued negotiations with the China Securities Regulatory Commission (CSRC) over reforms necessary for inclusion of China's stock market in its emerging market indexes, a major step toward its integration with international financial markets. This highlights the interest of foreign investors and has increased pressure for reforms that increase liquidity and lift constraints on the free flow of capital. Meanwhile, the top finance journals have increasingly opened up to China-focused research, fueling a growing body of literature.¹

On the corporate side of the stock market, researchers have focused primarily on the effects of the various stages of privatization on firm performance, the determinants of IPO underpricing, and the selection of firms for listing, marking the progress of reforms but highlighting the continued importance of firms' political connections. One of the challenges in financial economics research on China is that because the setting there is so different than that in most other finance studies, there is a risk of over-applying existing paradigms and oversimplifying conclusions. This risk is especially great in corporate finance, where individual-firm-value-maximization is ingrained as firms' primary objective, but where other objectives may be more important for many firms in China. As Lin, Cai, and Li (1998) emphasize, SOEs in China are charged with social, economic, and strategic objectives. They are a significant piece of the social safety net and the principal building blocks of China's planned economy. SOE reform remains one of the most important corporate finance issues in China, as calls for the restructuring of firms in industries plagued by over-capacity are countered by the desire to preserve employment and social stability, and by resistance from vested interests. Future research that seeks to evaluate its successes and failures might do well to view its objectives more broadly than is customary. Other areas ripe for further research include selection biases created by the IPO approval process and the broader question of Chinese corporate listing choice among alternative domestic and international exchanges.

On the asset pricing side, the literature has addressed a number of interesting issues. The premia in the prices of A-shares accessible to domestic investors over their B-share counterparts accessible to foreign investors has been attributed to discount rate differentials associated with differential information and investment opportunity sets. B-share issuance has died out since the Qualified Foreign Institutional Investor program was established in 2002. However, the premium in A-share prices over the H-share prices of their Hong Kong-listed counterparts persists despite the 2014 and 2016 openings of the Shanghai- and Shenzhen-Hong Kong Connect programs, which enabled cross-market trading, and remains a puzzle. Another strand of the asset pricing research uses distinctive aspects of the stock market to

¹In a survey of empirical research on China's stock market, Lu and Fu (2014) find that the average number of articles on this topic published in seven top finance journals rose from one per year over 2000-2007, to over five per year during 2008-2013.

construct new tests of information and behavioral effects in asset prices, such as location, status, and trust effects. A different focal point has been the firm-specific information content of A-share prices and its cross-sectional variation. Yet a further line of research studies the cross-section of A-share returns, with increasing power to discern pricing patterns as the sample period grows. Again, while numerous special features of China's markets present new research opportunities, they also require adaptation of existing paradigms and methodologies. These features include one-day minimum holding periods, 10% daily price move limits, short-sale restrictions, trading suspensions, IPO suspensions, direct government interventions, and special treatment status for distressed stocks, as well as non-tradable shares, market segmentation, and limited institutional participation.

Research on China's nascent equity mutual fund and derivatives markets is also becoming possible and looks likely to be fruitful. The institutional interface between the stock market and household investors is still underdeveloped, leaving most household savers to choose between investing in bank products or trading individual stocks. The growth of China's managed equity industry should provide researchers with a world of new evidence on the economics of asset management and the role of institutional investors in corporate governance, stock price informativeness, and household portfolio choice and welfare. The development of equity derivatives markets in China may also shed new light on the potential of derivatives to quantify tail risks and help complete markets. The potential for increased market participation by global institutional investors and the possibility of an offshore derivatives market in domestic China stock indexes may also illuminate the possibly distinct roles of domestic versus foreign investors in stock market development and efficiency.

China's increasing presence in global financial markets and ongoing financial reforms continue to supply researchers with a wealth of important new developments and natural experiments to study. A challenge for the field will be to gain familiarity with a financial system so unlike that in the US—centrally controlled, bank-dominated, and uniquely relationship-driven, as Allen, Qian, and Qian (2005) show, rather than based primarily on securities markets and legal contracts. Such a familiarity will be essential for framing the best questions and drawing correct inferences.

2 PRIVATIZATION, IPOS, AND LISTING CHOICE

China's modern stock market opened in Shanghai and Shenzhen in 1990 during the final years of the leadership of Deng Xiaoping. One of the primary goals of this "stock market experiment" was to create a platform for the partial privatization of China's SOEs, a major step in their ongoing reform. This objective significantly shaped the stock market's initial

form and development (Allen and Shen, 2011). The selection of firms for listing, the initial pricing, and the subsequent ownership structure were tightly controlled and monitored by the government. The original split-share ownership structure defined five classes of shares, of which roughly two-thirds were non-tradable—state shares, legal person shares, and employee shares—and one-third were tradable—A shares priced in RMB and held by domestic Chinese investors, and foreign shares, including B shares priced in USD or HKD and traded in Shanghai or Shenzhen, respectively, and H shares traded in HKD in Hong Kong.

Figure 1, reproduced from Carpenter, Lu, and Whitelaw (2017), shows the time series of the number of listed firms and the composition of market capitalization by ownership class since 1991. Non-tradable state shares, owned by the central or local government, averaged almost half of total shares during the first fifteen years of the market’s operation. Non-tradable legal person shares, typically owned by institutions or business agencies that supported the start-up, often with local government backing but with potentially more profit-oriented interest than state-share owners, typically constituted another 20% of total shares. The Split-Share Structure Reform of 2005 unlocked a significant number of non-tradable shares through a mechanism that compensated tradable share holders for potential adverse price effects, but almost 25% of total shares remain non-tradable today. Similarly, listing registration is still tightly restricted by the China Securities Regulatory Commission (CSRC), with almost 500 firms in line for approval in May 2017.

2.1 Privatization

One of the first strands of the academic literature on China’s stock market studies the effects of these stages of privatization on listed firms. Sun and Tong (2003) evaluate the success of China’s share issue privatization (SIP) on firm performance in SOEs listed during 1994–1998. China’s privatization process took place during a wave of privatizations around the world, ranging from the privatization of nationalized firms in the US and UK on seasoned stock exchanges to mass voucher privatization programs in Russia and eastern Europe, as studied in a literature surveyed by Megginson and Netter (2001). Following the methodology of these studies, Sun and Tong (2003) find that SIP increases SOE earnings, sales, and workers’ productivity, but not profitability. Wei, Xie, and Zhang (2005) analyze the relation between Tobin’s Q and ownership structure in partially privatized SOEs during 1991–2001 and find negative effects from state and institutional ownership and positive effects from foreign ownership. On the other hand, Calomiris, Fisman, and Wang (2010) study B-share stock returns after the announcements of proposed sales of government shares and find a negative effect, concluding that efficiency costs of government ownership might be outweighed

by benefits of political connections. China's SIP was itself part of a longer-term reform of SOEs begun when Deng took power in 1978. Li (1997) finds marked improvement in total factor productivity in SOEs in China between 1980 and 1989, raising the question of disentangling the effects of SIP from the effects of other ongoing SOE reforms.

