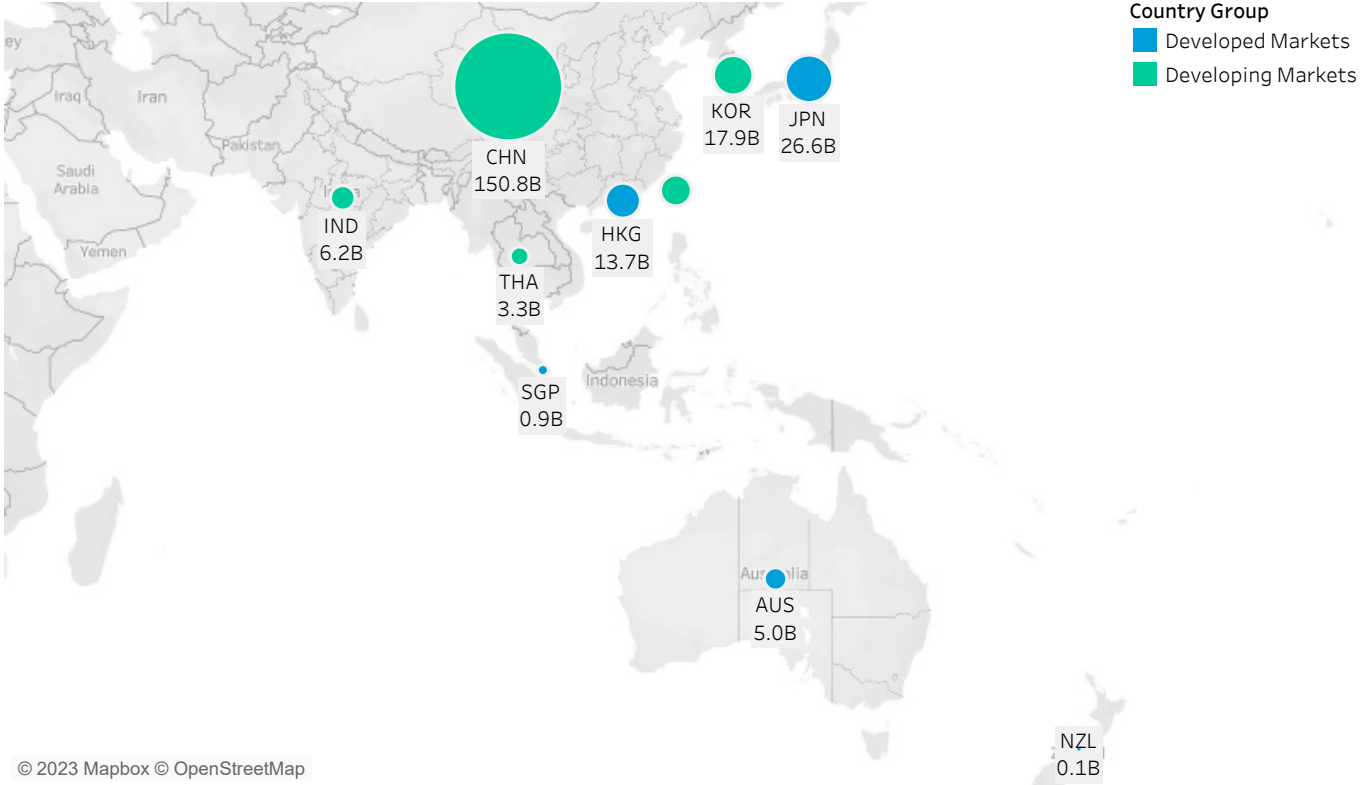


March 2023 APAC Market Structure Monthly

Average Daily Turnover (Notional USD)



Country Breakdowns

Hong Kong

China

Japan

Australia

South Korea

Taiwan

India

Thailand

New Zealand

Singapore

Mar 2023

AP Market Structure Monthly

MICROSTRUCTURE OBSERVATIONS

- 7 out of 10 countries in our APAC equities universe saw higher average daily value traded (ADT) month-over-month (MoM). Exceptions are Thailand, New Zealand and India.
- In Japan, 15.5% of intraday volume was completed at the Close Auction. This figure is 1.5% higher than the 12 month average.
- Intraday spreads and volatility remained at similar levels MoM.

AP MARKET STRUCTURE NEWS

[Cboe BIDS Australia Launched on 27 Mar 2023](#)

On 27 March 2023, Cboe BIDS Australia was officially launched and its first trades were printed. This adds a conditional venue option ([Conditional order white paper](#)) to the existing venues available in Australia. According to Cboe Australia, Cboe BIDS Australia is powered by the software used by the BIDS ATS, Cboe BIDS Europe and Cboe BIDS Canada. The BIDS Trader buy-side front-end interface integrates into buy-side order and execution management systems, and Cboe Australia market participants can also provide conditional and firm order liquidity through FIX connections.

[Hong Kong Exchange and Clearing Limited Further Expands Eligible Stocks Under The Stock Connect](#)

On 3 March 2023, Hong Kong Exchanges and Clearing Limited (HKEX) announced that the expansion of eligible stocks under the Stock Connect program will take effect from 13 March 2023, enabling eligible shares of international companies that are listed in Hong Kong to be included in Southbound trading. In addition, eligible constituent stocks of the SSE A Share Index and the SZSE Composite Index that meet certain requirements will be included in Northbound trading.

Hong Kong Investor Identification Regime Went Live on 20 March 2023

Under HKEX's [Hong Kong Investor Identification Regime \(HKIDR\)](#), Relevant Regulated Intermediaries are required to assign a unique Broker-to-Client Assigned Number to each of their Relevant Clients who have placed or propose to place an on-exchange order or an off-exchange order in securities listed and/or traded on the trading system of The Stock Exchange of Hong Kong Limited. The development testing, assignment and go-live tagging have been confirmed by the brokers. HKEX Securities Trading was conducted business-as-usual on 20 March 2023, with a daily turnover of \$16.5 billion (+0.88% vs past 10-day average daily turnover).

According to HKEX, this change will enhance market surveillance by identifying the originators of the orders and trades. HKEX also published [more notes on reporting form submission on 17 Mar 2023](#) to facilitate and prepare for the daily operations after HKIDR go-live.

[HKEX Announces New Specialist Technology Company Listing Rules](#)

On 24 March 2023, HKEX announced the expansion of Hong Kong's listing framework for the listings of Specialist Technology Companies, with a new chapter added to the Main Board Listing Rules (Listing Rules or Rules). New Rules will take effect on 31 March 2023, welcoming applications from issuers operating in five frontier industries.

[Japan Exchange Group Published Medium-Term Management Plan 2024](#)

On 30 March 2023, Japan Exchange Group (JPX) published its Medium-Term Management Plan 2024. From a market structure perspective, JPX mentioned its plan to further improve the convenience and resilience of market infrastructure, with ongoing improvement to systems and the operations. It should be noted that a replacement of cash equity trading system will take place in 2H 2024, together with the extension of cash equity trading hours.

[Korea Exchange to Launch English Translation Support for Korean Disclosure of Corporations on KOSDAQ Global Segment](#)

On 10 March 2023, Korea Exchange (KRX) announced that it began providing English translation support for Korean disclosure of 51 corporations listed on the KOSDAQ Global segment, in order to create a foreign-friendly corporate disclosure environment. KRX fully sponsors the translation costs, so there is no cost burden on these listed corporations.

[Indonesia Stock Exchange Extends Market Hour by One Hour with Normalization of Its Pandemic Relaxation Provisions](#)

On 30 March 2023, Indonesia Stock Exchange announced that it would carry out the normalization of the COVID-19 Pandemic provisions. As a result, the Trading hours will be adjusted starting from 2 April 2023: AM session extended by 30mins, Lunch break cut by 30mins, PM session extended by 60 mins.

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

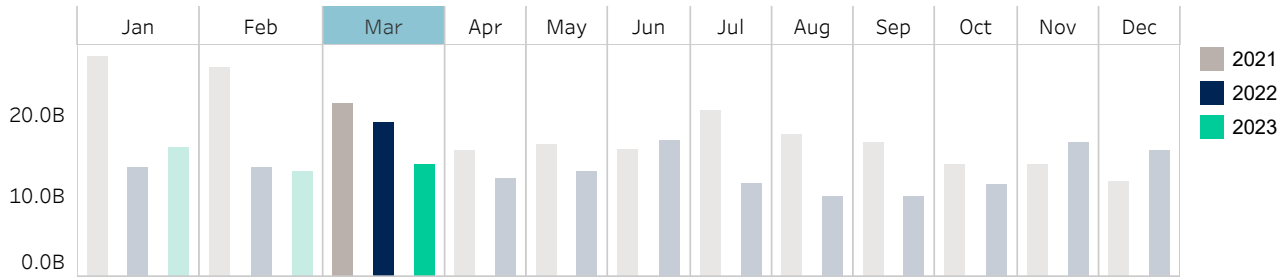
info@virtu.com | www.virtu.com

© 2023 Virtu Financial, Inc. All rights reserved. Not to be reproduced or retransmitted without permission. These materials are for informational purposes and are not intended to be used to make trading or investment decisions, they are not intended as an offer to sell or the solicitation of an offer to buy any security or financial product, and are not intended as advice (investment, tax or legal). The information contained herein includes Virtu proprietary information and/or has been taken from sources we believe to be reliable, but we do not represent or warrant that such information is accurate or complete and it should not be relied upon as such.

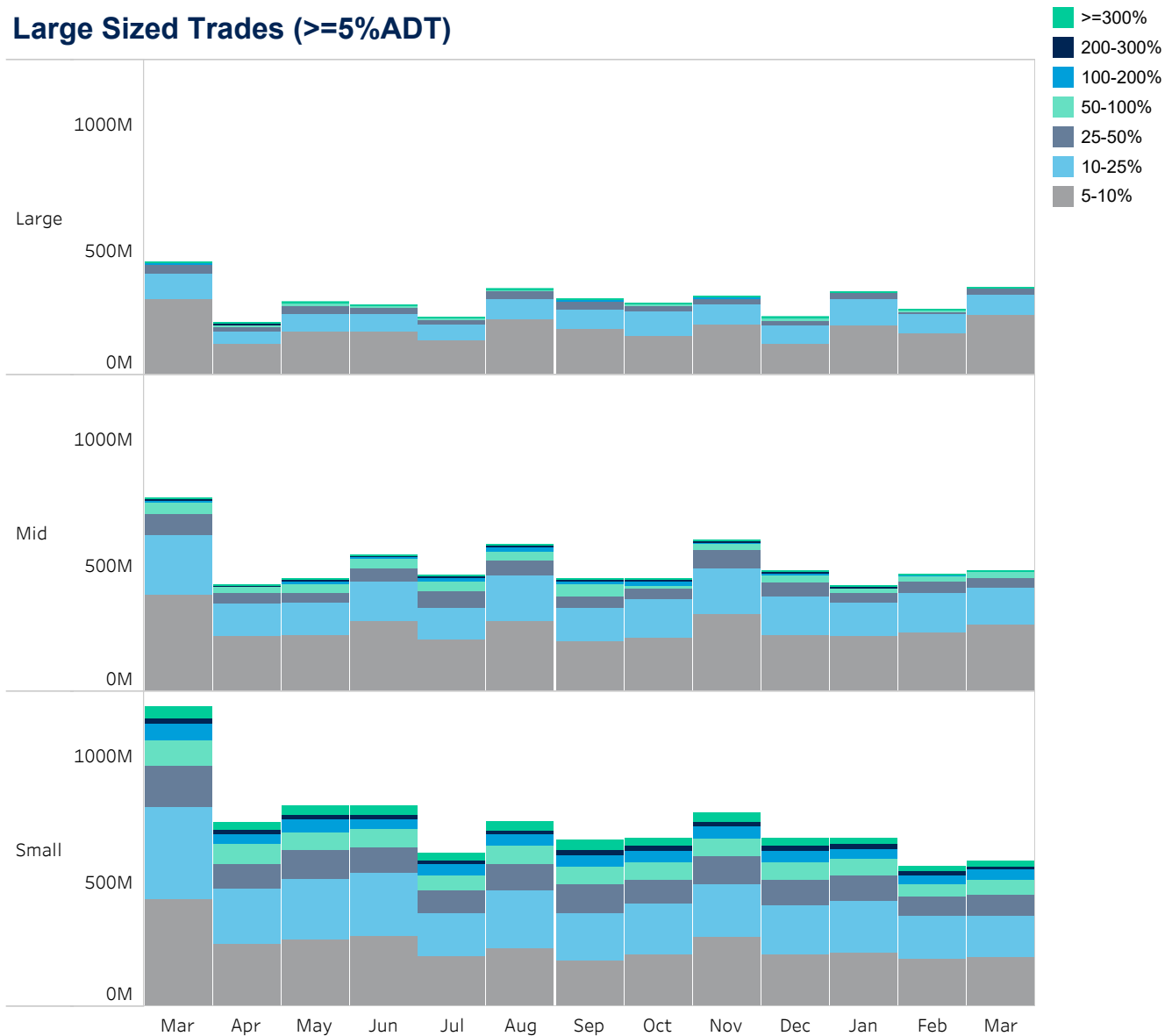
Securities products and services are offered by the following subsidiaries of Virtu Financial, Inc. In the U.S., Virtu Americas LLC, member FINRA and SIPC; in Canada, Virtu Canada Corp., member Canadian Investor Protection Fund and Investment Industry Regulatory Organization of Canada; in Europe, Virtu Europe Trading Limited, registered in Ireland No. 283940 ("VETL") (VETL is authorized and regulated by the Central Bank of Ireland), and Virtu Financial Ireland Limited, registered in Ireland No. 471719 ("VFIL") (VFIL is authorized and regulated by the Central Bank of Ireland). The registered office of VETL and VFIL is North Dock One, Fifth Floor, 91-92 North Wall Quay, Dublin 1, Ireland, D01 H7V7; in Asia, Virtu ITG Hong Kong Limited (SFC License No. AHD810), Virtu ITG Singapore Pte Limited (CMS License No. 100138-1), and Virtu ITG Australia Limited (AFS License No. 219582).

