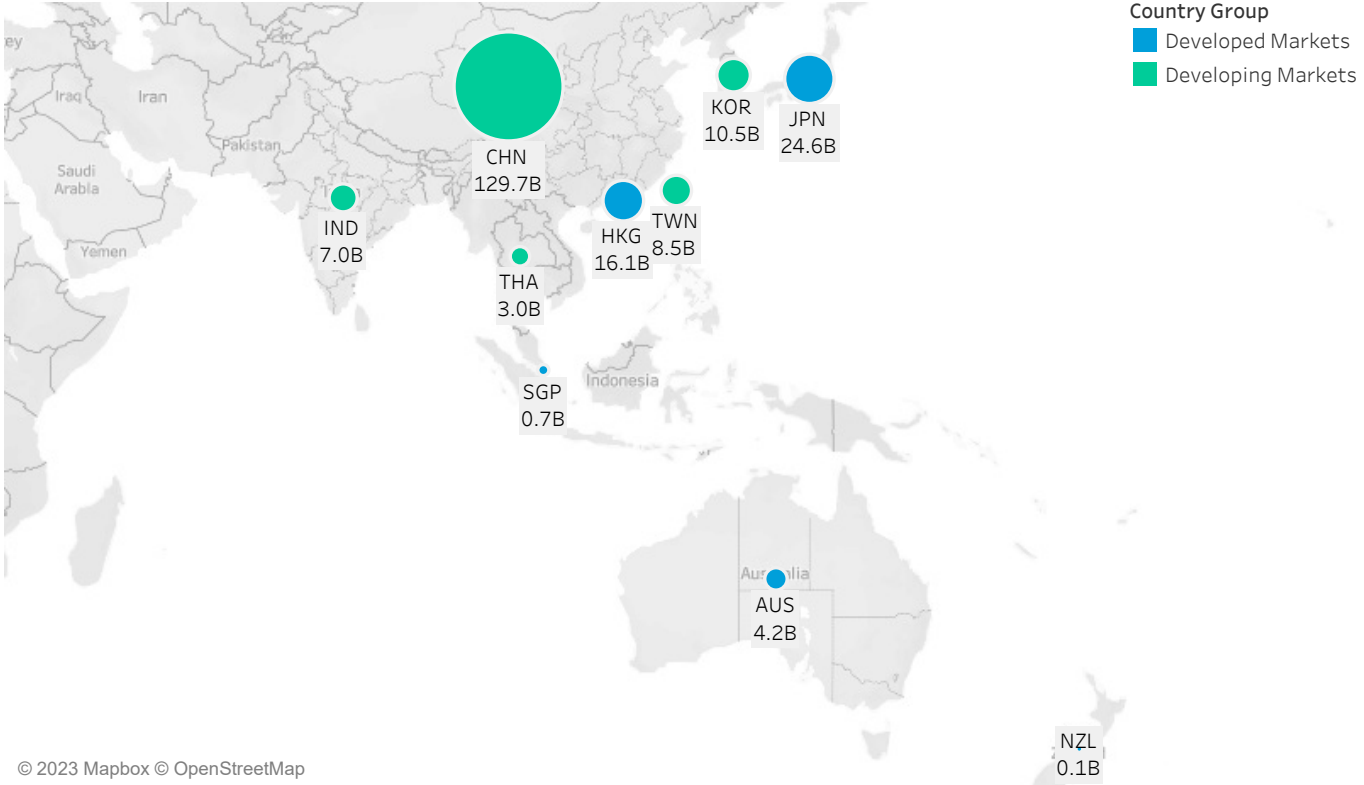


# December 2022 APAC Market Structure Monthly

## Average Daily Turnover (Notional USD)



© 2023 Mapbox © OpenStreetMap

## Country Breakdowns

Hong Kong

China

Japan

Australia

South Korea

Taiwan

India

Thailand

New Zealand

Singapore

# Dec 2022

## AP Market Structure Monthly

### MICROSTRUCTURE OBSERVATIONS

- Average daily value traded (ADT) declined across the APAC equities universe in December after notable increases in November, as most countries saw 10-20% decreases in ADT compared to November leading up to the holiday season. SGP led the ADT decrease at -26%, followed by AUS at -22% and KOR at -16%.
- Intraday spreads and volatility remained at similar levels in December 2022 compared to November 2022.

### AP MARKET STRUCTURE NEWS

#### **Hong Kong Exchanges and Clearing Limited to Expand Eligible Stocks for Stock Connect**

On 19 December 2022, Hong Kong Exchanges and Clearing Limited (HKEX) announced that it had reached an agreement with Shanghai Stock Exchange (SSE) and Shenzhen Stock Exchange (SZSE) to expand the scope of eligible stocks under Stock Connect. The scope will expand to include constituent stocks of broader indices with a market capitalization of HKD 5 billion or above, such as the Hang Seng Composite Small Cap Index (HSSI), or the SZSE Composite Index and SSE A Share Index that fulfil certain criteria. It is expected that the preparation work will take approximately three months to complete. The official launch date is yet to be announced.

[https://www.hkex.com.hk/News/News-Release/2022/2212192news?sc\\_lang=en](https://www.hkex.com.hk/News/News-Release/2022/2212192news?sc_lang=en)

#### **Korea Exchange Published Revision of Enforcement Rules of its Securities and Derivatives Market in Relation to Managing High-Speed Algorithmic Traders**

On 8 December 2022, Korea Exchange (KRX) published the revision of the enforcement rules of the securities and derivatives market business regulations as a follow-up to the notice announced on 25 October 2022. The revision includes relevant details on aspects including registering high-speed algorithm traders, members' responsibility to manage risks, improvements to call auction mechanisms, and improvements of the charges for excessive quotations in derivatives market. According to KRX, the enforcement rules will be enforced in line with the launching of the KRX's next generation system scheduled in January 2023 after collecting opinions from market participants in December 2022.

<https://global.krx.co.kr/contents/GLB/02/0203/0203000000/GLB0203000000.jsp#ab8758eced0475769e200e7e309baf77=1&view=20692>

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](mailto:info@virtu.com) | [www.virtu.com](http://www.virtu.com)



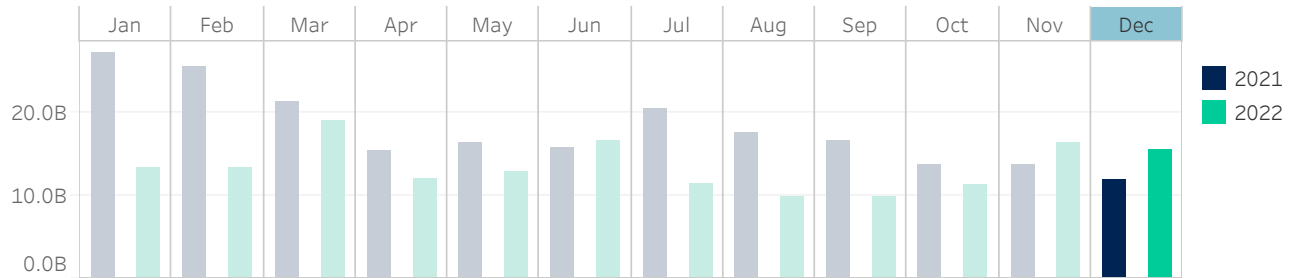
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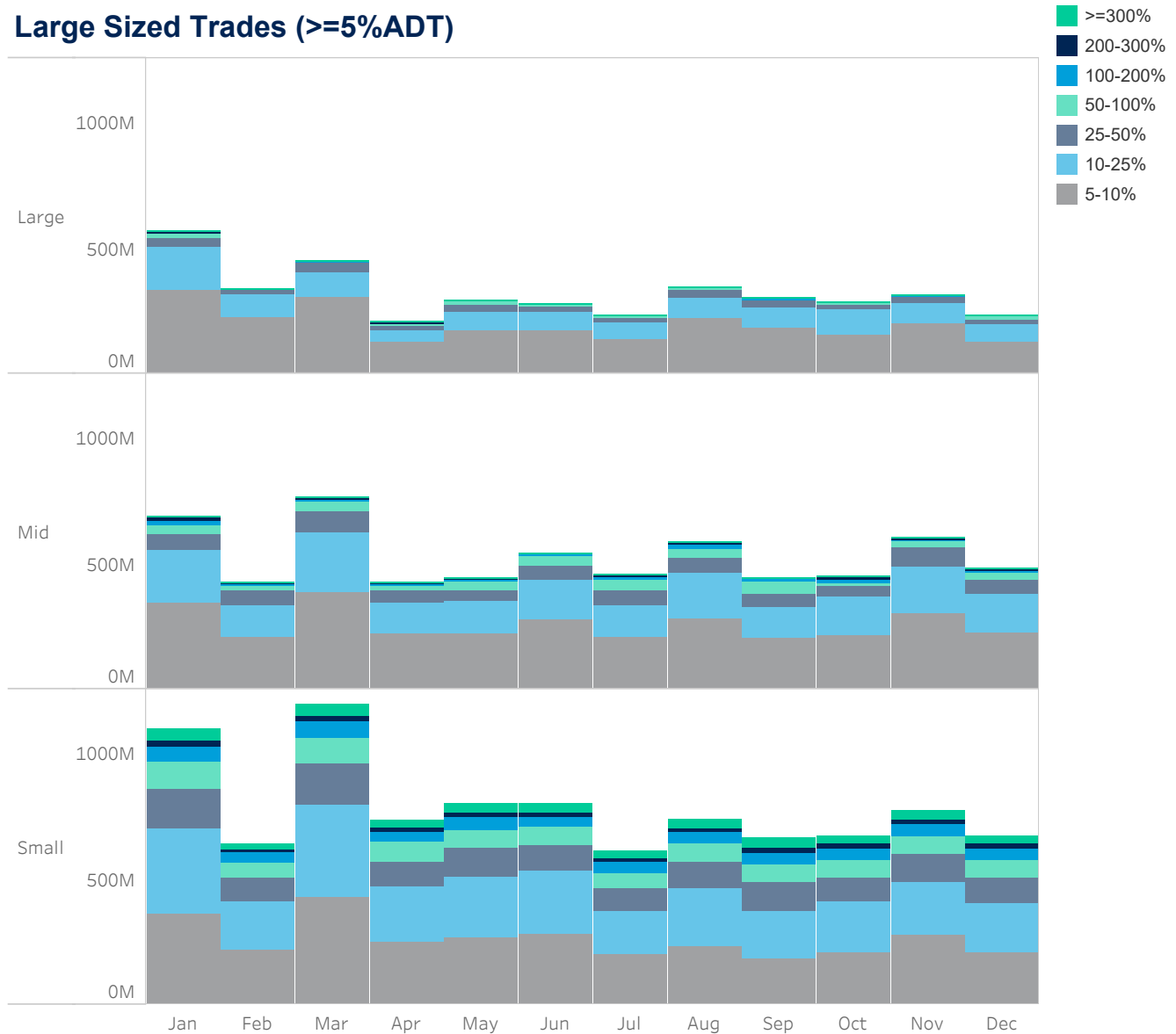
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# Hong Kong

## Average Daily Turnover (Notional USD)



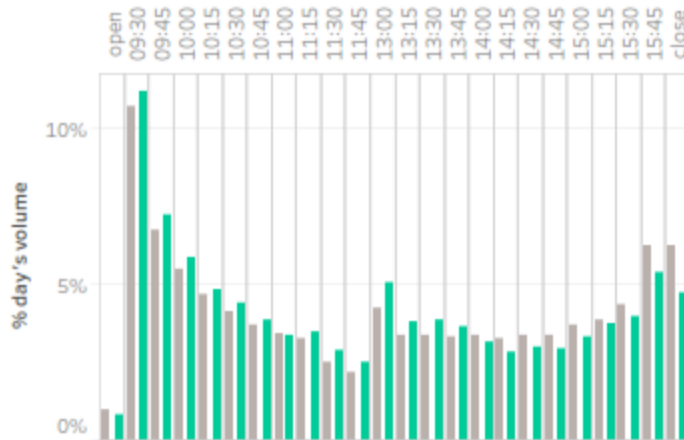
## Large Sized Trades (>=5%ADT)



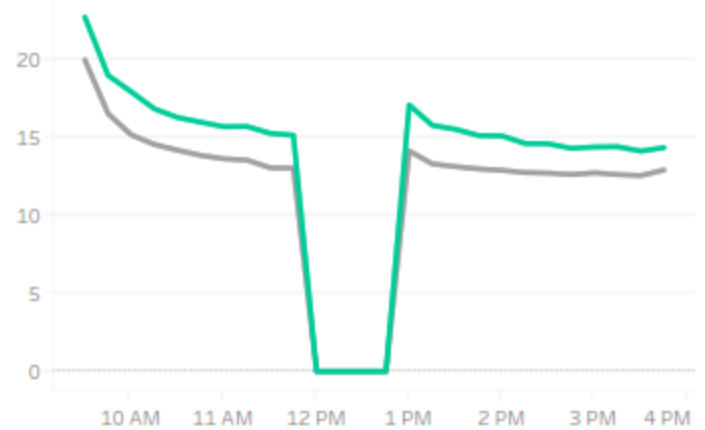
Source data: Virtu Financial

# Hong Kong

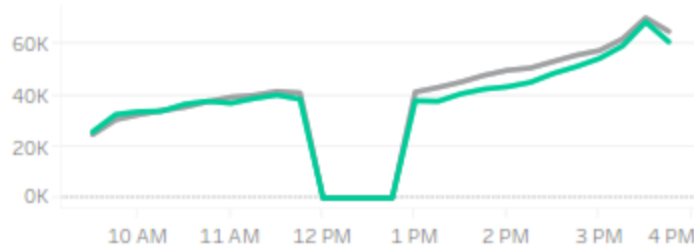
## Volume Curve



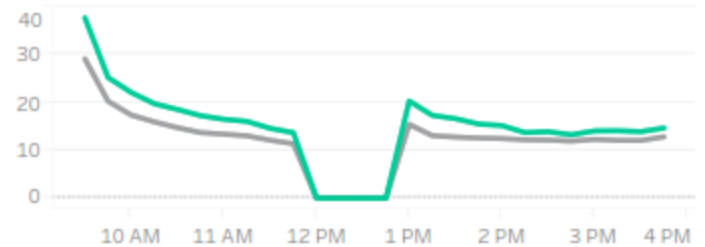
## Intraday Spread (bps)



