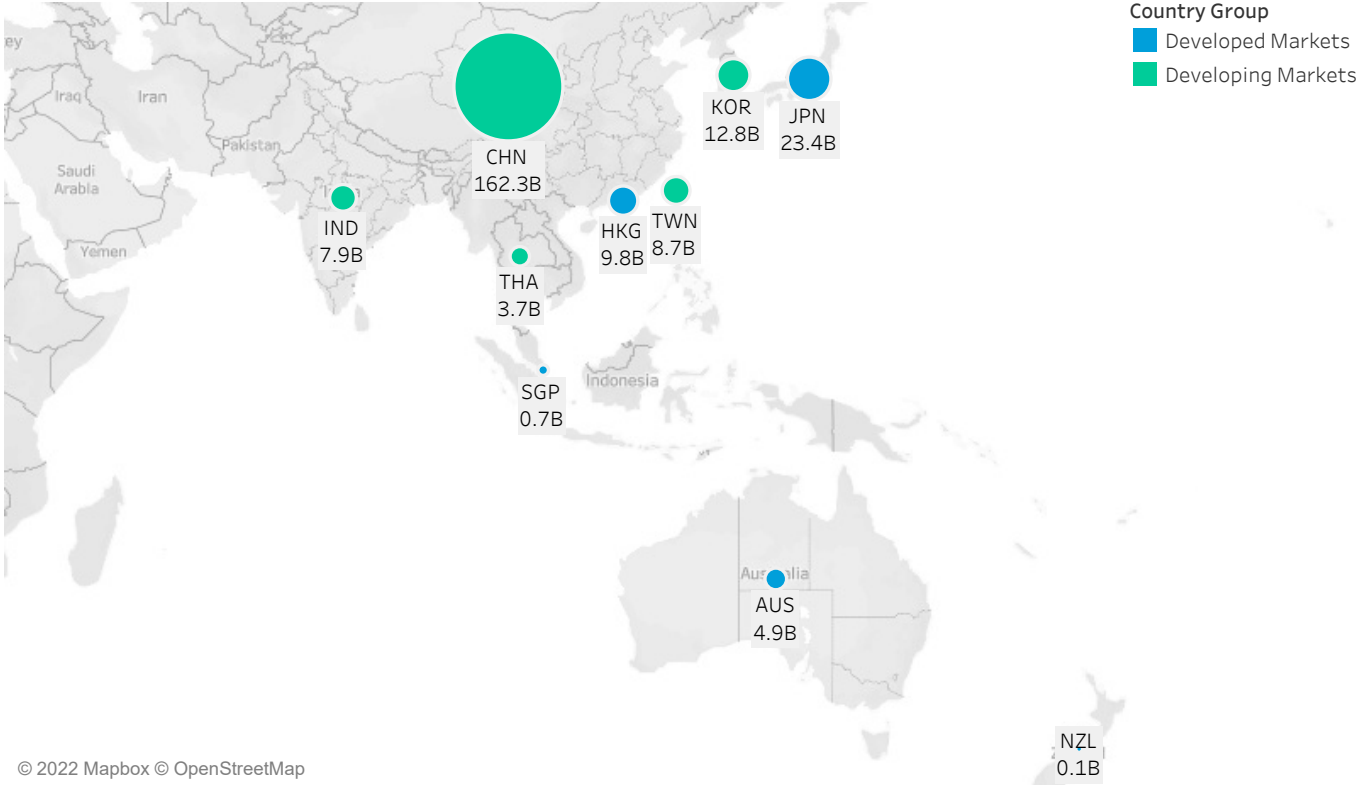


August 2022 APAC Market Structure Monthly

Average Daily Turnover (Notional USD)



© 2022 Mapbox © OpenStreetMap

Country Breakdowns

Hong Kong

China

Japan

Australia

South Korea

Taiwan

India

Thailand

New Zealand

Singapore

August 2022

AP Market Structure Monthly

MICROSTRUCTURE OBSERVATIONS

- Trading volume across most countries picked up slightly MoM from year low; IND saw +30% MoM increase in notional traded, whereas HKG saw -15% decrease MoM to YTD low at USD9.8B.
- In Japan, first half of trading day saw more intraday volume as the close auction represented 11% of daily flow; down 3% compared to the rolling 12 months avg.
- Intraday spread and volatility in more developed markets such as HKG, CHN, JPN, AUS fell consecutively since June to 2022 Q1 levels.

AP MARKET STRUCTURE NEWS

Changes Announced for Stock Connect Trading Calendar

Currently, there are several days in a calendar year when both Hong Kong and mainland China stock markets are open, but Stock Connect is closed—because of its settlement cycle—clearing services are unavailable on the Chinese market the day before a public holiday (H-1). The new enhancement will allow Stock Connect to remain open on all trading days when both Hong Kong and China stock markets are open. In 2021, this adjustment would have added six days to Northbound and eleven days to Southbound trading.

A six-month implementation timeline is estimated for the required adjustments. Upon regulatory approval, a launch date will be announced.

- CSRC/SFC Joint Announcement: <https://www.sfc.hk/en/News-and-announcements/Policy-statements-and-announcements/Joint-announcement-of-the-CSRC-and-SFC>
- SFC: <https://apps.sfc.hk/edistributionWeb/gateway/EN/news-and-announcements/news/doc?refNo=22PR61>
- HKEX: https://www.hkex.com.hk/News/News-Release/2022/220812news?sc_lang=en
- SSE: <http://english.sse.com.cn/news/newsrelease/c/5707079.shtml>
- SZSE (In Chinese): http://www.szse.cn/aboutus/trends/news/t20220812_595349.html

Shanghai-Hong Kong Stock Connect to Be Migrated to New Trading Gateway of the Shanghai Stock Exchange

Following the successful completion of the post-release test on 6 August, the Stock Exchange of Hong Kong (SEHK) announced that Orion Trading Platform - China Stock Connect (OTP-CSC) for Northbound Trading will be migrated to the new Shanghai Stock Exchange (SSE) trading gateway on 8 August 2022

<https://www.hkex.com.hk/-/media/HKEX-Market/Services/Circulars-and-Notices/Participant-and-Members-Circulars/SEHK/2022/CT11722E.pdf>

Readying for the Next Phase of the Hong Kong Investor Identification Regime Implementation

A circular issued by SEHK on 2 August reminded relevant regulated intermediaries (RRIs) to successfully complete the required end-to-end testing (E2E) by 5 August. In due course, details about the next phase of HKIDR's roll-out, Market Rehearsals, will be released. Although HKIDR's go-live date has not been announced, it is expected to take place within the second half of 2022.

<https://www.hkex.com.hk/-/media/HKEX-Market/Services/Circulars-and-Notices/Participant-and-Members-Circulars/SEHK/2022/CT11222E.pdf>

New Launch: MSCI China A 50 Connect Index Structured Product

MSCI China A 50 Connect Index Derivatives Warrants, which track the performance of 50 key Shanghai and Shenzhen stocks, was listed on 8 August 2022 by Hong Kong Exchanges and Clearing Limited.

https://www.hkex.com.hk/News/News-Release/2022/220808news?sc_lang=en

JPX Market Innovation and Research, Inc. Announces Creation of Centralized ESG Disclosure Portal for TSE-listed Companies

To benefit investors, JPX Market Innovation and Research, Inc. (JPXI) announced on 10 August that it had partnered with a third party to create an aggregated ESG information platform for Tokyo Stock Exchange (TSE)-listed companies. The JPX Listed Company Environmental, Social, and Governance (ESG) Information WEB (beta version) portal will launch sometime in Fall 2022.

<https://www.jpjx.co.jp/english/corporate/news/news-releases/0060/20220810-01.html>

Australia Securities & Investments Commission's Chair Outlines Priorities

On 23 August 2022, Australia Securities & Investments Commission (ASIC) published Chairman Longo's speech to the Committee for Economic Development of Australia (CEDA). As part of ASIC's strategic planning, Mr. Longo elaborated on four aspects:

- Product design and distribution
- Sustainable finance
- The retirement decision-making process, including superannuation products, managed investments, and financial advice.
- Technology risks, with an emphasis on digitally enabled misconduct.

As part of the four priorities, ASIC outlined eight core strategic projects, of which four were discussed in depth in the speech.

<https://asic.gov.au/about-asic/news-centre/speeches/looking-ahead-asic-s-priorities/>

Taiwan Stock Exchange Announces Changes to Odd-Lot Trading Auction

Beginning 19 December 2022, Taiwan Stock Exchange (TWSE) will reduce the auction interval for odd-lot trading on its intra-day odd-lot board (09:00-13:30 GMT+8) from three minutes to one minute.

<https://www.twse.com.tw/en/news/newsDetail/ff8080818262fb8a0182a0bf232300de>

Thought Leadership: The Conditional Order Type: Enhancing the Discovery of Block Liquidity

In August 2022, FIX Global Trading published a white paper by Virtu Financial entitled, The Conditional Order Type: Enhancing the Discovery of Block Liquidity. Using a block-seeking algorithmic order, the paper clarifies conditional orders and their benefits. Trading trends and statistics for conditional orders in APAC compared to the Americas, EMEA, and MENA are also discussed.

<https://www.fixglobal.com/the-conditional-order-type-enhancing-the-discovery-of-block-liquidity/>

To learn more, contact your sales representative or call our desk at:

APAC +852.2846.3592 | **CAN** +1.416.874.0800 | **EMEA** +44.20.7670.4066 | **US** +1.646.682.6199

info@virtu.com | www.virtu.com

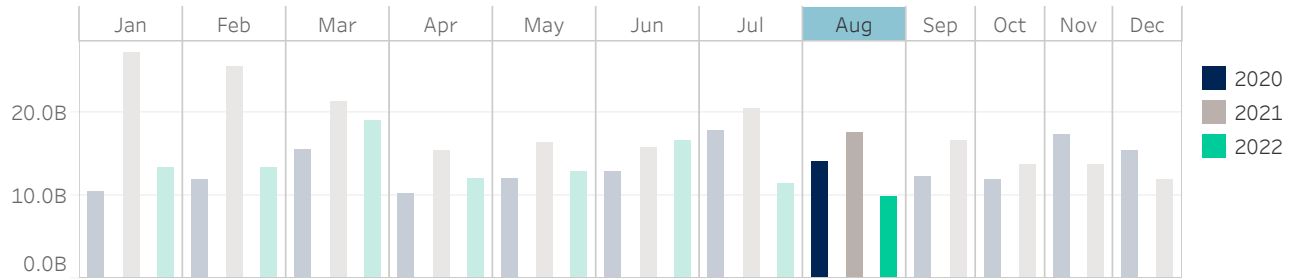
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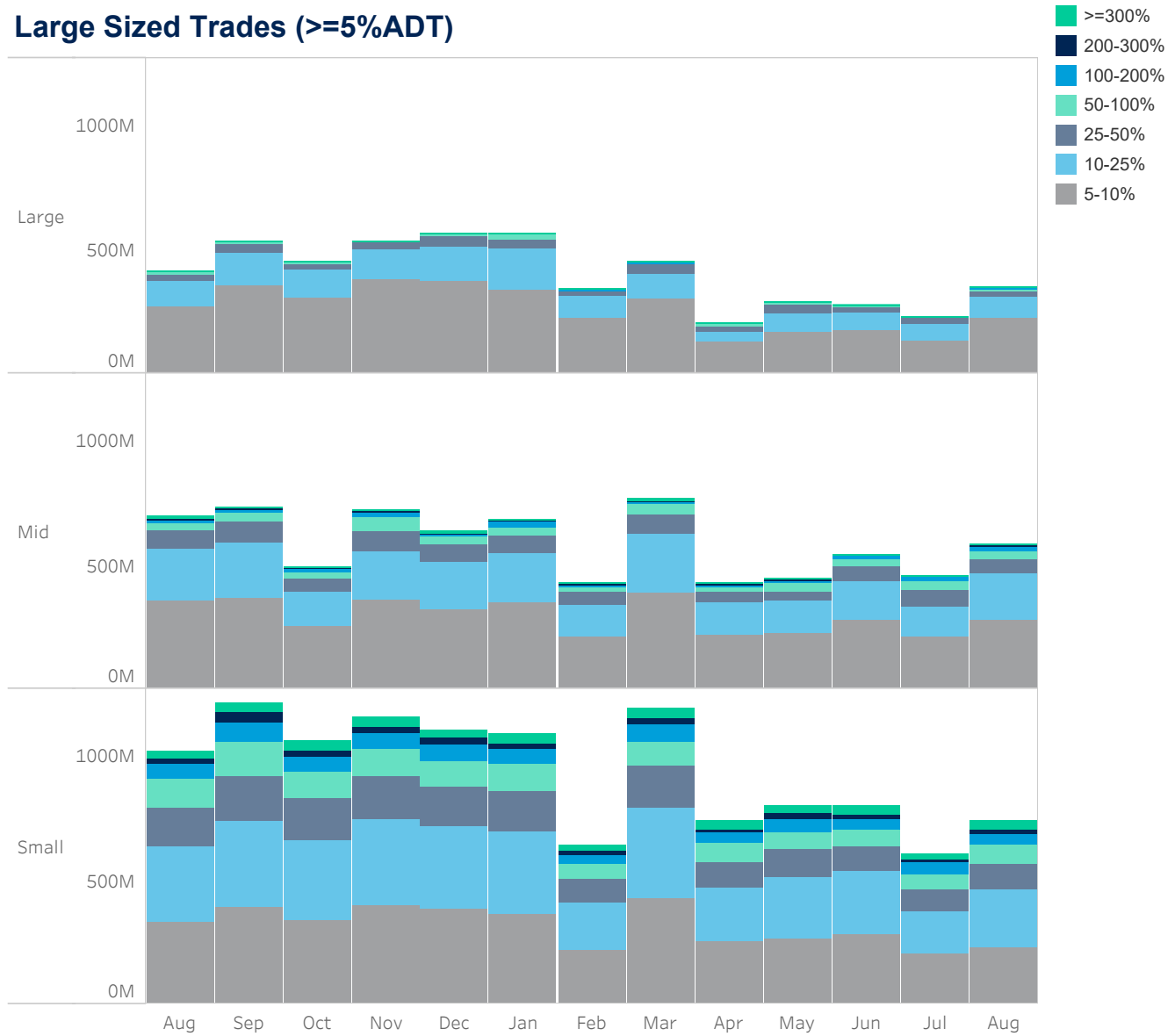
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Hong Kong