Hong Kong

Average Daily Turnover (Notional USD)



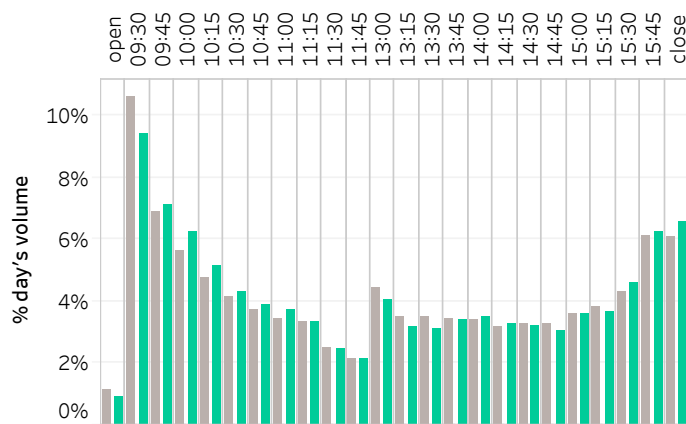
Large Sized Trades (>=5%ADT)



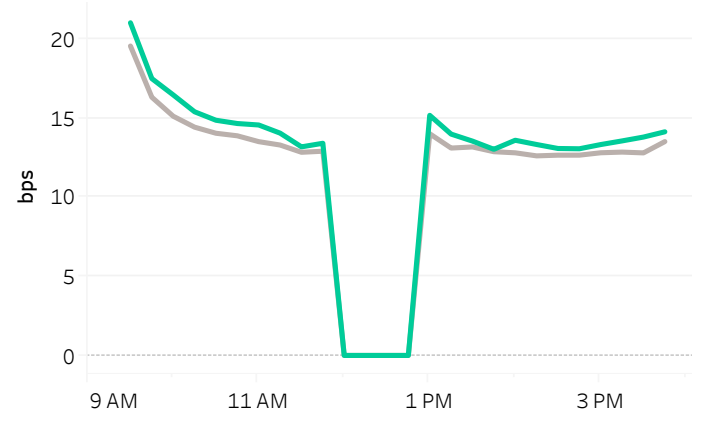
Source data: Virtu Financial

Hong Kong

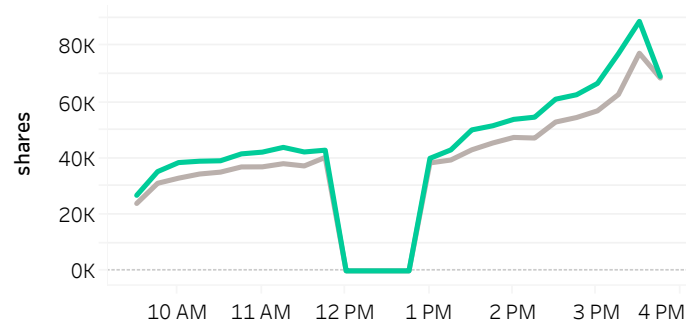
Volume Curve



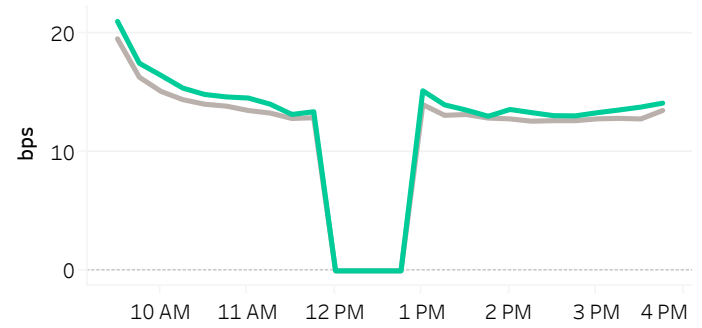
Intraday Spread (bps)



Intraday Quotesize (Shares)



Intraday Volatility (bps)



Rolling 12 Months Avg March 2023

Spread Bps

	2022			2023		
	Oct	Nov	Dec	Jan	Feb	Mar
FirstHalfHour	19.2	20.4	19.7	18.3	18.0	19.3
MidDay	14.0	14.6	14.0	13.1	12.8	13.7
LastHalfHour	13.7	14.0	14.0	13.0	13.2	14.0

One Minute Volatility Bps

FirstHalfHour	26.4	25.3	28.1	30.5	33.8	29.1
MidDay	17.0	15.9	16.2	18.5	20.1	18.3
LastHalfHour	16.5	16.7	17.3	18.0	19.1	18.6

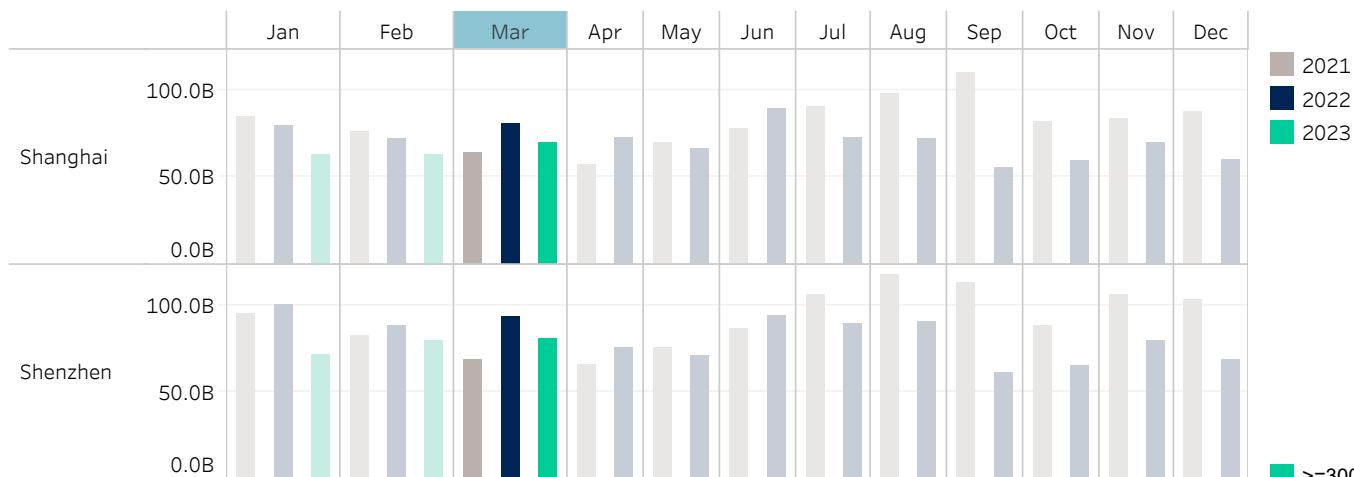
Quotesize (shares)

FirstHalfHour	27,135	28,857	29,077	29,622	27,296	30,646
MidDay	39,201	38,664	40,980	46,105	44,622	43,572
LastHalfHour	71,053	67,304	66,542	78,406	74,936	77,473

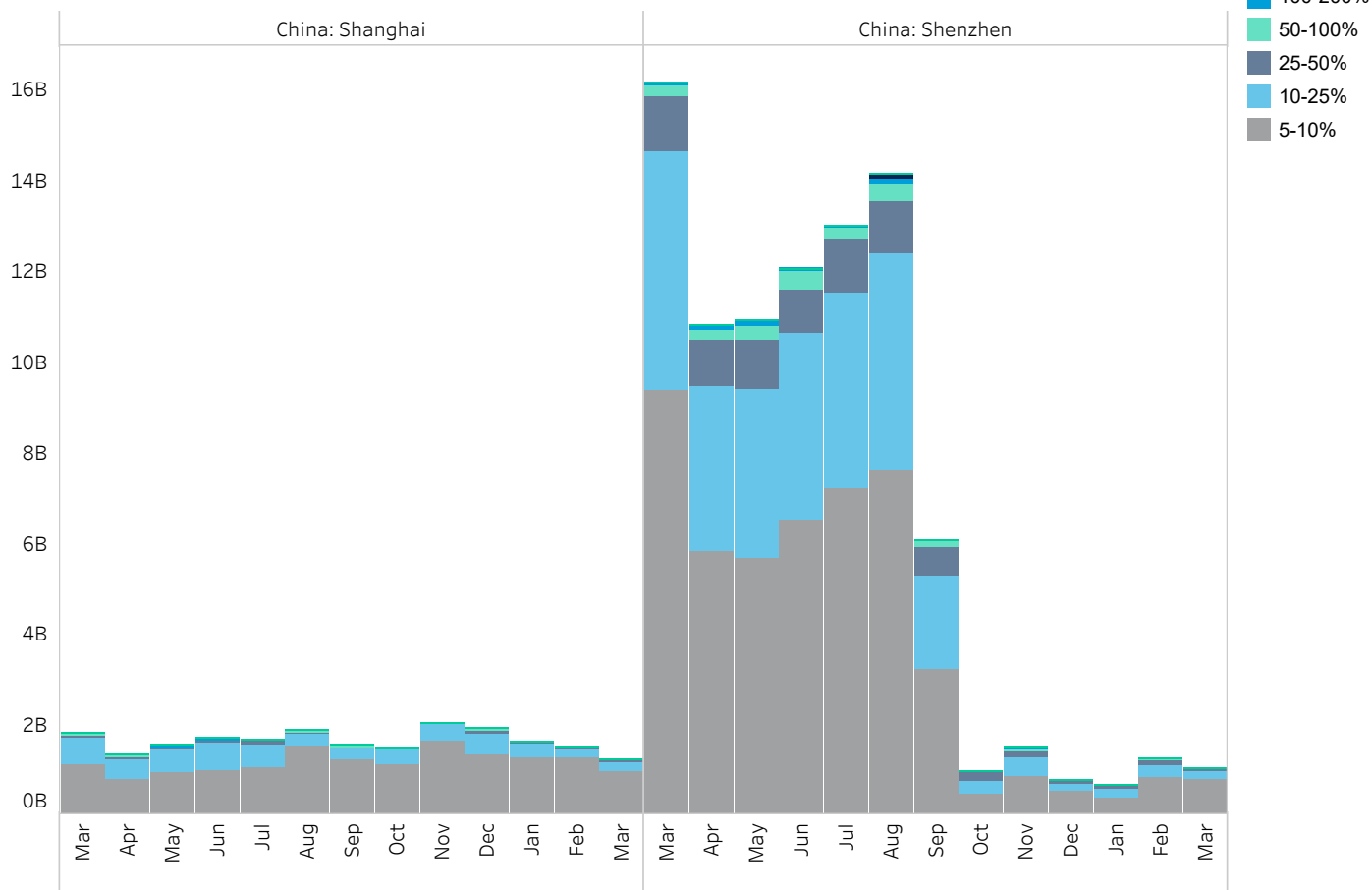
Median used for all metrics
 One minute volatility is calculated using the difference between the high and low price within a one minute time bin, divided by that bin's VWAP
 Source data: Virtu Financial

China

Average Daily Turnover (Notional USD)



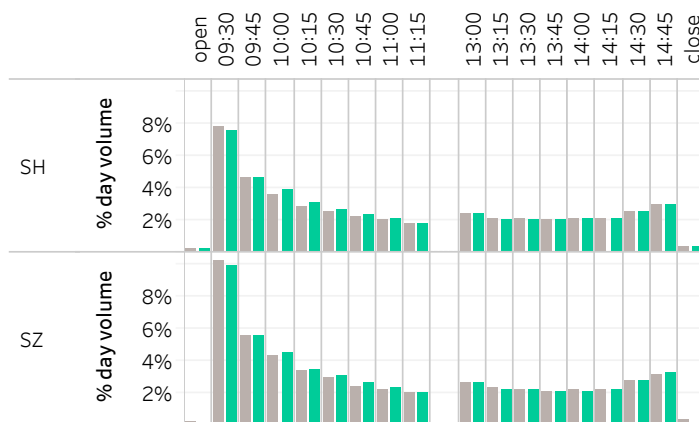
Large Sized Trades (>=5%ADT)



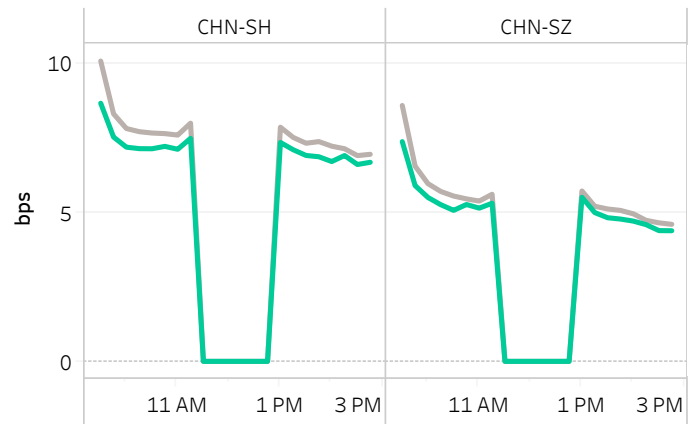
Source data: Virtu Financial

China

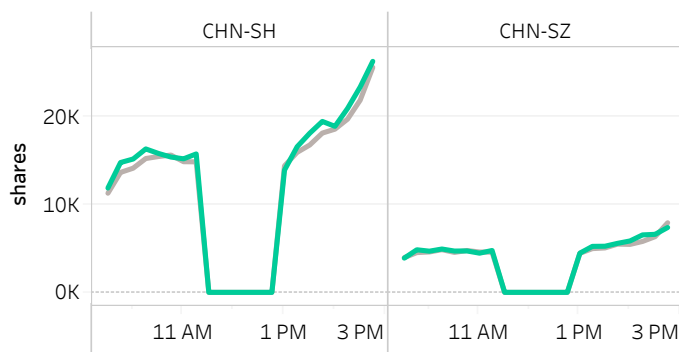
Volume Curve



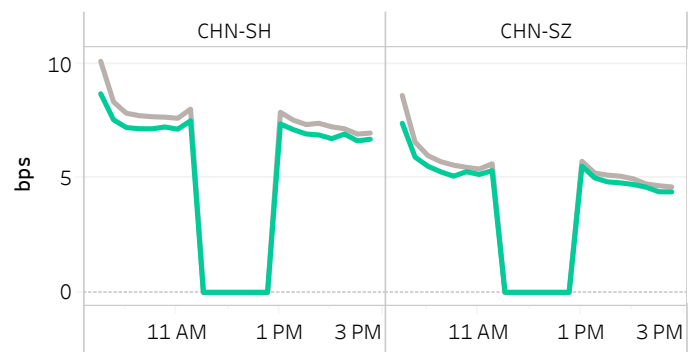
Intraday Spread (bps)



Intraday Quotesize (Shares)



Intraday Volatility (bps)