## Intraday Quotesize (Shares)



## Intraday Volatility (bps)



Rolling 12 Months Avg December 2022

## Spread Bps

	22 Q2			22 Q3			22 Q4		
	Apr 22	May 22	Jun 22	Jul 22	Aug 22	Sep 22	Oct 22	Nov 22	Dec 22
firstHalfHour	17.6	17.3	17.2	17.1	16.5	18.0	18.7	20.4	19.7
midday	13.3	13.5	13.6	13.1	12.8	13.9	14.8	15.9	14.0
lastHalfHour	12.3	13.1	13.2	12.4	12.4	13.5	14.0	14.1	14.0

## One Minute Volatility Bps

firstHalfHour	17.7	18.0	19.0	16.8	16.5	13.7	18.8	21.1	18.1
midday	8.4	7.3	7.7	7.3	6.9	6.0	8.1	9.7	10.2
lastHalfHour	6.5	6.2	6.5	6.0	6.1	5.2	6.6	6.0	5.5

## Quotesize in Shares

firstHalfHour	28,977	27,325	28,776	26,961	27,632	28,423	28,826	30,757	29,076
midday	40,059	40,646	42,935	42,223	43,511	50,516	44,101	40,471	40,979
lastHalfHour	62,184	60,328	71,107	68,053	69,022	78,846	72,138	69,665	66,542

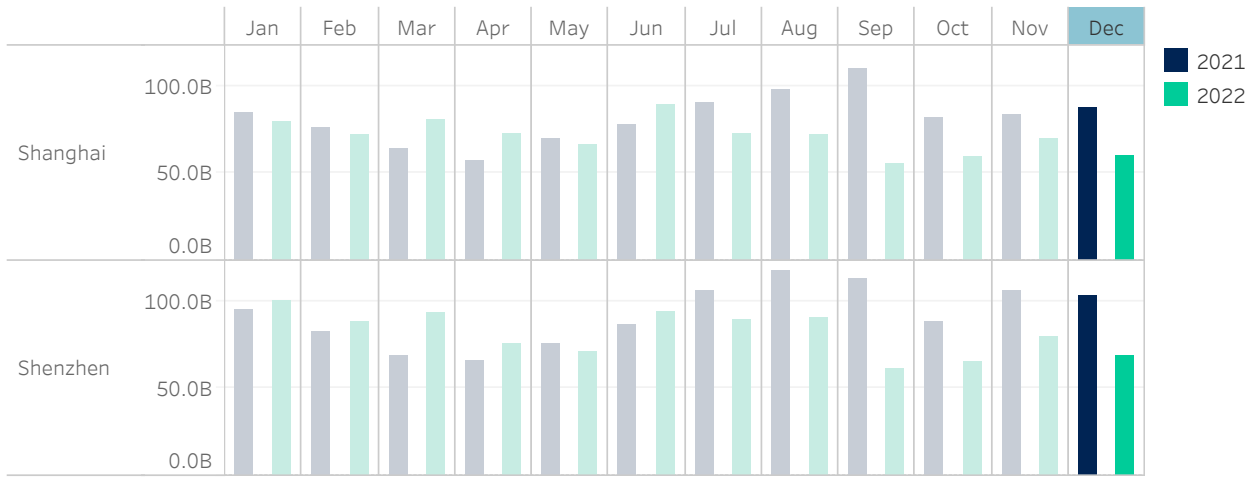
Median used for all metrics

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

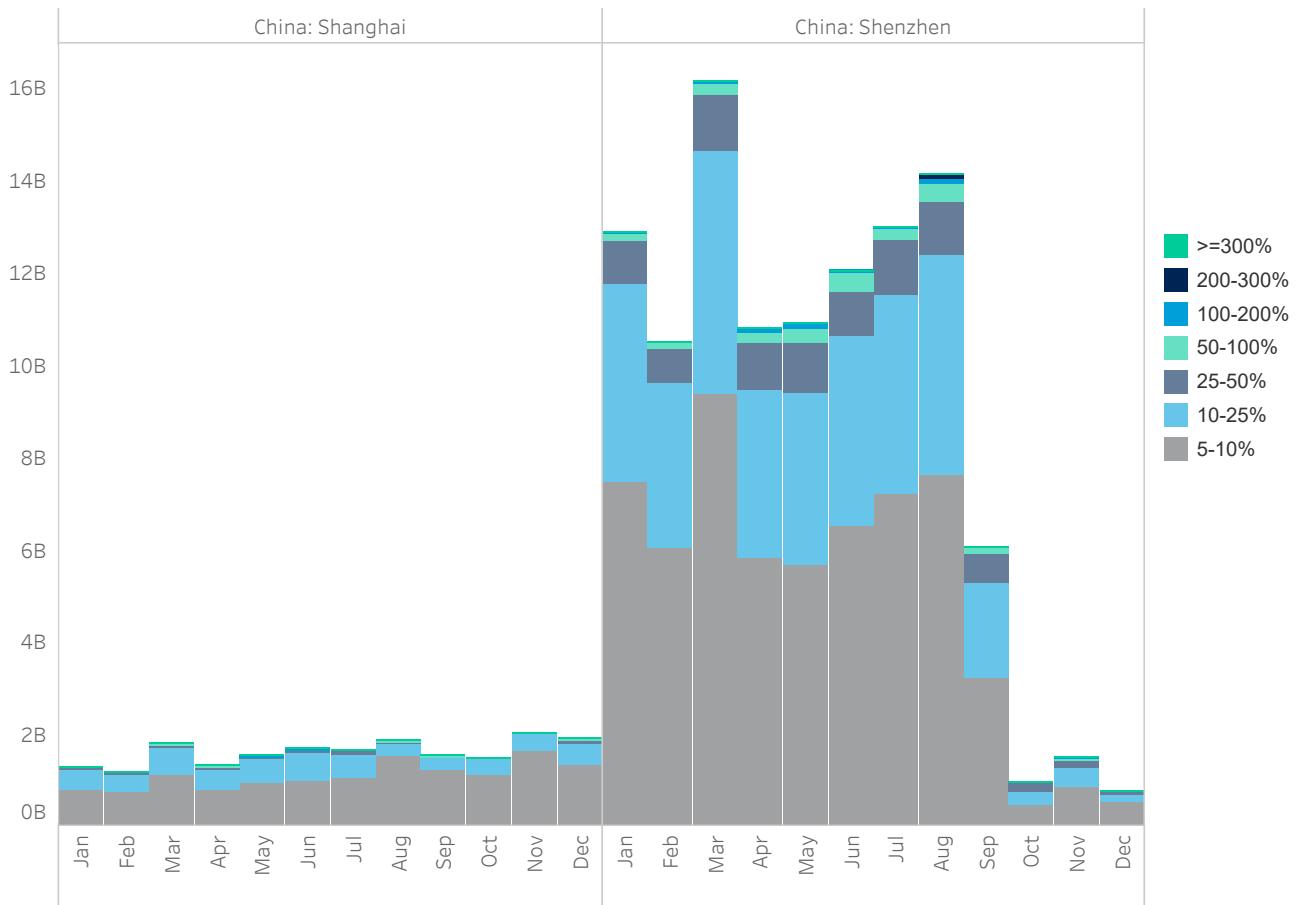
Source data: Virtu Financial

# China

## Average Daily Turnover (Notional USD)



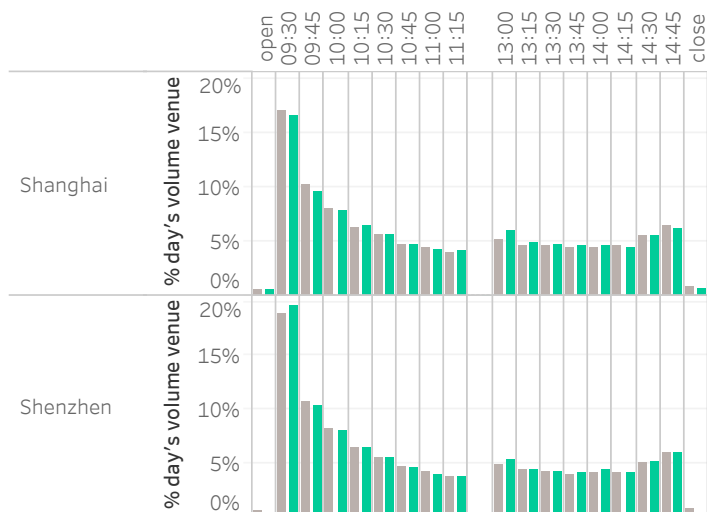
## Large Sized Trades (>=5%ADT)



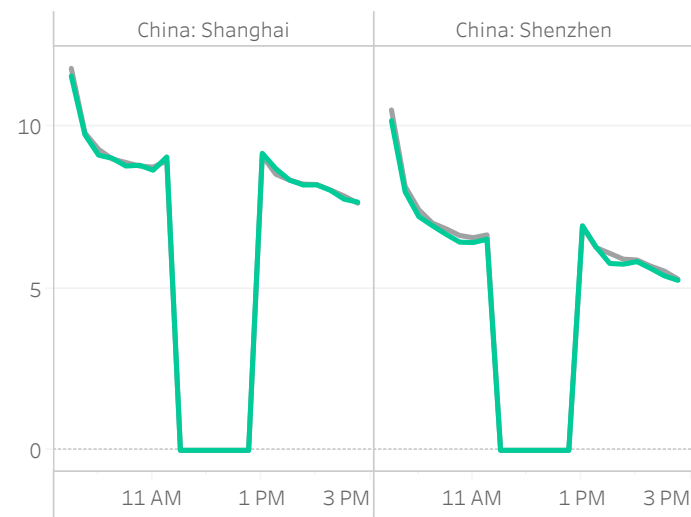
Source data: Virtu Financial

# China

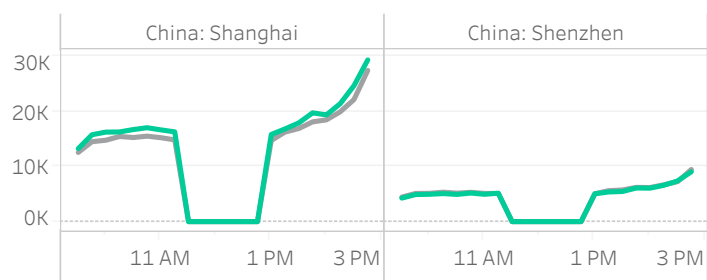
## Volume Curve



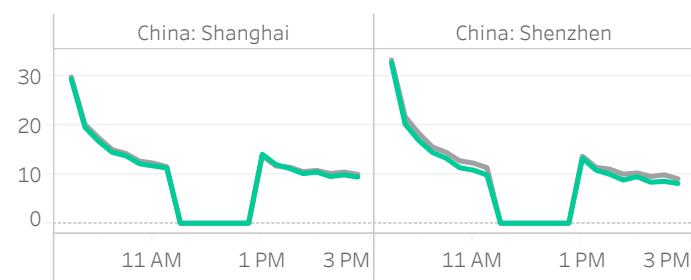
## Intraday Spread (bps)



## Intraday Quotesize (Shares)



## Intraday Volatility (bps)



■ Rolling 12 Months Avg ■ December 2022

## Spread Bps

	China: Shanghai									China: Shenzhen								
	22 Q2			22 Q3			22 Q4			22 Q2			22 Q3			22 Q4		
	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
firstHalfHour	11.1	10.9	10.3	9.9	9.6	9.1	9.5	9.2	9.1	9.9	9.0	8.5	8.6	8.1	7.7	8.3	7.7	7.3
midday	9.7	9.5	8.6	7.9	7.8	7.9	8.3	8.0	7.9	7.4	7.0	6.4	6.0	5.7	5.7	6.2	5.9	5.6
lastHalfHour	8.4	8.2	7.4	7.3	7.1	7.2	7.6	7.3	7.1	6.2	5.9	5.3	5.0	4.8	4.9	5.1	4.9	4.8

## One Minute Volatility Bps

firstHalfHour	23.8	19.6	20.1	17.2	16.4	17.8	19.5	18.7	17.0	27.8	23.3	23.4	23.2	22.0	21.8	25.6	22.2	19.4
midday	11.6	9.1	10.1	7.1	6.3	6.8	7.9	7.8	6.8	13.1	10.6	11.3	9.8	8.7	8.5	10.4	9.0	7.9
lastHalfHour	9.3	6.6	7.3	6.0	5.0	6.0	6.3	5.7	5.7	9.8	7.4	8.0	7.5	6.5	7.0	7.5	6.4	6.2

## Quotesize in Shares

firstHalfHour	11K	14K	14K	14K	14K	11K	12K	14K	11K	4K	5K	4K	4K	4K	4K	4K	4K	4K
midday	12K	15K	16K	17K	18K	14K	15K	16K	14K	5K	6K	5K	5K	5K	5K	5K	5K	5K
lastHalfHour	19K	24K	25K	25K	28K	21K	23K	26K	20K	7K	8K	7K	8K	7K	7K	7K	8K	7K