The Split-Share Structure Reform of 2005 ushered in the second stage of privatization in China. As Li, Wang, Cheung, and Jiang (2011) and Liao, Liu, and Wang (2014) explain, regulators and investors had become increasingly aware of problems created by the split-share ownership structure, which weakened minority shareholder protection and stifled the market for corporate control. After a number of unsuccessful attempts to unlock non-tradable shares, the CSRC devised a market mechanism to compensate tradable shareholders for the potential adverse price impact. Non-tradable shareholders in each firm would have to negotiate compensation to tradable shareholders sufficient to secure their approval of the unlock, which in turn would take place gradually over a period of one or more years. Most firms completed the reform by the end of 2007.

Liao et al. (2014) use this reform as a natural experiment to measure the effect of privatization on firm performance. They find that the expectation of privatization boosted SOE output, profits, and employment, though not operating efficiency and corporate governance. In contrast to studies of privatization in other transition economies such as Barberis, Boycko, Shleifer, and Tsukanova (1996), which find that new management is most important for the success of privatization, Liao et al. (2014) conclude that stimulating incumbent managers' incentives with the prospect of privatization also has positive effects. Chen, Chen, Schipper, Xu, and Xue (2012) find that Chinese firms reduced cash holdings after the 2005 reform, especially those with weak governance, suggesting that the reform led to better alignment between controlling and minority shareholders and relaxed financial constraints.

Li et al. (2011) and Firth, Lin, and Zou (2010) study the cross-sectional determinants of the compensation ratio, or compensation paid to tradable shareholders as a fraction of the value of their shares. Portfolio theory and evidence from Silber (1991) suggest that non-tradable shareholders stand to gain from the ability to diversify after the unlock. At the same time, tradable shareholders stand to lose from an adverse price impact. Li et al. (2011) find empirically that the compensation ratio is increasing in firm idiosyncratic risk and the fraction of non-tradable shares, highlighting the stock market's traditional role in allocating risk efficiently. Firth et al. (2010) consider a different angle and show that the compensation ratio is increasing in state ownership and decreasing in mutual fund ownership. They conclude that firms with higher state ownership were keener to comply with CSRC objectives and complete the reform quickly, while firms with higher fund ownership could be more easily pressured to accept terms, because senior fund managers serve at the approval

of the CSRC. This highlights the influence of the state in corporate transactions.

Abnormal stock returns in short windows around the key announcements during this process were arguably consistent with market efficiency, considering the effects on the supply of shares and liquidity, as argued by Beltratti, Bortolotti, and Caccavaio (2016). However, after a successful negotiation, non-tradable shares were restricted from sale for periods of one or more years depending on ownership levels. Liao, Liu, and Wang (2011) study stock returns around the lock-up expirations and find average abnormal returns of -14%, even larger than those documented by Ofek and Richardson (2000) around the unlock of IPO shares in the US. Lou, Wang, and Yuan (2014) show that transfer prices of non-floating shares reflect less earnings information than market prices of floating shares, but more after the 2005 reform than before.

Despite significant progress in privatization, state ownership and the dichotomy between state and privately controlled firms remain defining characteristics of China's corporate sector. In a study of internal capital markets in state-controlled and privately owned business groups over the period 2004 to 2013, Chen, Jiang, Ljungqvist, Lu, and Zhou (2015c) find that privately owned groups allocate capital to units with better investment opportunities, while state-controlled groups do the opposite. They find that promotion in state groups depends on avoiding layoffs, and when the chairman is near promotion, capital is allocated to large, struggling employers.

Whited and Zhao (2015) go beyond individual-firm-value maximization to the question of the total value of China's corporate sector and find capital structure misallocation is even more severe across firms than within firms. They find that if China's debt and equity markets were as developed as in the US, China would gain 70-100% in firm value. Liu and Siu (2012) report the related result that discount rates used for investment decisions appear to vary across otherwise similar firms based on their ownership, suggesting that not all firms can be value-maximizing. Interestingly, the discount rates of state firms tend to increase towards those of private firms after partial privatization. These results are consistent with Hsieh and Klenow (2009) who estimate that a hypothetical reallocation of capital and labor in China to the levels of efficiency seen in the US would increase total factor productivity by 30%-50%.

If possible, it would also be useful to evaluate the progress of China's corporate sector with respect to socialist objectives. Central planners might argue that compromises in value are outweighed by gains in enhanced social welfare or GDP growth. Skeptics would counter that central planners' primary objective is political control. The field of corporate finance may be well-positioned to shed more light on this issue. Given the rapid growth of China's corporate sector, its progress and objectives are of broad relevance.

2.2 IPOs

Another early strand of literature studies IPOs in China. A large literature on IPOs in the US focuses on their underpricing and long-run performance and the literature on IPOs in China follows this lead. The review articles of Jenkinson and Ljungqvist (2001) and Ritter and Welch (2002) lay out the theories of underpricing and evidence from the US. According to these, underpricing compensates uninformed bidders for the winner's curse, compensates investors for uncertainty about firm value, compensates informed investors for information revelation, addresses reputation concerns of underwriters, and serves as a signal of favorable prospects to be recouped in subsequent offerings.

IPO underpricing in China is an order of magnitude greater than in the US, with average A-share IPO returns of 100-900% in studies surveyed by Yu and Tse (2006), compared with 20% in the US according to Ritter and Welch (2002). A number of papers examine the cross-sectional determinants of A-share IPO underpricing in China during the 1990s. For example, Chinese firms face a long and unpredictable lag between IPO offering and listing dates, as firms need to clear a more extensive regulatory approval process than in other countries. Mok and Hui (1998) and Chan, Wang, and Wei (2004) find deeper underpricing is associated with longer time lags between offering and listing, with conflicting results on the effects of state ownership. Su and Fleisher (1999) find evidence in support of the signaling hypothesis, in which firms that underprice recoup losses in their SEOs. Chen, Firth, and Kim (2004a) also find underpricing is associated with listing lag, government ownership, and SEO activity. Yu and Tse (2006) find evidence from online fixed-price offerings in support of the winner's curse hypothesis.

A concern with these studies is that the setting in China is so different, it is not clear how much the US-based theories apply. First, it seems unlikely that these theories could explain IPO returns of these magnitudes. Mok and Hui (1998) describe how over half a million people flocked to Shenzhen in 1992 to queue for lottery forms to buy shares from a handful of issues with little or no information about the companies they might buy. Such large excess demand suggests the presence of deliberate government subsidies to investors in IPO pricing. It would be useful to understand the political logic behind these subsidies. Moreover, cross-sectional variation in such subsidies could confound tests for the elements of investor compensation and issuer signaling that are evident in US underpricing. Furthermore, theories based on the US underwriting mechanisms may not apply well in China. Yu and Tse (2006) report that during 1996 to 2002, the most common offering method was online fixed-price offering, in which the offer price was set to earnings times a PE ratio consistent with that of the firm's industry peers, subject to a cap by the CSRC.

Although underpricing has been large, it may not be the best conceptual starting point.

As a number of authors explain, the central government sets an annual quota for new issues and allocates it across provinces and industries according to regional development goals. The first question would then seem to be, what determines which firms get selected? Not only is this issue of importance in its own right, it also likely alters the model of IPO underpricing. A more recent literature bears on this selection issue. Fan, Wong, and Zhang (2007) show that three-year post-IPO stock returns at firms with politically connected CEOs underperform those without by 18%, and these firms also have poorer operating performance and are more likely to appoint other bureaucrats to their boards. They also find lower IPO returns when CEOs are politically connected. In contrast, Bao, Johan, and Kutsuna (2015) find better performance post-IPO for politically connected firms in a later sample covering 2009-2012, even though these connections do increase the probability of IPO approval. Piotroski and Zhang (2014) also document the politicization of the IPO selection process. They find that incentives for capital market development induce incumbent politicians to accelerate IPOs, while firms with connections to incumbents rush to complete IPOs before turnover, leading to lower quality offerings around promotion events.