Rolling 12 Months Avg March 2023

Spread Bps

	CHN-SH						CHN-SZ					
	2022			2023			2022			2023		
	Oct	Nov	Dec	Jan	Feb	Mar	Oct	Nov	Dec	Jan	Feb	Mar
FirstHalfHour	10.1	9.6	9.4	8.9	8.1	8.2	8.6	8.0	7.6	7.4	6.6	6.7
MidDay	8.5	8.3	8.0	7.4	7.2	7.2	6.3	5.9	5.6	5.2	4.9	5.2
LastHalfHour	7.7	7.4	7.2	6.7	6.6	6.6	5.1	4.9	4.8	4.4	4.3	4.4

One Minute Volatility Bps

FirstHalfHour	26.9	22.9	26.2	32.5	30.2	28.6	27.9	24.9	25.5	37.5	32.7	28.9
MidDay	15.1	14.3	15.1	17.8	17.3	16.1	14.0	12.2	13.0	16.8	15.2	14.1
LastHalfHour	13.9	13.7	14.0	16.6	15.5	15.1	11.1	11.1	11.1	14.6	12.9	11.9

Quotesize (shares)

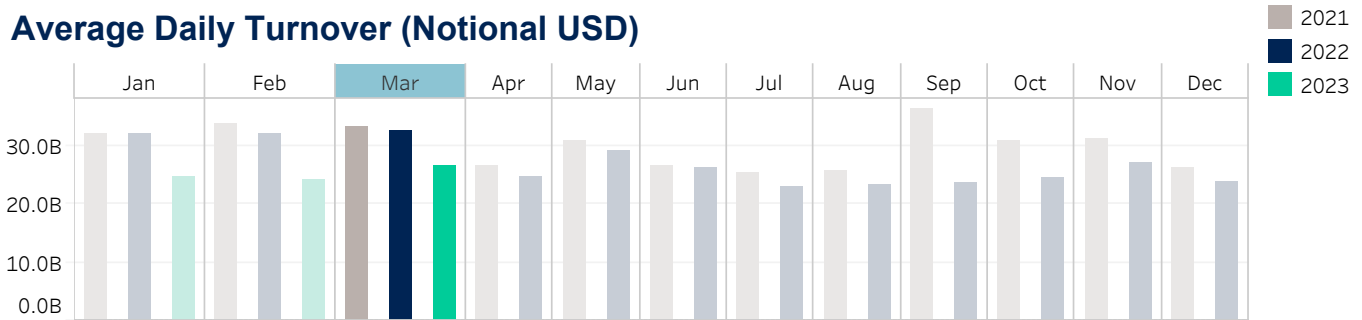
FirstHalfHour	11,703	13,524	10,302	11,776	13,865	13,413	4,175	4,523	3,794	4,051	4,423	4,390
MidDay	14,484	15,699	12,904	15,847	17,474	15,741	4,539	5,072	4,328	5,045	5,182	4,883
LastHalfHour	22,349	25,496	19,414	26,563	26,960	25,234	6,815	8,062	6,496	7,804	7,344	7,267

Median used for all metrics

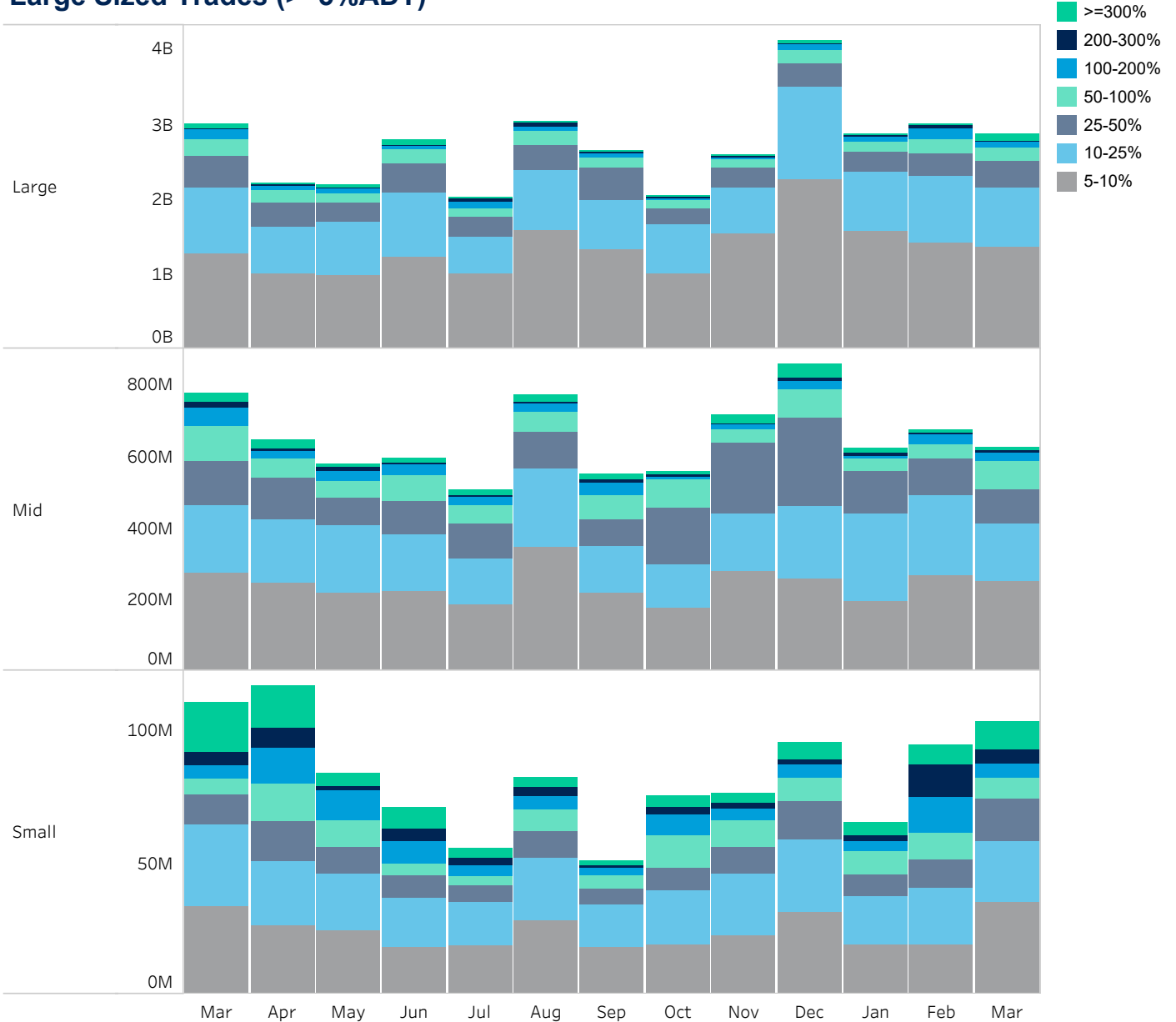
One minute volatility is calculated using the difference between the high and low price within a one minute time bin, divided by that bin's VWAP..

Japan

Average Daily Turnover (Notional USD)



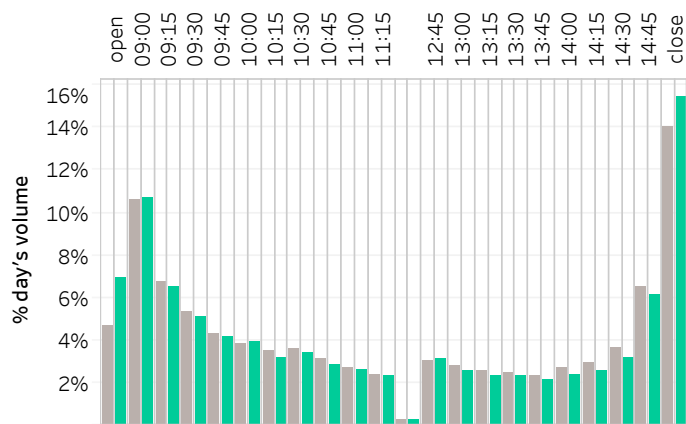
Large Sized Trades (>=5%ADT)



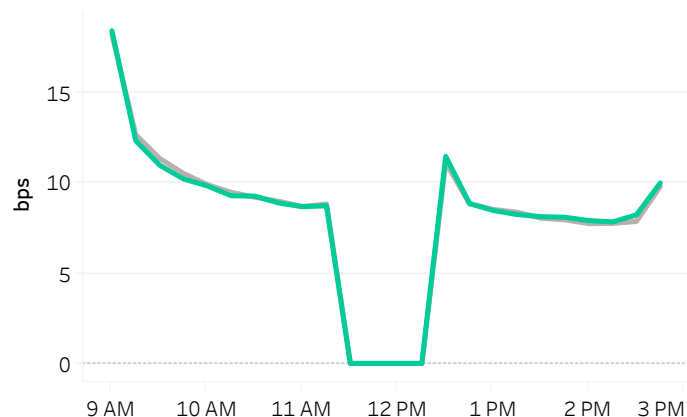
Source data: Virtu Financial

Japan

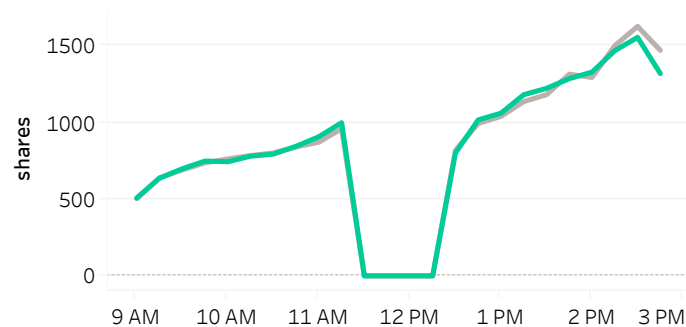
Volume Curve



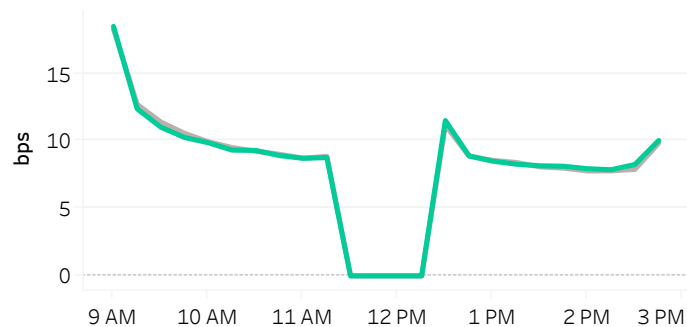
Intraday Spread (bps)



Intraday Quotesize (Shares)



Intraday Volatility (bps)



Rolling 12 Months Avg (grey line) March 2023 (green line)

Spread Bps

	2022			2023		
	Oct	Nov	Dec	Jan	Feb	Mar
FirstHalfHour	16.4	16.2	15.9	15.6	15.3	16.0
MidDay	9.3	9.3	9.0	8.6	8.8	9.1
LastHalfHour	9.6	9.4	9.4	9.1	9.1	9.5

One Minute Volatility Bps

FirstHalfHour	17.6	17.7	16.1	16.2	16.1	16.3
MidDay	8.5	8.7	8.4	8.0	8.3	8.4
LastHalfHour	9.7	9.7	9.5	9.3	9.3	9.4

Quotesize (shares)

FirstHalfHour	531	563	561	550	593	556
MidDay	809	927	902	897	1,012	891
LastHalfHour	1,375	1,572	1,441	1,414	1,620	1,387