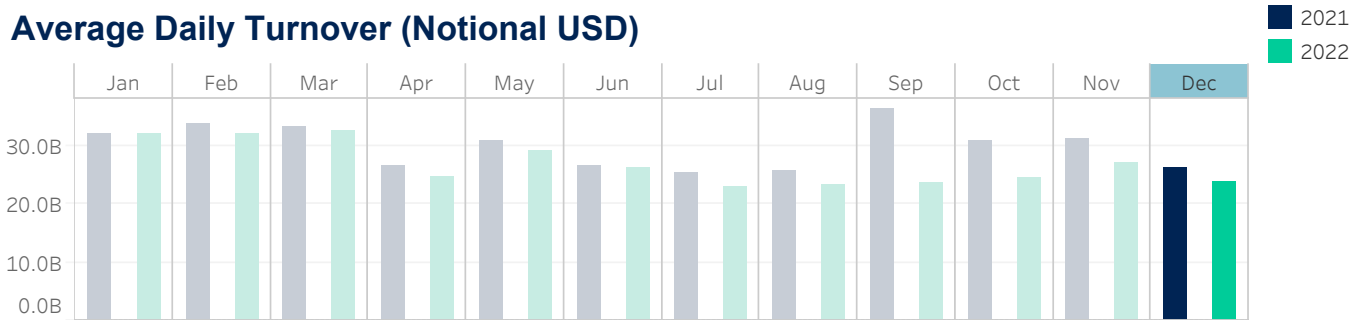
Median used for all metrics

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

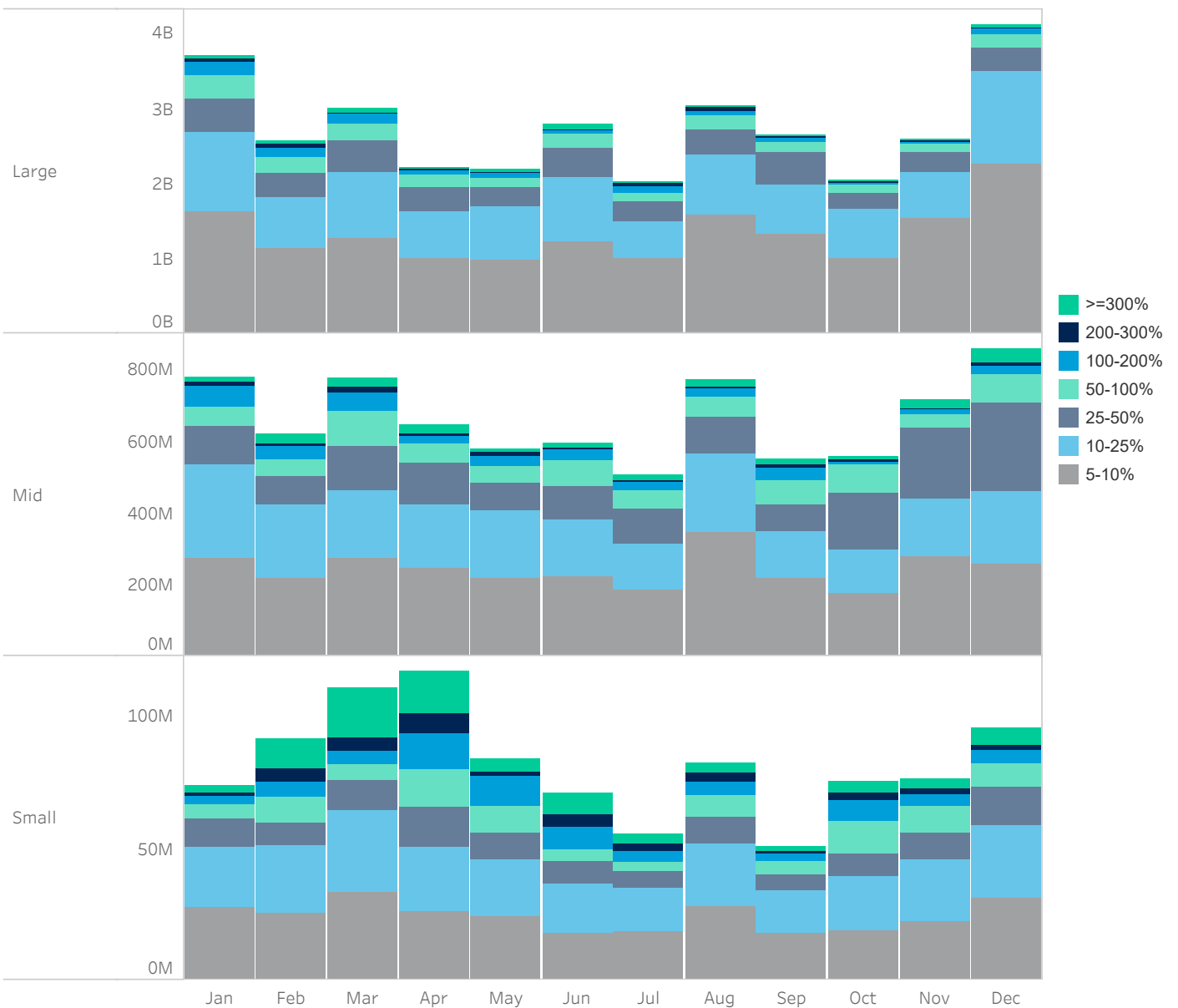
Source data: Virtu Financial

# Japan

## Average Daily Turnover (Notional USD)



## Large Sized Trades (>=5%ADT)

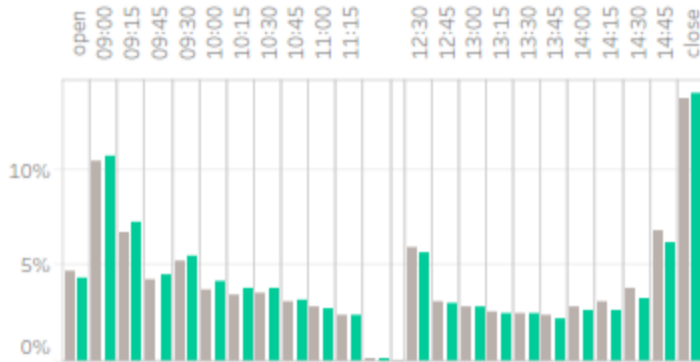


Source data: Virtu Financial

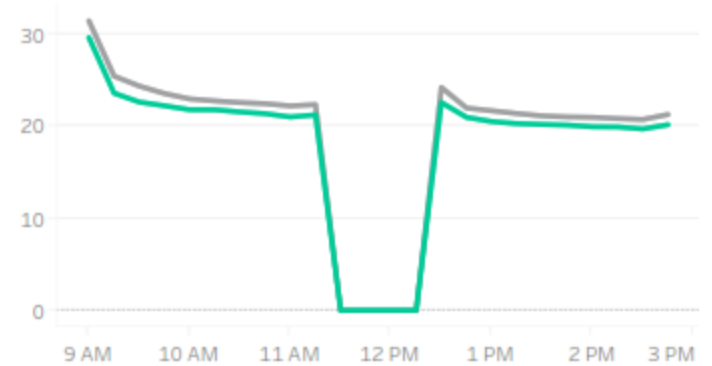


# Japan

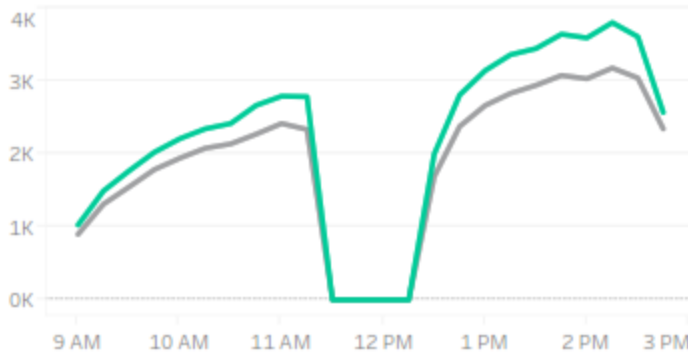
## Volume Curve



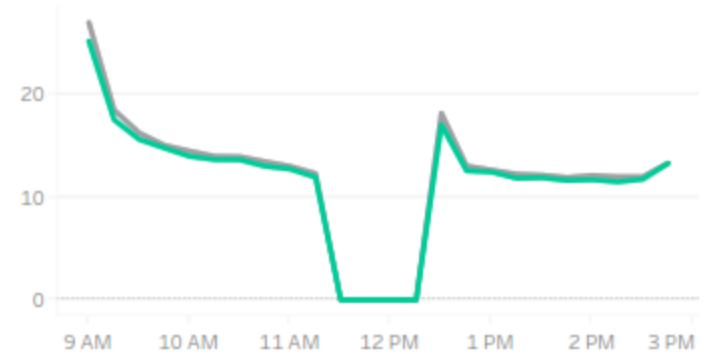
## Intraday Spread (bps)



## Intraday Quotesize (Shares)



## Intraday Volatility (bps)



Rolling 12 Months Avg (grey) December 2022 (green)

## Spread Bps

	22 Q2			22 Q3			22 Q4		
	Apr 22	May 22	Jun 22	Jul 22	Aug 22	Sep 22	Oct 22	Nov 22	Dec 22
firstHalfHour	27.0	27.4	26.8	26.6	24.5	25.2	26.1	25.3	25.2
midday	22.2	22.1	21.9	22.1	20.9	21.1	21.7	21.4	21.1
lastHalfHour	20.7	20.5	20.9	20.7	20.0	20.0	20.6	19.8	20.0

## One Minute Volatility Bps

firstHalfHour	15.3	16.7	15.4	13.3	12.1	12.4	13.6	13.0	13.6
midday	7.0	7.0	6.6	6.3	5.0	6.0	6.5	5.8	6.5
lastHalfHour	6.3	6.2	6.0	6.0	2.3	6.8	7.1	13.2	7.1

## Quotesize in Shares

firstHalfHour	1,149	1,078	1,114	1,251	1,279	1,377	1,276	1,274	1,279
midday	2,350	2,304	2,398	2,557	2,800	2,865	2,693	2,823	2,800
lastHalfHour	2,831	2,685	2,613	2,858	3,219	3,196	3,086	3,116	3,219