Average Daily Turnover (Notional USD)



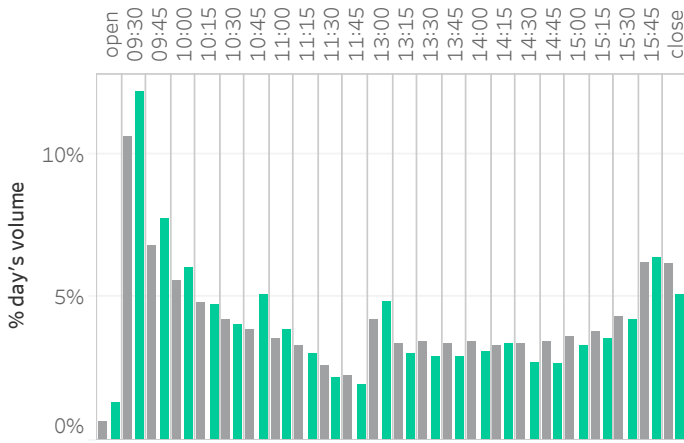
Large Sized Trades (>=5%ADT)



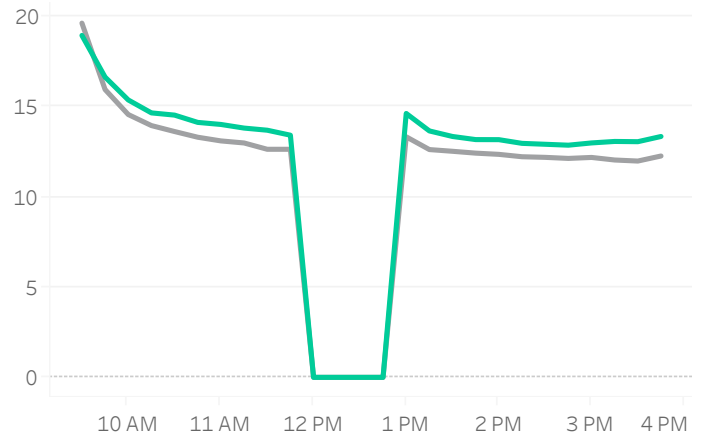
Source data: Virtu Financial

Hong Kong

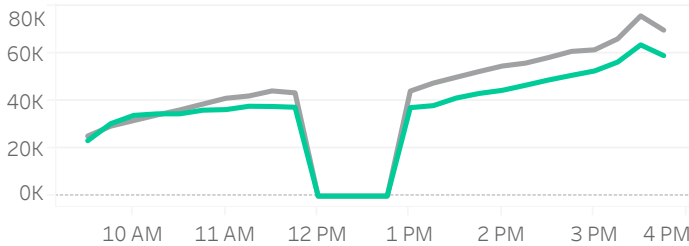
Volume Curve



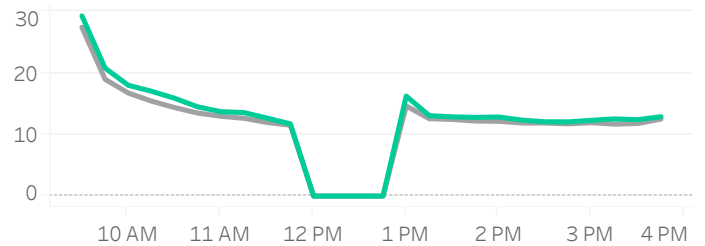
Intraday Spread (bps)



Intraday Quotesize (Shares)



Intraday Volatility (bps)



■ Rolling 12 Months Avg ■ August 2022

Spread Bps

	22 Q1			22 Q2			22 Q3	
	Jan 22	Feb 22	Mar 22	Apr 22	May 22	Jun 22	Jul 22	Aug 22
firstHalfHour	16.2	15.8	17.8	17.6	17.3	17.2	17.1	17.0
midday	11.9	12.0	13.4	13.3	13.5	13.6	13.1	13.0
lastHalfHour	11.6	11.7	12.6	12.3	13.1	13.2	12.4	12.5

One Minute Volatility Bps

firstHalfHour	15.5	15.1	21.2	17.7	18.0	19.0	16.8	17.0
midday	6.4	6.5	9.7	8.4	7.3	7.7	7.3	7.1
lastHalfHour	6.1	6.9	7.8	6.5	6.2	6.5	6.0	6.4

Quotesize in Shares

firstHalfHour	28,480	27,737	29,034	28,977	27,325	28,776	26,961	27,359
midday	47,428	46,616	40,716	40,059	40,646	42,935	42,223	42,963
lastHalfHour	70,843	71,318	65,291	62,184	60,328	71,107	68,053	67,865

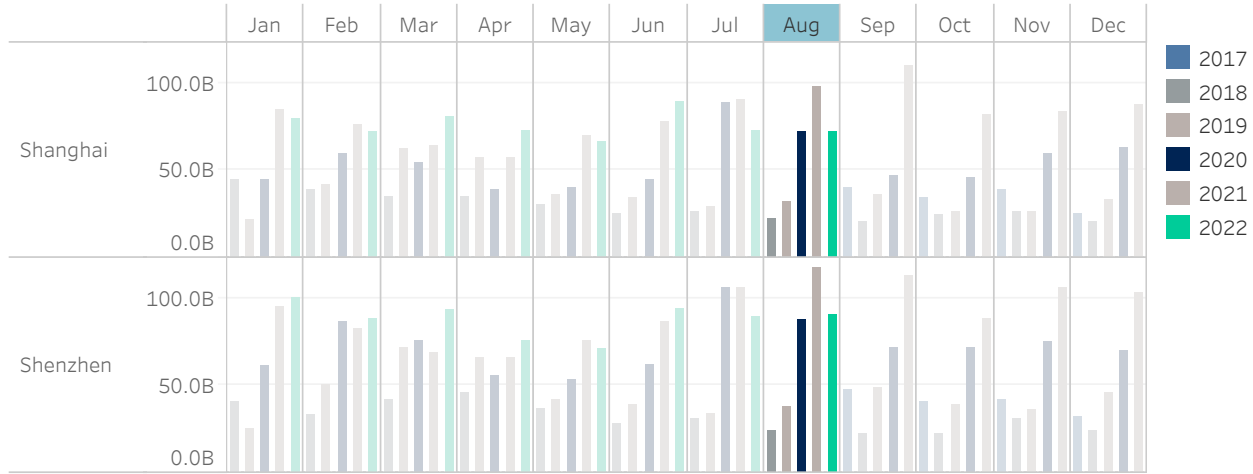
Median used for all metrics

One minute volatility is calculated using the difference between the high and low price within a one minute time bin, divided by that bin's VWAP

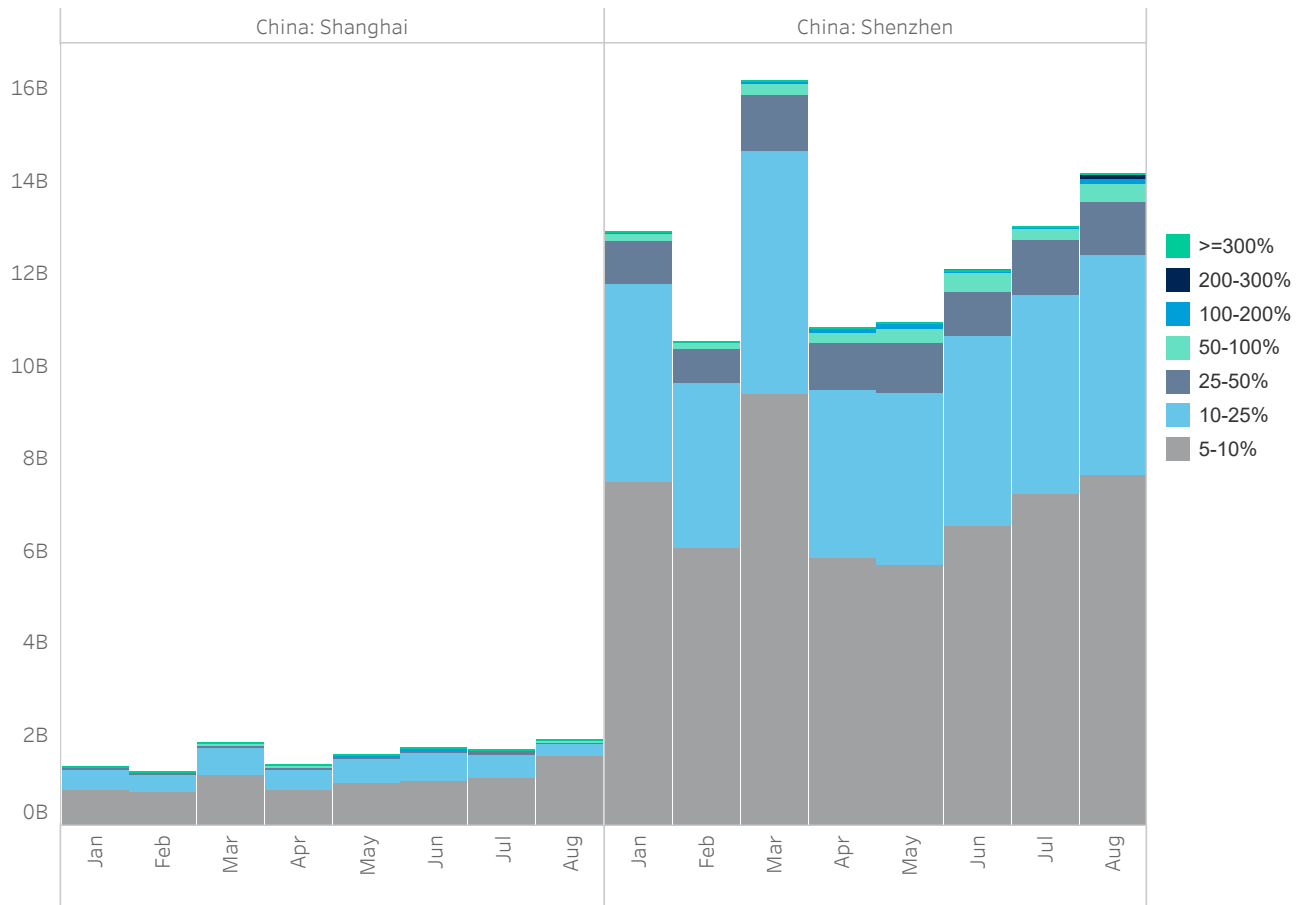
Source data: Virtu Financial

China

Average Daily Turnover (Notional USD)



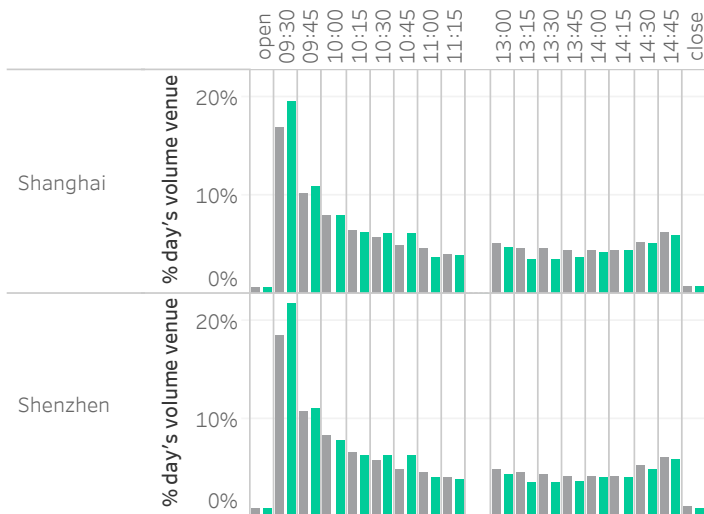
Large Sized Trades (>=5%ADT)



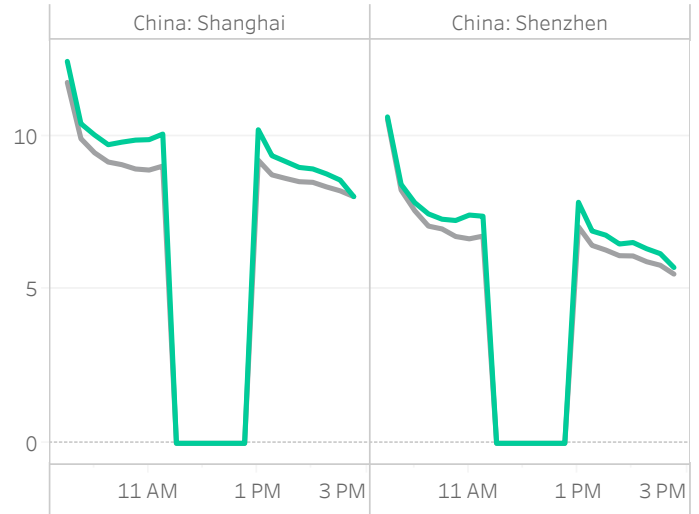
Source data: Virtu Financial

China

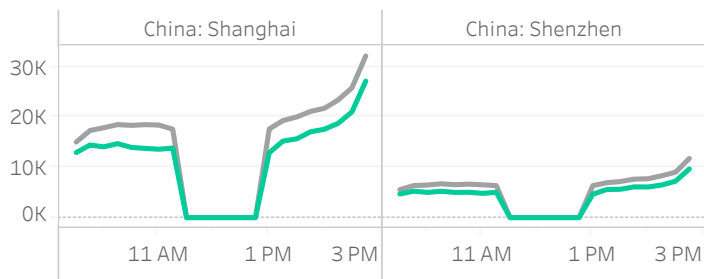
Volume Curve



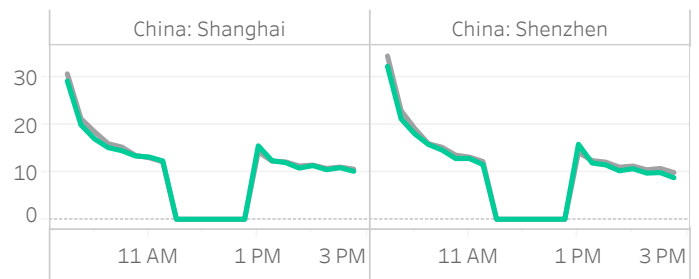
Intraday Spread (bps)



Intraday Quotesize (Shares)



Intraday Volatility (bps)



