

RESEARCH

Trading in the China A-Share Market

November 2021

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The China A-share market has seen steadily increasing participation by foreign investors thanks to eased restrictions in the last decade. In this paper, we take a deep dive into the market microstructure and find this market exhibits good liquidity and relatively low trading costs. Our research also shows that Dimensional's flexible trading approach in the A-share market provided an average trade price advantage of 11 basis points over an immediacy-demanding approach in 2020.

INTRODUCTION

The Chinese equity market is the second-largest stock market in the world, with its A-share market accounting for most of the liquidity. While historically the China A-share market was difficult to access for foreign investors due to regulations, it has become more accessible in recent years. As a result, more and more foreign investors are trading in the China A-share market, and major indices have started including A-share stocks.

Dimensional began trading China A-shares in Q2 2019 for a selection of separate-mandate clients who had a specific need to invest in China. Dimensional started trading A-shares more broadly, including in commingled vehicles, in Q2 2020. In an earlier paper, we studied the long-term drivers of returns in the China A-share market and found positive size, value, and profitability premiums, consistent with the predictions of valuation theory and with the ample evidence from other markets.¹ In this paper, we focus on intraday considerations when investing in the China A-share market. After a brief overview of the A-share market, we examine its microstructure and compare it to the H-share and ADR markets for Chinese stocks. We then show the price advantage of Dimensional’s flexible trading approach in the A-share market.

OVERVIEW OF CHINA A-SHARE MARKET

The Chinese equity market is segmented into three major share classes² based on listing market: A-shares, which are listed in mainland China and have restricted access to foreign investors, H-shares/Red-chips/P-chips, which are listed in Hong Kong, and N-shares/ADRs, which are listed in the US. The latter two groups are available for unlimited foreign investments. Firms can have dual listings or triple listings across markets. **Exhibit 1** summarizes the statistics of the listings in those three categories. As of December 31, 2020, there were 4,137 distinct A-share listings, compared to 1,062 in Hong Kong and 307 in the US. The A-share listings had a weighted average total market capitalization of \$44 billion, accounting for 52% of the total free-float capitalizations across the Chinese equity market, while the offshore listings had a much larger weighted average total market capitalization (\$286 billion in Hong Kong and \$296 billion in the US), accounting for a similar size of free-float capitalization proportion (48%). Despite similar proportions of free-float capitalizations, the A-share market is much more liquid than the offshore markets, accounting for 85% of total trading volume from the beginning of 2019 through the end of 2020. In fact, the mainland China equity market (mostly from A-shares and a small fraction from B-shares) is the second largest in the world in terms of nominal trading volume,

EXHIBIT 1: Summary Statistics of Major Share Classes in Chinese Equity Market, as of 12/31/2020

	A-Shares (Shanghai and Shenzhen Stock Exchange)	H-Shares and Red-Chips and P-Chips (Hong Kong Stock Exchange)	N-Shares and China ADRs (NYSE and Nasdaq and OTC)
Trading Currency	CNY	HKD	USD
Number of Names	4,137	1,062	307
Weighted Average Total Market Capitalization (USD Million)	\$43,718	\$285,542	\$295,788
% of Free Float Capitalization Across Market	52%	42%	6% ³
% of Trading Volume (2019-2020) Across Market	85%	7%	8%
% of Free Float Capitalization of 5 Largest Stocks	7%	45%	46%
% of Trading Volume (2019-2020) of 5 Largest Stocks	2%	28%	38%
% of Free Float Capitalization Held by Retail Investors ⁴	40%	7% (for the entire Hong Kong market)	4% (for the entire US market)
Available to Foreign Investors	Yes, under QFI/Stock Connect programs	Yes	Yes

Source: Dimensional using Refinitiv and Bloomberg data. As of 12/31/2020. Total market capitalization is averaged using free-float capitalization as the weight.

1. See Stanley Black and Wei Dai, “Dimensions of Expected Returns in the China A-Shares and H-Shares Stock Markets” (white paper, Dimensional Fund Advisors, 2019).
 2. Other share classes, like B-shares, S-Chips, etc., are not included in the paper because of their tiny representation.
 3. We ignore the free-float capitalizations for ADRs of dual listings of H-shares/Red-chips/P-chips to avoid double counting.
 4. As of mid-2018. Source: Haitong Securities, November 9, 2018. “A股与美股的市场结构对比” (The Market Structure Comparison Between China A-Share and US Market).

EXHIBIT 2: Global Equity Average Daily Trading Volume Map, 2019-2020



Data source: Dimensional using Refinitiv DataScope Equities data. In USD. Equity market only, excluding ETFs. Each dot represents the average daily total trading volume of all stocks listed in a country from 01/01/2019 to 12/31/2020.

as shown in Exhibit 2. In addition, the A-share listings are less concentrated than the offshore listings. The five largest A-shares (by total market capitalization) account for 7% of free-float capitalization and 2% of trading volume of the A-share market, while the five largest H-shares and China ADRs account for much larger proportion of free-float capitalization (45% and 46%) and much larger fraction of trading volume (28% and 38%) of their markets. Finally, the participation rate of local retail investors is high in the A-share market. Retail investors hold 40% of the A-share market by free-float capitalization, compared to only 7% in Hong Kong and 4% in the US as of mid-2018.