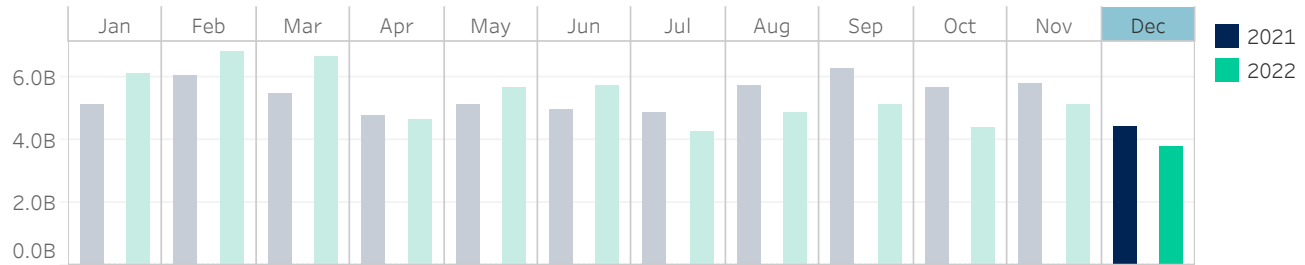
Median used for all metrics

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

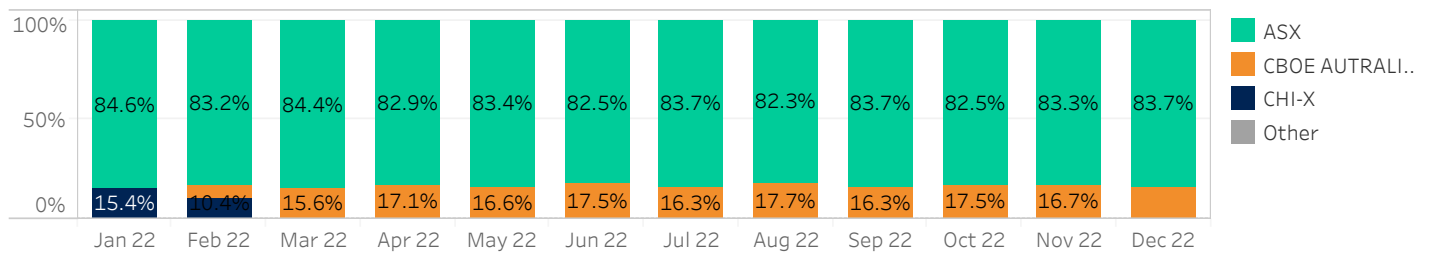
Source data: Virtu Financial

# Australia

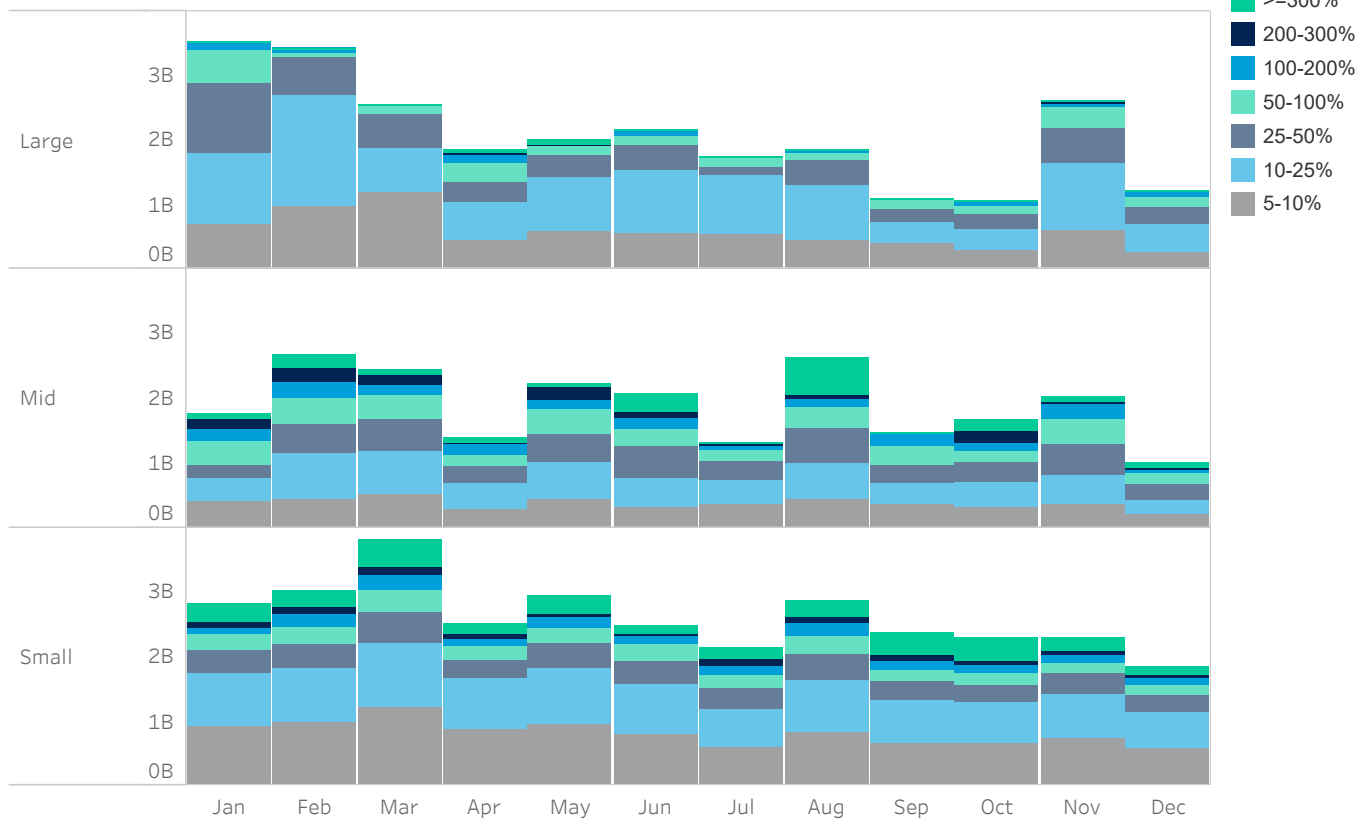
## Average Daily Turnover (Notional USD)



## Venue Market Share (Notional USD)



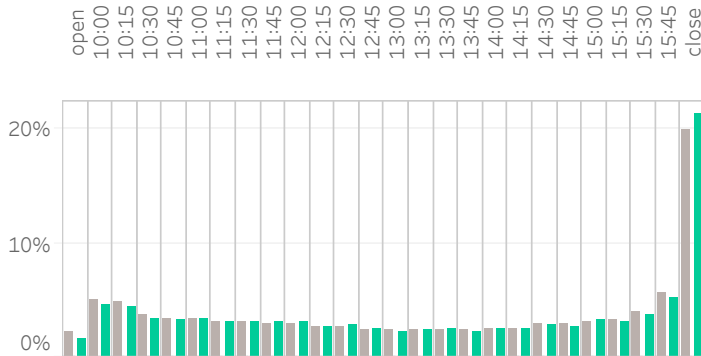
## Large Sized Trades (>=5%ADT)



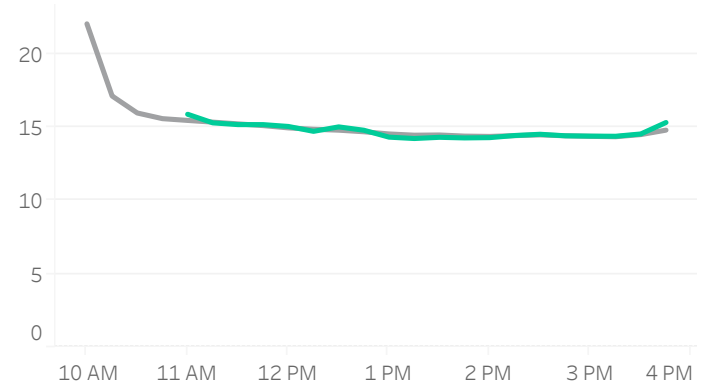
Source data: Virtu Financial

# Australia

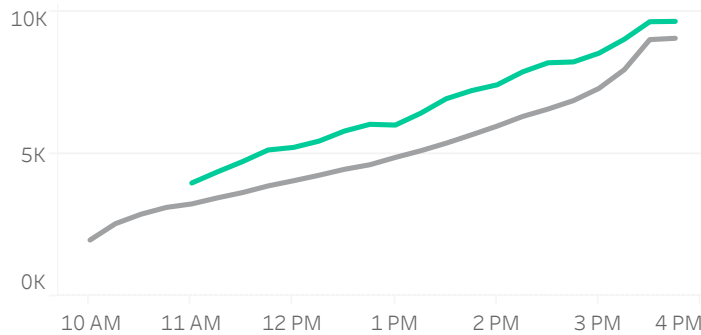
## Volume Curve



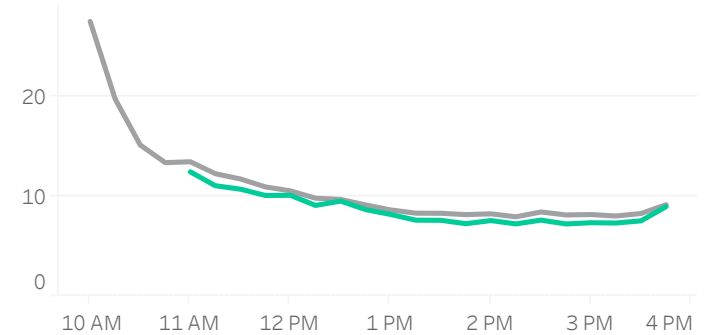
## Intraday Spread (bps)



## Intraday Quotesize (Shares)



## Intraday Volatility (bps)



■ Rolling 12 Months Avg ■ December 2022

## Spread Bps

	22 Q2			22 Q3			22 Q4		
	Apr 22	May 22	Jun 22	Jul 22	Aug 22	Sep 22	Oct 22	Nov 22	Dec 22
firstHalfHour	18.3	18.9	20.4	20.6	19.5	18.1	17.9	16.6	16.2
midday	14.5	14.5	16.1	15.8	14.8	20.2	19.4	19.0	16.2
lastHalfHour	14.3	14.6	16.2	15.8	14.9	20.4	20.7	19.7	17.3

## One Minute Volatility Bps

firstHalfHour	15.9	19.3	21.3	18.3	18.2	11.5	10.2	9.5	9.0
midday	4.2	4.7	5.3	5.0	4.6	3.3	3.5	2.9	2.9
lastHalfHour	3.2	3.6	4.1	4.1	4.1	3.0	1.9	2.3	2.2

## Quotesize in Shares

firstHalfHour	2,371	2,383	2,311	2,361	2,411	15,354	10,560	10,489	9,171
midday	5,097	5,077	5,460	5,271	5,523	55,188	47,959	47,236	39,891
lastHalfHour	9,297	9,791	9,397	9,527	9,576	72,681	65,583	62,790	56,653

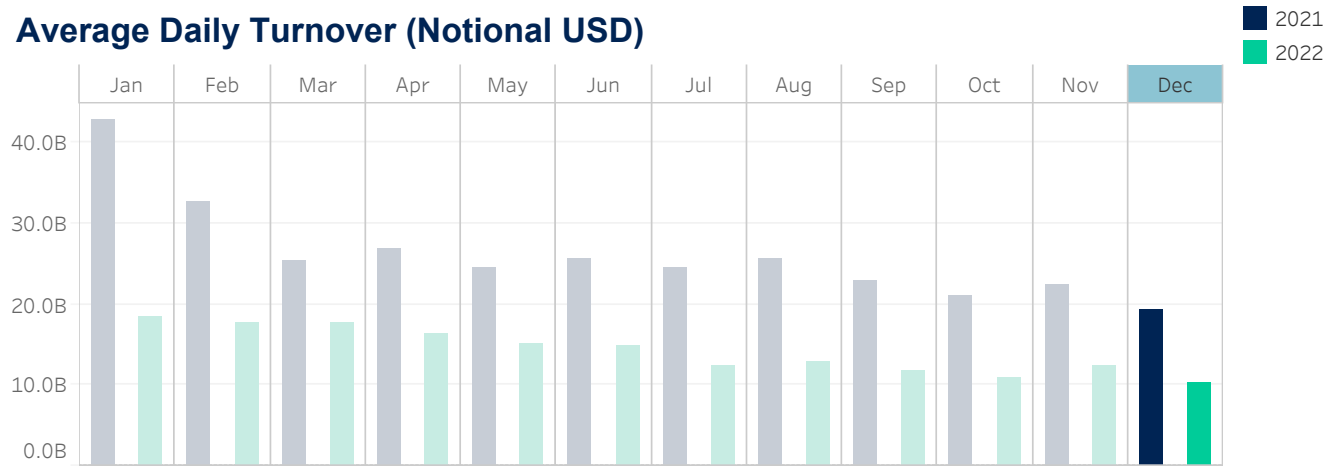
Median used for all metrics

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

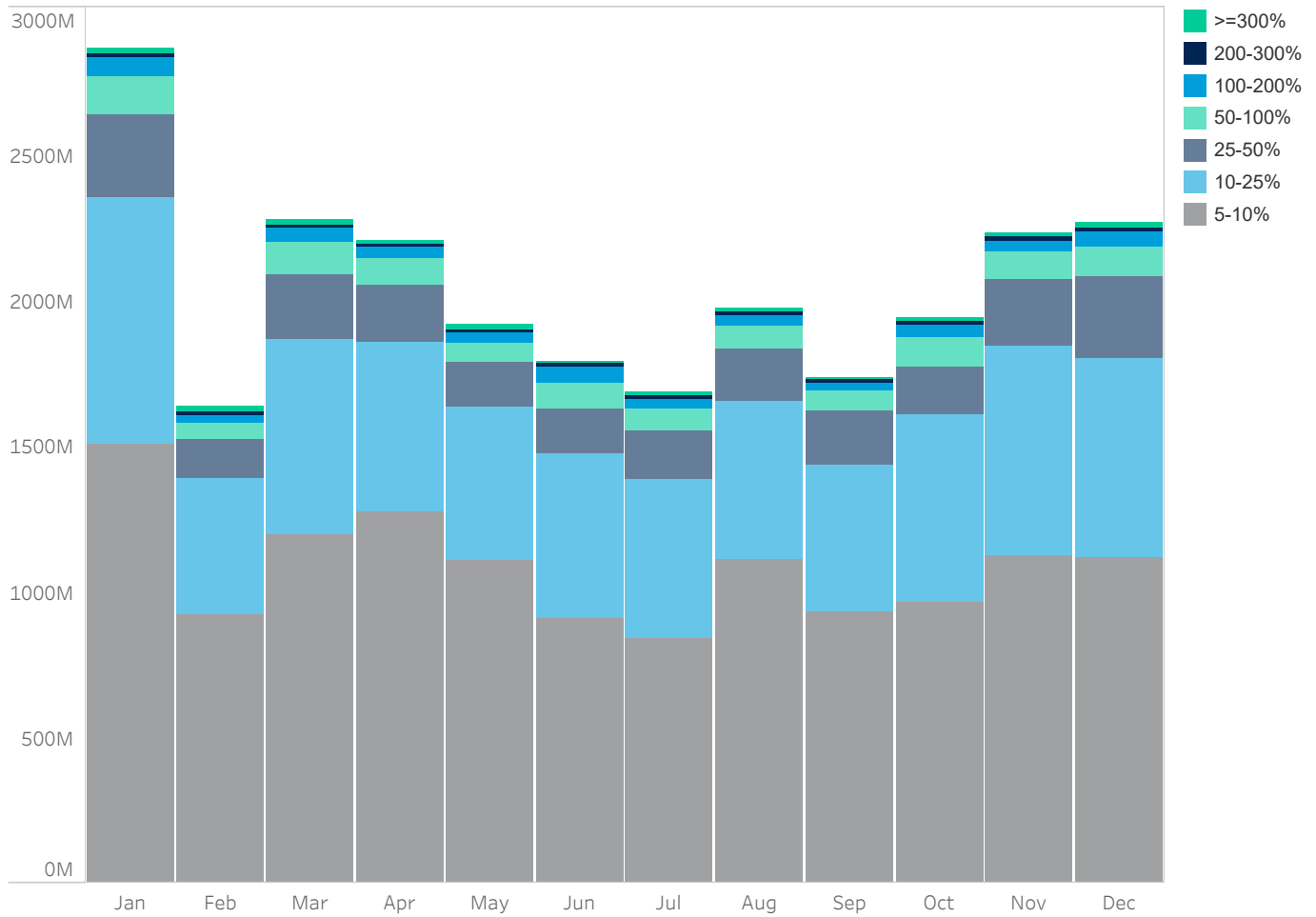
Source data: Virtu Financial

# South Korea

## Average Daily Turnover (Notional USD)



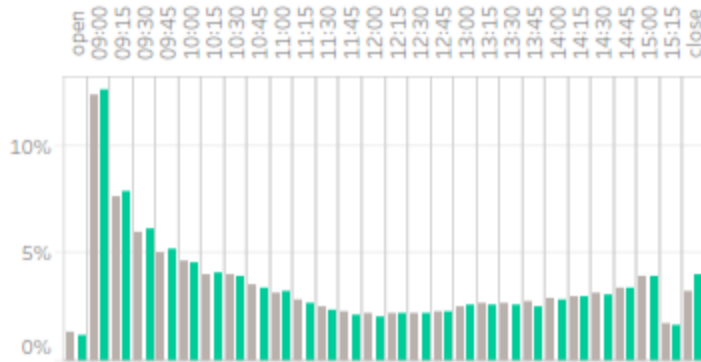
## Large Sized Trades (>=5%ADT)