■ Rolling 12 Months Avg ■ August 2022

Spread Bps

	China: Shanghai									China: Shenzhen							
	22 Q1			22 Q2			22 Q3			22 Q1			22 Q2			22 Q3	
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	
firstHalfHour	10.0	9.9	10.9	11.1	10.9	10.3	9.9	9.7	9.0	8.3	9.1	9.9	9.0	8.5	8.6	8.3	
midday	8.2	8.4	9.4	9.7	9.5	8.6	7.9	7.9	6.3	6.2	7.0	7.4	7.0	6.4	6.0	5.8	
lastHalfHour	7.7	7.7	8.3	8.4	8.2	7.4	7.3	7.2	5.3	5.2	5.9	6.2	5.9	5.3	5.0	4.9	

One Minute Volatility Bps

firstHalfHour	20.5	18.5	21.7	23.8	19.6	20.1	17.2	16.5	27.0	22.1	24.2	27.8	23.3	23.4	23.2	22.1
midday	8.4	7.8	10.1	11.6	9.1	10.1	7.1	6.3	11.3	9.8	11.9	13.1	10.6	11.3	9.8	8.8
lastHalfHour	7.4	6.4	8.3	9.3	6.6	7.3	6.0	5.0	8.8	7.6	8.7	9.8	7.4	8.0	7.5	6.5

Quotesize in Shares

firstHalfHour	13K	13K	13K	11K	14K	14K	14K	14K	4K	4K	4K	4K	5K	4K	4K
midday	16K	16K	14K	12K	15K	16K	17K	18K	4K	5K	5K	5K	6K	5K	5K
lastHalfHour	23K	23K	22K	19K	24K	25K	25K	28K	6K	7K	7K	7K	8K	7K	8K

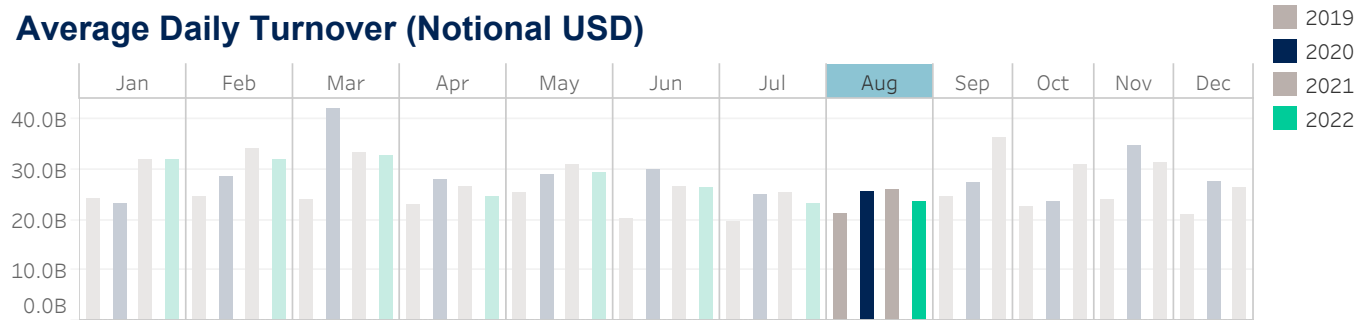
Median used for all metrics

One minute volatility is calculated using the difference between the high and low price within a one minute time bin, divided by that bin's VWAP

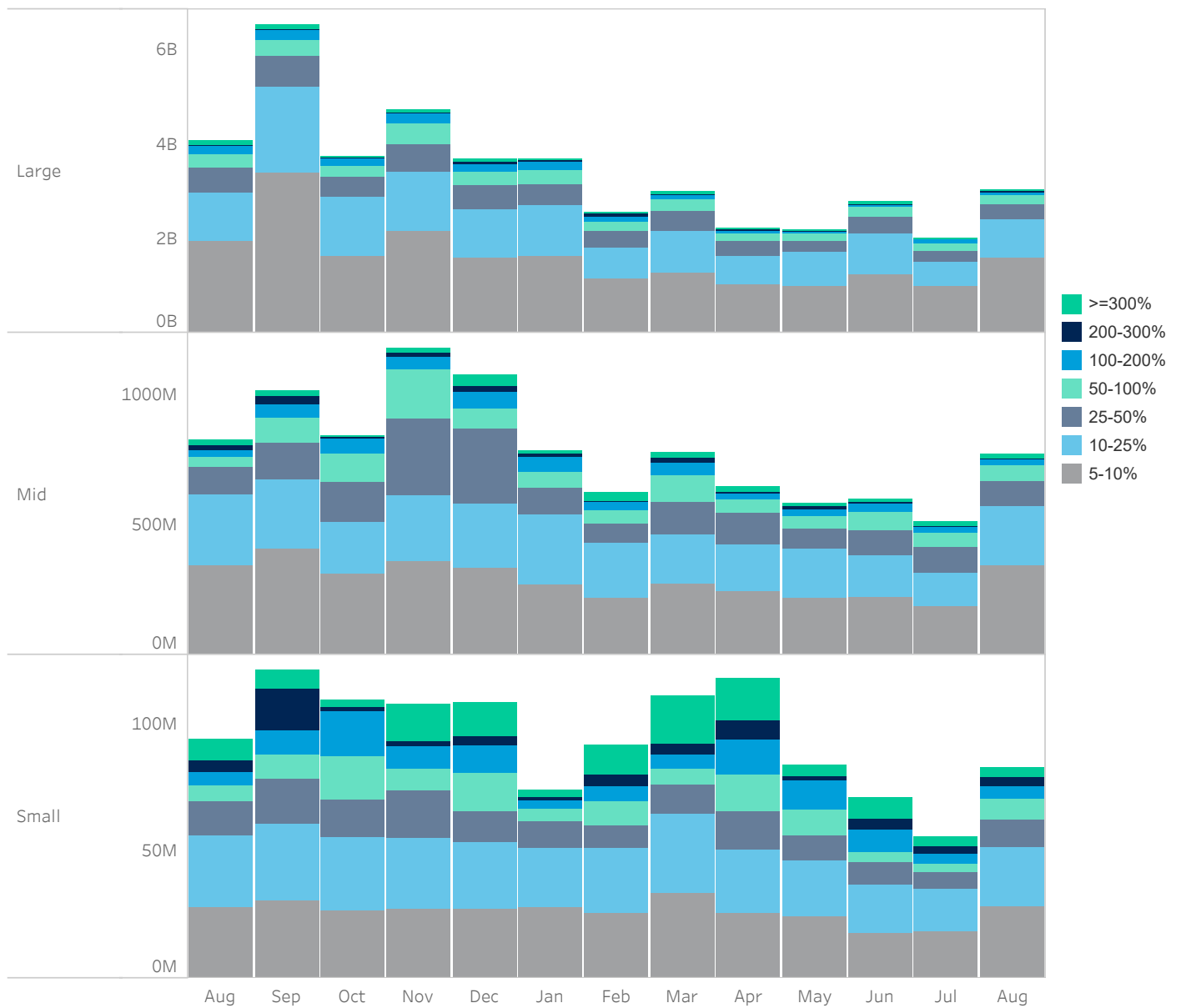
Source data: Virtu Financial

Japan

Average Daily Turnover (Notional USD)



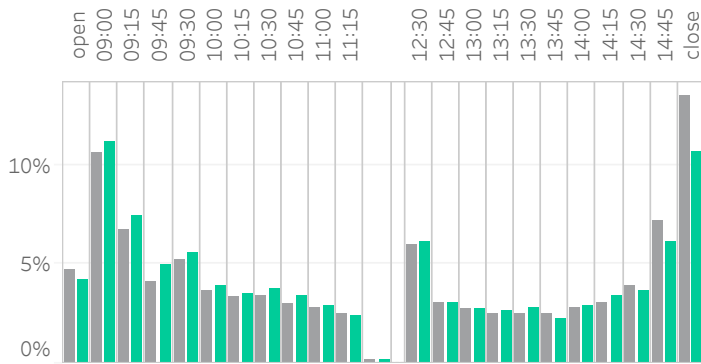
Large Sized Trades (>=5%ADT)



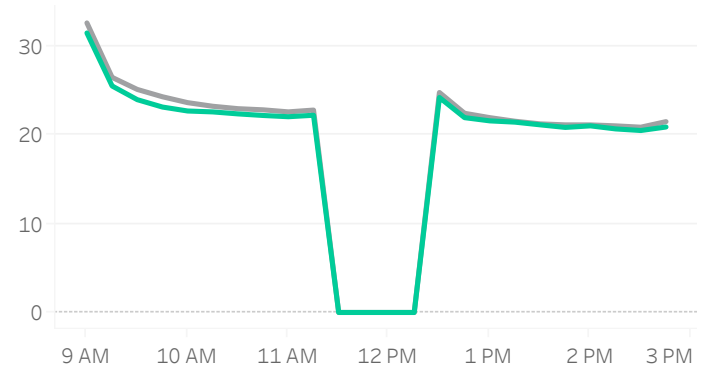
Source data: Virtu Financial

Japan

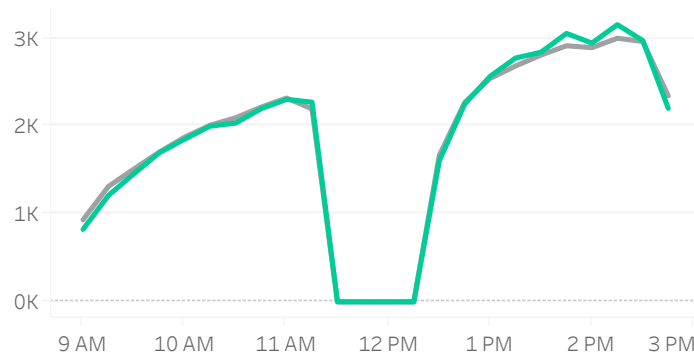
Volume Curve



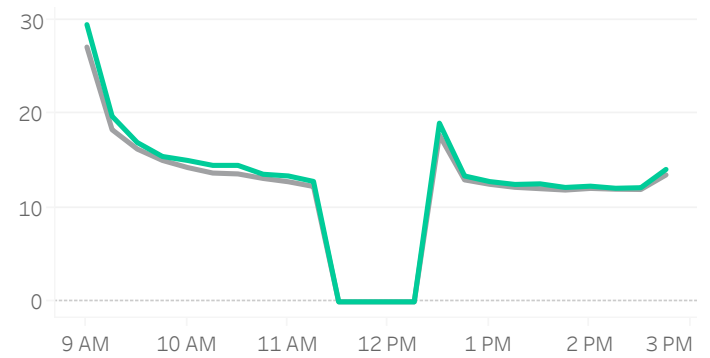
Intraday Spread (bps)



Intraday Quotesize (Shares)



Intraday Volatility (bps)



■ Rolling 12 Months Avg ■ August 2022

Spread Bps

	22 Q1			22 Q2			22 Q3	
	Jan 22	Feb 22	Mar 22	Apr 22	May 22	Jun 22	Jul 22	Aug 22
firstHalfHour	29.4	28.2	28.4	26.8	27.3	26.7	26.5	24.9
midday	23.3	22.7	22.7	22.1	22.0	21.8	22.0	21.0
lastHalfHour	21.6	21.2	21.2	20.6	20.4	20.8	20.7	20.0

One Minute Volatility Bps

firstHalfHour	16.5	17.0	17.5	15.2	16.6	15.4	13.3	12.3
midday	7.7	7.6	8.9	7.0	7.1	6.6	6.3	5.8
lastHalfHour	6.5	7.1	8.0	6.4	6.2	5.9	5.9	10.8

Quotesize in Shares

firstHalfHour	1,084	1,033	1,019	1,160	1,085	1,126	1,267	1,360
midday	2,128	2,031	2,109	2,379	2,337	2,423	2,592	3,035
lastHalfHour	2,602	2,605	2,496	2,872	2,720	2,642	2,902	3,410

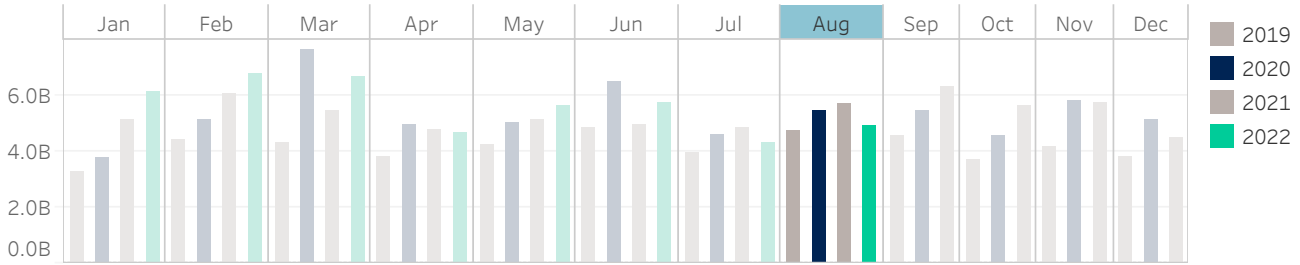
Median used for all metrics

One minute volatility is calculated using the difference between the high and low price within a one minute time bin, divided by that bin's VWAP