How can foreign investors access the A-share market?
There are mainly two ways: onshore and offshore.

QFI (Qualified Foreign Investor) Scheme

QFI was implemented on November 1, 2020, to replace the previous QFII (qualified foreign institutional investors) and

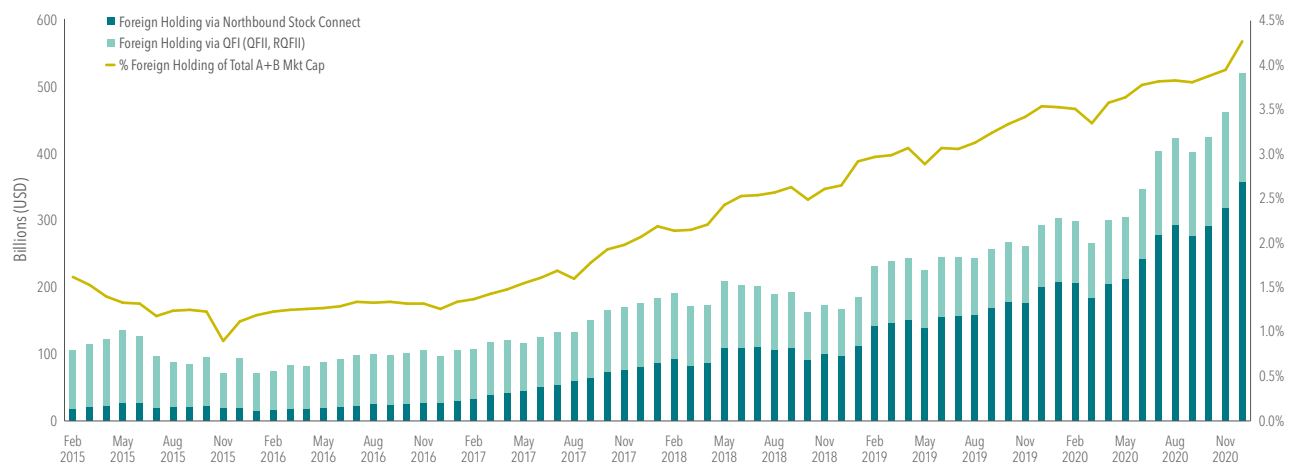
RQFII (renminbi QFII) schemes. To qualify under the QFI scheme, the foreign institutional investors (FIIs) have to first set up an account in China, convert foreign currency into onshore renminbi (also referred to as CNY), and make the investments onshore. When they want to repatriate these investments, they need to convert CNY back into foreign currency and remit offshore. Further requirements include the type of FII as well as the credit and operations records of the investor.⁵

Stock Connect Program

The stock connect program is a cross-boundary investment channel that enables mutual market access between Mainland China’s stock exchanges and the Hong Kong Stock Exchange. The program for southbound trading (Southbound Stock Connect) allows onshore Chinese investors to trade eligible stocks listed in Hong Kong Stock Exchange, while the program for northbound trading (Northbound Stock Connect) allows foreign investors to trade a particular subset of A-shares

5. For details, see “CSRC, PBC and SAFE Release the Measures for the Administration of Domestic Securities and Futures Investment by Qualified Foreign Institutional Investors and RMB Qualified Foreign Institutional Investors,” China Securities Regulatory Commission (September 2020).

EXHIBIT 3: Foreign Ownership in China Onshore Equity Market from Stock Connect and QFI, 2015-2020



Source: HKEX, PBOC, and UBS. PBOC monthly data are published quarterly. UBS provided the data.

without having to open accounts onshore in China by using the trading and clearing facilities of the Hong Kong Stock Exchange. The main benefits of Northbound Stock Connect over QFI are: (1) foreign investors are more familiar with and may already be using the Hong Kong Stock Exchange’s trading, clearing, and settlement infrastructure, and (2) foreign investors face less repatriation risks. The Shanghai-Hong Kong Stock Connect started in November 2014, followed by the Shenzhen-Hong Kong Stock Connect in December 2016. Since then, the ownership of A-shares and B-shares by foreign investors has been increasing steadily, from 1.6% in February 2015 to 4.2% in December 2020, as shown in **Exhibit 3**.