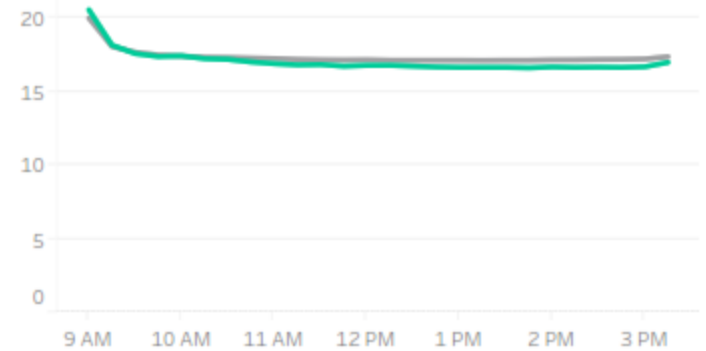
Source data: Virtu Financial

# South Korea

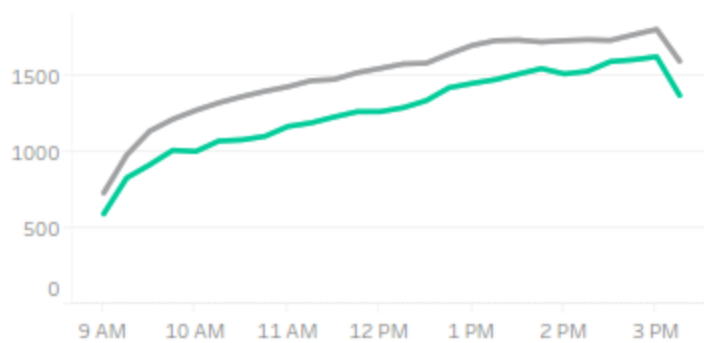
## Volume Curve



## Intraday Spread (bps)



## Intraday Quotesize (Shares)



## Intraday Volatility (bps)



■ Rolling 12 Months Avg ■ December 2022

## Spread Bps

	22 Q2			22 Q3			22 Q4		
	Apr 22	May 22	Jun 22	Jul 22	Aug 22	Sep 22	Oct 22	Nov 22	Dec 22
firstHalfHour	17.5	17.6	18.5	18.8	18.7	18.5	18.7	18.0	17.7
midday	16.6	16.9	17.2	17.1	17.0	17.5	17.4	16.7	17.0
lastHalfHour	16.7	16.9	17.3	17.2	17.0	17.6	17.4	16.6	17.0

## One Minute Volatility Bps

midday	10.2	10.8	11.6	11.2	50.1	13.6	12.3	12.4	11.7
firstHalfHour	13.1	14.4	18.0	17.1	74.5	25.5	27.8	27.6	22.7
lastHalfHour	23.1	25.3	13.8	12.7	31.5	11.8	13.6	12.1	11.4

## Quotesize in Shares

firstHalfHour	945	898	743	731	726	659	707	776	
midday	1,603	1,653	1,351	1,235	1,697	1,340	1,222	1,281	1,410
lastHalfHour	1,900	1,950	1,495	1,375	1,942	1,459	1,501	1,529	1,580

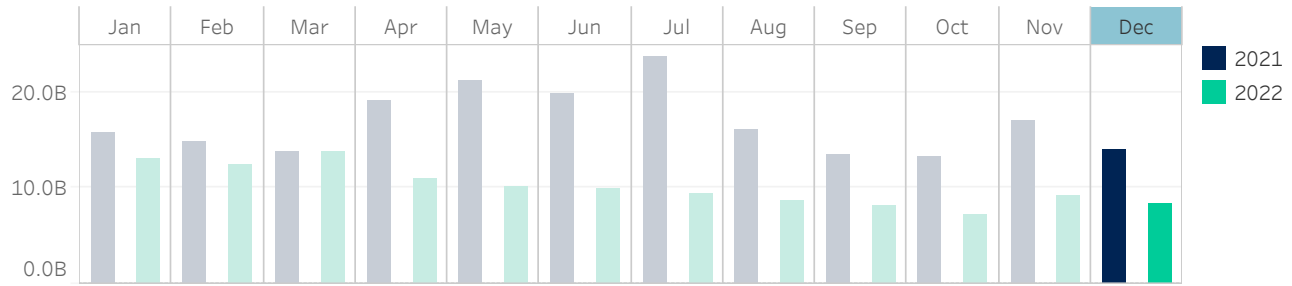
Median used for all metrics

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

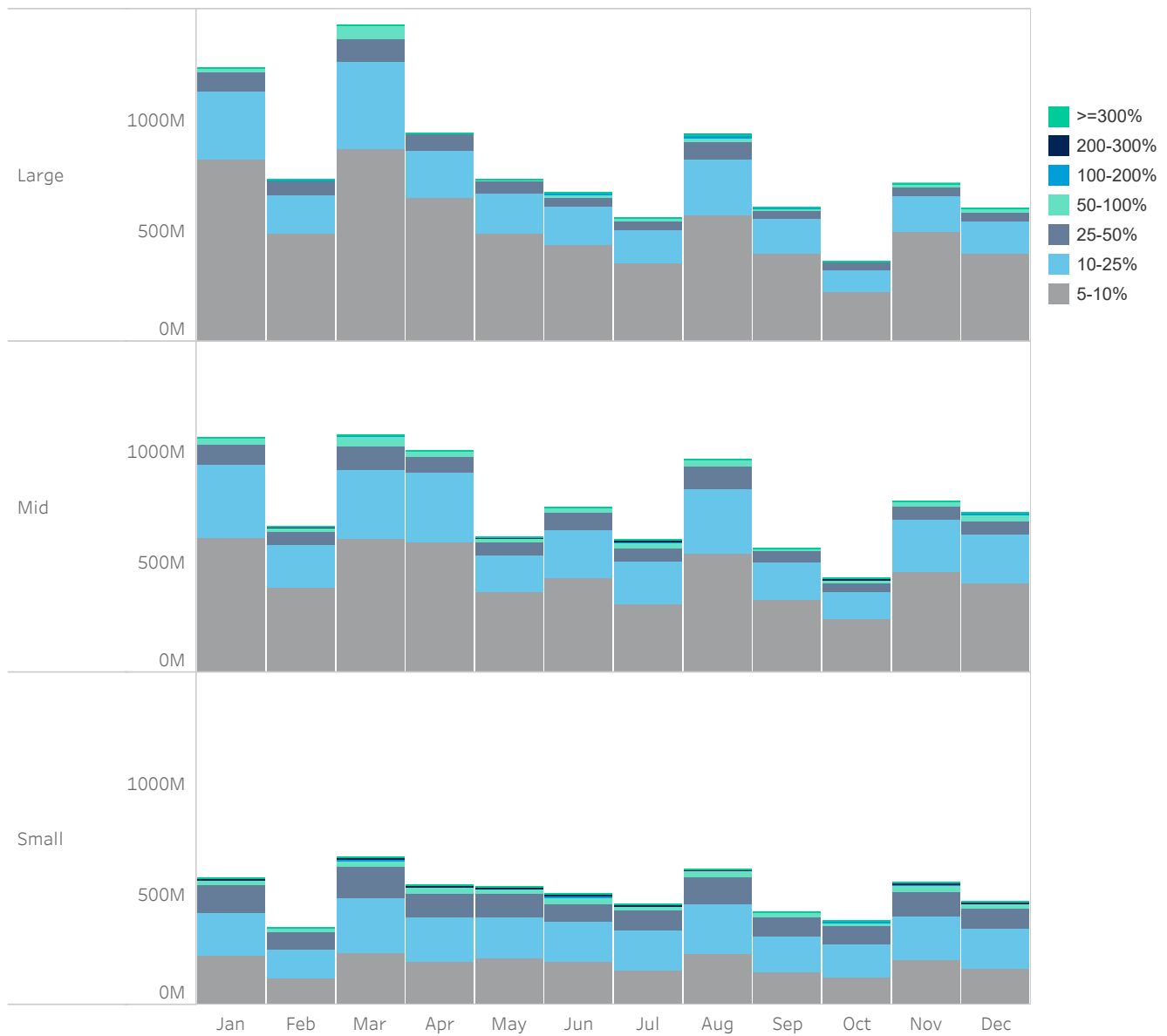
Source data: Virtu Financial

# Taiwan

## Average Daily Turnover (Notional USD)



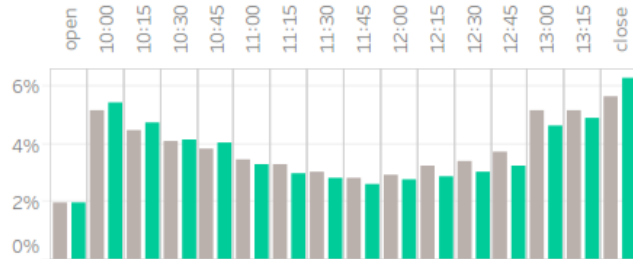
## Large Sized Trades (>=5%ADT)



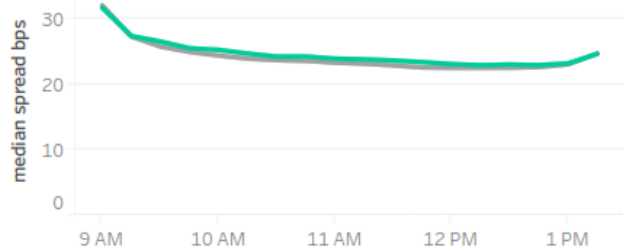
Source data: Virtu Financial

# Taiwan

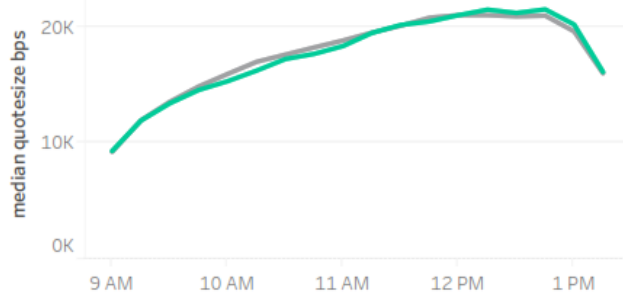
## Volume Curve



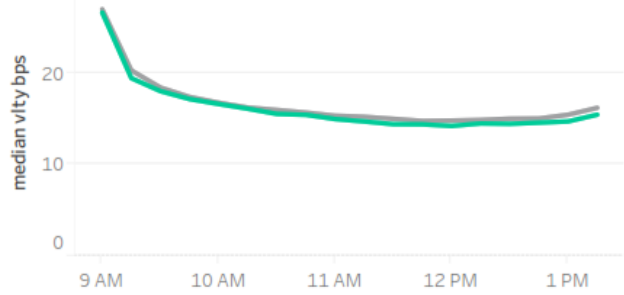
## Intraday Spread (bps)



## Intraday Quotesize (Shares)



## Intraday Volatility (bps)



■ Rolling 12 Months Avg ■ December 2022

## Spread Bps

	22 Q2			22 Q3			22 Q4		
	Apr 22	May 22	Jun 22	Jul 22	Aug 22	Sep 22	Oct 22	Nov 22	Dec 22
firstHalfHour	26.8	27.3	28.1	29.6	27.8	27.8	30.4	26.8	26.6
midday	22.4	22.9	23.4	24.5	23.0	32.3	36.2	30.2	29.2
lastHalfHour	23.0	24.0	24.8	25.5	23.2	31.7	35.5	30.0	29.4

## One Minute Volatility Bps

firstHalfHour	13.2	13.1	14.5	16.9	14.3	15.2	17.3	14.2	14.3
midday	6.8	6.8	7.6	8.6	7.0	7.4	8.3	7.0	7.0
lastHalfHour	8.1	8.7	9.9	8.9	8.9	8.5	9.9	8.6	8.9

## Quotesize in Shares

firstHalfHour	11,310	10,719	10,126	9,514	10,698	9,385	8,733	10,983	11,218
midday	20,329	18,947	17,181	14,545	18,826	9,907	8,748	11,547	12,104
lastHalfHour	18,389	16,685	14,454	14,115	18,926	9,781	10,242	12,089	12,808