Allen, Qian, Shan, and Zhu (2017) shine additional light on the selection issue by comparing the financial and accounting performance of listed firms to that of matched non-listed firms. They find that selection is problematic in that listed firms are poorer performers than non-listed firms both *ex ante* and *ex post*. One of the selection criteria is that firms must show at least three years of positive earnings in order to gain approval, and Allen et al. (2017) argue that this can lead to value-destroying short-termism. Jia, Pownall, and Zhao (2014) interpret Red chips and P chips, which are, respectively, state-owned and private Chinese firms incorporated outside China and listed in Hong Kong, as firms that would have been rejected for mainland listing, and uses them as controls for approved firms. They find that SOEs listed on the mainland exchanges are better politically connected than Red chips and that private firms listed on the mainland exchanges are more profitable than P chips. Cong, Howell, and Zhang (2017) study the effects of China's four IPO suspensions between 2004 and 2015 and find that the resulting delay in the listing of approved firms stunts these firms' standardization process with adverse consequences for patent applications, underwriting syndicate structure, and executive compensation and hiring.

The implications of the listing selection process are potentially far-reaching. As Allen et al. (2017) argue, this selection process alters the composition of the listed corporate sector with potentially serious consequences for growth. It also hinders the development of the market for private equity, where IPOs are a key exit strategy. On the other hand, the potential availability of matched samples of successful and rejected applicants creates a rich new laboratory for the study of the causal effects a public listing. Whereas in the US, firms

have been de-listing in recent years, thousands of firms in China may seek public listing in the coming decades.

2.3 Corporate listing choice

Chinese firms actually have a range of potential incorporation and listing choices, making China a uniquely rich setting for research on the determinants and consequences of corporate listing choice. Chinese firms incorporated in mainland China can apply to list A shares and B shares on the Shanghai (SSE) or Shenzhen (SZSE) Exchanges, or H shares on the Stock Exchange of Hong Kong (SEHK). The SSE and SZSE each have main boards, where larger, more mature companies list, including most SOEs, and the SZSE also has the SME and ChiNext Boards, with more relaxed listing standards, designed to accommodate smaller and more entrepreneurial firms. Similarly, the SEHK has a Main Board and a Growth Enterprise Market. Chinese firms can also avoid the need for CSRC approval by incorporating outside of China, typically in the Cayman Islands, the British Virgin Islands, Bermuda, or Hong Kong. From there, they have a choice of listing on the SEHK as Red chips or P chips, on the NYSE or NASDAQ as N shares, or in rarer cases, on the London LSE as L shares or Singapore SGX as S shares. Pan and Brooker (2014) report that over 1000 Chinese firms had listed overseas by 2011 and tabulate the geography and time series of these listings.

Table 1 summarizes listing requirements, legal costs, processing time, and the number and size of Chinese firms on the mainland, Hong Kong, and US exchanges. While listing in China is least expensive, incorporating overseas is generally most expensive, because it requires foreign legal counsel, particularly when the firm uses a complex variable interest entity (VIE) structure to bypass Chinese restrictions on foreign direct investment in strategic industries. Therefore, foreign incorporation is generally only an option for larger firms. Requirements on pre-listing net income also vary across exchanges. The SSE is strictest, requiring 3-year cumulative net profits in excess of RMB 30 million, while NASDAQ is the most tolerant, allowing negative earnings for firms that meet other criteria. Finally, governance requirements also vary across exchanges. The US exchanges allow dual-class structures with differential voting rights, while the Hong Kong and Chinese exchanges do not.

In addition to differential listing requirements, Chinese firms may also consider longer-term effects of listing choice. Evidence from the literature on cross-listing on US exchanges provides some insights: firms that cross-list exhibit lower voting premiums and thus better minority shareholder protection than non-cross-listers, are more likely to terminate poorly performing CEOs, and have higher Tobin's q , lower cost of capital, and larger stock return

and trading volume reactions to earnings announcements (Doidge, 2004; Doidge, Karolyi, and Stulz, 2004; Bailey, Karolyi, and Salva, 2006; Lel and Miller, 2008; Hail and Leuz, 2009).

In the Chinese setting, Carpenter et al. (2017) show that A-share price informativeness about future profits of firms with H shares dual-listed on the SEHK is lower than the A-share price informativeness of non-dual-listed firms. Conversely, Loh (2016) finds that the H-share price informativeness of firms with A shares dual-listed on the mainland exchanges is lower than the H-share price informativeness of non-dual-listed firms. Similarly, Kot and Tam (2016) find that H-share prices contain less firm-specific information after Hong Kong-listed Chinese firms dual-list A shares in the mainland, although Li, Brockman, and Zurbrugg (2015) argue that H shares contain more firm-specific information than A shares, and Hu, Huang, Xiao, and Zou (2016) find that investment is more sensitive to these prices. Foucault and Gehrig (2008) show theoretically that cross-listing should increase stock price informativeness and improve investment decision-making. Empirically, however, Fernandes and Ferreira (2008) find that while cross-listing on US exchanges improves price informativeness for firms from developed markets, it reduces it for firms from emerging markets. Perhaps, when listing across segmented markets, gains from broadening the investor base are offset by adverse effects of discount rate shocks from the foreign market leaking into local prices and scrambling signals about future earnings.

In a preliminary study of the listing choices of Chinese firms on the SSE, SEHK, NYSE, and NASDAQ, Shen (2016) finds that industrial firms tend to list in China, while firms in the technology, media, and telecommunications sector tend to list in the US. The issue of listing choice is likely to become increasingly important as large numbers of Chinese firms seek to go public in the coming decades, particularly if overseas listing remains popular. The stakes will be especially high if different listing choices lead to significant differences in corporate outcomes.

3 EQUITY PRICING

On the asset pricing side, researchers have studied a number of interesting issues, including differential pricing across segmented markets, the firm-specific information content of prices, and cross-sectional pricing patterns in China. More generally, the literature has exploited unique features of China's stock market to provide new evidence on issues of broad interest.

3.1 The A-share premium puzzle

The early literature on the pricing of Chinese equities focuses on the premia in A-share prices relative to B-share prices. Firms can issue two classes of tradable shares in the domestic Chinese stock market with identical cash flow and voting rights: A shares and B shares. Prior to 2001, domestic Chinese investors could hold only A shares, while foreign investors could hold only B shares, and numerous studies report that B shares typically traded at discounts of 60-80% relative to their A-share counterparts during this period. This large domestic share premium is in contrast to the foreign share premium found in other markets, such as in Switzerland, Mexico, Finland, and Thailand (Stulz and Wasserfallen, 1995; Domowitz, Glen, and Madhavan, 1997; Hietala, 1989; Bailey and Jagtiani, 1994).