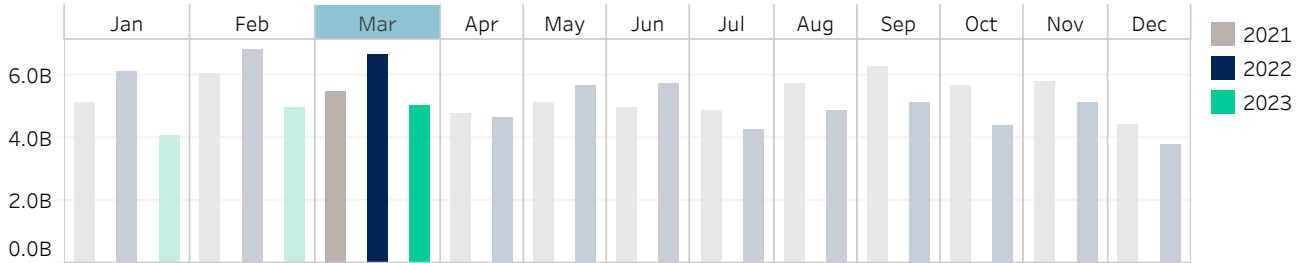
Median used for all metrics

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

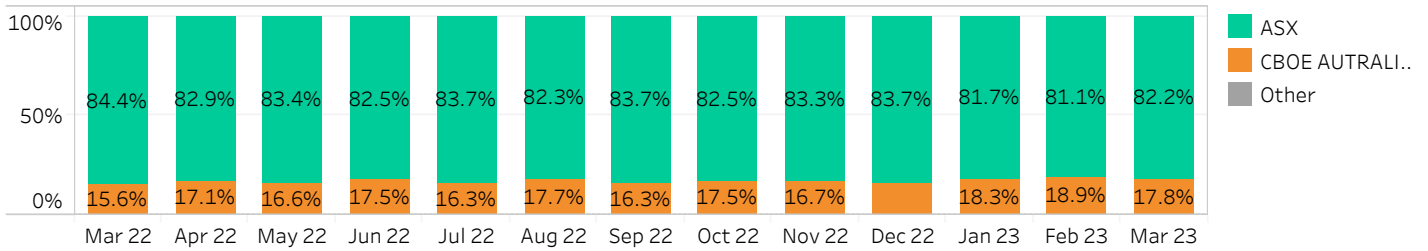
Source data: Virtu Financial

Australia

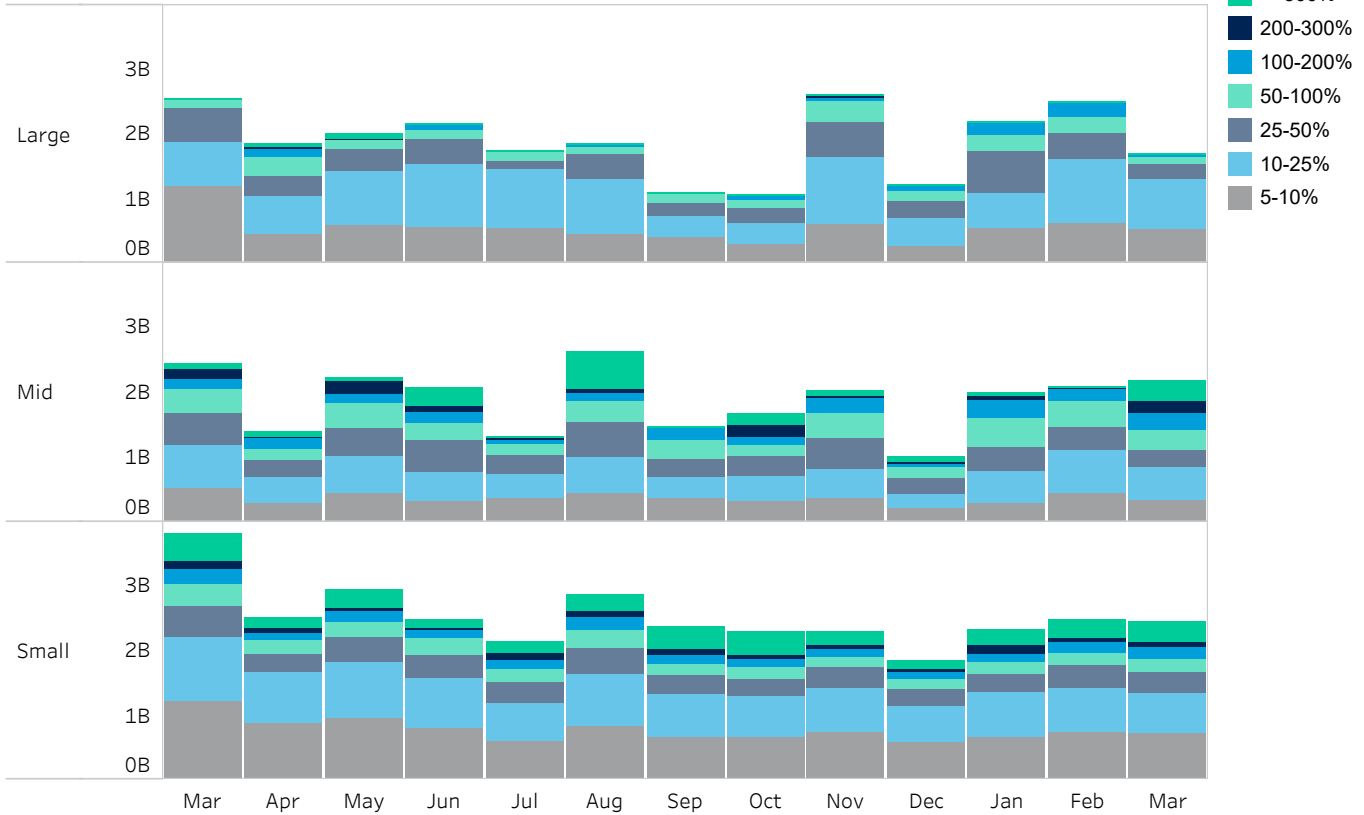
Average Daily Turnover (Notional USD)



Venue Market Share (Notional USD)



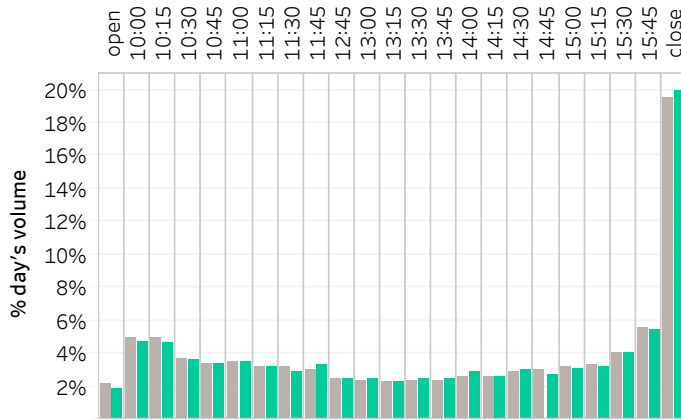
Large Sized Trades (>=5%ADT)



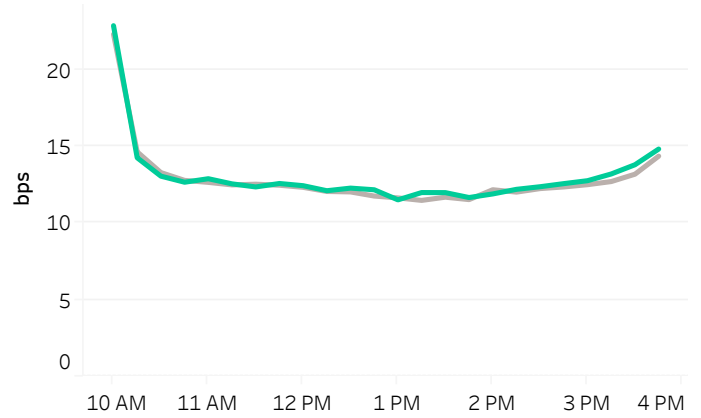
Source data: Virtu Financial

Australia

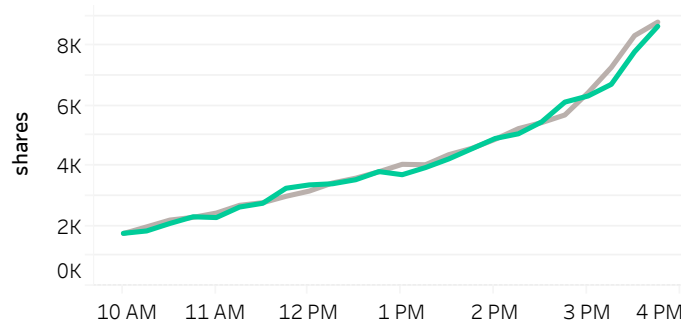
Volume Curve



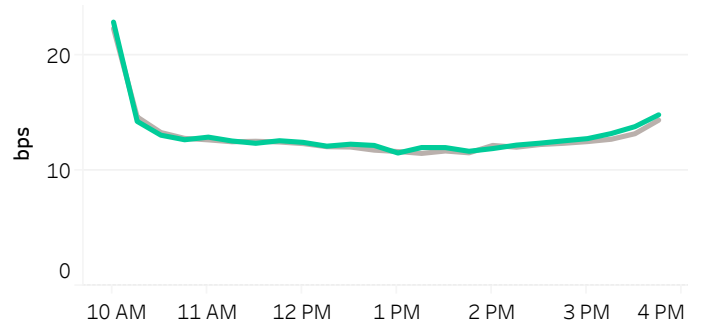
Intraday Spread (bps)



Intraday Quotesize (Shares)



Intraday Volatility (bps)



Rolling 12 Months Avg March 2023

Spread Bps

	2022			2023		
	Oct	Nov	Dec	Jan	Feb	Mar
FirstHalfHour	18.9	17.5	16.6	15.9	16.8	17.4
MidDay	13.0	12.5	12.1	11.1	11.6	12.4
LastHalfHour	14.9	13.9	13.7	13.1	13.8	14.3

One Minute Volatility Bps

FirstHalfHour	19.1	21.3	21.7	22.9	21.5	20.4
MidDay	9.9	10.3	10.7	12.3	11.4	10.5
LastHalfHour	12.2	12.5	13.2	13.8	12.9	12.6

Quotesize (shares)

FirstHalfHour	1,938	2,000	1,772	1,629	1,640	1,864
MidDay	4,056	4,453	3,558	3,279	3,260	3,759
LastHalfHour	9,008	9,111	7,705	6,643	7,185	8,215

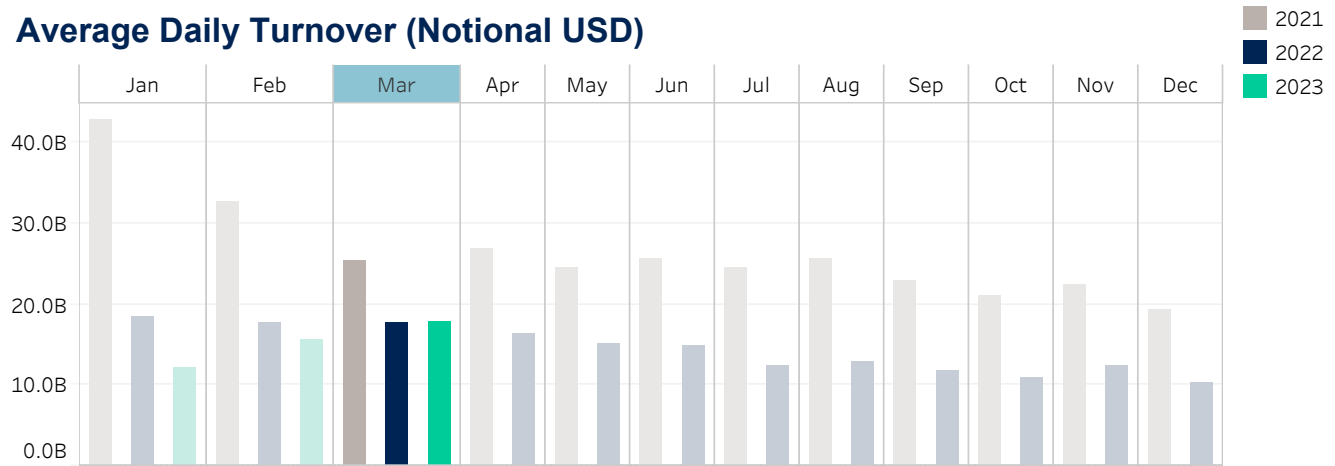
Median used for all metrics

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

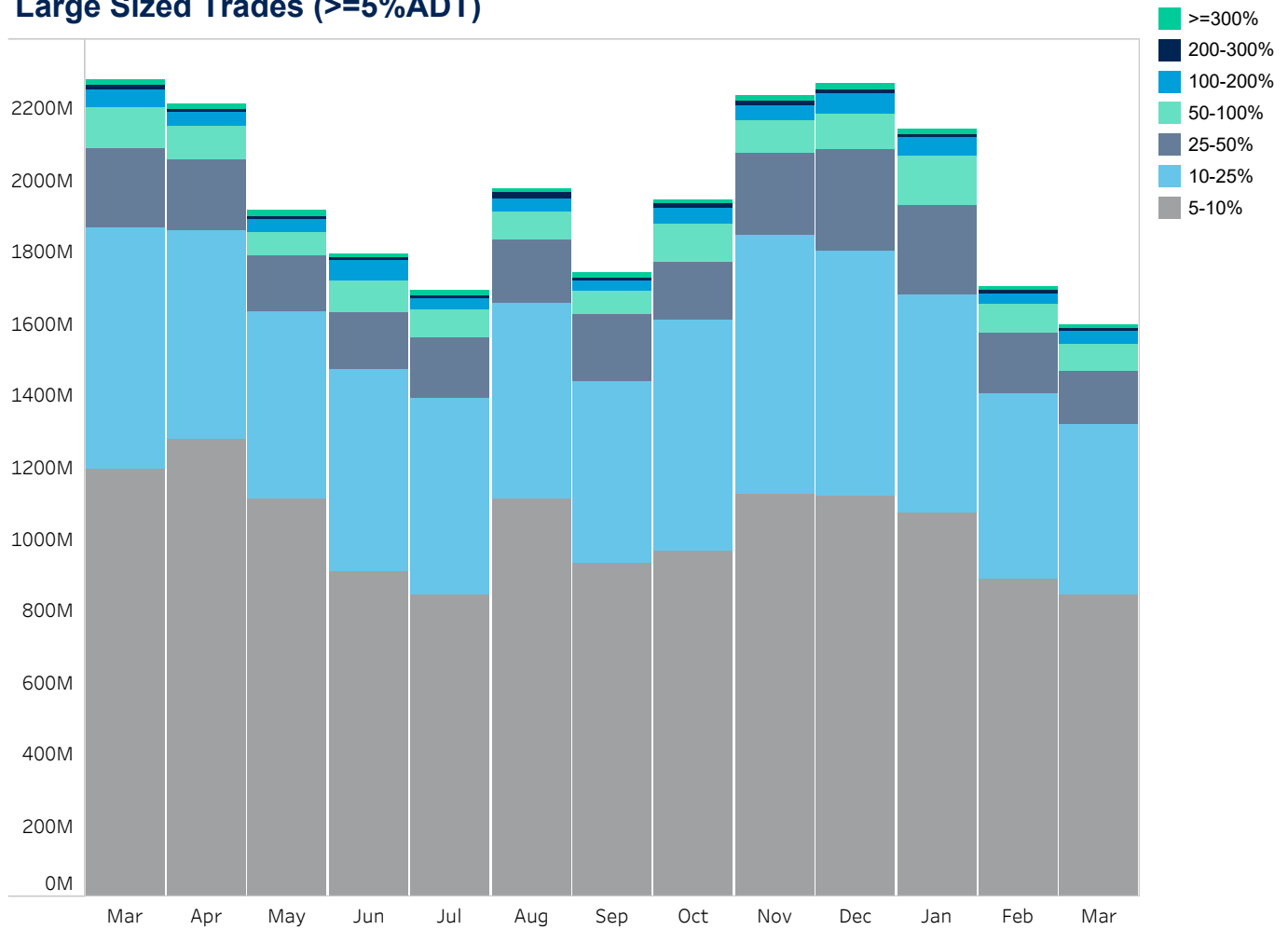
Source data: Virtu Financial

South Korea

Average Daily Turnover (Notional USD)



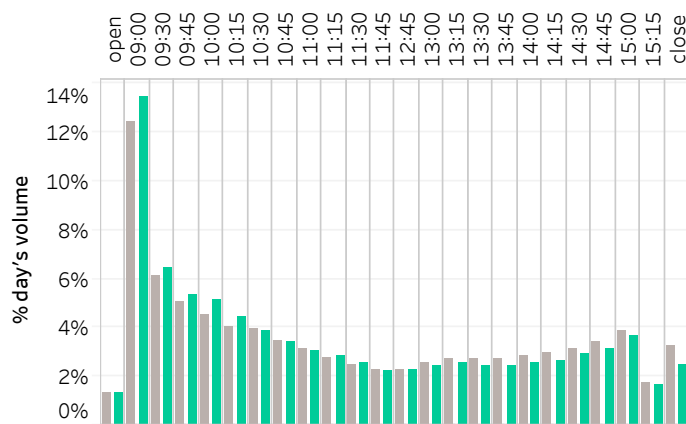
Large Sized Trades (>=5%ADT)