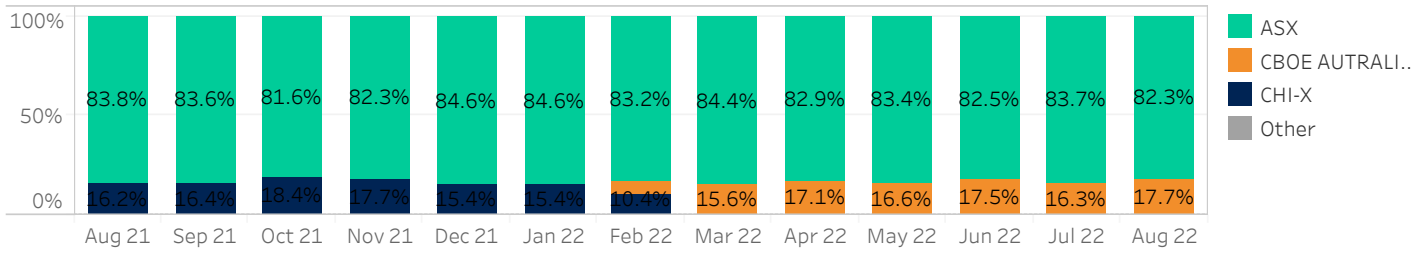
Source data: Virtu Financial

Australia

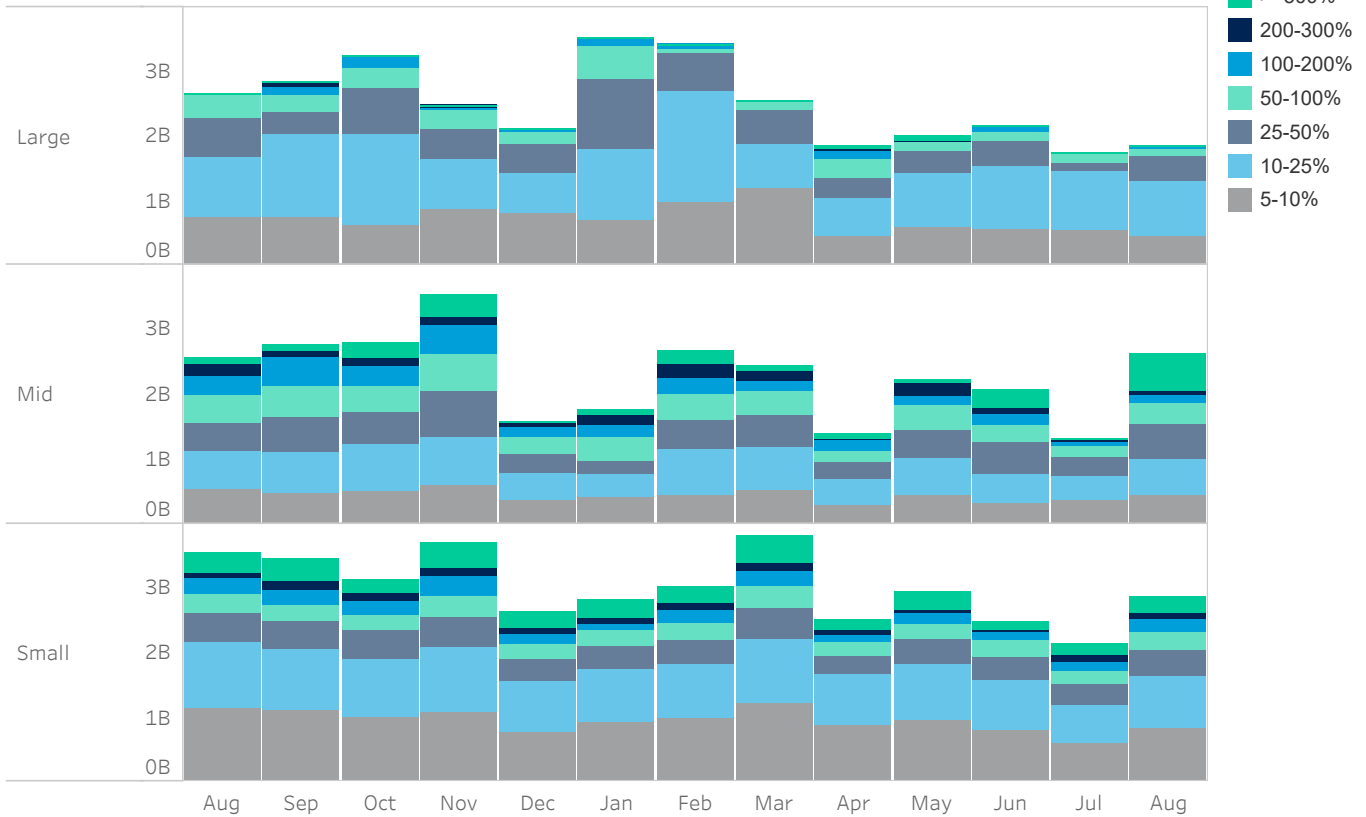
Average Daily Turnover (Notional USD)



Venue Market Share (Notional USD)



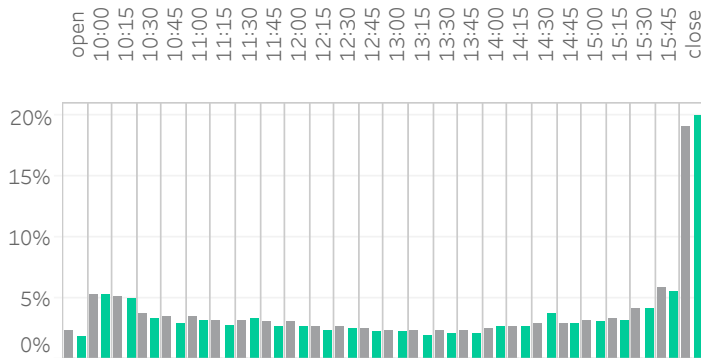
Large Sized Trades (>=5%ADT)



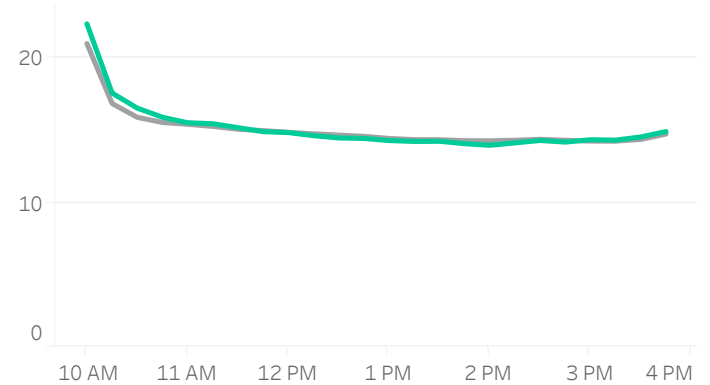
Source data: Virtu Financial

Australia

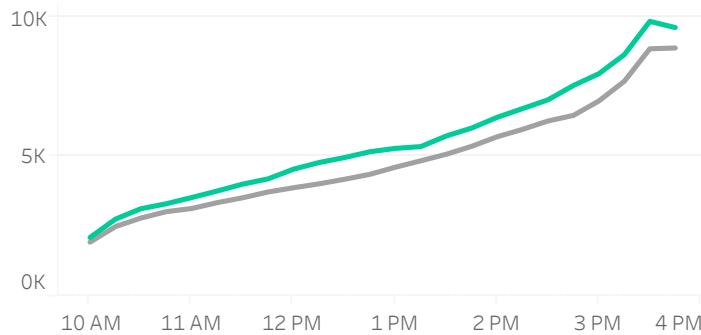
Volume Curve



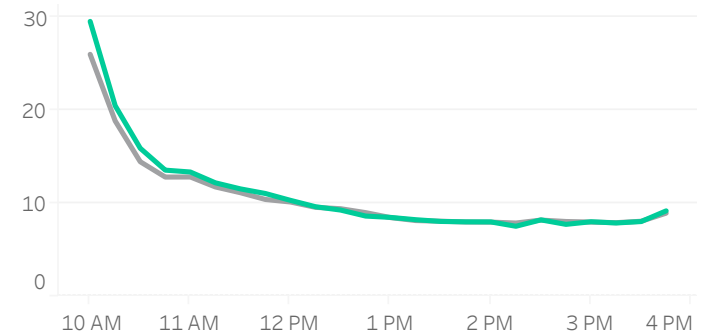
Intraday Spread (bps)



Intraday Quotesize (Shares)



Intraday Volatility (bps)



■ Rolling 12 Months Avg ■ August 2022

Spread Bps

	22 Q1			22 Q2			22 Q3	
	Jan 22	Feb 22	Mar 22	Apr 22	May 22	Jun 22	Jul 22	Aug 22
firstHalfHour	18.0	18.9	18.6	18.4	19.0	20.5	20.7	19.7
midday	14.6	15.0	15.1	14.6	14.6	16.2	15.9	14.7
lastHalfHour	14.1	14.3	14.5	14.3	14.7	16.4	16.0	14.9

One Minute Volatility Bps

firstHalfHour	16.4	20.9	18.6	15.8	19.3	21.3	18.3	19.1
midday	5.4	6.2	5.2	4.2	4.7	5.3	5.0	4.7
lastHalfHour	5.0	3.9	3.7	3.1	3.6	4.0	4.0	4.2

Quotesize in Shares

firstHalfHour	1,991	2,092	2,236	2,394	2,413	2,340	2,405	2,364
midday	3,945	4,008	4,728	5,180	5,148	5,554	5,352	5,316
lastHalfHour	8,020	8,680	9,575	9,457	9,953	9,528	9,648	9,498

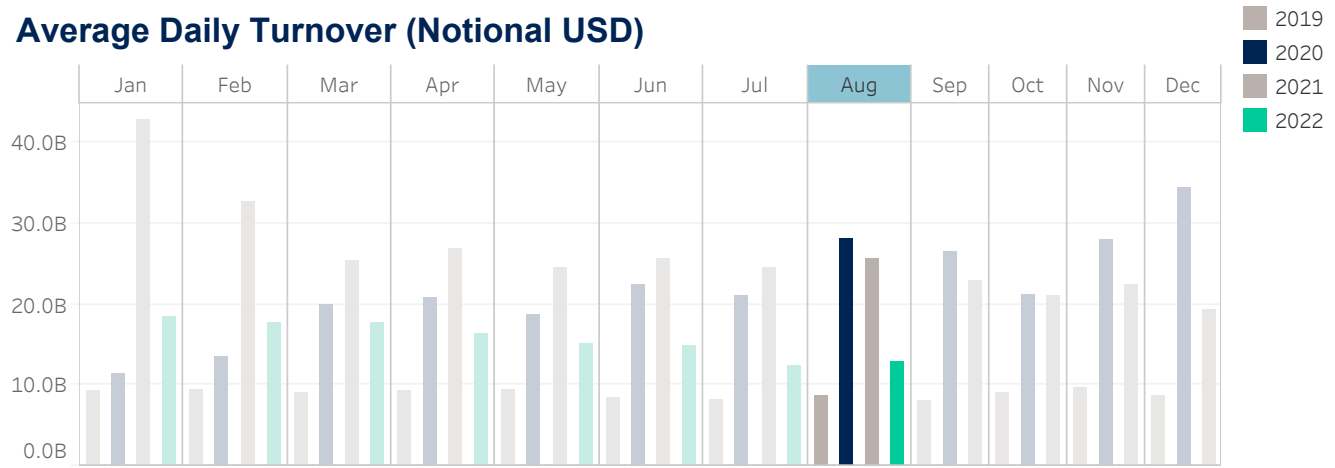
Median used for all metrics

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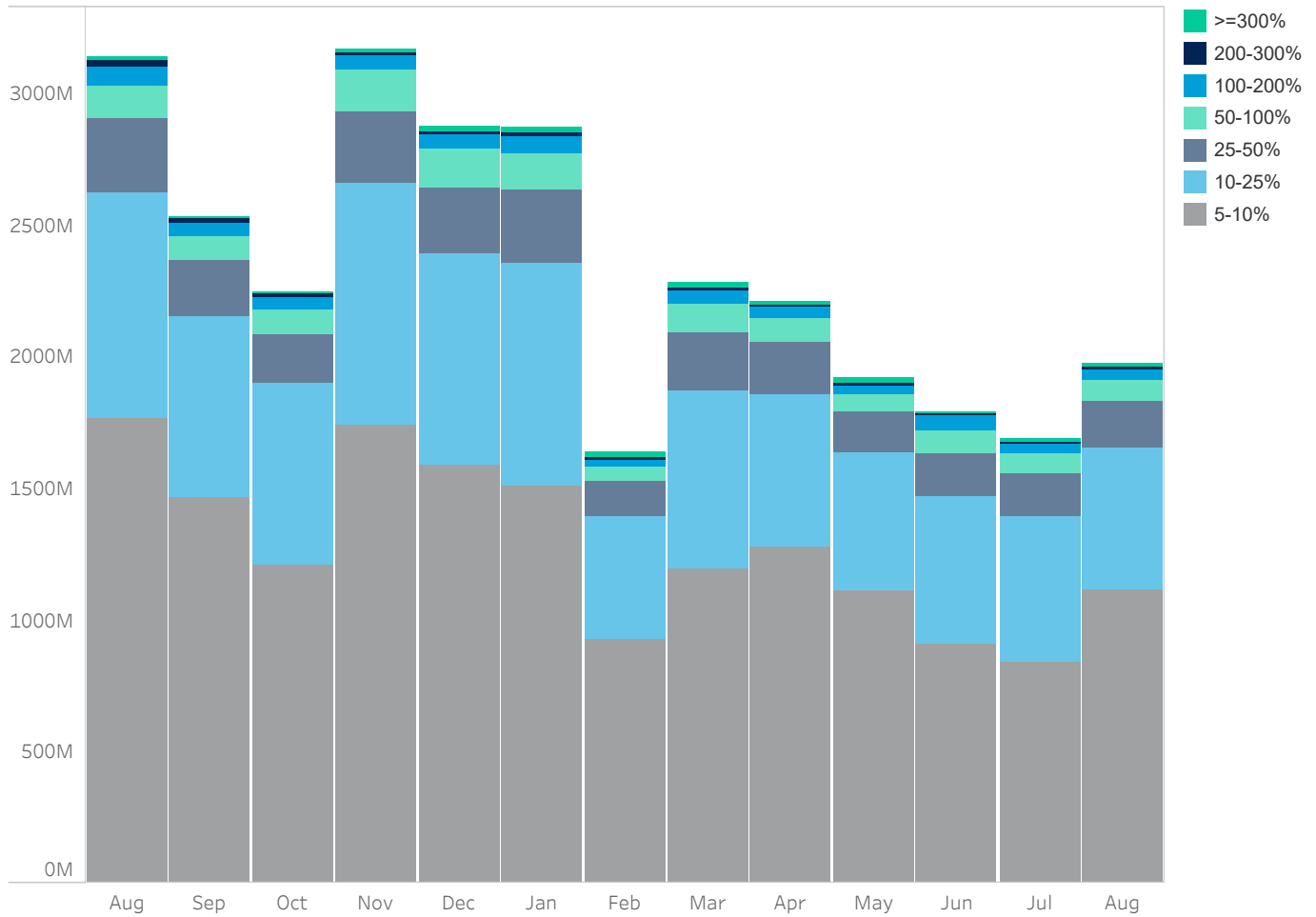
Source data: Virtu Financial

South Korea

Average Daily Turnover (Notional USD)