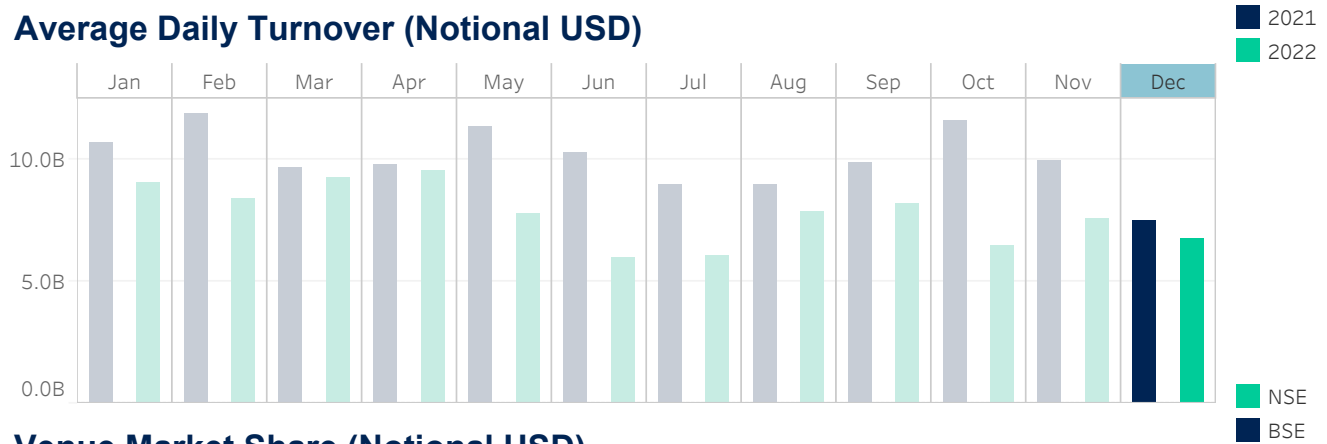
Median used for all metrics

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

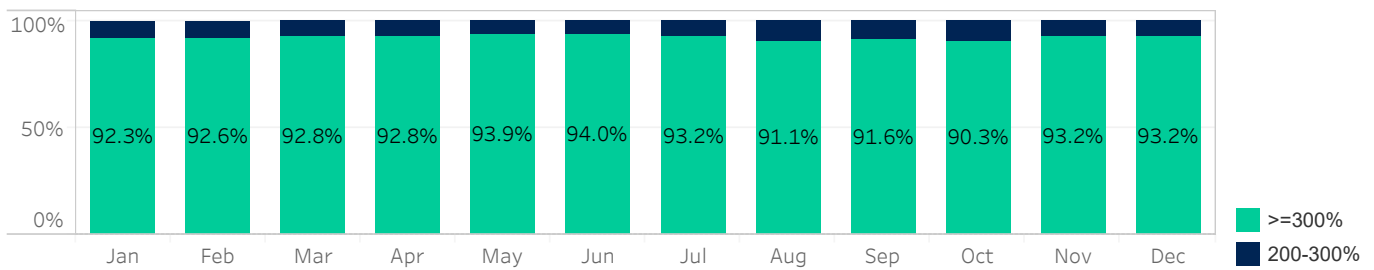
Source data: Virtu Financial

# India

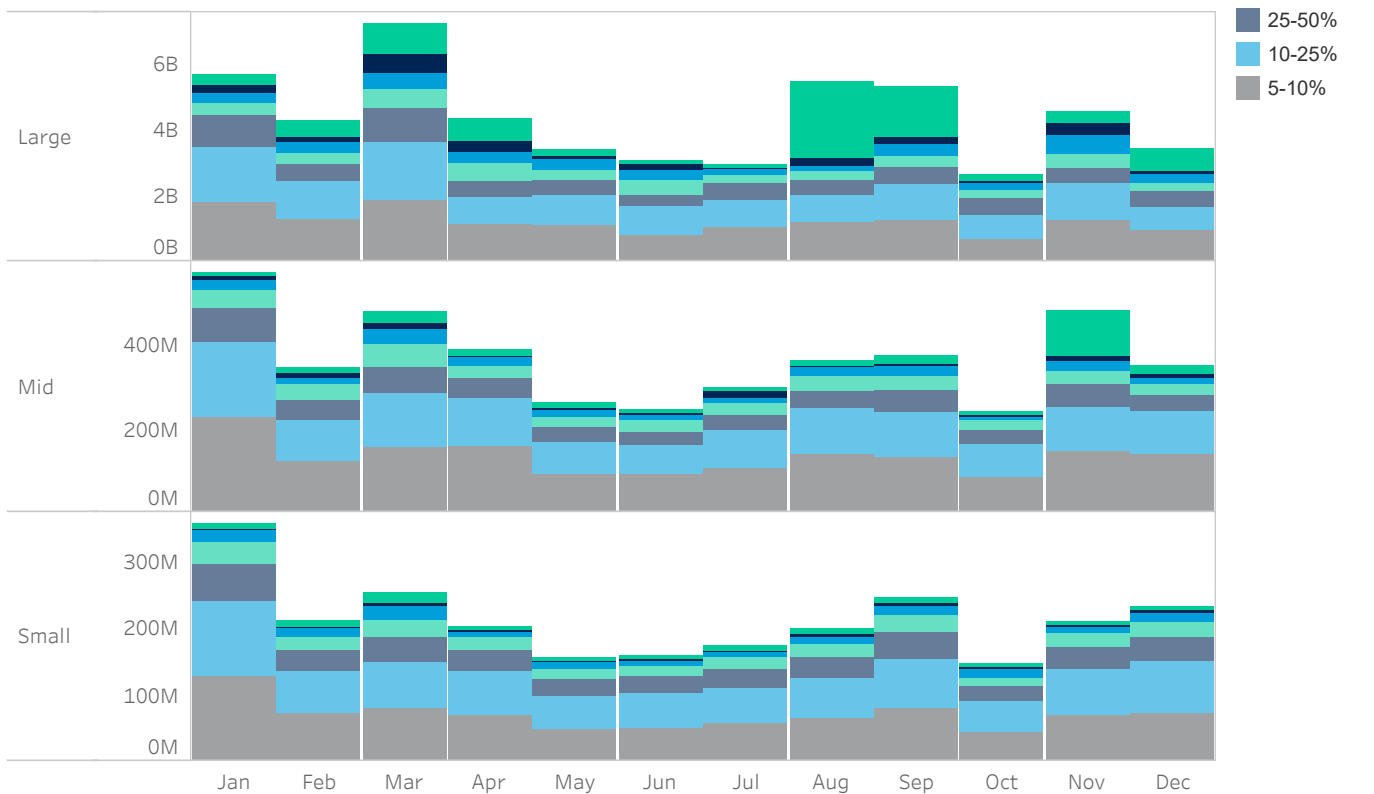
## Average Daily Turnover (Notional USD)



## Venue Market Share (Notional USD)



## Large Sized Trades (>=5%ADT)

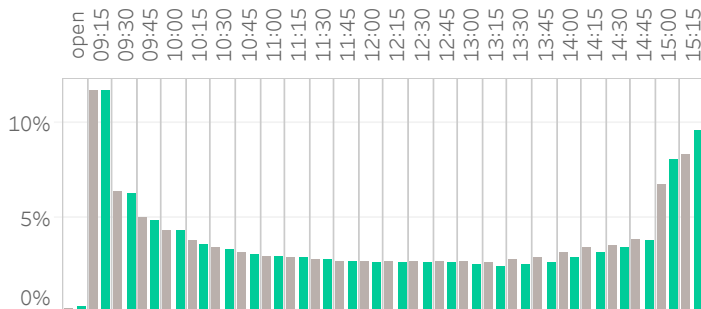


Source data: Virtu Financial

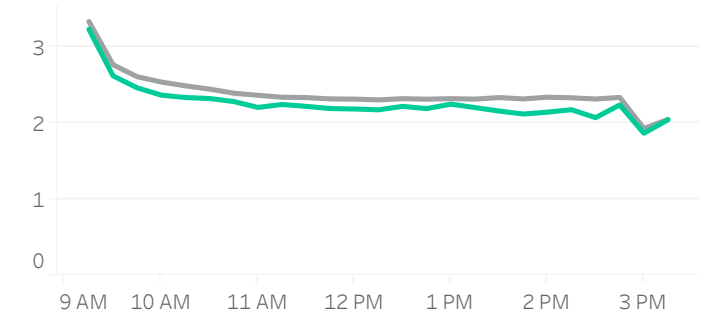


# India

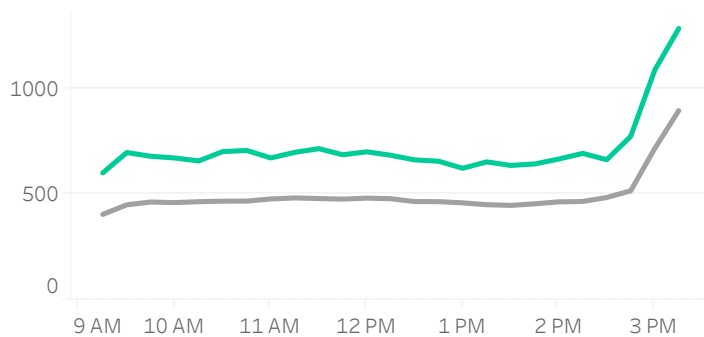
## Volume Curve



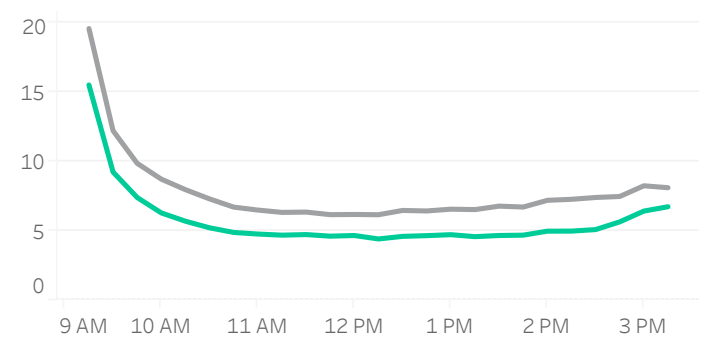
## Intraday Spread (bps)



## Intraday Quotesize (Shares)



## Intraday Volatility (bps)



Rolling 12 Months Avg December 2022

## Spread Bps

	22 Q2			22 Q3			22 Q4		
	Apr 22	May 22	Jun 22	Jul 22	Aug 22	Sep 22	Oct 22	Nov 22	Dec 22
firstHalfHour	2.8	3.0	3.0	2.7	2.8	3.0	2.9	2.8	2.9
midday	2.2	2.4	2.4	2.2	2.2	2.2	2.1	2.0	2.1
lastHalfHour	1.9	2.0	1.9	1.8	1.8	1.7	1.6	1.6	1.5

## One Minute Volatility Bps

firstHalfHour	13.4	16.7	14.8	12.0	12.2	13.0	11.9	10.5	10.5
midday	6.1	8.6	7.1	5.5	5.3	6.0	5.3	4.4	4.8
lastHalfHour	7.8	9.7	8.1	7.0	6.5	6.9	6.4	6.0	6.2

## Quotesize in Shares

firstHalfHour	415	345	364	411	545	134	130	141	118
midday	455	373	393	458	567	138	138	148	121
lastHalfHour	725	586	672	703	829	242	253	251	251