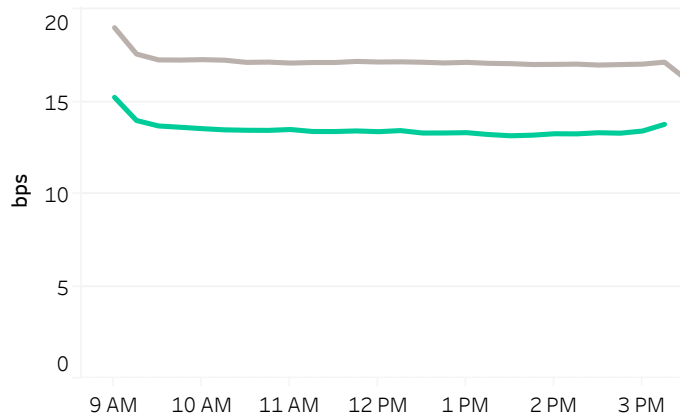
Source data: Virtu Financial

Korea

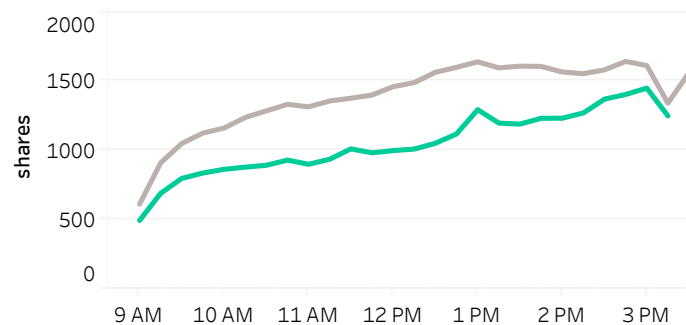
Volume Curve



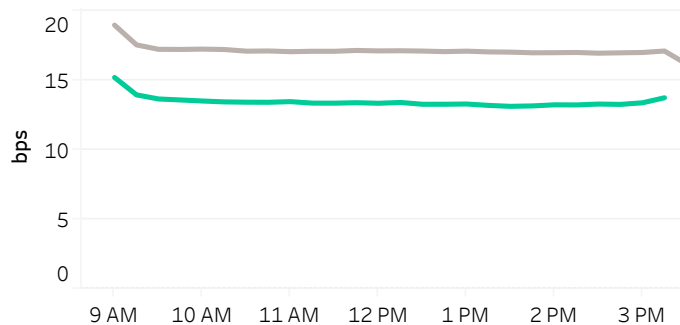
Intraday Spread (bps)



Intraday Quotesize (Shares)



Intraday Volatility (bps)



■ Rolling 12 Months Avg ■ March 2023

Spread Bps

	2022			2023		
	Oct	Nov	Dec	Jan	Feb	Mar
FirstHalfHour	19.1	18.1	18.1	17.4	14.7	14.7
MidDay	17.5	16.7	17.1	16.5	13.5	13.4
LastHalfHour	17.5	16.2	17.1	16.5	13.7	13.5

One Minute Volatility Bps

FirstHalfHour	29.4	23.6	24.9	32.7	31.4	29.5
MidDay	18.1	14.9	15.0	19.6	18.7	18.7
LastHalfHour	18.9	15.6	16.0	20.8	19.7	20.6

Quotesize (shares)

FirstHalfHour	704	716	803	727	655	595
MidDay	1,415	1,541	1,721	1,396	1,188	1,025
LastHalfHour	1,529	1,360	1,628	1,506	1,447	1,390

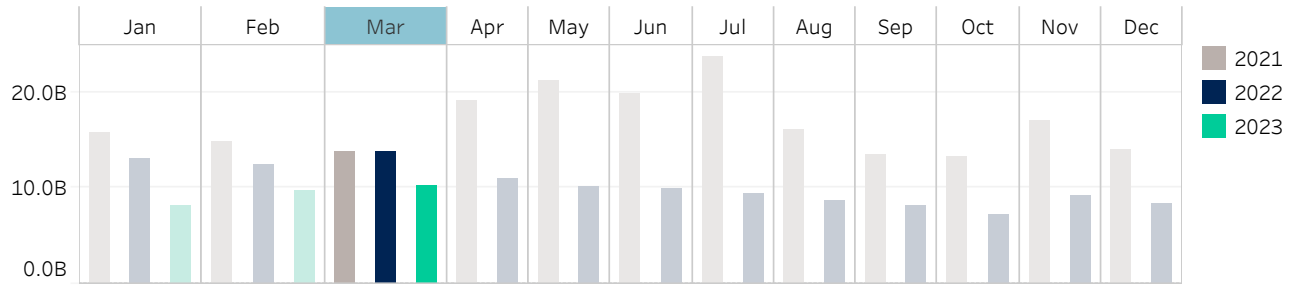
Median used for all metrics

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

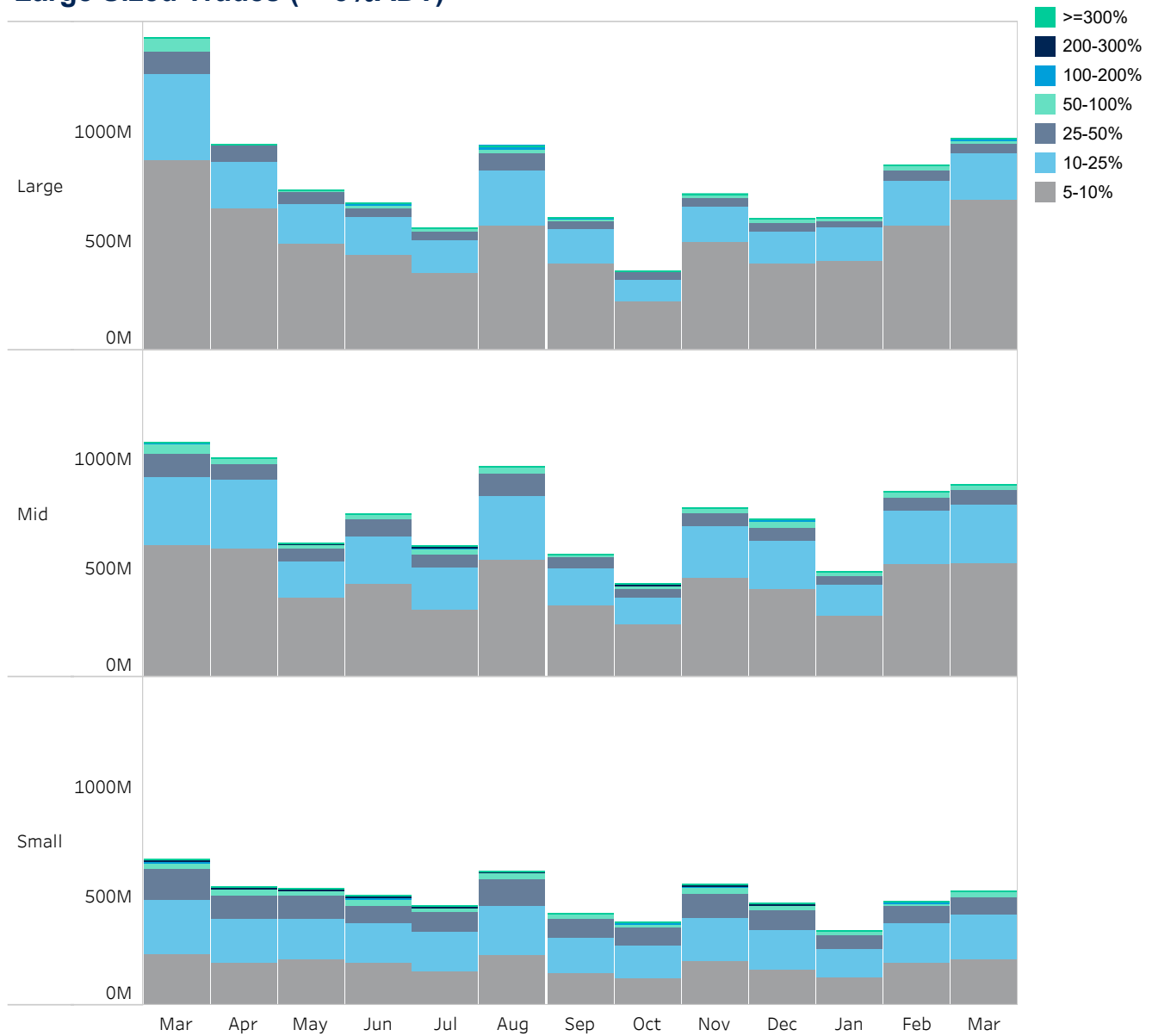
Source data: Virtu Financial

Taiwan

Average Daily Turnover (Notional USD)



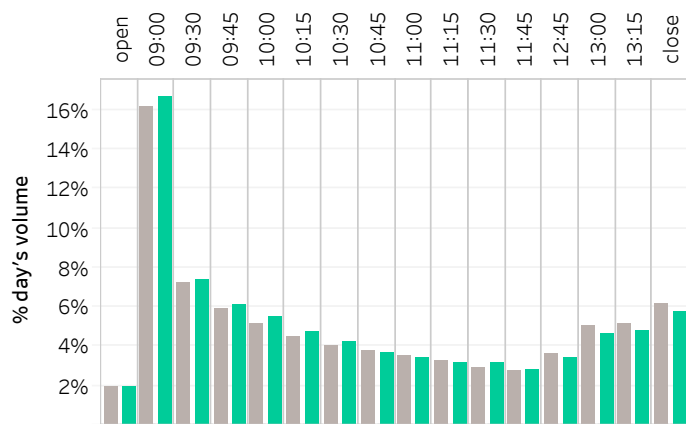
Large Sized Trades (>=5%ADT)



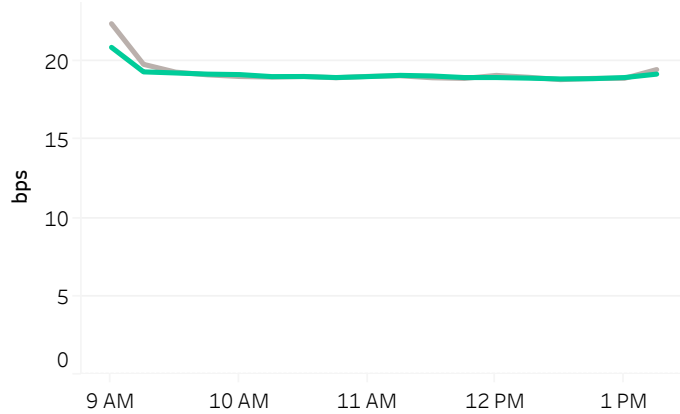
Source data: Virtu Financial

Taiwan

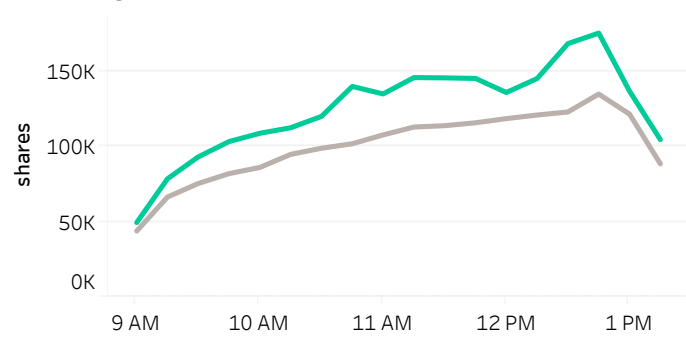
Volume Curve



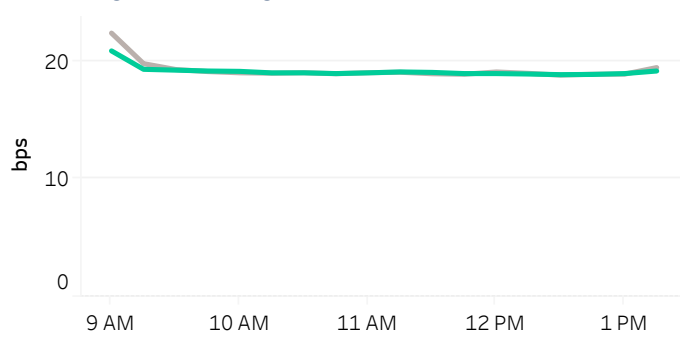
Intraday Spread (bps)



Intraday Quotesize (Shares)



Intraday Volatility (bps)



Rolling 12 Months Avg (Grey) March 2023 (Green)

Spread Bps

	2022			2023		
	Oct	Nov	Dec	Jan	Feb	Mar
FirstHalfHour	24.0	21.5	20.9	20.2	20.6	20.1
MidDay	20.9	19.1	19.2	18.5	18.9	19.0
LastHalfHour	21.2	19.2	19.2	18.7	18.9	19.1

One Minute Volatility Bps

FirstHalfHour	31.1	31.3	31.6	34.5	30.8	31.0
MidDay	28.9	28.9	29.1	25.8	23.4	28.6
LastHalfHour	29.0	28.9	29.6	26.7	23.6	28.9

Quotesize (shares)

FirstHalfHour	42,999	52,487	55,849	59,008	57,971	61,802
MidDay	77,390	113,736	109,432	118,834	117,559	138,448
LastHalfHour	81,045	112,549	102,743	113,870	116,979	124,571