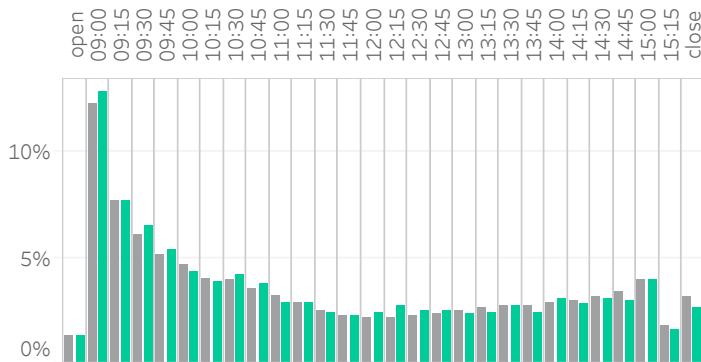
Large Sized Trades (>=5%ADT)



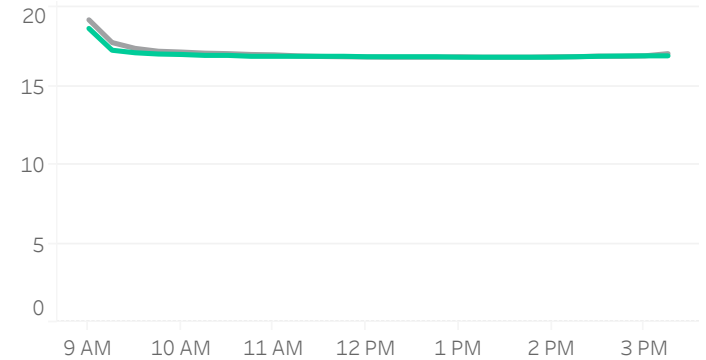
Source data: Virtu Financial

South Korea

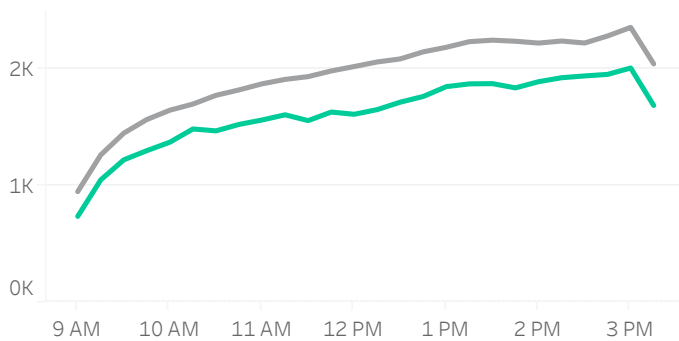
Volume Curve



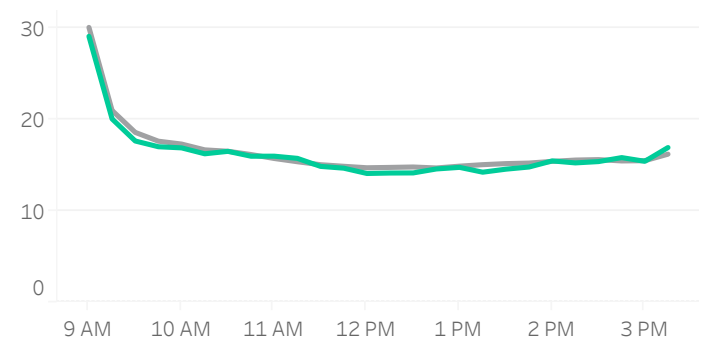
Intraday Spread (bps)



Intraday Quotesize (Shares)



Intraday Volatility (bps)



■ Rolling 12 Months Avg ■ August 2022

Spread Bps

	22 Q1			22 Q2			22 Q3	
	Jan 22	Feb 22	Mar 22	Apr 22	May 22	Jun 22	Jul 22	Aug 22
firstHalfHour	18.9	18.8	17.9	17.5	17.6	18.5	18.8	18.9
midday	17.4	17.4	17.0	16.6	16.9	17.2	17.1	17.0
lastHalfHour	17.4	17.3	17.0	16.7	16.9	17.3	17.2	17.0

One Minute Volatility Bps

midday	11.9	11.5	10.3	10.2	10.8	11.6	11.2	60.2
firstHalfHour	18.2	17.6	15.1	13.1	14.4	18.0	17.1	87.3
lastHalfHour	13.0	13.3	25.4	23.1	25.3	13.8	12.7	32.6

Quotesize in Shares

firstHalfHour	813	822	931	945	898	743	731	
midday	1,528	1,313	1,669	1,603	1,653	1,351	1,235	1,697
lastHalfHour	1,727	1,598	1,929	1,900	1,950	1,495	1,375	1,942

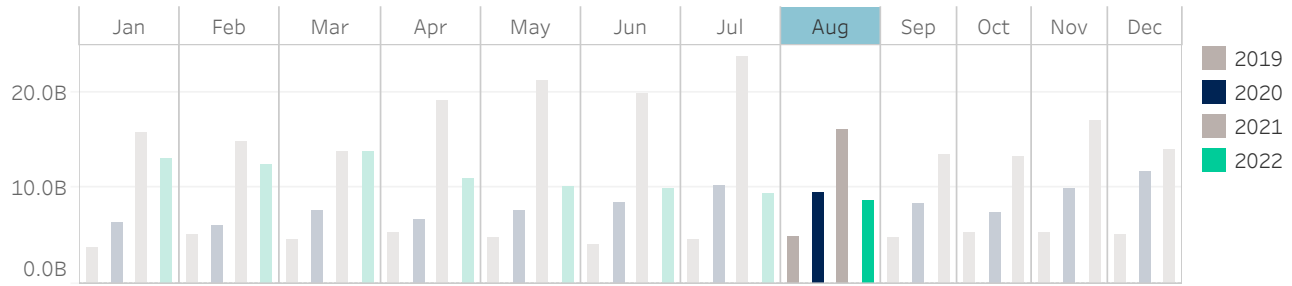
Median used for all metrics

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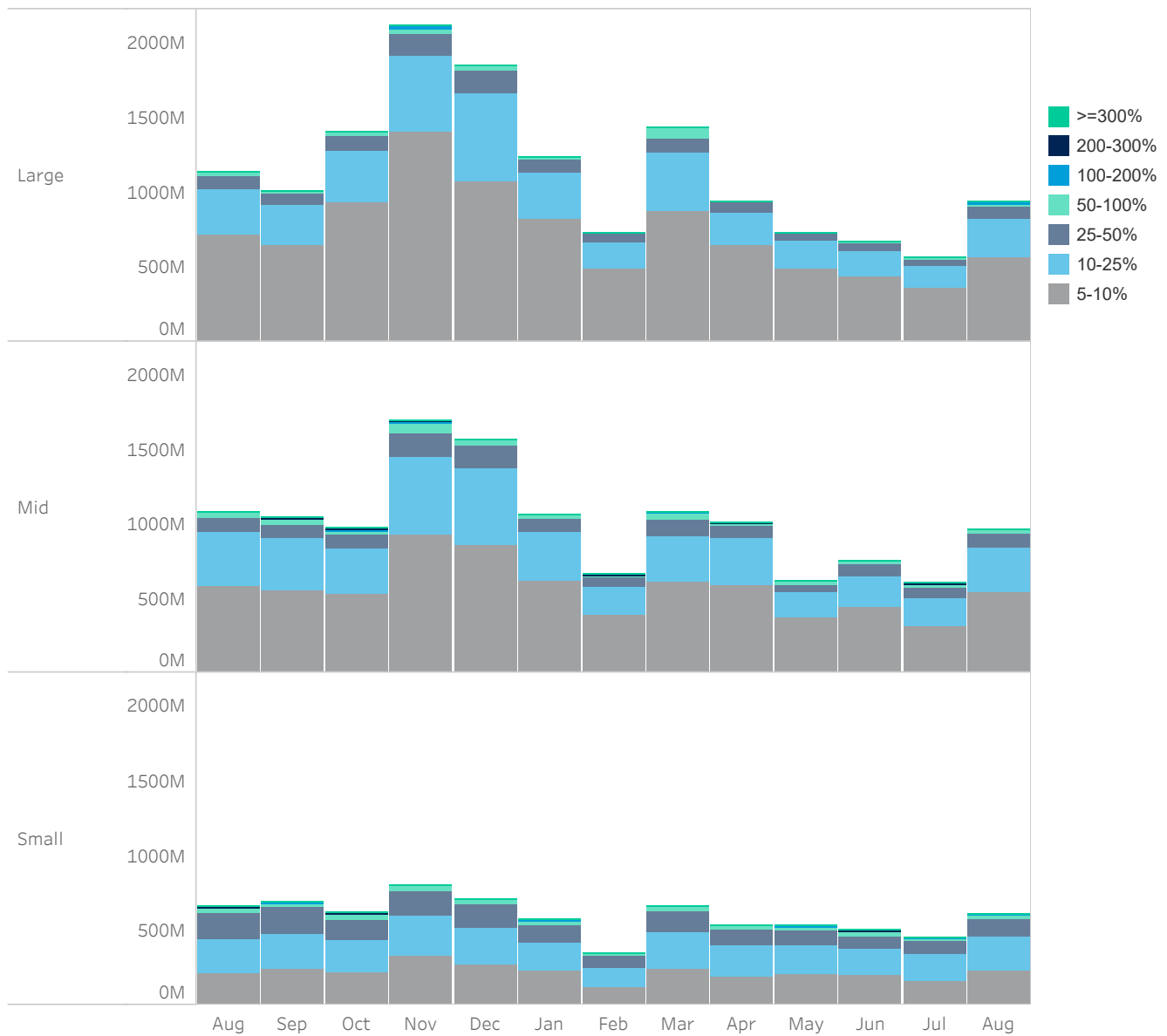
Source data: Virtu Financial

Taiwan

Average Daily Turnover (Notional USD)



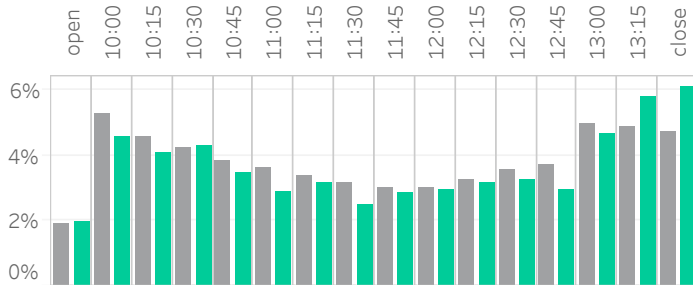
Large Sized Trades (>=5%ADT)



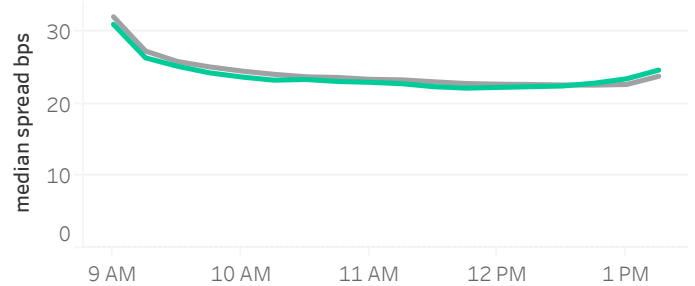
Source data: Virtu Financial

Taiwan

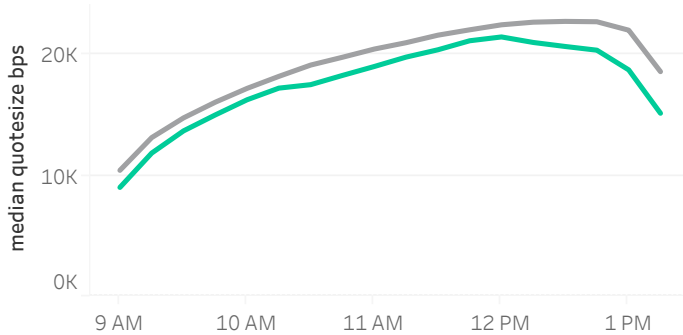
Volume Curve



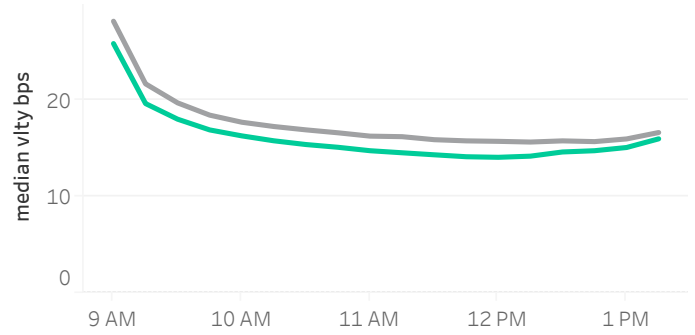
Intraday Spread (bps)



Intraday Quotesize (Shares)



Intraday Volatility (bps)



■ Rolling 12 Months Avg ■ August 2022

Spread Bps

	22 Q1			22 Q2			22 Q3	
	Jan 22	Feb 22	Mar 22	Apr 22	May 22	Jun 22	Jul 22	Aug 22
firstHalfHour	28.6	26.7	26.6	26.8	27.3	28.1	29.6	27.8
midday	22.2	21.9	21.7	22.4	22.9	23.4	24.5	23.0
lastHalfHour	22.5	22.3	22.1	23.0	24.0	24.8	25.5	23.2

One Minute Volatility Bps

firstHalfHour	13.6	11.9	12.2	13.2	13.1	14.5	16.9	14.3
midday	7.6	6.6	6.5	6.8	6.8	7.6	8.6	7.0
lastHalfHour	7.8	9.1	8.1	8.1	8.7	9.9	8.9	8.9

Quotesize in Shares

firstHalfHour	12,163	11,965	12,023	11,310	10,719	10,126	9,514	10,698
midday	22,569	22,550	24,000	20,329	18,947	17,181	14,545	18,826
lastHalfHour	21,873	20,395	22,040	18,389	16,685	14,454	14,115	18,926