The main limitation of Northbound Stock Connect is the investment scope: Only a subset of A-shares that belong to certain indices or meet the minimum market capitalization requirement are eligible for trading via Stock Connect.⁶ **Exhibit 4** provides a breakdown of A-shares based on eligibility for Stock Connect as of December 31, 2020. Although only 35% of A-shares by count are eligible for buy and sell under Stock Connect, they account for 80% of the aggregate free-float capitalization. The other limitation of Stock Connect is its daily quota, which limits the net buy value (buys minus sells) of cross-boundary trades via Stock Connect each day. The northbound daily quota⁷ was initially set at CNY ¥13

EXHIBIT 4: Breakdown of A-Shares by Eligibility for Northbound Stock Connect, as of 12/31/2020

Share Class	Exchange	Stock Connect Type	Number of Stocks	Weighted Average Total Market Capitalization (USD Million)	% of Stocks	% of Free-Float Capitalization
A-Shares	Shanghai	Stock Connect (Buy and Sell)	574	\$74,558	32%	79%
		Stock Connect (Sell Only)	389	\$2,195	22%	8%
		Ineligible for Stock Connect	829	\$4,137	46%	13%
	Shenzhen	Stock Connect (Buy and Sell)	886	\$31,986	38%	81%
		Stock Connect (Sell Only)	461	\$1,467	20%	7%
		Ineligible for Stock Connect	998	\$1,192	43%	11%
	Total	Stock Connect (Buy and Sell)	1,460	\$54,039	35%	80%
		Stock Connect (Sell Only)	850	\$1,876	21%	8%
		Ineligible for Stock Connect	1,827	\$2,847	44%	12%

Source: Dimensional using Bloomberg and Refinitiv DataScope Equities data. As of 12/31/2020. Total market capitalization is averaged using free-float capitalization as the weight.

6. For details, see “Chapter 14A: China Connect Service-Shanghai” and “Chapter 14B: China Connect Service-Shenzhen,” HKEX.

7. The Southbound Stock Connect is subject to a separate set of daily quota.

EXHIBIT 5: Northbound Stock Connect Daily Quota Limit and Usage, 2014–2020



Data source: Instinet, Nomura Ideas Hub, Bloomberg, HKEX. Instinet provided the data. 11/18/2014 to 12/31/2020. The daily quota limit is CNY ¥13 billion before 05/01/2018, and is CNY ¥52 billion on and after 05/01/2018. The quota usage is the difference between daily quota limit and daily quota balance published by Hong Kong Stock Exchange at the end of each trading day.

billion (about USD \$1.99 billion) for each of Shanghai Connect and Shenzhen Connect⁸ and later increased to CNY ¥52 billion (about USD \$7.95 billion) on May 1, 2018. However, this quota limit is large enough that it has never been reached in recent years. In fact, the daily usage was 2.2% on average and remained below 50% from May 2018 to December 2020, as shown in **Exhibit 5**.

MICROSTRUCTURE OF CHINA A-SHARE MARKET

How different is trading in the China A-share market compared to the Hong Kong and US markets? **Exhibit 6** compares several aspects of market microstructure across those markets. All three support market and limit orders and have open and closing auctions to start and end the trading session each day. A unique feature of the A-share market is that day trading activities are not allowed, which

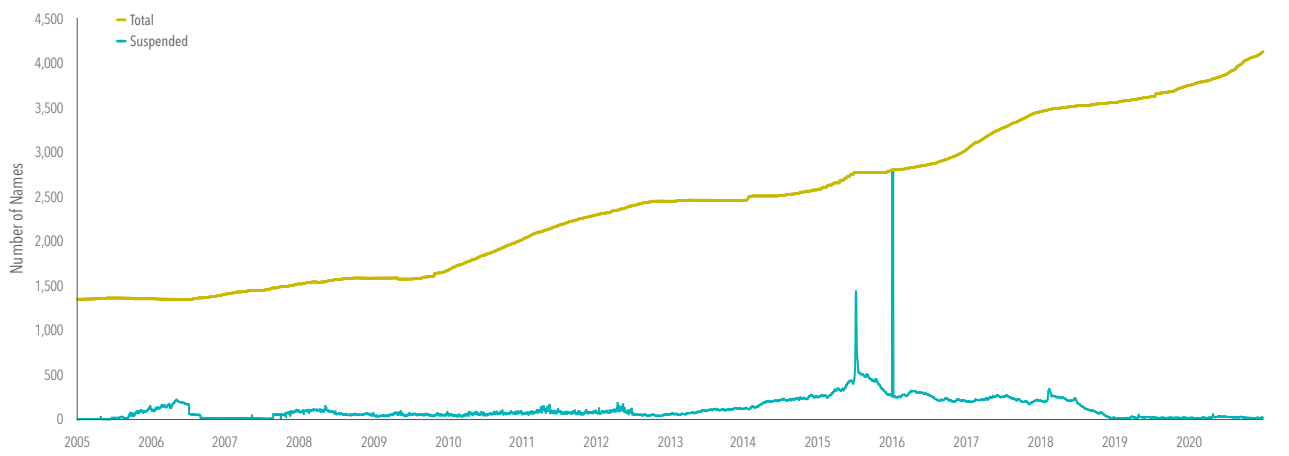
EXHIBIT 6: Comparison of Microstructure Among Chinese Equity Markets, as of 12/31/2020