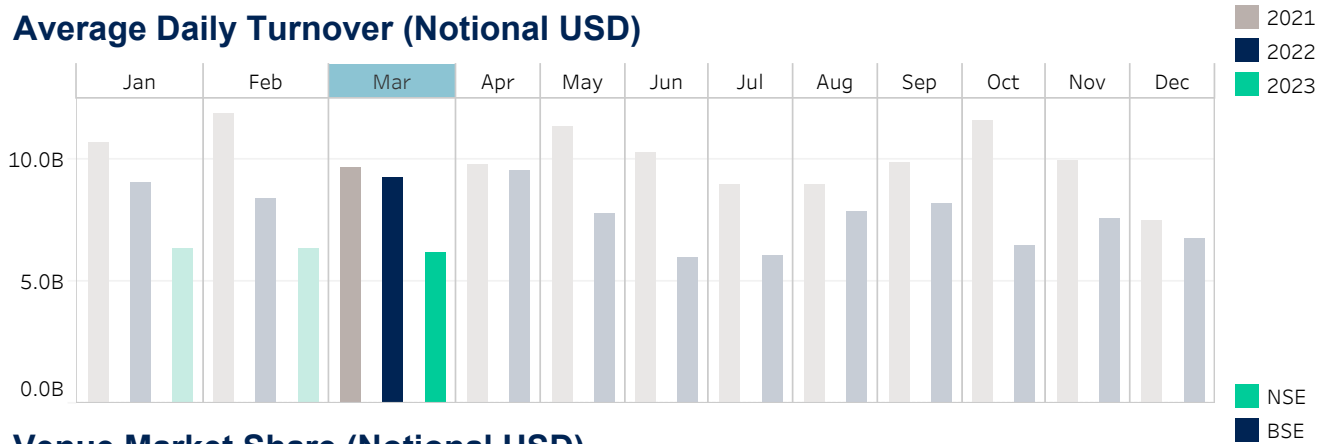
Median used for all metrics

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

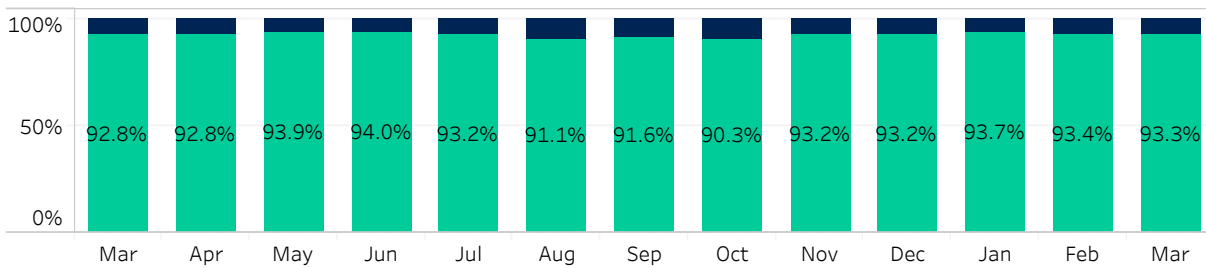
Source data: Virtu Financial

India

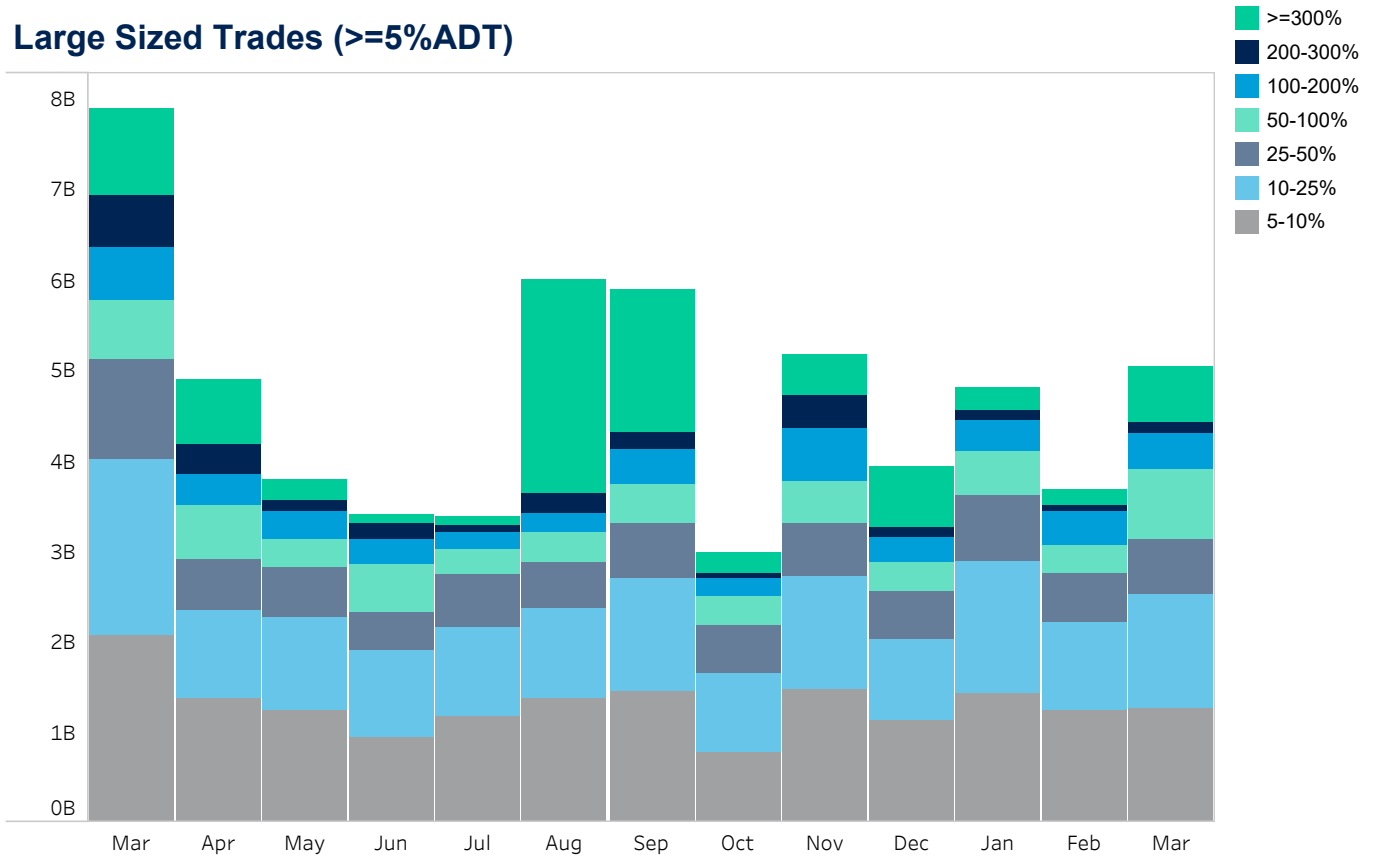
Average Daily Turnover (Notional USD)



Venue Market Share (Notional USD)



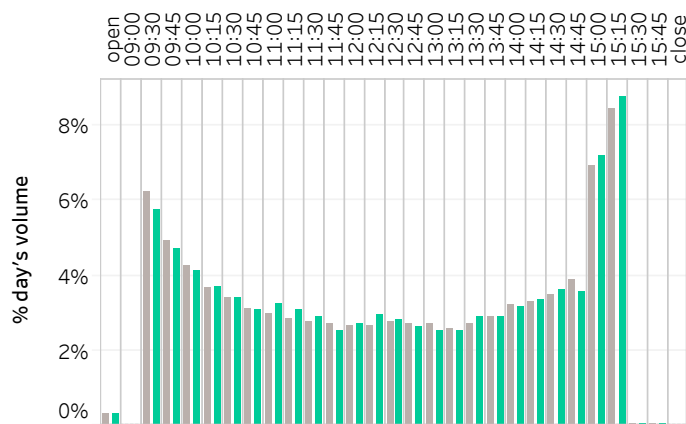
Large Sized Trades (>=5%ADT)



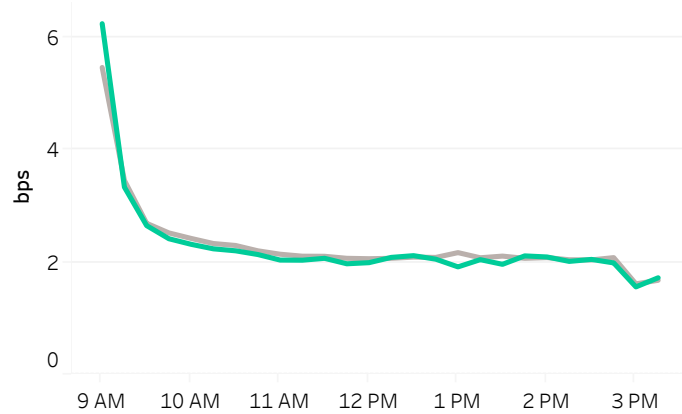
Source data: Virtu Financial

India

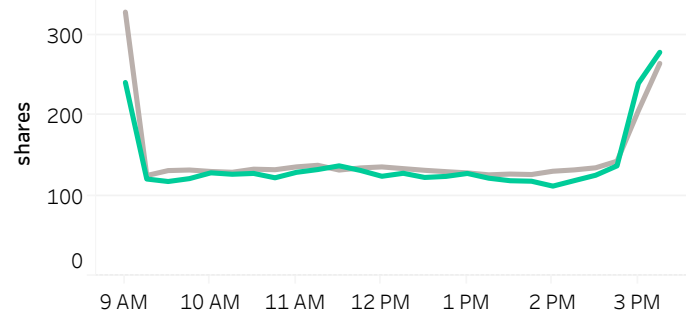
Volume Curve



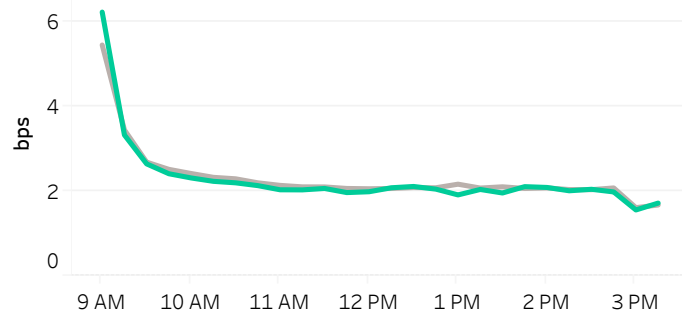
Intraday Spread (bps)



Intraday Quotesize (Shares)



Intraday Volatility (bps)



Rolling 12 Months Avg March 2023

Spread Bps

	2022			2023		
	Oct	Nov	Dec	Jan	Feb	Mar
FirstHalfHour	3.5	3.3	3.4	3.5	3.7	3.4
MidDay	2.1	1.9	2.0	2.1	2.2	2.1
LastHalfHour	1.6	1.6	1.6	1.7	1.8	1.7

One Minute Volatility Bps

FirstHalfHour	18.8	19.7	19.1	20.3	18.4	18.0
MidDay	8.2	8.4	8.2	8.2	7.4	7.7
LastHalfHour	10.1	10.3	10.5	10.2	9.7	10.2

Quotesize (shares)

FirstHalfHour	125.4	138.7	120.1	121.8	119.8	123.5
MidDay	131.3	143.8	122.4	128.7	124.1	124.2
LastHalfHour	243.8	257.7	257.9	228.8	249.5	253.0

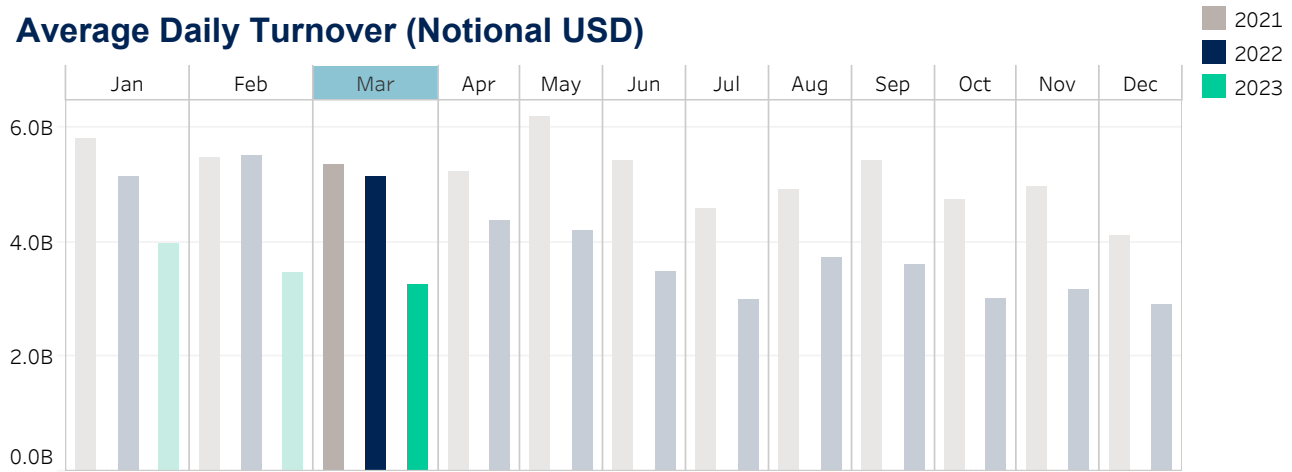
Median used for all metrics

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

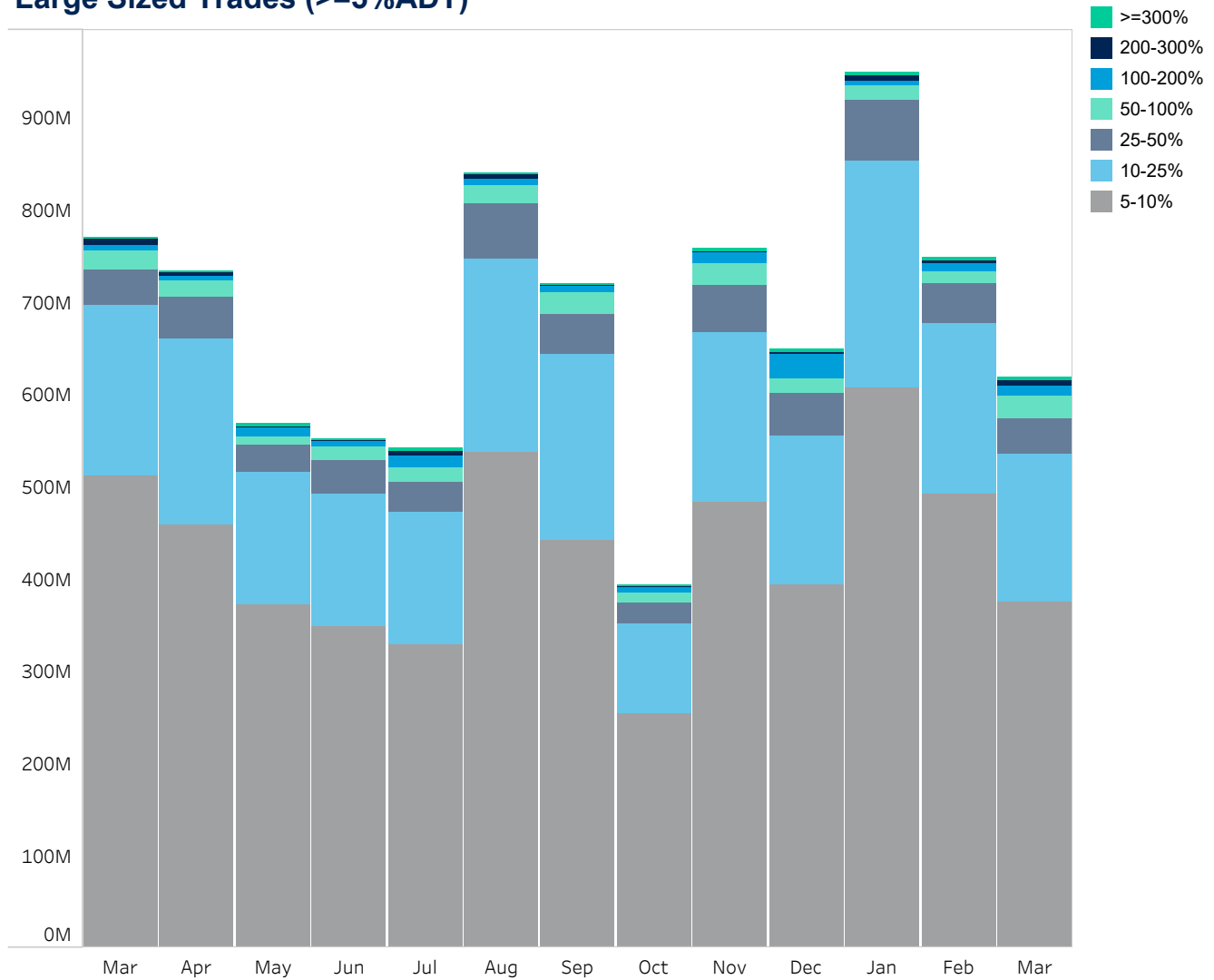
Source data: Virtu Financial

Thailand

Average Daily Turnover (Notional USD)