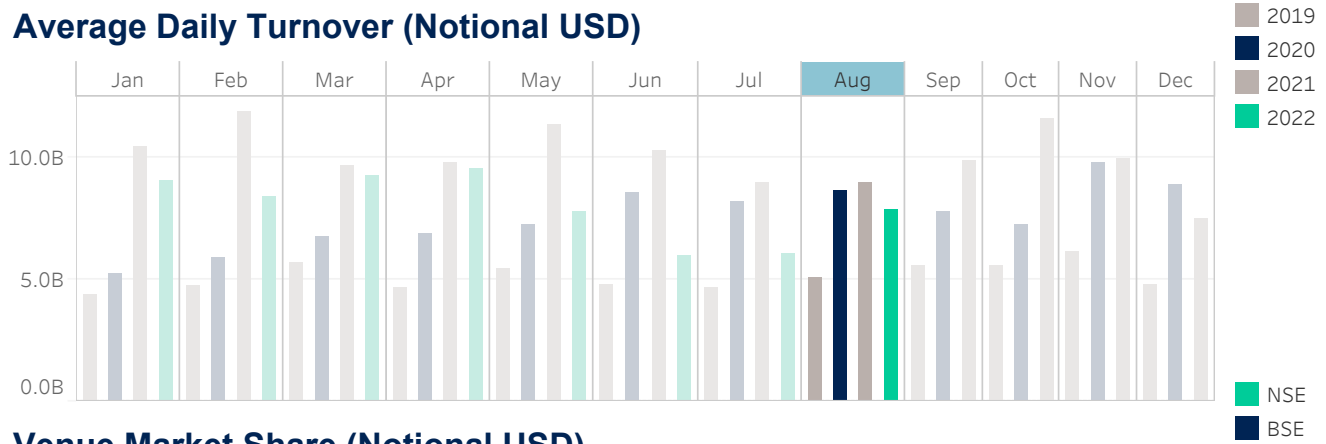
Median used for all metrics

One minute volatility is calculated using the difference between the high and low price within a one minute time bin, divided by that bin's VWAP

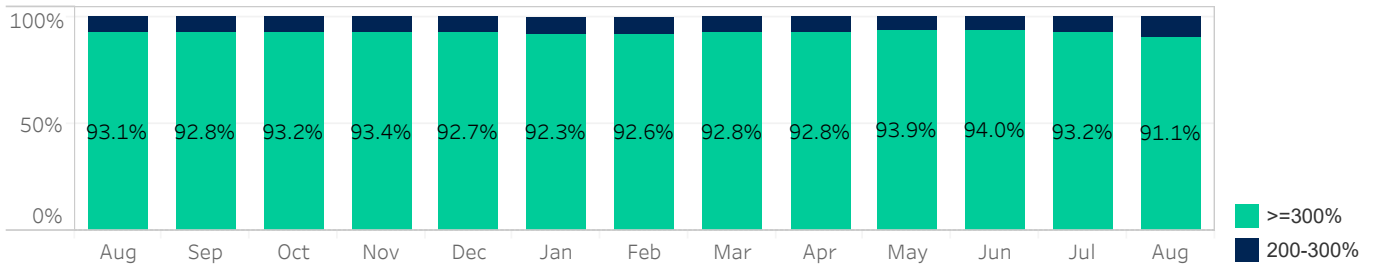
Source data: Virtu Financial

India

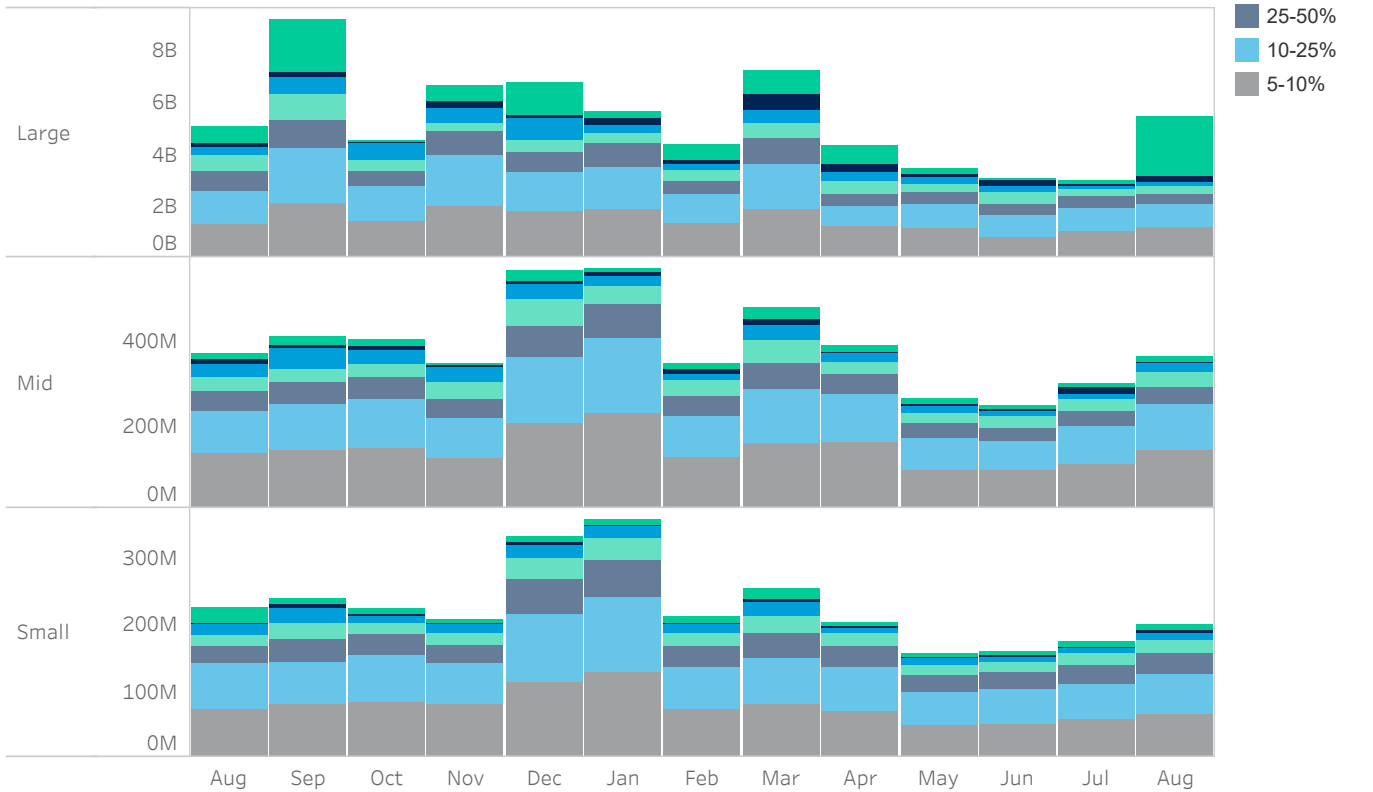
Average Daily Turnover (Notional USD)



Venue Market Share (Notional USD)



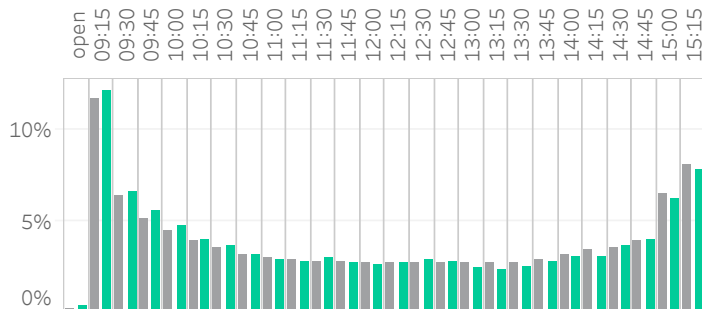
Large Sized Trades (>=5%ADT)



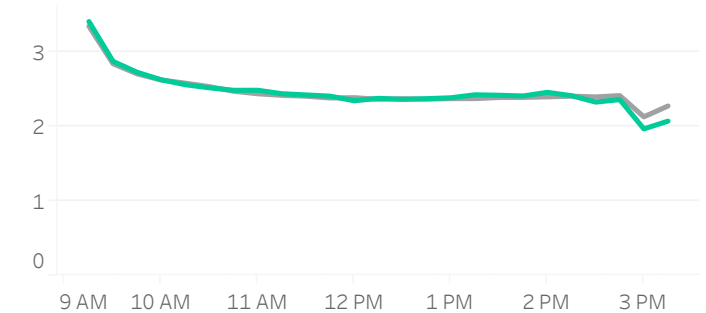
Source data: Virtu Financial

India

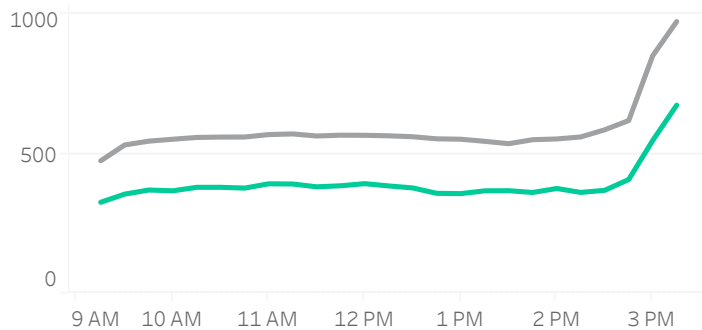
Volume Curve



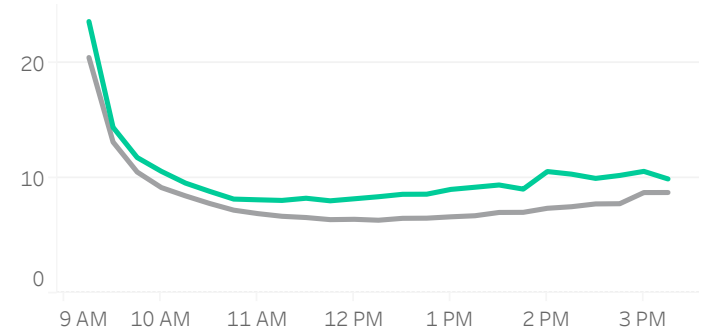
Intraday Spread (bps)



Intraday Quotesize (Shares)



Intraday Volatility (bps)



■ Rolling 12 Months Avg ■ August 2022

Spread Bps

	22 Q1			22 Q2			22 Q3	
	Jan 22	Feb 22	Mar 22	Apr 22	May 22	Jun 22	Jul 22	Aug 22
firstHalfHour	3.1	3.1	2.9	2.8	3.0	3.0	2.7	2.8
midday	2.4	2.5	2.4	2.2	2.4	2.4	2.2	2.2
lastHalfHour	2.0	2.0	2.0	1.9	2.0	1.9	1.8	1.8

One Minute Volatility Bps

firstHalfHour	14.7	16.4	15.7	13.4	16.7	14.8	12.0	12.2
midday	5.9	7.4	7.3	6.1	8.6	7.1	5.5	5.3
lastHalfHour	7.3	7.8	8.7	7.8	9.7	8.1	7.0	6.5

Quotesize in Shares

firstHalfHour	394	370	465	415	345	364	411	557
midday	451	417	478	455	373	393	458	590
lastHalfHour	736	664	783	725	586	672	703	879

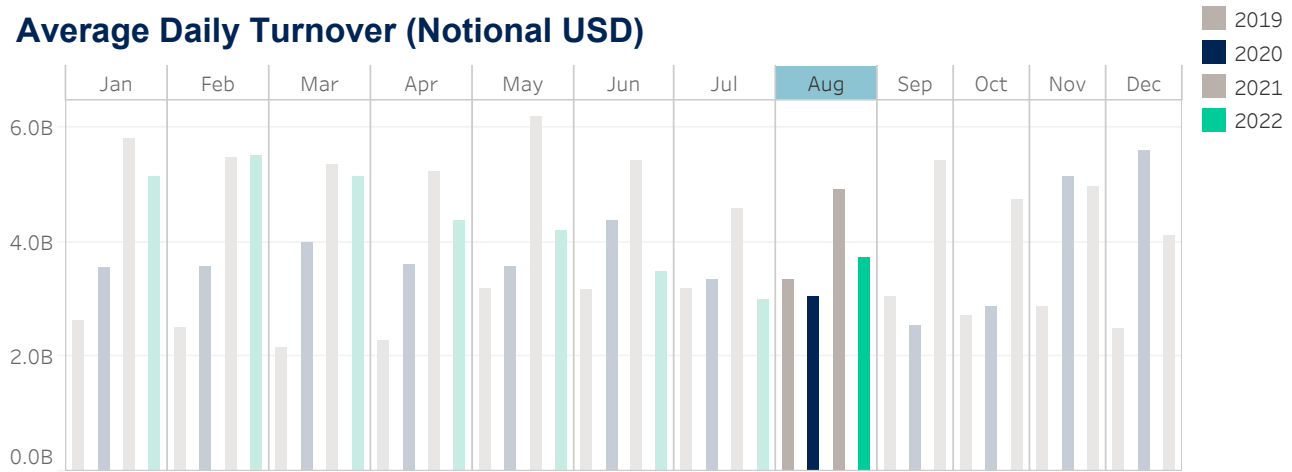
Median used for all metrics

One minute volatility is calculated using the difference between the high and low price within a one minute time bin, divided by that bin's VWAP