	Shanghai and Shenzhen Stock Exchange (A-Shares)	Hong Kong Stock Exchange (H-Shares and Red-Chips and P-Chips)	US Stock Markets (N-Shares and China ADRs)
Day Trading	Not allowed	Allowed	Allowed
Trading Days	Mon-Fri, except public holidays in mainland China For Northbound Stock Connect, also exclude: (1) public holidays in Hong Kong (2) banking services are not available in mainland China or Hong Kong on T+1, the corresponding money settlement day	Mon-Fri, except public holidays in Hong Kong	Mon-Fri, except public holidays in US
Trading Hour	9:30–11:30 13:00–15:00	9:30–12:00 13:00–16:00	9:30–16:00
Order Types	Limit/Marketable Order	Limit/Marketable Order	Limit/Marketable/Pegged
Order Visibility	Displayed only	Displayed only	Displayed/Non-Displayed
Auctions	Open/Close	Open/Close	Open/Close (except for OTC markets)
Price Limit	For individual stocks: yes Marketwide circuit breaker: implemented on September 7, 2015, and removed on January 8, 2016	For individual stocks: yes Marketwide circuit breaker: no	For individual stocks: yes Marketwide circuit breaker: yes

Sources: Shanghai Stock Exchange, Shenzhen Stock Exchange, Hong Kong Stock Exchange, New York Stock Exchange, Nasdaq Stock Market, and OTC Markets.

8. "Stock Connect Another Milestone: FAQ," HKEX (October 2021).

EXHIBIT 7: China A-Shares Daily Trading Suspensions, 2005-2020



Source: Dimensional using Bloomberg data.

means investors who buy shares today can only sell those shares tomorrow or later.

Another important feature of the A-share market is the trading suspension rules. In China, there are two types of trading suspensions—mandatory and voluntary. Prior to 2018, the mandatory suspension accounted for 3% of all suspension events and lasted for five days on average, while the voluntary suspension accounted for 97% of all suspension events and lasted for 22 days on average.⁹ As a result, the mainland China A-share market had higher overall rates of trading suspensions than what is typically seen in emerging markets (5.5% vs. 0.6% from 2005 to 2018).

To address the high suspension rate issue, the regulators removed the market-wide circuit breaker¹⁰ on January 8, 2016, four months after implementation (September 7, 2015). During this four-month period, the circuit breaker was triggered twice and resulted in all A-share stocks being suspended from trading on January 4 and 7, 2016. In 2018, the regulators significantly tightened guidelines governing the voluntary trading suspensions in the A-share market, leading to a sharp drop in the number of suspended names afterwards, as shown in **Exhibit 7**.

To further understand the A-share market microstructure, we use our comprehensive data set of tick-by-tick trade

EXHIBIT 8: Tick Data Analysis of Chinese Equity Market Microstructure, 2019-2020

Trading Market	Share Class	Stock Connect Eligibility	Number of Stocks	Avg. Daily Market Traded Value (USD)	% of Total Daily Traded Value in Emerging Markets	Avg. Free-Float Capitalization (USD)	Avg. Stock Daily Traded Value (USD)	Avg. Stock Daily Turnover	Avg. Intraday Bid-Ask Spread (bps)	Avg. % of Closing Auction Volume
CN	A-Shares	Eligible for Buy and Sell	1,448	\$67B	43%	\$7.5B	\$152M	3.2%	10.6	1.4%
		Ineligible or Eligible for Sell Only	2,493	\$30B	23%	\$0.4B	\$24M	7.6%	18.3	1.5%
		All	3,941	\$97B	66%	\$6.0B	\$124M	4.2%	12.3	1.4%
HK	H-Shares/ Red-Chips/ P-Chips		614	\$7B	6%	\$129.3B	\$442M	0.4%	19.8	9.0%
US	N-Shares/ China ADRs		86	\$7B	5%	\$160.9B	\$1,639M	0.7%	8.0	6.5%
Other Emerging Markets			5,142	\$32B	23%	\$30.3B	\$104M	0.7%	23.1	11.9%

Source: Dimensional using Refinitiv Tick History Data and Bloomberg Data. 01/01/2019 to 12/31/2020. Universe includes all China A-Shares and stocks in other markets that are in Dimensional's investment universe. Stock connect eligibility is as of 12/31/2020. Cross-sectional averages are weighted by average stock free-float capitalization from 01/2019 to 12/2020.

9. From May 2005 to December 2016. Source: Qing He, Jingyun Gan, Shuwan Wang, and Terence Tai Leung Chong, "The Effects of Trading Suspensions in China," *North American Journal of Economics and Finance* 50 (May 2019): 100985.
 10. US market also has the marketwide circuit breaker when the decline of S&P 500 index breaches certain thresholds against the prior day's closing price. In March 2020, this circuit breaker was triggered in four different trading days and halted trading for 15 minutes each time.

and quote data to compute several key microstructure statistics. **Exhibit 8** summarizes the cross-sectional averages of the daily statistics from 2019 to 2020 for 3,941 A-shares, selected¹¹ H-shares/red-chips/p-chips, and N-shares/ADRs. Stocks from other emerging markets¹² are also included for reference.