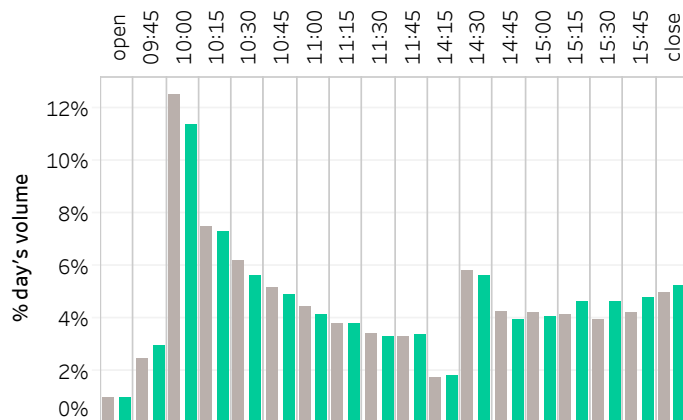
Large Sized Trades (>=5%ADT)



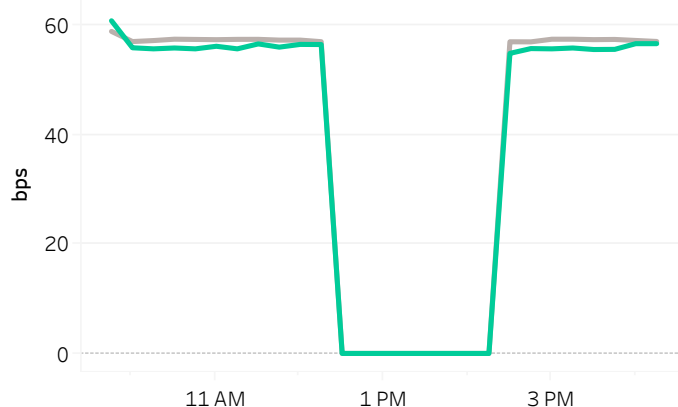
Source data: Virtu Financial

Thailand

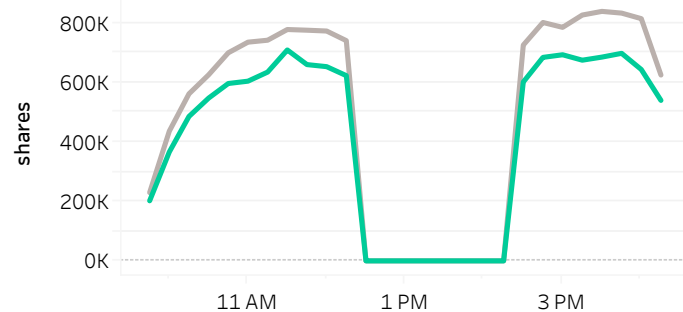
Volume Curve



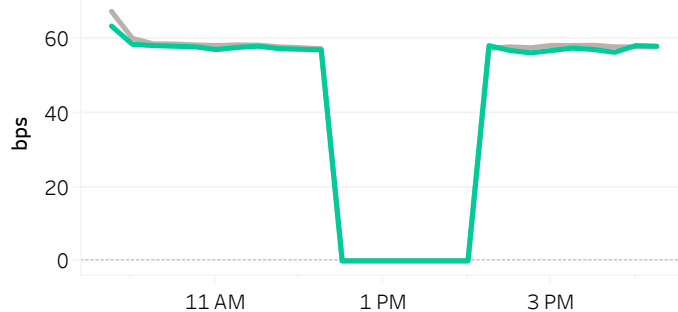
Intraday Spread (bps)



Intraday Quotesize (Shares)



Intraday Volatility (bps)



Rolling 12 Months Avg (brown line) March 2023 (green line)

Spread Bps

	2022			2023		
	Oct	Nov	Dec	Jan	Feb	Mar
FirstHalfHour	61.2	61.0	58.1	58.0	56.4	59.5
MidDay	59.2	57.6	55.9	54.1	54.1	56.0
LastHalfHour	59.7	57.3	55.7	54.2	54.8	56.7

One Minute Volatility Bps

FirstHalfHour	64.3	61.9	67.8	74.9	71.7	74.1
MidDay	55.4	55.4	57.6	60.8	58.3	56.7
LastHalfHour	56.0	56.0	58.3	60.4	58.0	56.7

Quotesize (shares)

FirstHalfHour	217,331	227,211	245,311	284,548	236,082	219,491
MidDay	691,861	760,712	805,102	865,107	737,967	634,271
LastHalfHour	620,002	675,335	738,049	812,231	679,491	552,716

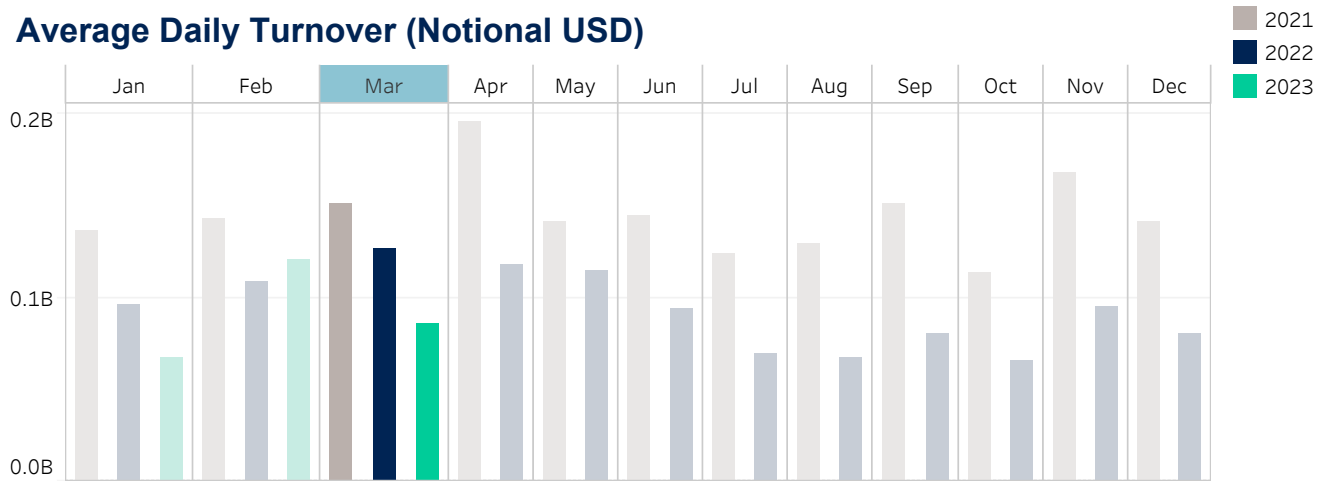
Median used for all metrics

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

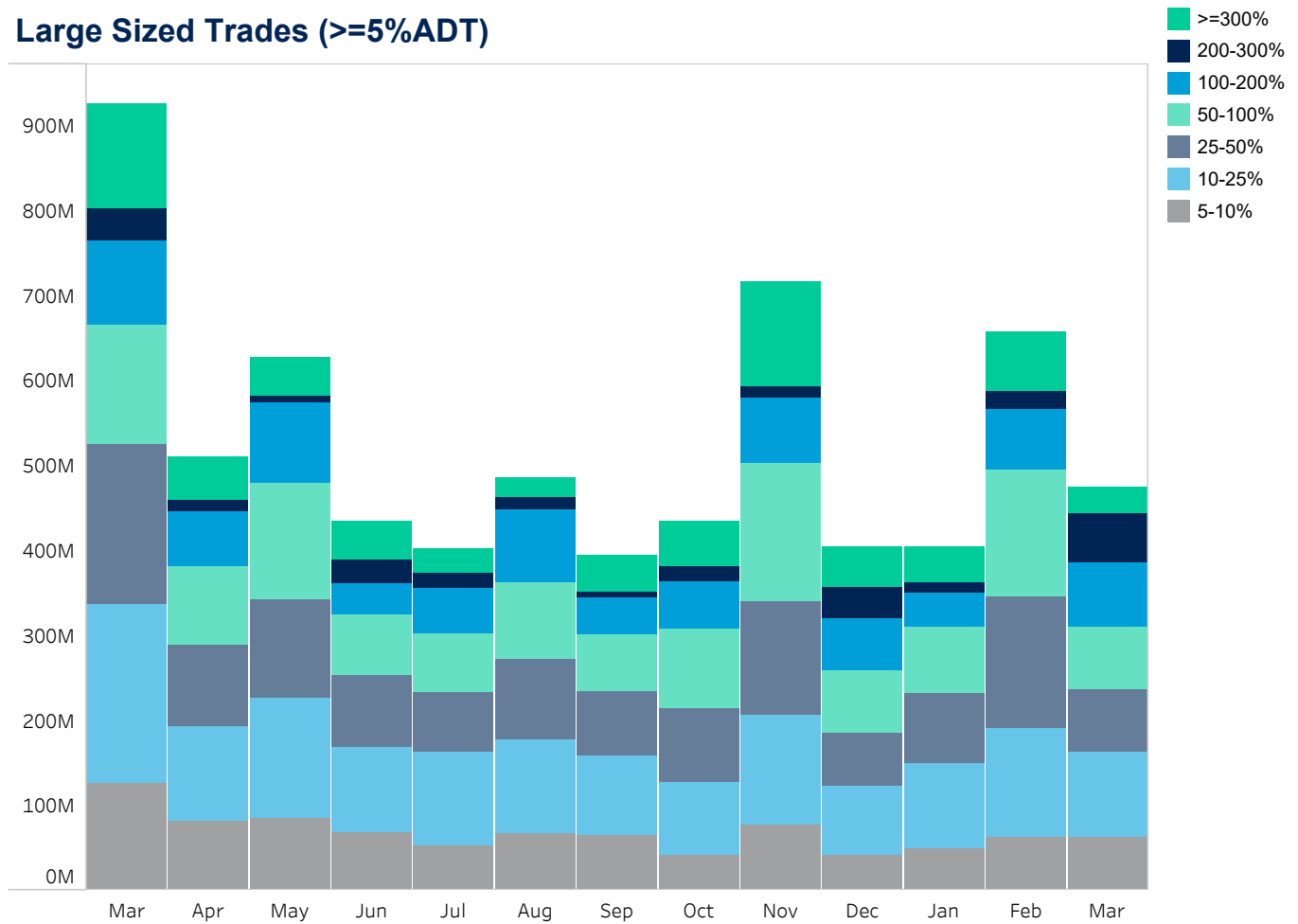
Source data: Virtu Financial

New Zealand

Average Daily Turnover (Notional USD)



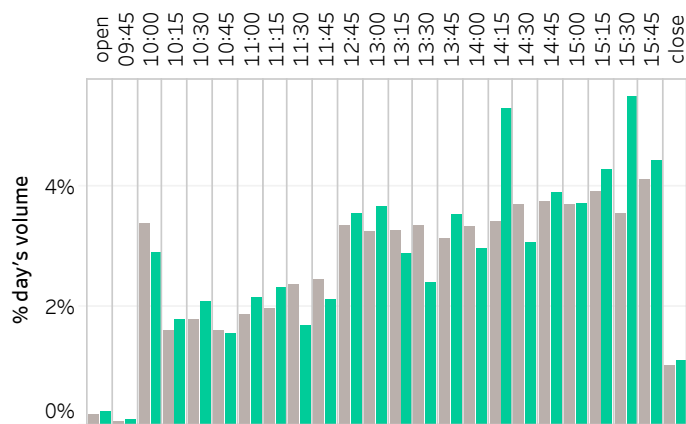
Large Sized Trades (>=5%ADT)



Source data: Virtu Financial

New Zealand

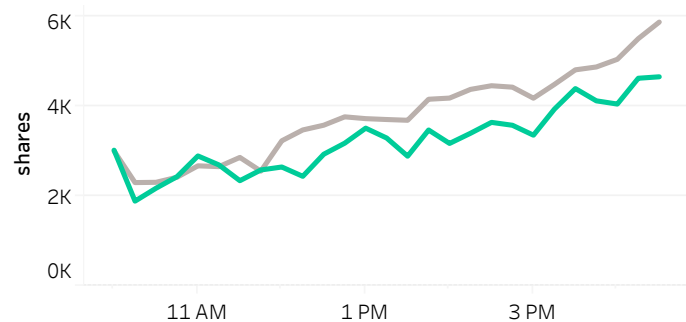
Volume Curve



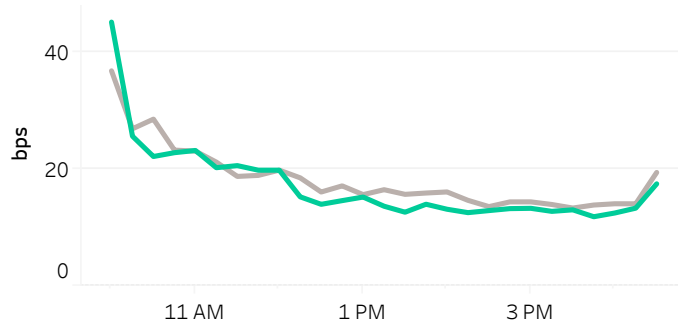
Intraday Spread (bps)