The literature offers several explanations for the A-share premia. Chakravarty, Sarkar, and Wu (1998) argue that domestic investors are better informed about firms' prospects and therefore face lower conditional variance and require lower returns. Chen, Lee, and Rui (2001) find that B-share discounts are primarily due to lower liquidity in the B-share market. Fernald and Rogers (2002) attribute A-share premia to the limited investment opportunity set available to domestic investors. However, Ma (1996) finds no evidence that A-share premia are correlated with differences in real interest rates in China and the US. Chan and Kwok (2005) find that A-share premia are negatively correlated with the relative supply of A shares and positively correlated with the supply of B shares. Chan, Menkveld, and Yang (2008) provide an explanation based on information asymmetry within the A-share market, and find that traditional measures of information asymmetry help to explain the cross-section of A-share premia.

Mei, Scheinkman, and Xiong (2009) use the dual-class structure to test the theory that speculative trading in the presence of short-sales constraints can lead to overvaluation (Miller, 1977; Harrison and Kreps, 1978; Chen, Hong, and Stein, 2002; Scheinkman and Xiong, 2003). They view B-share prices as controls for stock fundamentals and find that A-share premia are cross-sectionally correlated with turnover rates and idiosyncratic return volatility, proxies for speculative motives in trading. In 2001, the CSRC allowed domestic Chinese investors to hold B shares, which brought B-share discounts down to 40%, according to Karolyi, Li, and Liao (2009). They find that the firms with the greatest declines in B-share discounts were those with lowest state ownership, and conclude that political risk is an important determinant of the price differential.

With the introduction of the QFII program in 2002, which allows qualified foreign institutional investors to hold A shares directly, B share issuance and trading has largely died out. However, A-share premia over corresponding H shares with identical cash flow and voting rights are still prevalent for firms that are dual-listed in mainland China and Hong Kong.

Figure 2 shows the time series of the median A-H premium, i.e., A price over H price, for the full sample of dual-listed firms, as well as for the half of smaller capitalization firms, and for firms in the manufacturing and financial sectors, since 2006. The full-sample median has been around 1.5 or 2 in recent years, but was over 3 in 2009 and peaked in the 10-15 range in the late 1990s and early 2000s. The median A-H premium for smaller firms is consistently higher than for larger firms, possibly reflecting the shell value of a listing on the domestic Chinese stock market that could potentially be acquired by a firm seeking to circumvent the usual listing process for A shares. A-H premia are consistently higher for firms in the manufacturing sector, and lower for firms in the financial sector, where the median premium fell below 1 during 2010-11.

The premium of A-share prices over their dual-listed H-share twins has persisted despite the 2007 introduction of the QDII program, which allows qualified domestic Chinese investors to invest limited amounts outside China, and the 2014 and 2016 openings of the Shanghai- and Shenzhen-Hong Kong Stock Connect programs, which allow cross-market trading in a selection of stocks, including all dual-listed stocks. This violation of the law of one price does not represent an arbitrage opportunity because the significant degree of segmentation remaining between the two markets means convergence trades expose would-be arbitrageurs to the risk of large short-term losses. Chung, Hui, and Li (2013) attribute this price disparity to differential parameter uncertainty faced by investors in the two markets, while Guo, Tang, and Yang (2013) emphasize variation in corporate governance characteristics that may proxy for the possibility of wealth expropriation by controlling shareholders or corporate insiders. However, neither explanation is fully consistent with the substantial cross-sectional and time-series variation evident in Figure 2, and thus the A-share premium remains a puzzle. At the same time, the existence of multiple claims on identical cash flows, or at least claims on cash flows subject to similar shocks, traded in different venues by different groups of investors, presents the intriguing possibility of gaining additional insight into the determination of discount rates.

3.2 Information asymmetry and behavioral effects

A number of papers take advantage of distinctive features of China’s stock market to construct new tests of asset pricing theories, particularly with respect to information asymmetry and behavioral effects. In addition to market segmentation for dual-listed stocks, restrictions on investor trading location, and the dominance of retail investors, who hold 58% of the market according to Jia, Wang, and Xiong (2015) and account for 80% of trading volume according to the CSRC, help to make China’s stock market a rich new laboratory for the

study of asset pricing.

Feng and Seasholes (2004) use account-level data to study correlation in trading across groups of individuals in different locations, exploiting the restriction that individuals in China are allowed to open only one account and must place all trades through the branch office where the account was opened. Consistent with the logic of Brennan and Cao (1997) that nearby investors are better informed than those farther away, and will thus react less to information and execute trades of opposite sign, they find that trades of investors across branches within a given region are positively correlated and trades across regions are negatively correlated. Jia et al. (2015) study the reactions of A- and H-share prices of dual-listed stocks to analysts' earnings forecast revisions and find that A-share prices react more strongly to revisions from local, i.e., mainland-based analysts, while H-share prices react more strongly to revisions from foreign analysts. They attribute this result to investors' greater trust of analysts from their home region, associated with social and cultural factors like those studied in Guiso, Sapienza, and Zingales (2008) and Guiso, Sapienza, and Zingales (2009). Jia et al. (2015) distinguish this trust effect from the information asymmetry effect of Brennan and Cao (1997) by contrasting price reactions to analysts revisions with price reactions to earnings announcements. They acknowledge that limited investor attention and information immobility effects as in Peng and Xiong (2006) and Van Nieuwerburgh and Veldkamp (2009) could also play a role and amplify the effects of social trust.

Andrade, Bian, and Burch (2013) identify China's stock market as a natural setting for the study of asset price bubbles generated by dispersion in investor beliefs because of its short-sale constraints and the dominance of retail investors. Focusing on the 2007 stock price bubble, they find that stocks with greater analyst coverage had smaller bubbles, attributing this to analysts' coordinating beliefs across investors. Chang, Hong, Tiedens, Wang, and Zhao (2015) provide evidence on the origins of the investor disagreement by studying the relation between linguistic diversity and diversity of investor opinion across provinces in China. They show that in provinces with a greater number of unique languages spoken, investors express greater disagreement in opinions posted on stock message boards and through measures of household trading activity.

Hong, Jiang, Wang, and Zhao (2014) exploit the uneven rise in household wealth and growth of the middle class across Chinese regions over the period 1998-2012 to test for evidence of Keeping-Up-with-the-Jones preferences and trading for status concerns. They proxy for status concerns with a province or city's GDP per capita and proxy for local stock turnover by the difference between small and large stock turnover. They show that investors in regions that got richer faster traded more actively in small local stocks. Chen, Jiang, and Tong (2016) use economic policy uncertainty as a proxy for belief dispersion in the time

series to provide evidence in support of the theory of overvaluation in the presence of short sale restrictions. Bian, Su, and Wang (2015) study the effects of the prohibition on intraday round-trip stock trades and show that illiquidity discounts in prices decay over the course of the trading day.

These studies illustrate the power of employing unique features of China’s markets to address questions of broad interest. As more and better data become available and researchers become more familiar with these data, such analyses will likely yield a range of new insights. Moreover, the ongoing development of the stock market in China and the parallel evolution of regulations promise a wealth of new natural experiments to study.

3.3 Stock price informativeness

Another strand of the literature studies the quantity of firm-specific information in China’s stock prices. The macroeconomic stakes are high. A large literature, surveyed by Bond, Edmans, and Goldstein (2012), emphasizes the stock market’s special role in aggregating diffuse information across heterogeneous agents, generating useful signals for managers, and allocating capital accordingly (Grossman and Stiglitz, 1980; Glosten and Milgrom, 1985; Kyle, 1985; Roll, 1984; Dow and Gorton, 1997; Wurgler, 2000; Durnev, Morck, and Yeung, 2004; Markovitch, Steckel, and Yeung, 2005; Luo, 2005; Chen, Goldstein, and Jiang, 2007; Chari and Henry, 2008; Bakke and Whited, 2010).