Turnover

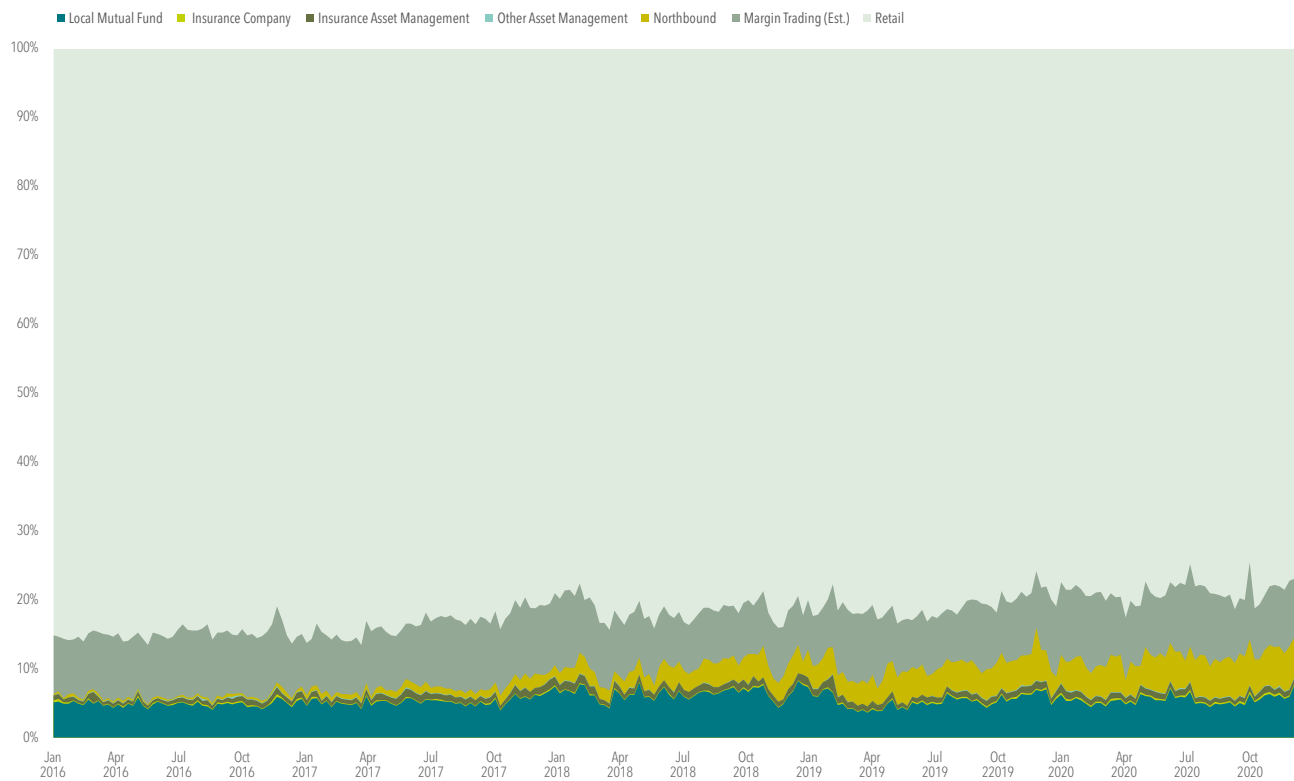
Turnover, the ratio between average daily traded volume and free-float capitalization, is one way to measure market liquidity. A-shares have a much higher weighted average turnover of 4.2%, compared to 0.4%–0.7% across other markets. Such high turnover rate in the A-share market may be largely due to the high participation of local retail

investors. As shown in **Exhibit 9**, retail investors accounted for about 80% of the A-share market turnover from 2016 to 2020, compared to less than 30% in Hong Kong and US markets.¹³

Bid-Ask Spread

The bid-ask spread is the difference between the lowest ask price and the highest bid price, divided by the midpoint price. It can be thought of as the execution price difference between supplying and demanding immediacy, and is one component of the trading costs incurred by traders who demand immediacy. For each stock on each day, we compute the time-weighted average¹⁴ intraday bid-ask spread in basis points (bps). We then take a simple average across

EXHIBIT 9: Decomposition of China A-Share Market Volume by Investor Type, 2016–2020



Sources: UBS-S and Wind. UBS provided the data.