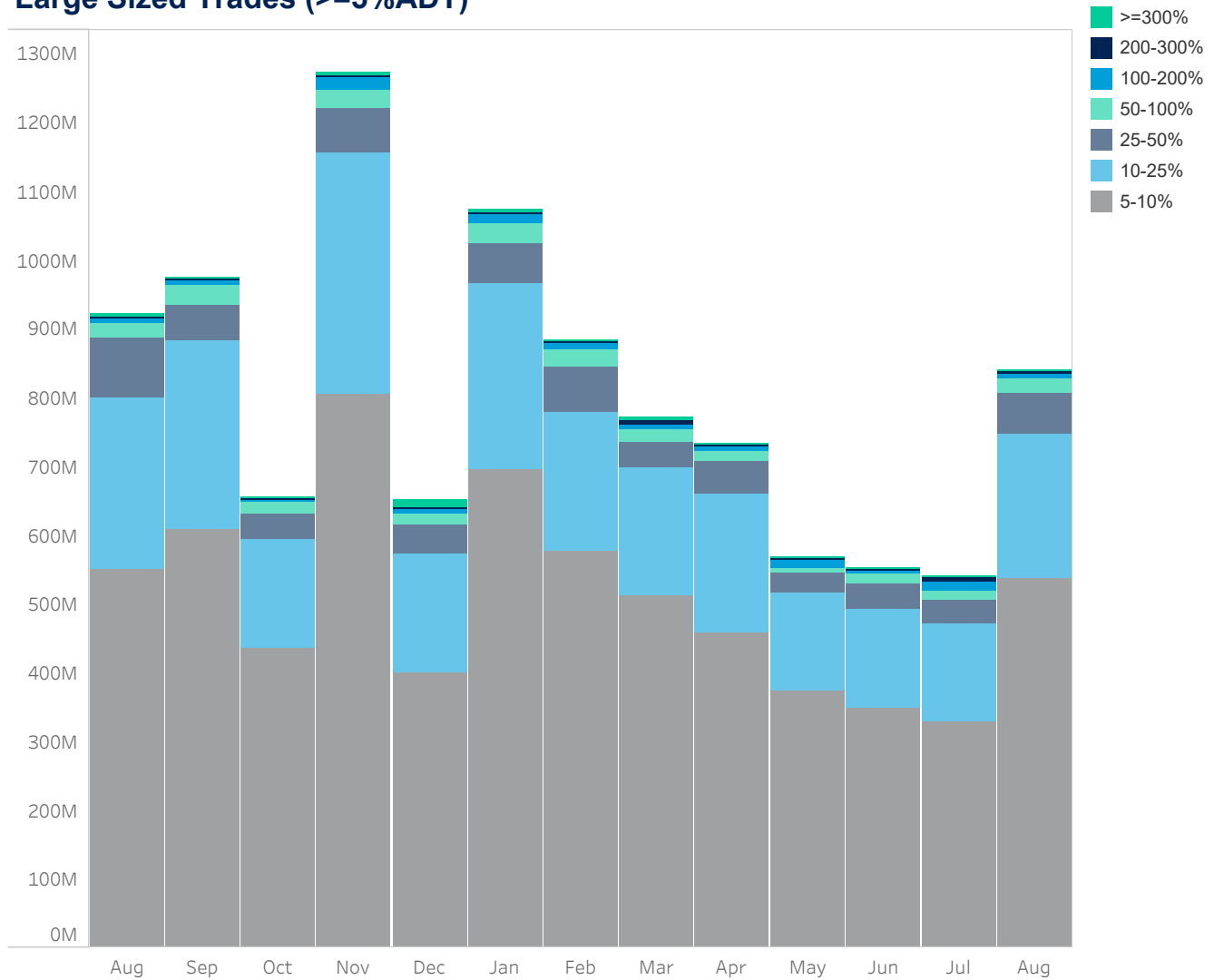
Source data: Virtu Financial

Thailand

Average Daily Turnover (Notional USD)



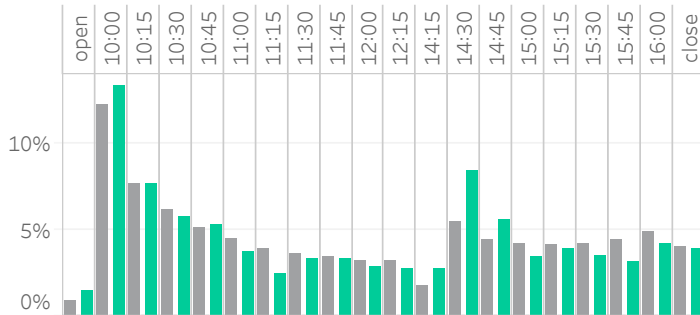
Large Sized Trades (>=5%ADT)



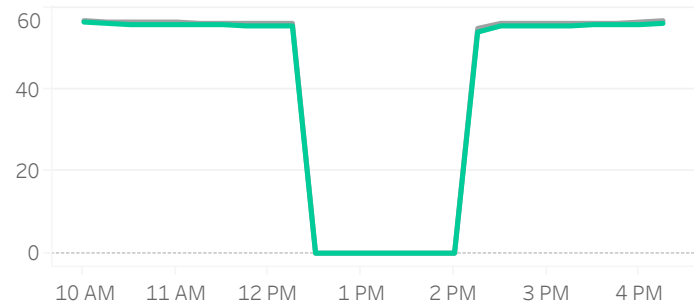
Source data: Virtu Financial

Thailand

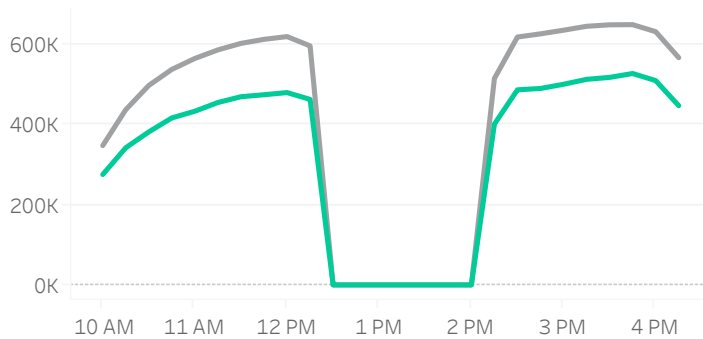
Volume Curve



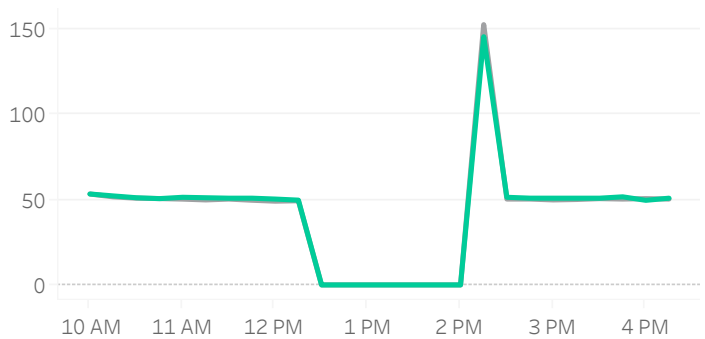
Intraday Spread (bps)



Intraday Quotesize (Shares)



Intraday Volatility (bps)



■ Rolling 12 Months Avg ■ August 2022

Spread Bps

	22 Q1			22 Q2			22 Q3	
	Jan 22	Feb 22	Mar 22	Apr 22	May 22	Jun 22	Jul 22	Aug 22
firstHalfHour	54.5	55.2	56.2	55.8	56.5	57.5	60.1	58.1
midday	54.3	54.9	55.6	55.4	55.9	57.1	59.9	57.9
lastHalfHour	54.4	55.2	55.7	55.9	56.2	57.5	60.0	58.1

One Minute Volatility Bps

firstHalfHour	145.0	151.1	54.1	158.6	54.3	144.1	148.5	152.5
midday	152.7	158.8	152.0	157.2	155.2	173.0	142.6	155.7
lastHalfHour								

Quotesize in Shares

firstHalfHour	385,390	374,157	334,148	350,199	296,888	309,227	249,174	356,306
midday	617,268	597,117	540,531	568,254	472,504	481,812	401,100	577,313
lastHalfHour	606,051	597,584	539,031	562,618	479,643	473,218	415,479	587,211

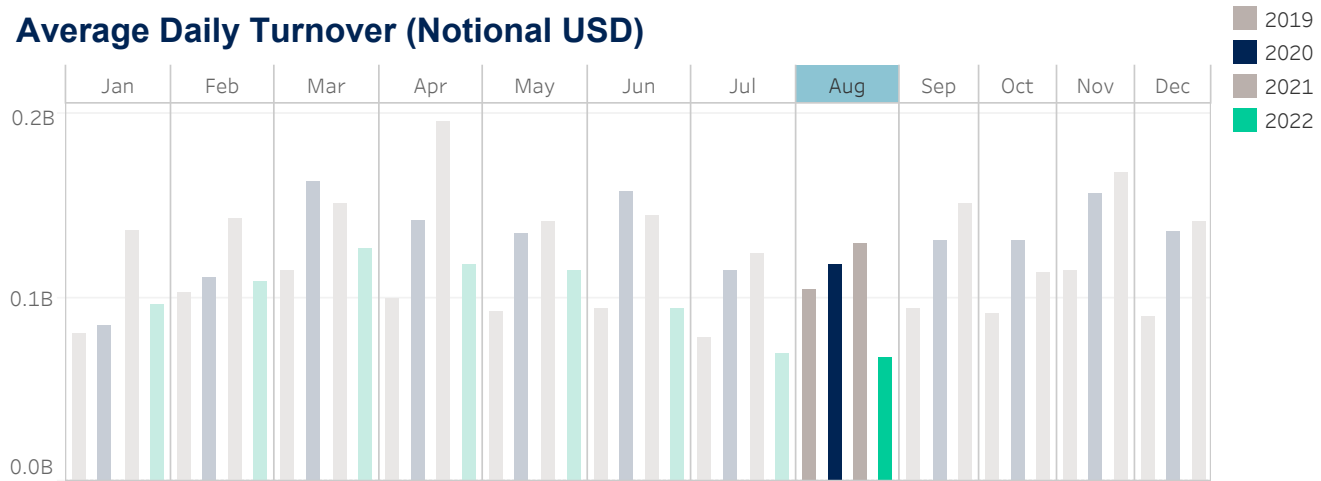
Median used for all metrics

One minute volatility is calculated using the difference between the high and low price within a one minute time bin, divided by that bin's VWAP

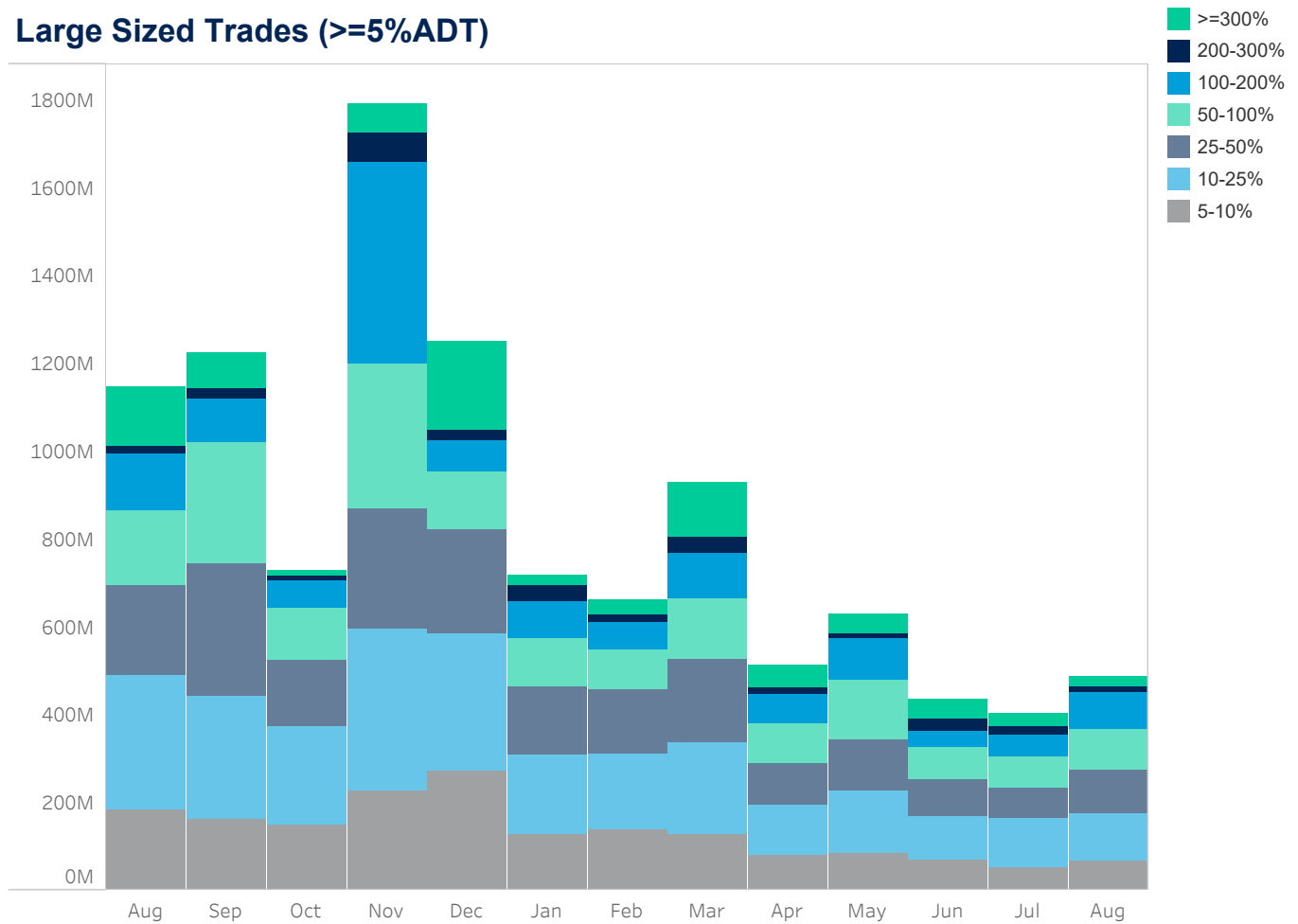
Source data: Virtu Financial

New Zealand

Average Daily Turnover (Notional USD)



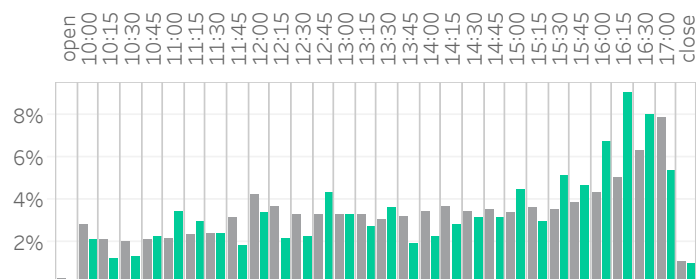
Large Sized Trades (>=5%ADT)