Roll (1988) first used time series regressions of individual stock returns on market and industry returns to distinguish variation attributable to common factors from variation attributable to firm-specific information. Morck, Yeung, and Yu (2000) formalize the use of a stock’s market model R^2 as an inverse measure of the firm-specific information content in the stock price and study average R^2 of stocks over time and across countries. They show that stock synchronicity is negatively correlated with GDP per capita in a sample of 40 countries, holding out China as an example with especially high synchronicity. They document a negative correlation between stock synchronicity and the strength of property rights across countries. In a sample of US firms, Durnev, Morck, Yeung, and Zarowin (2003) provide support for R^2 as an inverse measure of stock price informativeness by showing that firms with lower R^2 have more information about future earnings in their current stock returns.

Jin and Myers (2006) show theoretically that it is a firm’s lack of transparency, rather than weak property rights per se, that boosts its R^2 , and find empirically that average R^2 is positively correlated with country-level measures of opacity in a sample of 40 countries. On the other hand, in a sample of firms from 25 developing countries, Chan and Hameed (2006) show that stocks with greater analyst coverage have higher stock price synchronicity. In a

sample of 48 countries, Fernandes and Ferreira (2009) find that enforcement of insider trading laws increases firm-specific stock return variation, although the effect is stronger among developed countries than among emerging markets. In a sample of Chinese-listed firms, Gul, Kim, and Qiu (2010) study cross-sectional variation in stock synchronicity and find that synchronicity is a hump-shaped function of ownership concentration, and greater when the largest shareholder is connected to the government. They also find that synchronicity decreases with audit quality and foreign ownership.

As Morck, Yeung, and Yu (2013) acknowledge, cross-country comparisons of stock price informativeness based on stocks' average market model R^2 are confounded by cross-country variation in market-level volatility, which mechanically boosts individual R^2 for a given level of idiosyncratic volatility. Therefore, to quantify stock price informativeness in China and compare it to that in the US, Carpenter et al. (2017) follow the methodology of Bai, Philippon, and Savov (2016). They measure stock price informativeness as the predicted variation in a cross-sectional regression of future earnings on the log of past market valuations, scaled by book assets, together with other controls. They show that stock price informativeness in China varies over the period 1995 to 2011, with a low in 2001 when the "Casino theory" of the stock market was proposed, but is rarely statistically significantly lower than that of the US, and often even exceeds that of the US. This result is surprising given the dominance of retail traders and in striking contrast to the view that China's stock market is inefficient, or disconnected from stock fundamentals. It suggests that China's stock market has an important informational role to play in generating useful signals for managers and investors and improving the efficiency of capital allocation and corporate investment decisions in China.

At the same time, China's frequent regulatory experiments and interventions can undermine price informativeness and the link between firm-specific fundamentals and prices, as Brunnermeier, Sockin, and Xiong (2017) show theoretically. Minor adjustments such as changes in the stamp duty on stock transactions seem to have had little effect on prices (Peng, Tang, and Wang, 2014), however, dramatic revisions in restrictions on margin financing during 2014-2015 appear to have fueled large stock market gyrations (Qian, 2016). Moreover, government interventions to support prices during this period increased stock synchronicity (Lou, 2016). While regulatory reforms are a necessary and welcome part of the development of the market, a permanent policy of heavy-handed intervention seems counterproductive (Smith, 2016).

3.4 Cross-sectional patterns in returns

The cross-sectional pricing of Chinese stocks has also attracted the attention of researchers. The A-share market was legally segmented for many years and is still dominated by Chinese investors, so China is the only large-scale laboratory for investigating such pricing effects in a setting independent of the more integrated markets that have been the subject of most of the literature. In this context, the natural question is whether Chinese investors price the same factors as those priced elsewhere. At the same time, the unique features of China's stock market, and its economy more generally, suggest that China-specific factors might also play an important role.

With regard to cross-sectional pricing phenomena that have been found in other markets, Chen, Kim, Yao, and Yu (2010) provide both a survey of the earlier literature and an examination of a comprehensive set of 18 variables. The results from this earlier literature are mixed, probably for two reasons. First, there is only a short history of stock returns, so the power to detect any effects is limited. Second, as Chen et al. (2010) note, there is probably less cross-sectional heterogeneity across traded firms in China in the early part of the sample period. The initial public listings constituted a set of large, state-owned firms from a limited number of industries. The more recent rapid expansion of the SME and ChiNext boards of the Shenzhen Stock Exchange, which brought smaller, younger and fundamentally different firms into the market, may be important for identifying interesting effects.

Papers using these richer data report results that are quite consistent with those documented in other markets (Fama and French, 1992; Jegadeesh and Titman, 1993; Amihud, 2002; Ang, Hodrick, Xing, and Zhang, 2006; Bali, Cakici, and Whitelaw, 2011). Size (e.g., Chen, Hu, Shao, and Wang (2015a)), illiquidity (e.g., Chen et al. (2010)), volatility (e.g., Cakici, Chan, and Topyan (2011)), and extreme returns (e.g., Nartea, Kong, and Wu (2015)) appear to be statistically and economically significant predictors of returns in the cross-section. There is less consensus about the robustness of the ability of scaled prices, e.g., book-to-market or earnings-to-price ratios, to forecast returns. Chen, Hu, Shao, and Wang (2015a) argue that this predictive power is confined to the 1995-1996 period, while Carpenter et al. (2017) document a more persistent value effect. Interestingly, momentum, which one might conjecture would be a strong effect in a retail-driven market such as China, is weak or non-existent, except when controlling for a host of other factors (Carpenter et al. (2017)). One reason for the mixed results may be that methodology matters more than in other markets (Xu and Zhang (2014)). For example, value weighting, float weighting and equal weighting can give very different portfolio returns in China where non-tradable shares dominated the market for much of the sample, where a significant number of large firms have

shares cross-listed in other markets such as Hong Kong, and where there are many large, state-owned enterprises.

While the majority of studies employ variables previously used in other markets, some researchers either use China-specific variables or interpret the results in the context of China's unique setting. Motivated by the looser regulatory environment in China that arguably creates more information asymmetry across investors, Choi, Jin, and Yan (2016) find that stocks with higher information asymmetry, as proxied by the aggressiveness of institutional investor trading, exhibit higher future returns. Chen, Demirer, and Jategaonkar (2015b) document that stocks with greater sensitivity to cross-sectional return dispersion also exhibit higher returns, interpreting dispersion as a measure of uncertainty associated with economic transitions, which is particularly high in a fast-growing developing economy such as China. Hilliard and Zhang (2015), while examining traditional size and book-to-market effects, condition the magnitudes of the associated premiums on measures of monetary policy and herding, with the former a possible proxy for the willingness of the government to intervene to prop up firms and the latter potentially an important phenomenon in the retail-driven Chinese market. Finally, Carpenter et al. (2017) use the fraction of state-ownership and the fraction of non-tradable shares as potential measures of the extent to which firms are subject to either state support or policy risk, while Liu, Shu, and Wei (2017) provide evidence of priced political risk in the context of the Bo Xilai political scandal.