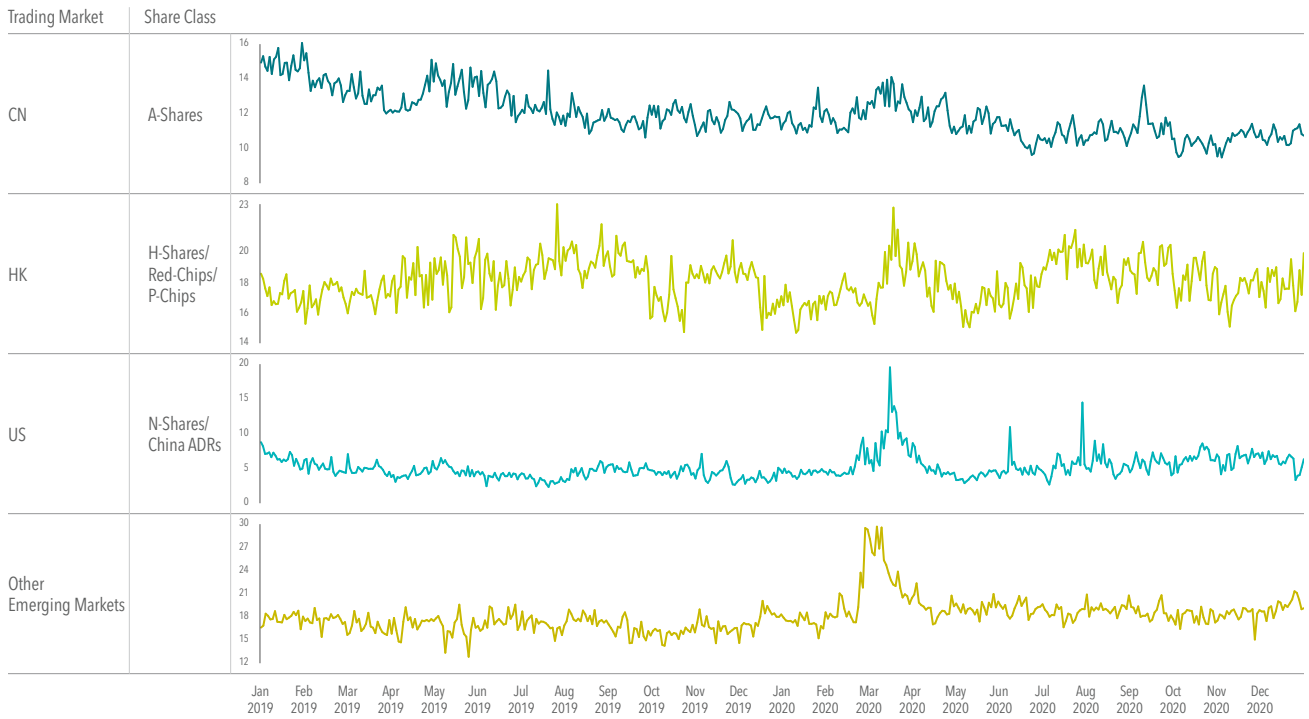
11. Stocks in Dimensional’s investment universe.

12. Brazil, Chile, Colombia, Czech Republic, Egypt, Greece, Hungary, India, Indonesia, Malaysia, Mexico, Peru, Philippines, Poland, South Africa, Korea, Taiwan, Thailand, Turkey.

13. As of mid-2018. “Global Investors Take Their Positions Ahead of China’s Inclusion in MSCI Index,” *South China Morning Post*, May 1, 2018.

14. Weight for each distinct intraday bid/ask price is the duration that the bid/ask price lasts for.

EXHIBIT 10: Bid-Ask Spreads of Different Markets Over Time, 2019-2020



Source: Dimensional using Refinitiv Tick History Data. 01/01/2019 to 12/31/2020. Universe includes all China A-shares and stocks in other emerging markets that are in Dimensional's investment universe. Bid-ask spreads are computed by taking trade-value-weighted average across stocks for each day.

days for each stock. Despite their smaller average market capitalizations, A-shares have a weighted average spread of 12.3 bps, which is smaller than that of H-shares (19.8 bps). The bid-ask spread of A-shares is also much tighter than that of other emerging markets (23.1 bps).