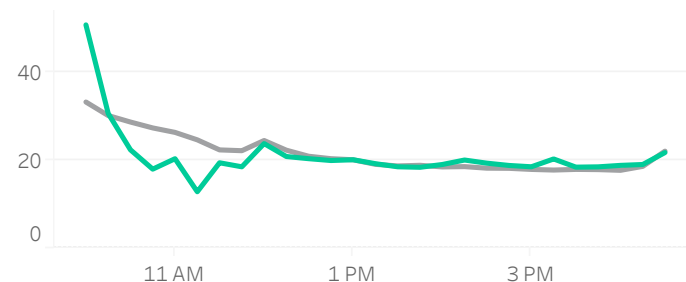
Source data: Virtu Financial

New Zealand

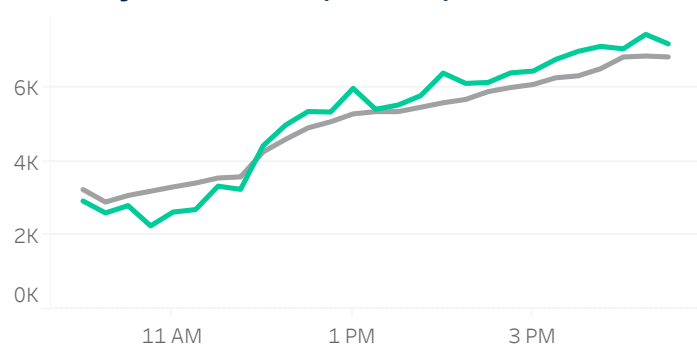
Volume Curve



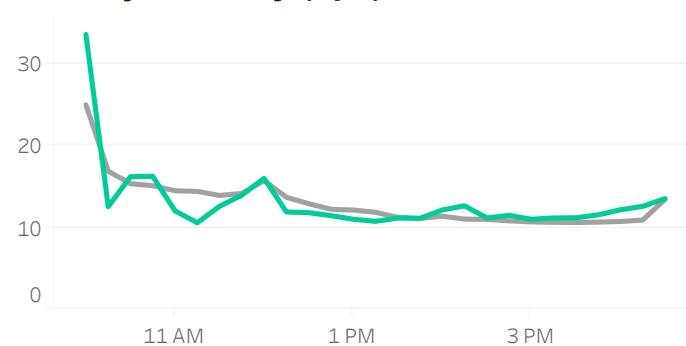
Intraday Spread (bps)



Intraday Quotesize (Shares)



Intraday Volatility (bps)



■ Rolling 12 Months Avg ■ August 2022

Spread Bps

	22 Q1			22 Q2			22 Q3	
	Jan 22	Feb 22	Mar 22	Apr 22	May 22	Jun 22	Jul 22	Aug 22
firstHalfHour	33.3	32.2	30.8	34.0	38.6			
midday	21.6	20.8	19.3	17.7	19.6	22.2	20.0	18.4
lastHalfHour	21.3	23.6	19.3	18.0	20.7	24.8	20.4	19.0

One Minute Volatility Bps

firstHalfHour	9.6	8.8	7.1	6.3	9.1			
midday	4.3	4.8	4.3	3.2	3.8	3.7	3.7	3.8
lastHalfHour	3.3	4.7	4.8	3.7	5.3	5.6	4.7	4.7

Quotesize in Shares

firstHalfHour	2,843	3,412	3,092	3,044	2,841			
midday	5,011	5,684	5,284	5,456	5,955	6,180	5,959	5,623
lastHalfHour	6,831	7,951	8,238	7,811	7,376	7,341	7,577	7,166

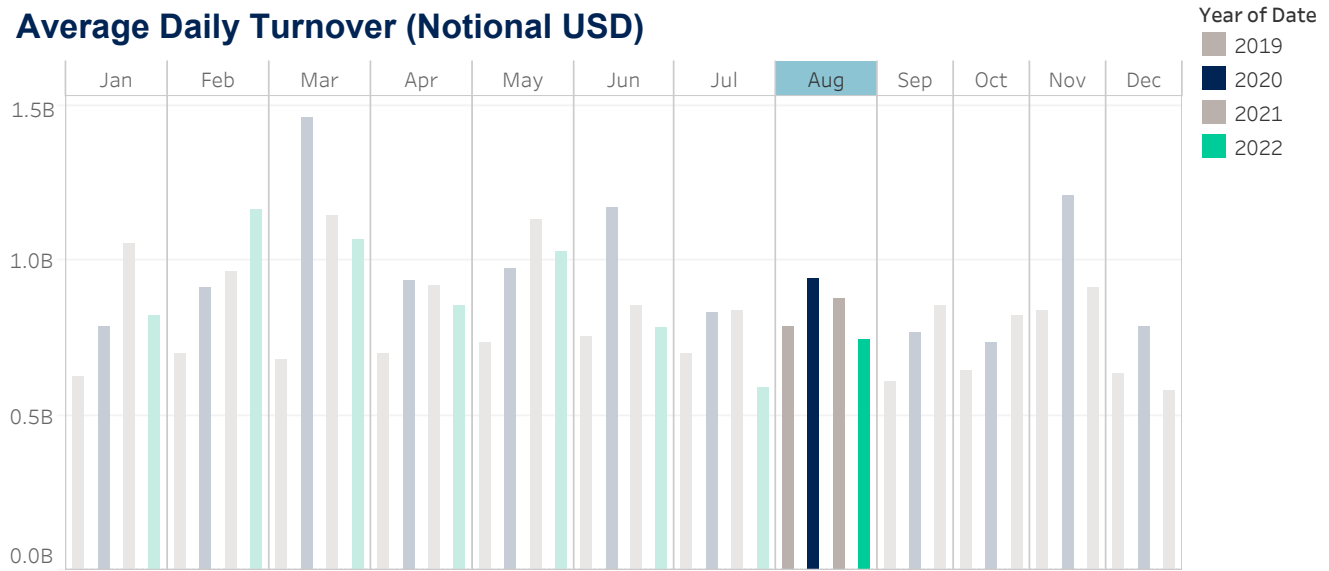
Median used for all metrics

One minute volatility is calculated using the difference between the high and low price within a one minute time bin, divided by that bin's VWAP

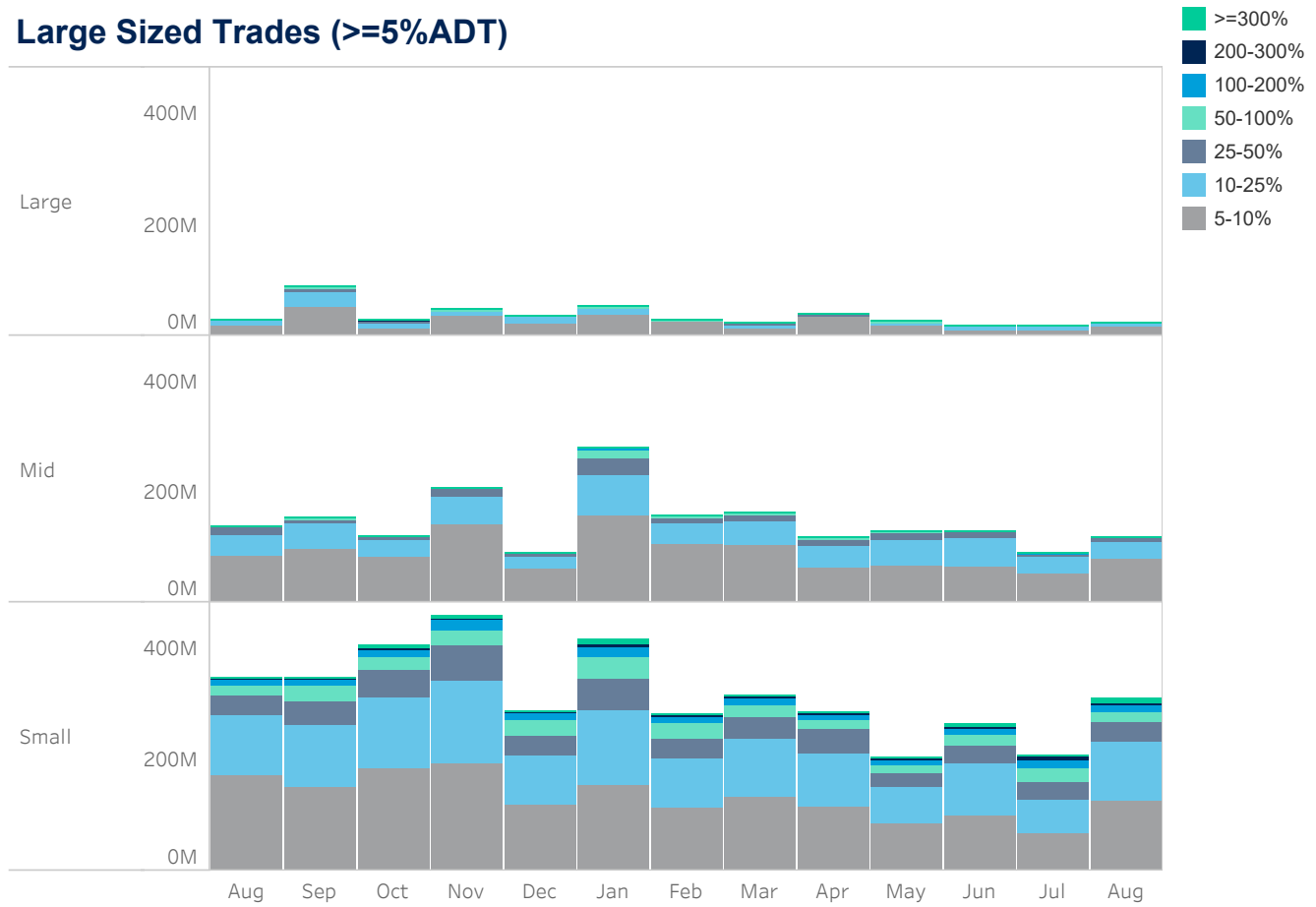
Source data: Virtu Financial

Singapore

Average Daily Turnover (Notional USD)



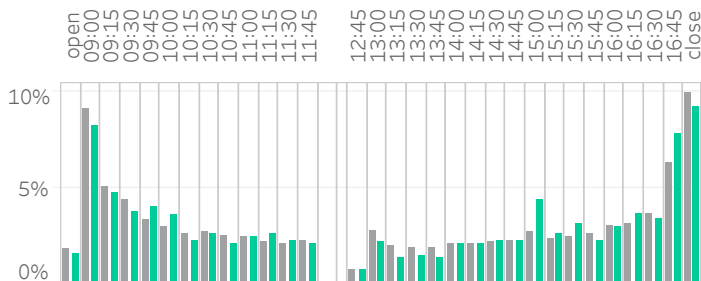
Large Sized Trades (>=5%ADT)



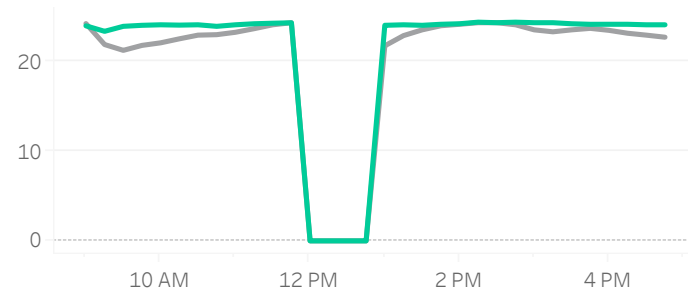
Source data: Virtu Financial

Singapore

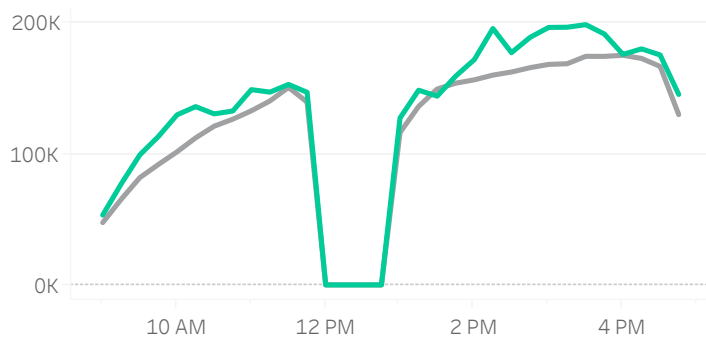
Volume Curve



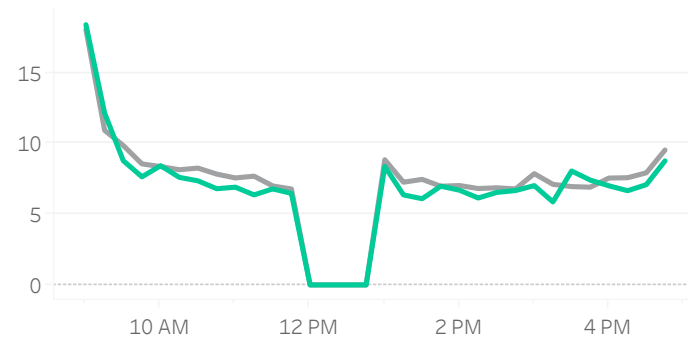
Intraday Spread (bps)



Intraday Quotesize (Shares)



Intraday Volatility (bps)



■ Rolling 12 Months Avg ■ August 2022

Spread Bps

	22 Q1			22 Q2			22 Q3	
	Jan 22	Feb 22	Mar 22	Apr 22	May 22	Jun 22	Jul 22	Aug 22
firstHalfHour	22.5	21.3	21.0	20.5	22.2	22.8	23.0	19.6
midday	23.4	21.6	21.2	21.8	23.9	24.0	24.4	23.8
lastHalfHour	21.9	21.2	20.8	21.1	23.9	22.8	22.0	21.6

One Minute Volatility Bps

firstHalfHour	5.5	7.6	8.7	5.7	8.1	5.9	6.2	5.5
midday	4.1	5.3	5.0	4.5	5.8	3.9	5.1	5.4
lastHalfHour	4.6	2.7	3.7	4.9	5.7	3.6	4.4	3.9

Quotesize in Shares

firstHalfHour	57,597	62,465	51,450	48,491	66,272	58,725	49,988	61,757
midday	140,047	127,607	119,649	116,792	159,349	136,036	111,790	155,222
lastHalfHour	134,260	152,729	122,584	122,775	163,525	129,298	102,873	148,883

Median used for all metrics

One minute volatility is calculated using the difference between the high and low price within a one minute time bin, divided by that bin's VWAP

Source data: Virtu Financial

Glossary

Volume curve - average of value traded during the month, per 15-minute time bin.

Intraday volatility - Median of difference between the high and low price within a one minute time bin, divided by that bin's VWAP

Spread - median of bid-ask spread of the index.

Quotesize - Median bid and ask size of all stocks in the index.

Average daily turnover - average daily value traded in the market.

Indices used:

Australia: ASX 200

Japan: TOPIX

China: CSI 300

Hong Kong: Hang Seng Index

Taiwan: TWSE

India: NIFTY 50

Korea: MSCI Korea 25/50 Index

New Zealand: MSCI New Zealand IMI 25/50 Index

Singapore: MSCI Singapore Index

Thailand: MSCI Thailand IMI 25/50 Index

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