As a whole, these papers on cross-sectional predictability suggest a market that is functioning in much the same way as the markets of other developed and emerging economies, at least in terms of priced factors, but there is clearly more to be done as the cross-section of firms continues to expand in size and scope. One important point is that these composition effects suggest that a GLS approach in a Fama-Macbeth regression context, that weights the coefficients from each cross-sectional regression by the amount of information that they contain, could conceivably use the information more efficiently (Carpenter et al., 2017).

4 EQUITY MUTUAL FUNDS AND DERIVATIVES

Markets for equity mutual funds and derivatives support stock markets by providing opportunities for equity risk management, generating incremental information, increasing liquidity, and improving corporate governance. Though China's stock market has grown to over \$7 trillion, of which over 75% is tradable, its markets for equity mutual funds and derivatives are still very small and new. The equity mutual fund market began in 1998 but still has only \$500 billion under management. By contrast, ICI (2016) reports that US domestic equity mutual funds have over \$7 trillion under management, representing over 30% of US stock

market capitalization. Derivatives markets are at an even earlier stage of development. The market for stock index futures opened in 2010 and index options began trading in 2015.

4.1 Equity mutual funds

The market for managed equity available to Chinese household investors remains surprisingly small relative to the size of the stock market, despite efforts by the CSRC to encourage the development of the equity mutual fund market. Yao (2012) highlights significant agency problems between investors and fund managers that might put investors off. Yet while the market for active management might require time for managers to develop expertise, track records, and reputation, it would seem that low-fee index funds should be straightforward to set up and offer much in terms of diversification and cost savings to retail investors who are directly holding and trading small numbers of stocks. One impediment is the underdevelopment of platforms to market these products to households.

The academic literature on mutual funds in China is just beginning. Yuan, Xiao, and Zou (2008) looks at whether mutual fund ownership in China improves corporate performance, as suggested by Admati, Pfleiderer, and Zechner (1994). While the evidence on the impact of institutional ownership from developed countries is mixed (Smith, 1996; Wahal, 1996; Morck and Nakamura, 1999; Allen, 2001; Woidtke, 2002; Cornett, Marcus, Saunders, and Tehranian, 2007), Yuan et al. (2008) find that mutual fund ownership increases a firm's Tobin's Q and other measures of firm performance. Tang, Wang, and Xu (2012) study the relationship between mutual fund size and performance in China. In contrast to Chen, Hong, Huang, and Kubik (2004b), who show that fund returns decline with lagged fund size in the US, Tang et al. (2012) find a humped-shaped relation between fund performance and size, due to conflicting effects of economies of scale and liquidity.

4.2 Equity futures and options

While the mutual fund market provides risk management to retail investors and can increase incentives for information generation and corporate monitoring, the derivatives markets allow institutional investors to trade risks wholesale and can provide additional information about the distributions of returns on underlying assets (Breedon and Litzenberger, 1978; Chiras and Manaster, 1978; Manaster and Rendleman, 1982; Figlewski and Webb, 1993; Pan and Poteshman, 2006). Commodity, currency, and bond futures have traded on exchanges in China since the early 1990s, but stock index futures did not trade until 2010, when the China Financial Futures Exchange (CFFEX) introduced futures on the CSI 300 Index, the index of the 300 largest and most active stocks listed on the Shanghai and Shenzhen Stock Exchanges.

In April 2015, the CFFEX also introduced futures on the CSI 500 Index, consisting of smaller stocks, and on the SSE50 index of large stocks. In February 2015, the SSE introduced the option on the SSE50 ETF, which itself began trading in 2005.

In the tradition of earlier literature on futures markets (Stein, 1987; Harris, 1989; Chan, Chan, and Karolyi, 1991; Chan, 1992; Bessembinder and Seguin, 1992), preliminary research on stock index futures in China focuses on volatility transmission between the spot and futures markets and price discovery, with mixed results (Yang, Yang, and Zhou, 2012; Chen, Han, Li, and Wu, 2013; Xie and Mo, 2014). Most recently, Han and Liang (2015) find that the severe restrictions on CSI 300 and CSI 500 futures trading introduced in September 2015 reduced the quality of the spot market in terms of bid-ask spreads, liquidity, and volume.

Research on equity options is also in an early stage, but China provides a compelling example of the importance of options in incomplete markets and in settings where volatility risk is high. Xiong and Yu (2011) study the Chinese warrants bubble of 2005-2008 and find additional evidence in support of the theory that belief dispersion and short sale restrictions lead to overvaluation. However, Wang, Zhou, and Zhu (2016) counter that many of the observed warrant prices can be reconciled with a model of option pricing in incomplete markets. In preliminary research, we find that deviations from put-call parity were close to zero in the early months of SSE50 ETF option trading, but spiked up after the ban on short selling of the SSE50 ETF in July 2015 and futures markets restrictions in September 2015, with puts becoming expensive relative to their synthetic counterparts, consistent with Ofek, Richardson, and Whitelaw (2004). Clearly, equity derivatives are a substitute channel for margin trading and short selling, so restrictions on their trading can have deleterious effects on the quality of stock prices, like restrictions on trading in the underlying spot market.

5 THE ROLE OF GLOBAL INVESTORS

While much of the development of China's stock markets over their almost 30 year history has been driven by domestic concerns, global investors are now becoming increasingly influential. As China has made initial steps towards relaxing capital controls and Chinese investors have viewed international investments as increasingly attractive, in part due to fear of depreciation of China's currency, capital outflows have become an increasing concern. One fix for these outflows would be to replace them with offsetting inflows from global investors, with the stock market being a natural destination. The presence of sophisticated international institutional investors might also increase the informativeness of prices and reduce the cost of capital as argued in Carpenter et al. (2017). For example, Huang and Zhu (2015) and Li et al. (2015) offer evidence that QFII investors improve corporate governance and increase the amount of

firm-specific information in stock prices. At the same time, it is natural that global investors have begun to appreciate the diversification benefits and investment opportunities associated with getting access to China’s market, as documented in Carpenter et al. (2017).

The QFII and RQFII programs that have existed for quite some time are not ideal for accessing these investment opportunities due to licensing requirements, quotas, and repatriation restrictions. Thus, it is not surprising that many global investors have eschewed exposure to A shares, getting China exposure through Chinese companies traded in more accessible markets such as Hong Kong and the US. Table 2 illustrates this phenomenon in the context of the US exchange traded fund (ETF) market, providing details on the ten largest China-focused ETFs. Both the largest and oldest ETFs hold equities traded outside of China, tracking primarily float-weighted, large cap indexes. However, these internationally traded shares are not a substitute for those traded domestically, given the time-varying pricing differentials between domestic and foreign-listed shares discussed in Section 3.1 and the associated relatively low correlations. It is only recently that ETFs tracking broader A-share indexes have been introduced, and they have not yet gained significant traction within the international investment community.