Intraday Quotesize (Shares)



Intraday Volatility (bps)



Rolling 12 Months Avg March 2023

Spread Bps

	2022			2023		
	Oct	Nov	Dec	Jan	Feb	Mar
FirstHalfHour	34.5	38.8	33.0	28.6	36.2	32.4
MidDay	17.2	17.4	14.4	13.0	14.2	13.5
LastHalfHour	20.3	19.7	19.9	17.6	19.1	17.5

One Minute Volatility Bps

FirstHalfHour	19.2	20.9	23.1	25.5	25.6	20.2
MidDay	12.9	15.1	13.8	17.7	17.3	14.7
LastHalfHour	18.7	23.1	19.7	21.5	22.0	21.1

Quotesize (shares)

FirstHalfHour	2,695	2,859	2,800	2,352	2,572	2,470
LastHalfHour	5,615	5,396	6,890	5,554	6,137	4,537
MidDay	3,955	3,593	3,663	2,964	3,634	3,092

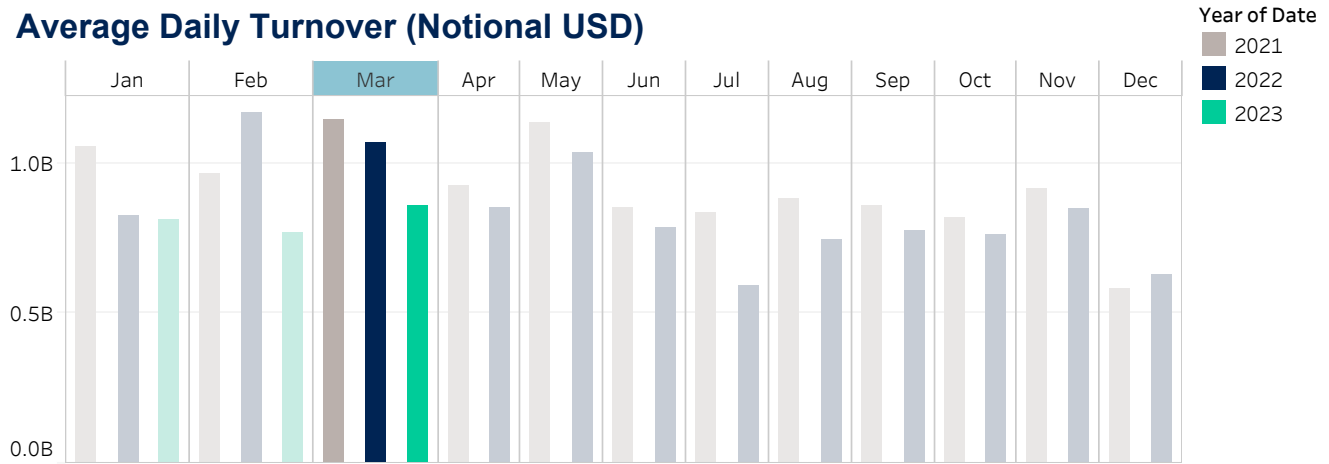
Median used for all metrics

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

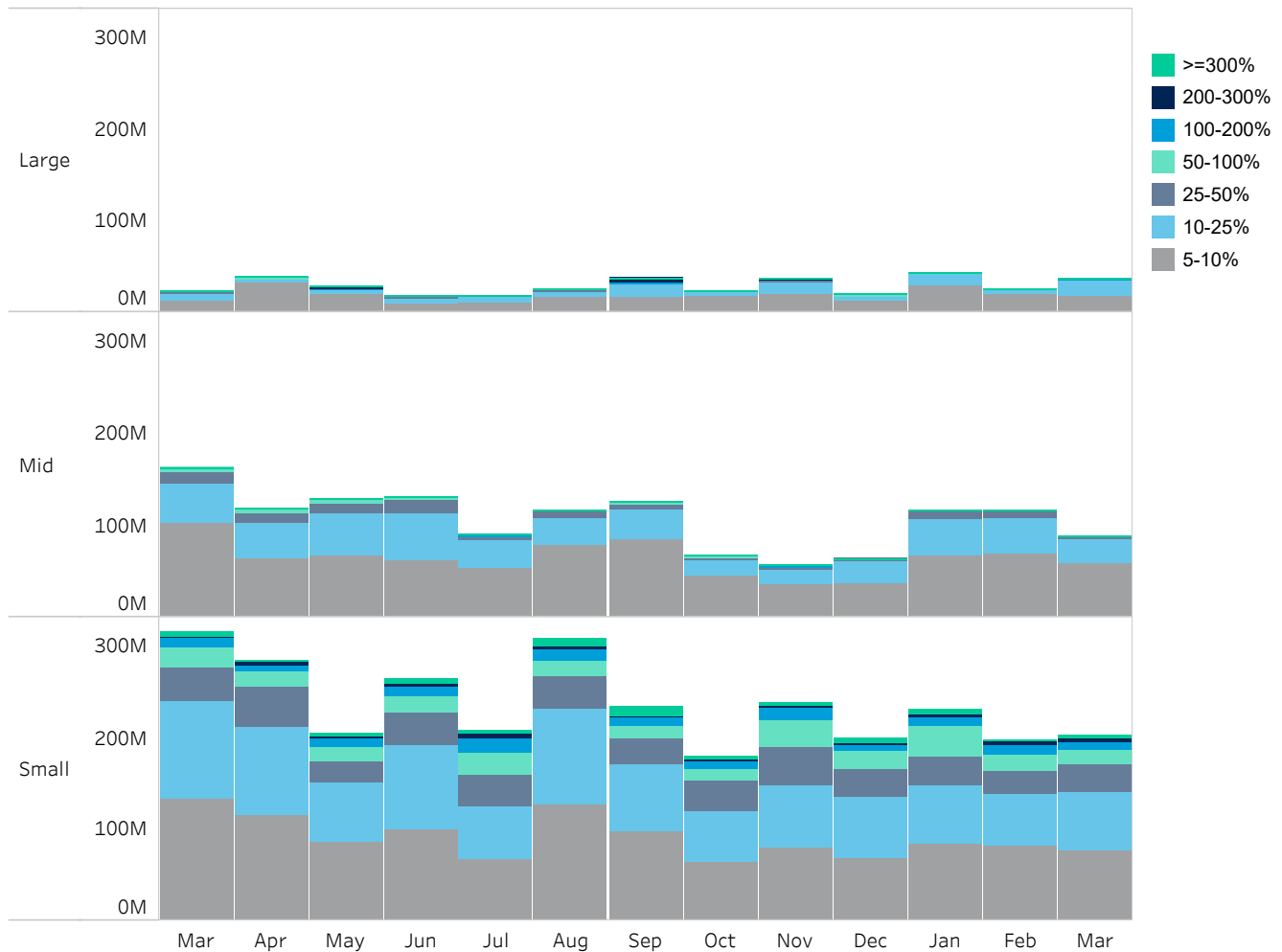
Source data: Virtu Financial

Singapore

Average Daily Turnover (Notional USD)



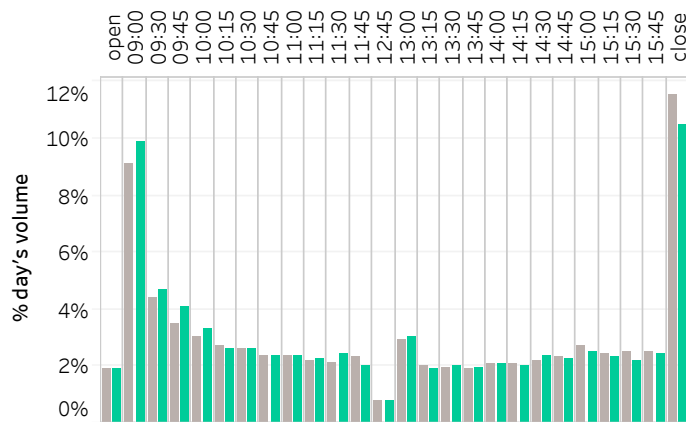
Large Sized Trades (>=5%ADT)



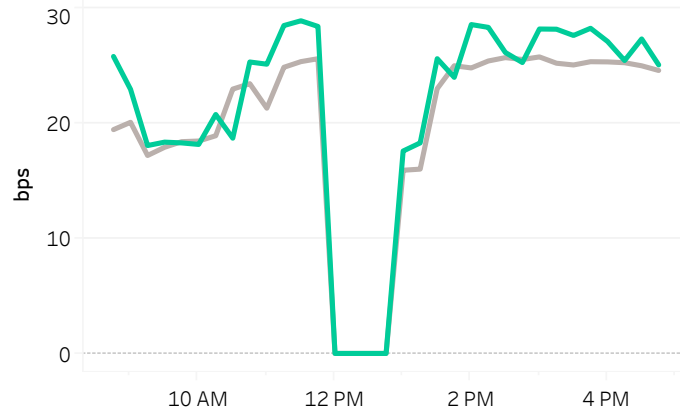
Source data: Virtu Financial

Singapore

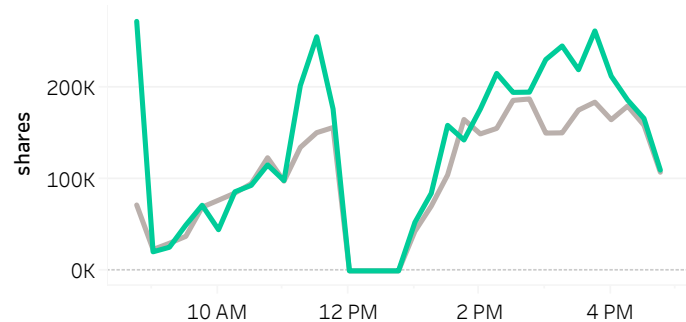
Volume Curve



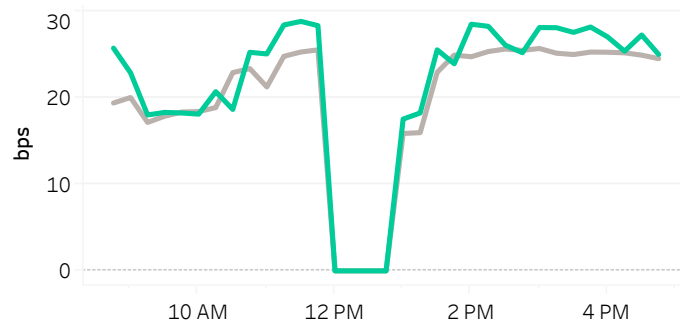
Intraday Spread (bps)



Intraday Quotesize (Shares)



Intraday Volatility (bps)



Rolling 12 Months Avg (Brown line) March 2023 (Green line)

Spread Bps

	2022			2023		
	Oct	Nov	Dec	Jan	Feb	Mar
FirstHalfHour	19.2	16.5	18.0	19.8	14.5	16.6
MidDay	22.8	22.3	24.2	24.3	25.0	27.2
LastHalfHour	27.8	20.3	24.4	24.2	25.1	25.3

One Minute Volatility Bps

FirstHalfHour	37.7	43.5	34.5	66.4	44.0	34.5
MidDay	25.2	25.4	28.4	26.6	25.3	24.6
LastHalfHour	24.8	25.5	27.6	28.5	24.7	27.1

Quotesize (shares)

FirstHalfHour	41,303	59,495	65,760	55,481	49,035	126,098
MidDay	89,492	106,664	123,584	140,704	159,315	169,961
LastHalfHour	121,825	94,969	128,454	109,921	138,744	141,752

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

ABOUT VIRTU

Virtu is a leading financial services firm that leverages cutting-edge technology to provide execution services and data, analytics and connectivity products to its clients and deliver liquidity to the global markets. Leveraging its global market making expertise and infrastructure, Virtu provides a robust product suite including offerings in execution, liquidity sourcing, analytics and broker-neutral, multi-dealer platforms in workflow technology. Virtu's product offerings allow clients to trade on hundreds of venues across 50+ countries and in multiple asset classes, including global equities, ETFs, foreign exchange, futures, fixed income and myriad other commodities. In addition, Virtu's integrated, multi-asset analytics platform provides a range of pre and post-trade services, data products and compliance tools that clients rely upon to invest, trade and manage risk across global markets.

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

APAC+852.2846.3553 | **CAN**+1.416.874.0800 | **EMEA**+44.20.7670.4066 | **US**+1.212.444.6250

info@virtu.com | www.virtu.com

© 2023 Virtu Financial, Inc. All rights reserved. Not to be reproduced or retransmitted without permission. These materials are for informational purposes and are not intended to be used to make trading or investment decisions, they are not intended as an offer to sell or the solicitation of an offer to buy any security or financial product, and are not intended as advice (investment, tax or legal). The information contained herein includes Virtu proprietary information and/or has been taken from sources we believe to be reliable, but we do not represent or warrant that such information is accurate or complete and it should not be relied upon as such.

Analytics products and services referenced herein may not be subject to oversight by regulatory authorities in one or more jurisdictions, including in Europe, where such products and services are offered by Virtu ITG Ventures Limited, registered in Ireland No. 295549 ("VIVL"). VIVL does not engage in regulated activity.

Securities products and services are offered by the following subsidiaries of Virtu Financial, Inc. In the U.S., Virtu Americas LLC, member FINRA and SIPC; in Canada, Virtu ITG Canada Corp., member Canadian Investor Protection Fund and Investment Industry Regulatory Organization of Canada; in Europe, Virtu ITG Europe Limited, registered in Ireland No. 283940 ("VIEL") (VIEL is authorized and regulated by the Central Bank of Ireland), and Virtu Financial Ireland Limited, registered in Ireland No. 471719 ("VFIL") (VFIL is authorized and regulated by the Central Bank of Ireland). The registered office of VIEL and VFIL is Whitaker Court, Whitaker Square, Sir John Rogerson's Quay, Dublin 2, Ireland; in Asia, Virtu ITG Hong Kong Limited (SFC License No. AHD810), Virtu ITG Singapore Pte Limited (CMS License No. 100138-1), and Virtu ITG Australia Limited (AFS License No. 219582).