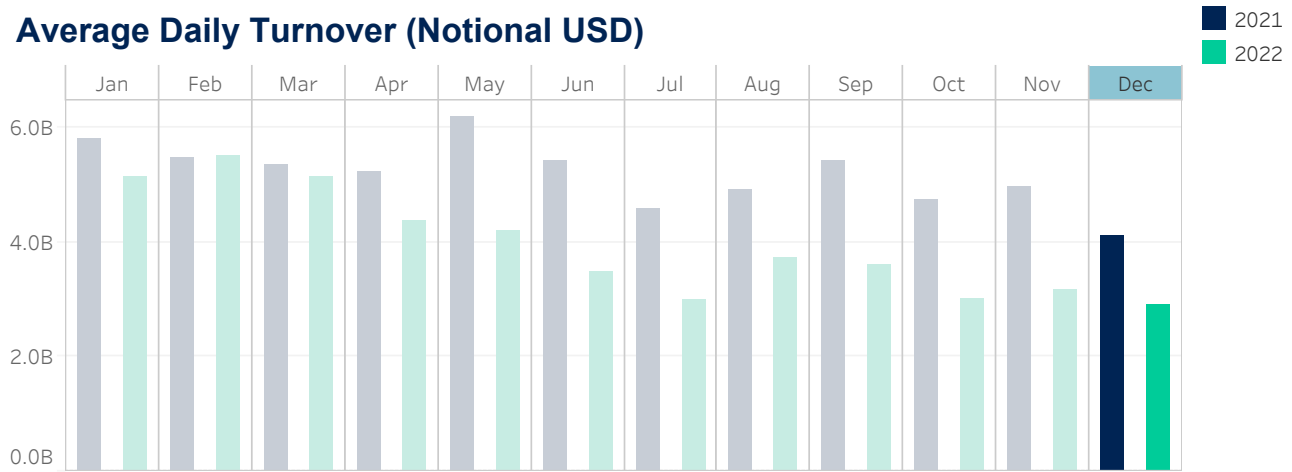
Median used for all metrics

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

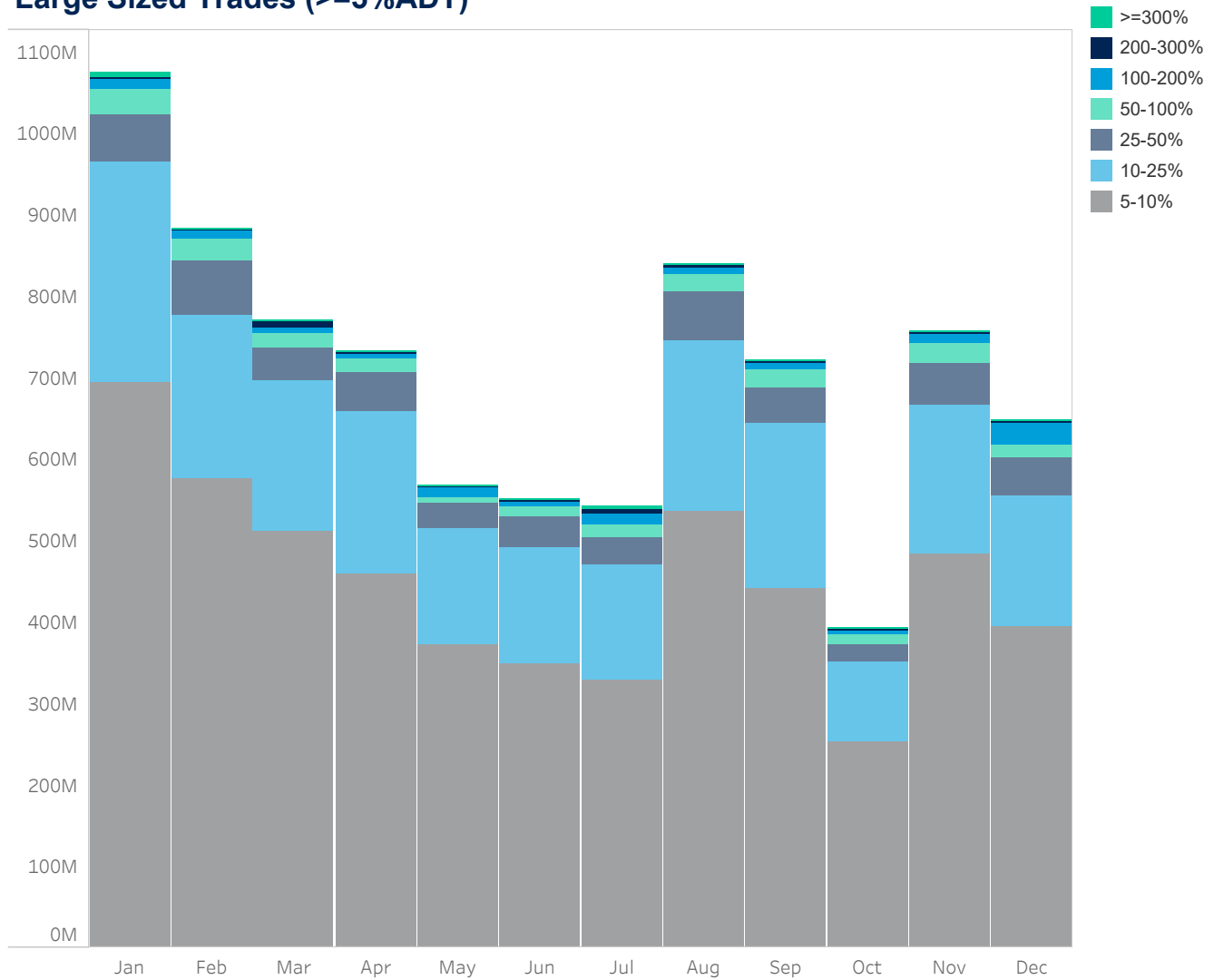
Source data: Virtu Financial

# Thailand

## Average Daily Turnover (Notional USD)



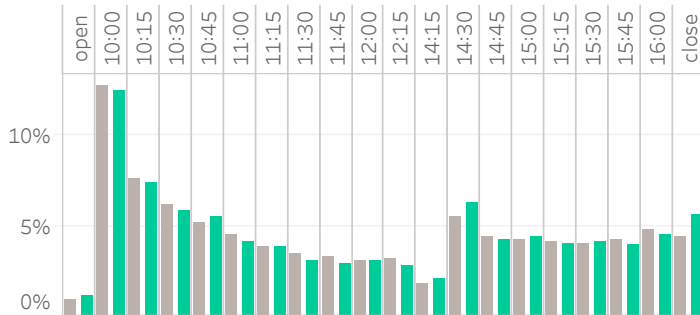
## Large Sized Trades (>=5%ADT)



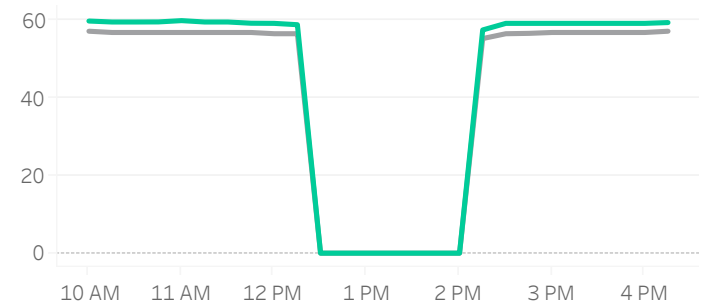
Source data: Virtu Financial

# Thailand

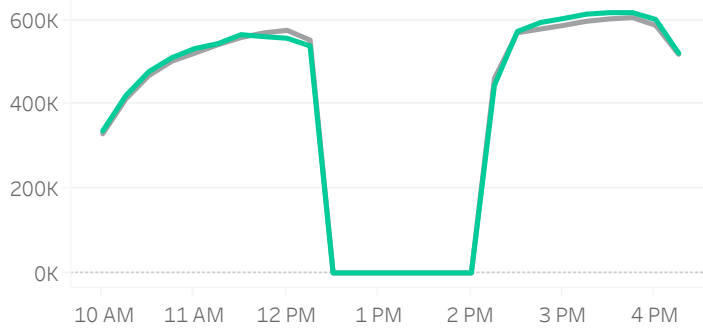
## Volume Curve



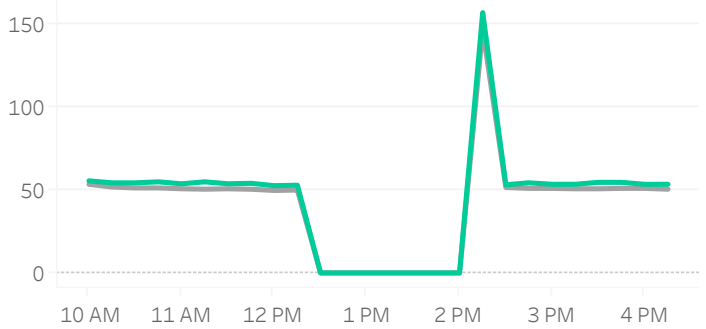
## Intraday Spread (bps)



## Intraday Quotesize (Shares)



## Intraday Volatility (bps)



Rolling 12 Months Avg December 2022

## Spread Bps

	22 Q2			22 Q3			22 Q4		
	Apr 22	May 22	Jun 22	Jul 22	Aug 22	Sep 22	Oct 22	Nov 22	Dec 22
firstHalfHour	55.8	56.5	57.5	60.1	58.0	53.1	54.3	53.7	53.0
midday	55.4	55.9	57.1	59.9	57.8	53.6	55.6	54.6	52.4
lastHalfHour	55.9	56.2	57.5	60.0	58.0	54.3	57.8	56.8	53.2

## One Minute Volatility Bps

firstHalfHour	158.6	54.3	144.1	148.5	55.5	53.8	55.9	53.9	52.9
midday	157.2	155.2	173.0	142.6	52.1	53.2	55.0	54.0	51.8
lastHalfHour					56.9	52.5	55.4	54.2	51.8

## Quotesize in Shares

firstHalfHour	350,199	296,888	309,227	249,174	342,551	249,884	214,286	230,704	279,326
midday	568,254	472,504	481,812	401,100	563,559	358,044	323,129	360,800	394,877
lastHalfHour	562,618	479,643	473,218	415,479	574,505	336,514	327,846	376,583	454,446

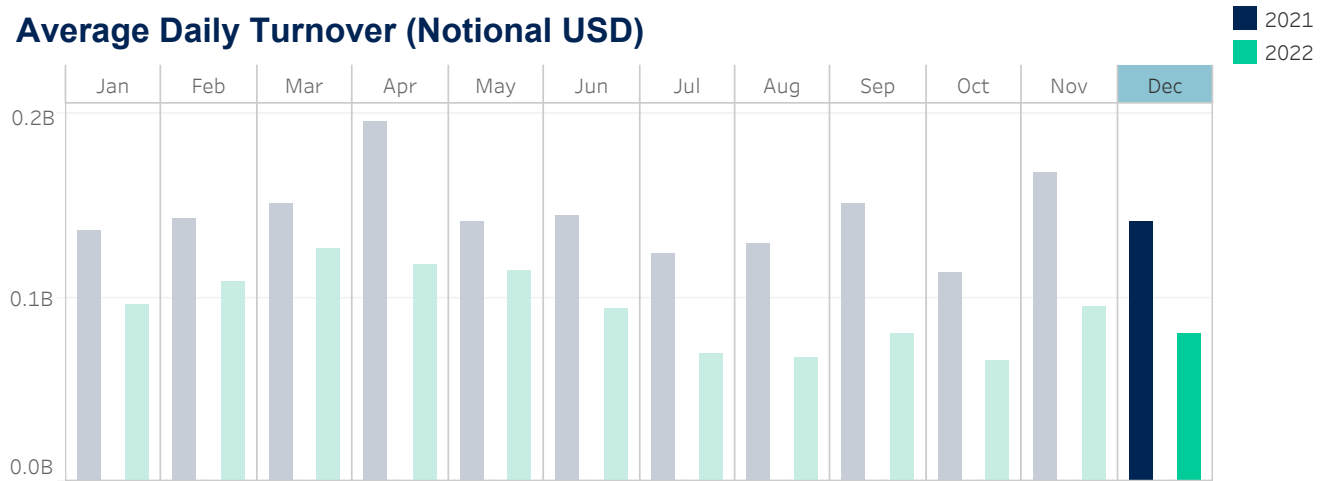
Median used for all metrics

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

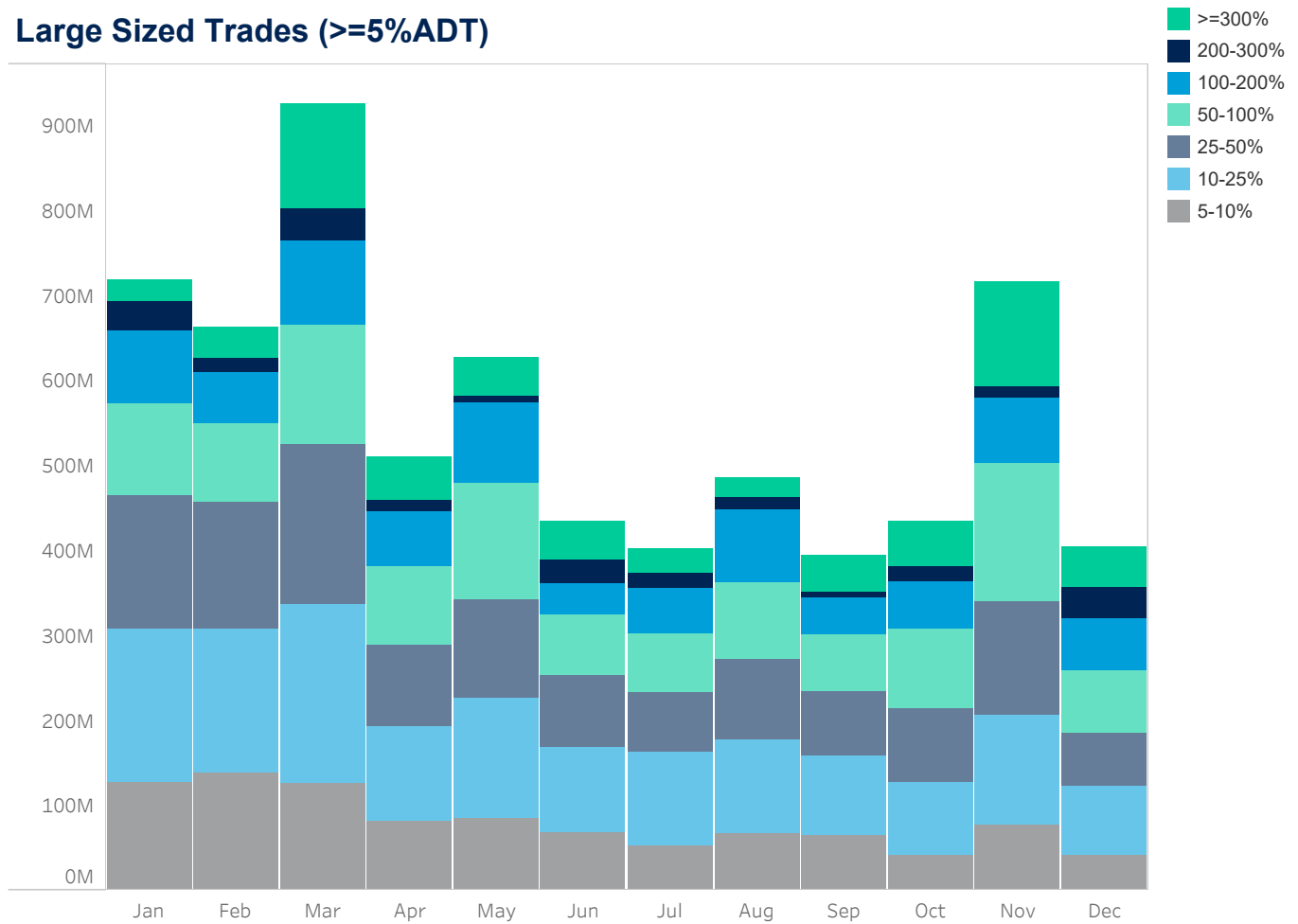
Source data: Virtu Financial

# New Zealand

## Average Daily Turnover (Notional USD)



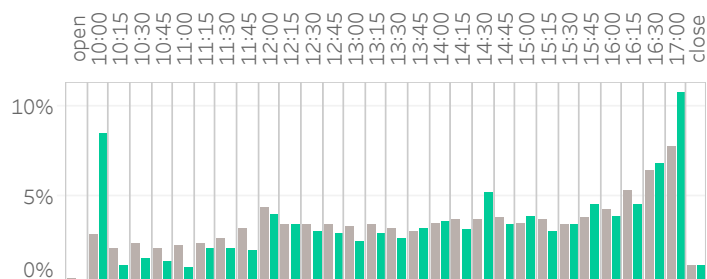
## Large Sized Trades (>=5%ADT)