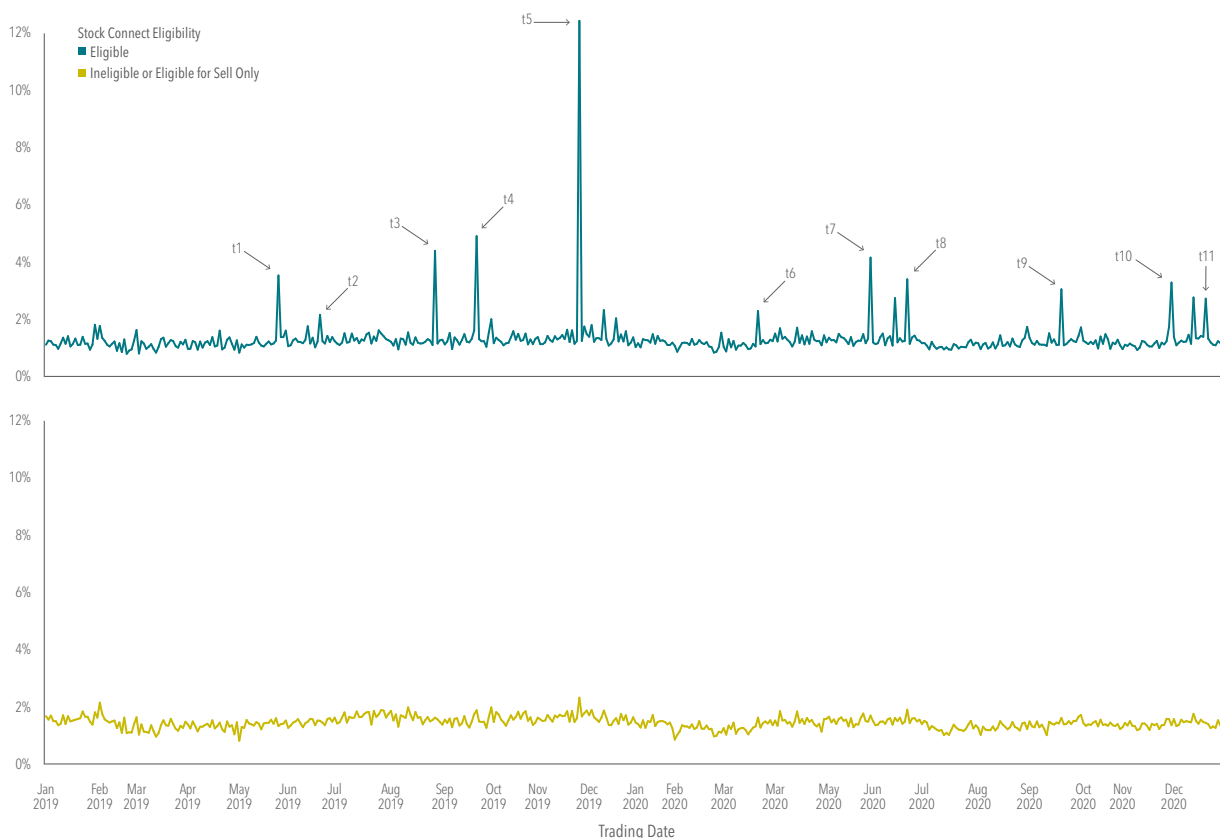
Closing Auction Volume

Closing auction is a mechanism occurring at the end of each trading day to determine the closing price for each stock. Closing prices are used to price mutual fund shares and report performance by institutional investors, as well as to compute asset values for exchange-traded funds (ETFs) and stock indices. As a result, closing auction orders are heavily used by institutional investors who want to track closing prices. To measure closing auction activities, we

compute the ratio between the closing auction volume and daily total trading volume. For A-shares, closing auction volume represents on average 1.4% of the daily volume, much lower than in other markets, where it represents between 6.5% and 11.9%. The low closing auction volume may reflect the relatively lower institutional participation in the A-share market.

To see how the market microstructure changed over time, we plot the day-by-day statistics from January 2019 to December 2020. **Exhibit 10** shows the time-series plot of the bid-ask spread. During March 2020, the global equity markets tumbled due to the pandemic and market volatility reached an all-time high. The bid-ask spread of the H-shares, China ADRs, and other emerging markets all peaked while the spread in the A-share market remained flat. Again, this

EXHIBIT 11: Percentage of Closing Auction Volume in A-Share Market Over Time, 2019-2020



Source: Dimensional using Refinitiv Tick History Data. 01/01/2019 to 12/31/2020. Universe includes all China A-Shares. Percentages of closing auction volume are computed by taking trade-value-weighted average across stocks for each day.

may be driven by the higher participation of local retail investors and lower participation of institutional investors in the A-share market.

EXHIBIT 12: Schedules for Major Index Rebalancing Events Related to China A-Shares

Label	Date	MSCI Emerging Market Index	FTSE Global Equity Index Series (GEIS)	S&P Global and Emerging
t1	05/28/2019	Inclusion factor: 5%->10%		
t2	06/21/2019		Inclusion factor: 0%->5%	
t3	08/27/2019	Inclusion factor: 10%->15%		
t4	09/20/2019		Inclusion factor: 5%->15%	Inclusion factor: 0%->25%
t5	11/26/2019	Inclusion factor: 15%->20%		
t6	03/20/2020		Inclusion factor: 15%->17.5%	
t7	05/29/2020	Semi-annual index rebalancing		
t8	06/19/2020		Inclusion factor: 17.5%->25%	Semi-annual index rebalancing
t9	09/18/2020		Semi-annual index rebalance	
t10	11/30/2020	Semi-annual index rebalancing		
t11	12/18/2020			Semi-annual index rebalancing

Sources: MSCI, FTSE, and S&P.