This lack of traction is partly a result of the fact that major index providers do not include A shares in their flagship indexes. For example, MSCI has for the last three years been considering including A shares in their Emerging Markets Index, to which over \$1.5 trillion of assets are benchmarked, but they have not yet done so. Negotiations between MSCI and the CSRC over reforms necessary for MSCI inclusion are ongoing and MSCI is expected to announce another decision on June 20, 2017. MSCI inclusion would boost global demand for A shares, an outcome that the CSRC clearly desires.² Thus MSCI has significant power to accelerate regulatory reform. The stock connect programs between Hong Kong and the exchanges in Shanghai and Shenzhen now appear to be the focal point of these negotiations, and MSCI is apparently pushing for two key concessions: a reduction in the number and duration of voluntary trading halts and the right to freely construct derivative contracts that rely on A-share prices. It is possible that global investors will have increasing influence over additional aspects of stock market regulation in China, and development of the derivatives markets discussed in Section 4 may actually occur outside of China. More generally, there is a vast literature on the effects of market integration on all manner of financial and economic outcomes. Henry (2000a,b) documents positive impacts on investment, wages, equity prices, and economic growth. More recently, Rey (2015) finds evidence of negative effects created

²Burnham, Gakidis, and Wurgler (2017) find that inclusion in the MSCI Emerging Markets Index increases the fraction of a stock’s tradable shares held by benchmarked portfolios to 45% of their total market capitalization.

by the volatility of foreign capital flows, but there is some question about whether concerns based on the experiences of smaller emerging markets are applicable to an economy and financial market as large as China's.

6 CONCLUSION

The rise of China and the five-fold growth of its stock market over the last decade have fueled a growing literature in financial economics. As China's stock market continues to grow in global influence, numerous areas are ripe for future research. More extensive research on the progress of China's SOE reform and the effects of equity capital infusion and privatization on corporate governance, profitability, and social impact would be of broad relevance. Additional evidence on the selection of firms for listing would also clarify numerous issues. Conversely, the range of listing alternatives available to Chinese firms creates a rich laboratory for studying the determinants and consequences of corporate listing choice. On the asset pricing side, ongoing reforms are likely to present opportunities for new tests and experiments, including the opening of new Stock Connect programs between China and international exchanges, the inclusion of China in international equity indexes, ad hoc government interventions, and continued reforms to improve liquidity, price discovery, and freer capital flow. Meanwhile, segmented markets for dual-listed stocks yield new evidence on differential discount rates. More broadly, the expanding panel of data will support deeper analysis of cross-sectional and market-level asset pricing in China.

One challenge for researchers will be to gain familiarity with China's distinctive financial system and avoid over-applying research paradigms developed for the US setting. A more pragmatic concern is the issue of the availability and accessibility of high quality data. The China Stock Market and Accounting Research Database (CSMAR) is now widely available and easily accessible on WRDS, and it provides data on publicly traded Chinese equities similar to that provided by CRSP and COMPUSTAT for US firms, in addition to a comprehensive mutual fund database. However, to a large extent the data is limited to A and B shares, with extremely limited coverage of Chinese firms listed in other markets. Services such as Datastream and Bloomberg, which are oriented toward practitioners, have data across the full universe of trading locations, but in our experience the historical data are not fully adequate for academic research. Perhaps the most reliable and comprehensive data are available through the Wind Datafeed Service, which provides historical data for stocks, bonds, derivatives and funds, plus economic data and access to the underlying primary documents and filings. However, Wind is not easily accessible to much of the research community. In addition, there is a wealth of data that has been collected by Chinese government agencies

and regulators, but much of these data are also not easily accessible. One way to stimulate more valuable and interesting research would be to facilitate greater access to these resources.

Finally, while there are a host of interesting and unanswered research questions about China's developing stock market, from a domestic and global economic perspective the key issue is the role of this market in sustaining China's economic growth going forward. China is at a pivotal point in its development as it attempts to transition from a state-controlled, investment-driven economy to one that is more market-oriented and consumption-driven. It is also at a critical point in its path to integration in global financial markets, as highlighted by the debate over the potential inclusion of China A shares in MSCI indexes. The development of the financial system, in general, and the stock market in particular, will likely play an instrumental role in both of these transitions. There are two key questions. First, can the stock market improve the efficiency of capital allocation and support broader financial stability? Second, can the stock market serve as a platform for greater global diversification, thus improving risk sharing and potentially lowering the cost of capital for Chinese companies? Research that speaks to these questions is of first-order importance.

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Table 1 Potential listing venues for Chinese firms

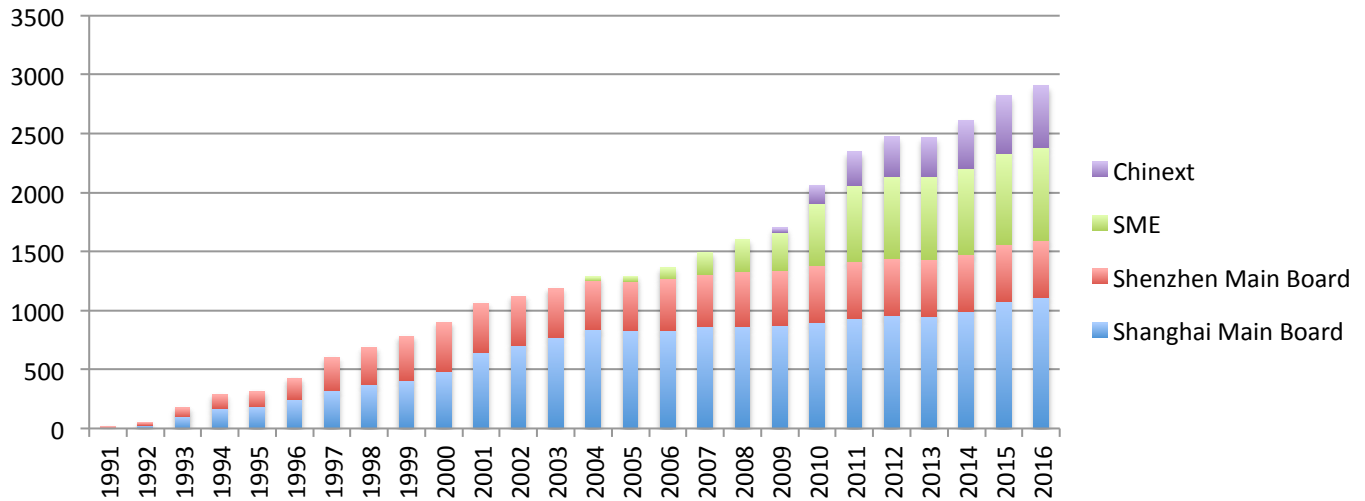
	Shanghai SE	Shenzhen SE	SE of Hong Kong	NYSE	Nasdaq
Legal costs	Low	Low	Medium	High	High
Dual class permitted	No	No	No	Yes	Yes
Earnings/size requirement	Strict positive earnings threshold for three consecutive years	Strict positive earnings threshold for three consecutive years for MB, softer tests for SME and ChiNext	Softer three-year earnings test	Softer three-year earnings test or size threshold	Even softer earnings test or size threshold
Selection mechanism	IB sponsorship and CSRC approval	IB sponsorship and CSRC approval	IB sponsorship	Registration-based	Registration-based
Average processing time	10 months	10 months	6 months	4 months	4 months
Total market cap 8/2016, trillion USD	4.0	3.2	3.2	19.3	9.1
Parent company	CSRC	CSRC	HK Exchanges and Clearing Limited	Intercontinental Exchange	The Nasdaq OMX Group
Year founded	1990	1990	1891	1792	1971
Number of listed companies 8/2016	1114	1796	1925	3176	3170