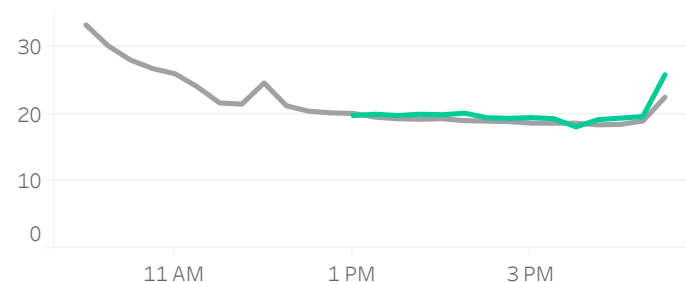
Source data: Virtu Financial

# New Zealand

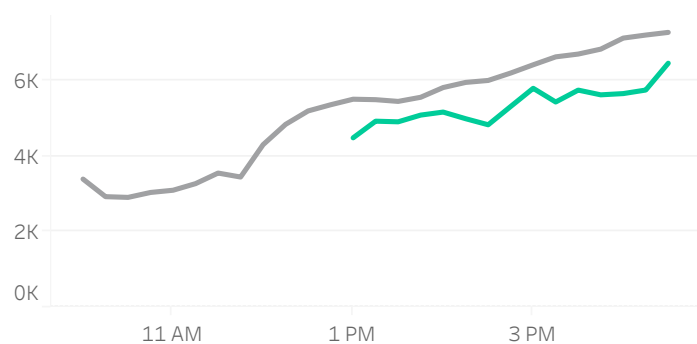
## Volume Curve



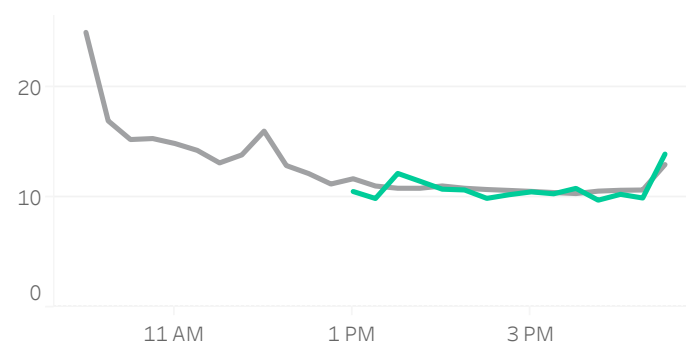
## Intraday Spread (bps)



## Intraday Quotesize (Shares)



## Intraday Volatility (bps)



■ Rolling 12 Months Avg ■ December 2022

## Spread Bps

	22 Q2			22 Q3		22 Q4
	Apr 22	May 22	Jun 22	Jul 22	Aug 22	Oct 22
firstHalfHour	34.0	38.6				
midday	17.7	19.6	22.2	20.0	18.3	
lastHalfHour	18.0	20.7	24.8	20.4	18.8	7.0

## One Minute Volatility Bps

firstHalfHour	6.3	9.1				
midday	3.2	3.8	3.7	3.7	3.9	
lastHalfHour	3.7	5.3	5.6	4.7	6.3	7.0

## Quotesize in Shares

firstHalfHour	3,044	2,841				
midday	5,456	5,955	6,180	5,959	5,704	
lastHalfHour	7,811	7,376	7,341	7,577	7,322	2,604

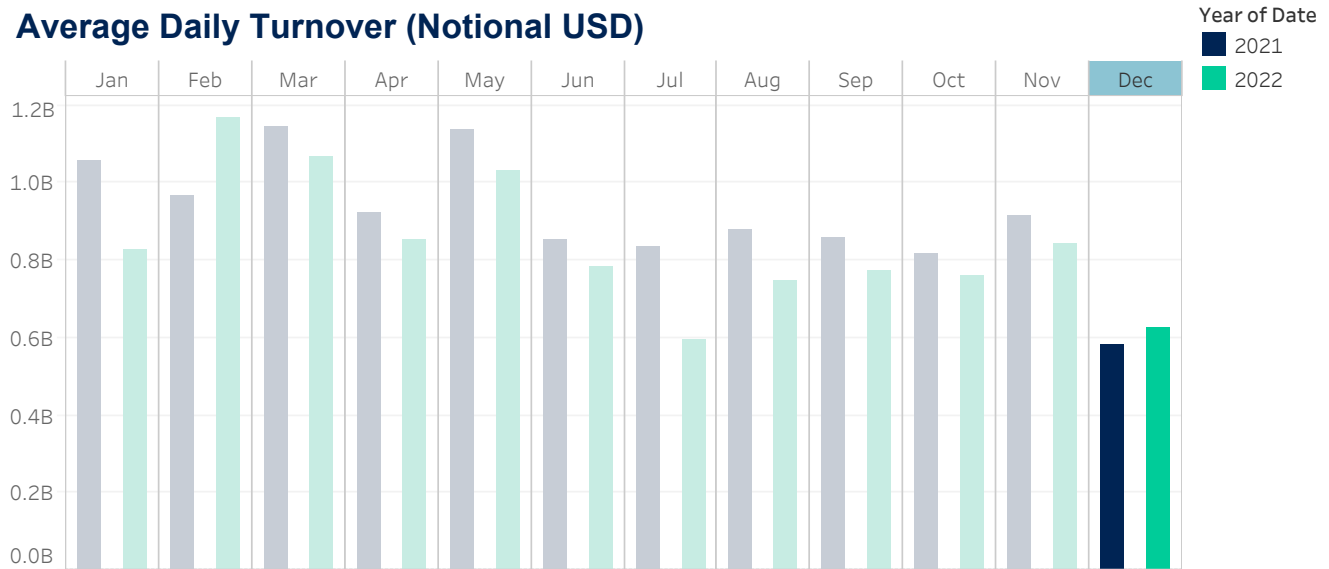
Median used for all metrics

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

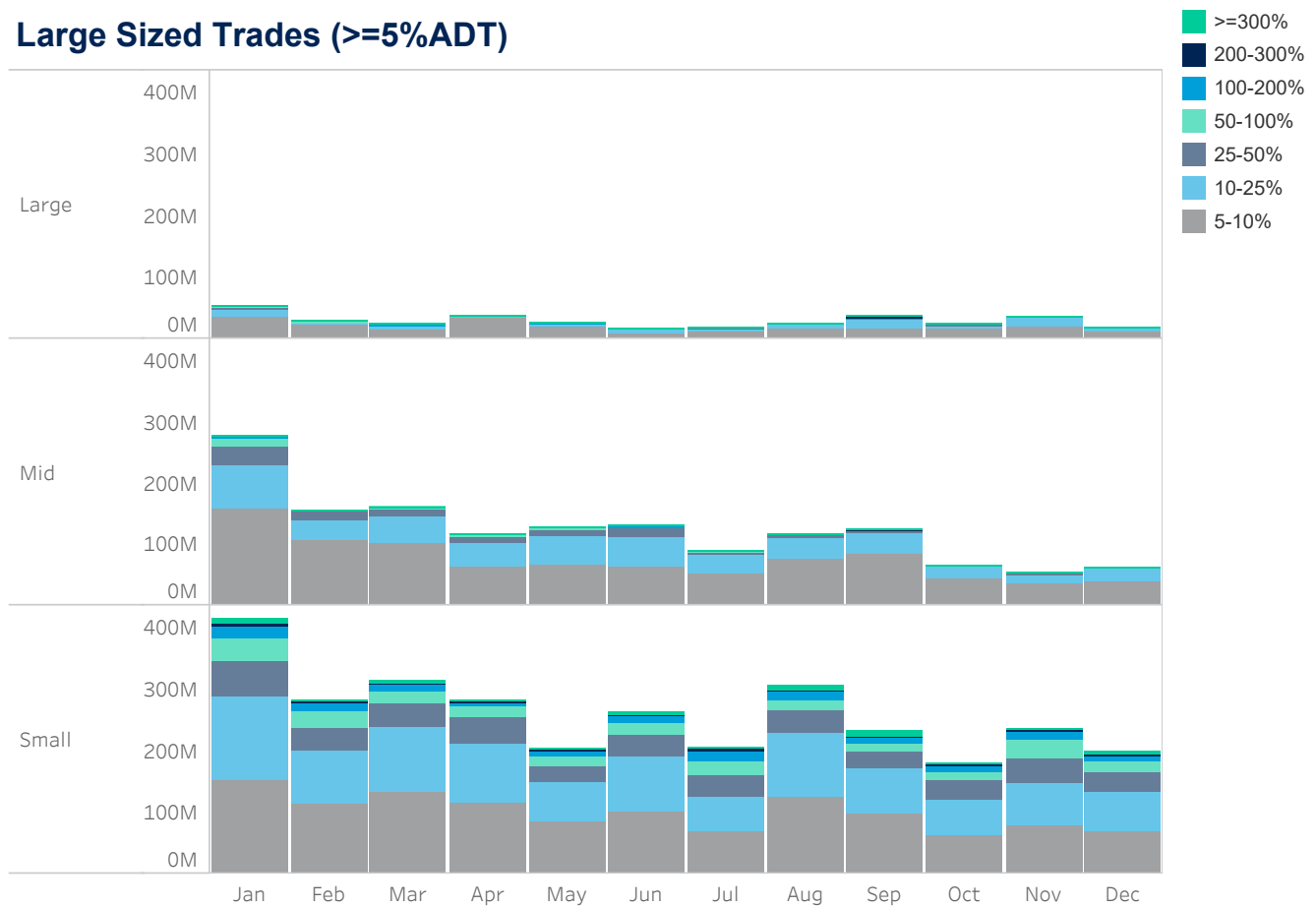
Source data: Virtu Financial

# Singapore

## Average Daily Turnover (Notional USD)



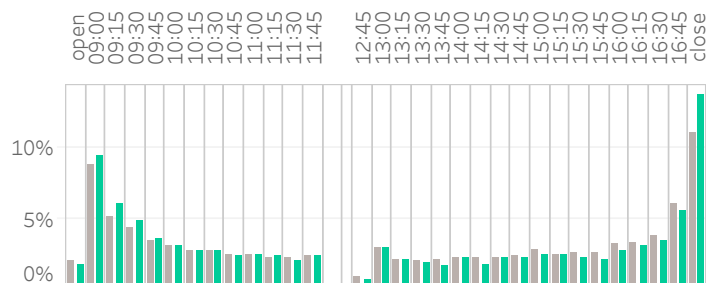
## Large Sized Trades (>=5%ADT)



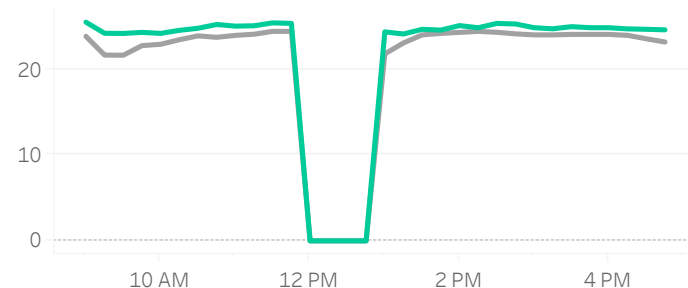
Source data: Virtu Financial

# Singapore

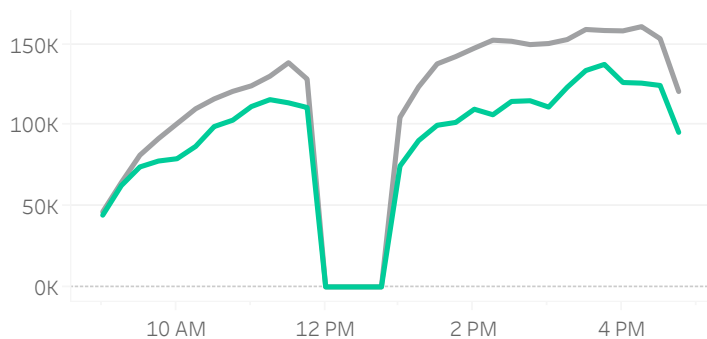
## Volume Curve



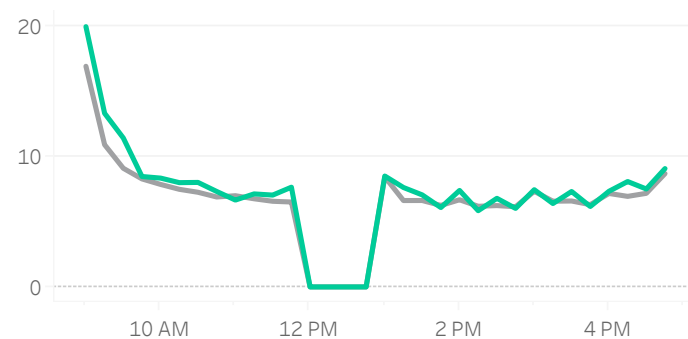
## Intraday Spread (bps)



## Intraday Quotesize (Shares)



## Intraday Volatility (bps)



■ Rolling 12 Months Avg ■ December 2022

## Spread Bps

	22 Q2			22 Q3			22 Q4		
	Apr 22	May 22	Jun 22	Jul 22	Aug 22	Sep 22	Oct 22	Nov 22	Dec 22
firstHalfHour	20.5	22.2	22.8	23.0	19.6	22.9	24.7	24.4	23.9
midday	21.8	23.9	24.0	24.4	23.8	25.2	27.3	24.5	23.6
lastHalfHour	21.1	23.9	22.8	22.0	21.6	22.9	27.3	23.7	21.5

## One Minute Volatility Bps

firstHalfHour	5.7	8.1	5.9	6.2	5.5	5.5	6.7	8.1	6.0
midday	4.5	5.8	3.9	5.1	5.4	4.5	4.3	4.5	3.2
lastHalfHour	4.9	5.7	3.6	4.4	3.9	3.1	2.2	5.7	2.9

## Quotesize in Shares

firstHalfHour	48,491	66,272	58,725	49,988	61,757	71,222	44,097	53,092	48,785
midday	116,792	159,349	136,036	111,790	155,222	200,856	106,687	110,934	110,585
lastHalfHour	122,775	163,525	129,298	102,873	148,883	165,031	121,942	107,844	113,437

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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