EXHIBIT 13: Summary Statistics of Aggregate Market and Dimensional Trades in Different Chinese Equity Markets, 2019-2020

Share Class	Market	Number of Stocks	Sample Period	Market		Dimensional		
				Traded Volume (USD)	Average Bid/Ask Spread (bps)	Total Amount Traded (USD)	Price Advantage over SBBO (bps)	% of Value Bought at Bid and Sold at Offer
A-Shares (Stock Connect)	CN	1,028	04/2020-12/2020	\$3.8T	11.6	\$2.4B	11.4	96%
H-Shares/Red-Chips/P-Chips	HK	748	01/2019-12/2020	\$3.5T	22.7	\$12.4B	21.0	94%
N-Shares/China ADRs	US	84	01/2019-12/2020	\$1.3T	5.0	\$2.7B	5.6	87%

Past performance is no guarantee of future results.

Source: Dimensional Fund Advisors. Price advantage is estimated relative to a liquidity-demanding approach that sells at the bid and buys at the offer (SBBO), and aggregated by taking trade-value-weighted average.

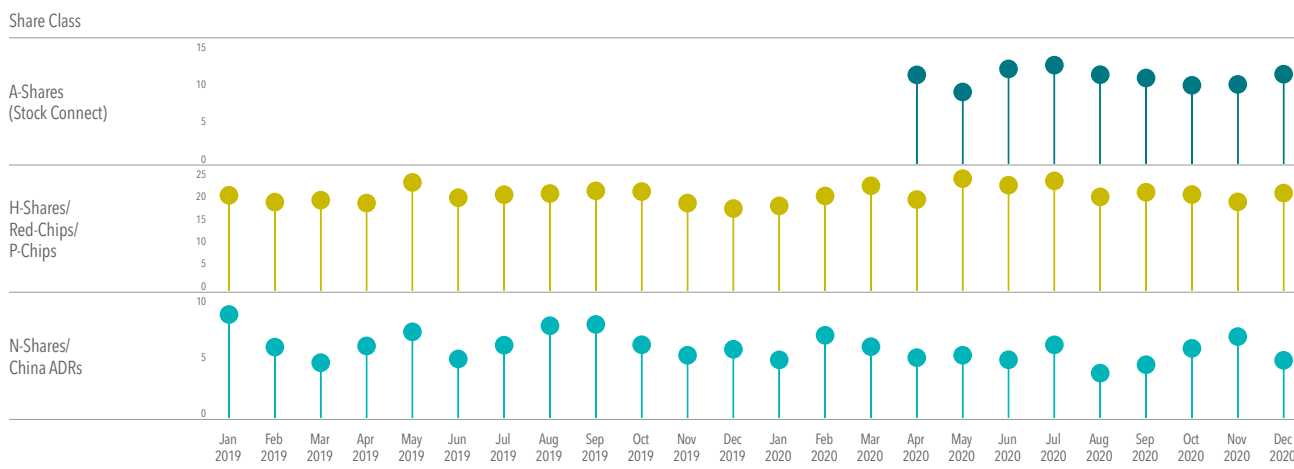
Exhibit 11 shows the percentage of daily volume traded in the closing auction for the A-share market over the studied period. Although on average A-shares exhibited less volume in the closing auction than the other markets, there were big spikes for the names that are eligible for trading via Northbound Stock Connect on the days of major index rebalancing events listed in Exhibit 12. This indicates the assets linked to those major indices did have a large impact on the volume at close of the A-share market on index rebalancing dates, similar to what we have seen in other markets.

DIMENSIONAL'S FLEXIBLE TRADING APPROACH AND PRICE ADVANTAGE

Dimensional's approach to trading seeks to reduce implementation costs by participating in the available trading that occurs in markets each day. We have documented the relative price advantage of our flexible trading approach across US, developed ex US, and emerging markets around the world.¹⁵ Do we see similar results for China A-shares? The answer is yes. Exhibit 13 shows Dimensional had an average price advantage of 11.4 bps vs. the demanding-immediacy approach of selling at the bid and buying at the offer (SBBO) from April 2020 (when we started systematically trading China A-shares via Stock Connect) to December 2020.

The exhibit also highlights that Dimensional consistently employed our flexible approach in the A-share market, with

EXHIBIT 14: Dimensional's Price Advantage Over SBBO in Different Chinese Equity Markets, 2019-2020



Past performance is no guarantee of future results.

Monthly average price advantages over SBBO in basis points (bps). Source: Dimensional Fund Advisors.

15. For a related study, see Jerry Liu and Ryan Wiley, "Global Trading Price Advantages of Flexible Equity Portfolios" (white paper, Dimensional Fund Advisors, 2021).

96% of total traded value occurring at the passive side (buying at the bid and selling at the offer). This price advantage was consistent over time, similar to the other markets for Chinese equity, as shown in **Exhibit 14**.

CONCLUSION

With the ease of access restrictions, the China A-share market has seen steadily increasing participation of foreign investors over the past decade. Despite having many unique features, like ban on day trading, relatively high local retail participation, and relatively low institutional participation, trading in the A-share market appears similar to trading in other markets around the world. The A-share market exhibits good liquidity and relatively low trading costs. Our research shows that Dimensional's flexible trading approach in the A-share market provided significant price advantages, both cross-sectionally and over time.

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