Table 2 Top 10 China ETFs

The 10 largest China ETFs by assets under management as of May 25, 2017. Source: etfdb.com

Ticker	Name	AUM (\$M)	Index	Composition	Number of Holdings	Inception Date
FXI	iShares China Large-Cap ETF	3,146	FTSE China 50	HK-traded (e.g., H shares, P chips)	50	10/5/04
MCHI	iShares MSCI China ETF	2,407	MSCI China	Non-China-traded (e.g., H shares, N shares)	150	3/29/11
GXC	SPDR S&P China ETF	870	S&P China BMI	Non-China-traded (e.g., H shares, N shares)	350	3/19/07
KWEB	KraneShares CSI China Internet ETF	454	CSI China Overseas Internet	Non-China-traded (e.g., H shares, N shares) internet companies	33	7/31/13
ASHR	Deutsche X-trackers Harvest CSI 300 China A-Shares ETF	353	CSI 300	China-traded (A shares)	300	11/6/13
PGJ	PowerShares Golden Dragon China Portfolio ETF	174	NASDAQ Golden Dragon China	US-traded (N shares)	62	12/9/04
YINN	Direxion Daily FTSE China Bull 3x Shares ETF	154	FTSE China 50	Levered 3x, e.g., using total return swaps	NA	12/3/09
KBA	KraneShares Bosera MSCI China A ETF	110	MSCI China A	China-traded (A shares)	413	3/4/14
CHAD	Direxion Daily CSI 300 China A Share Bear 1x Shares ETF	94	CSI 300	Inverse -1x, e.g., using total return swaps	NA	6/17/15
CQQQ	Guggenheim China Technology ETF	94	AlphaShares China Technology	Non-China-traded (e.g., H shares, N shares) information technology	73	12/8/09

A. Number of listed firms 1991-2016



B. Market capitalization of listed firms 1991-2016

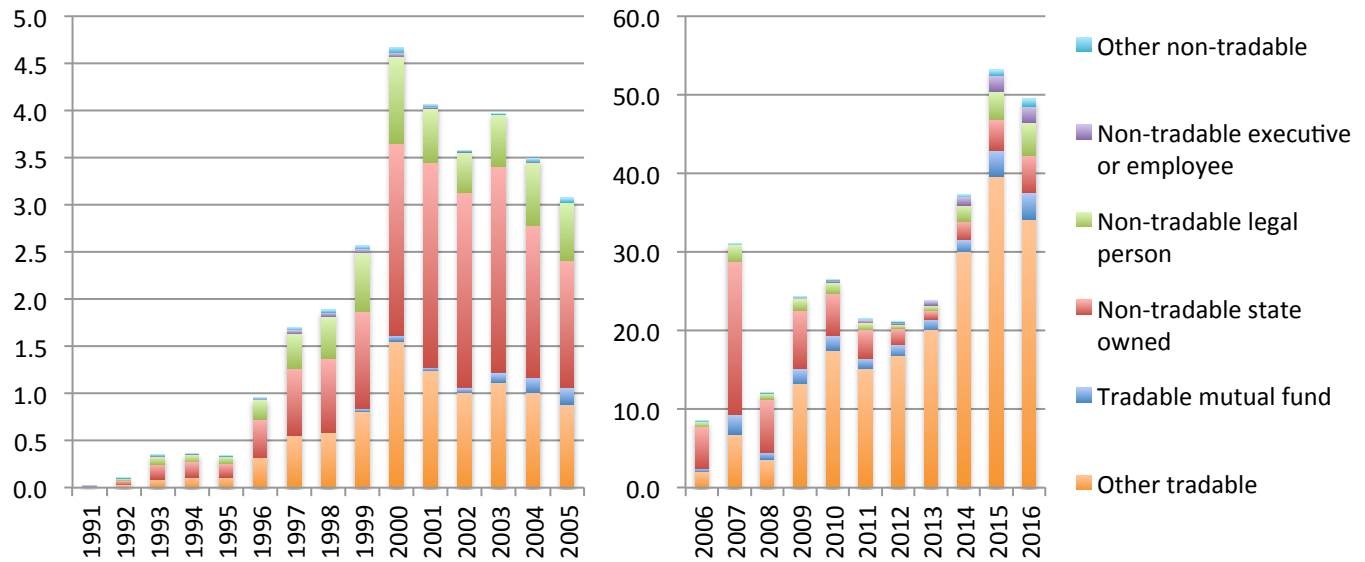


Figure 1

Number of firms and market capitalization, in trillions of RMB, listed on China's stock market 1991-2016. The time series of market capitalizations in Figure 1B is split at year 2006 to accommodate the significant increase in scale.

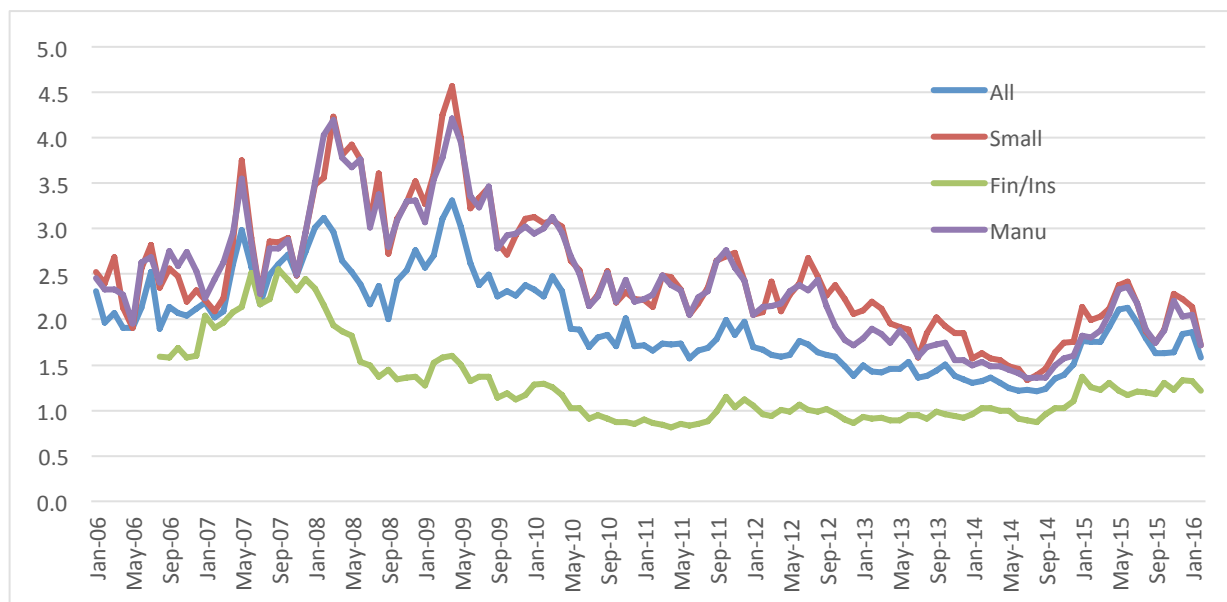


Figure 2

Median premium in A-share price over H-share price 2006-2016. All is the full sample of firms with dual-listings of A shares in Shanghai or Shenzhen and H shares in Hong Kong. Small is the smaller half of these firms, Fin/Ins are firms in the financial and insurance sectors, Manu are firms in the manufacturing sector.