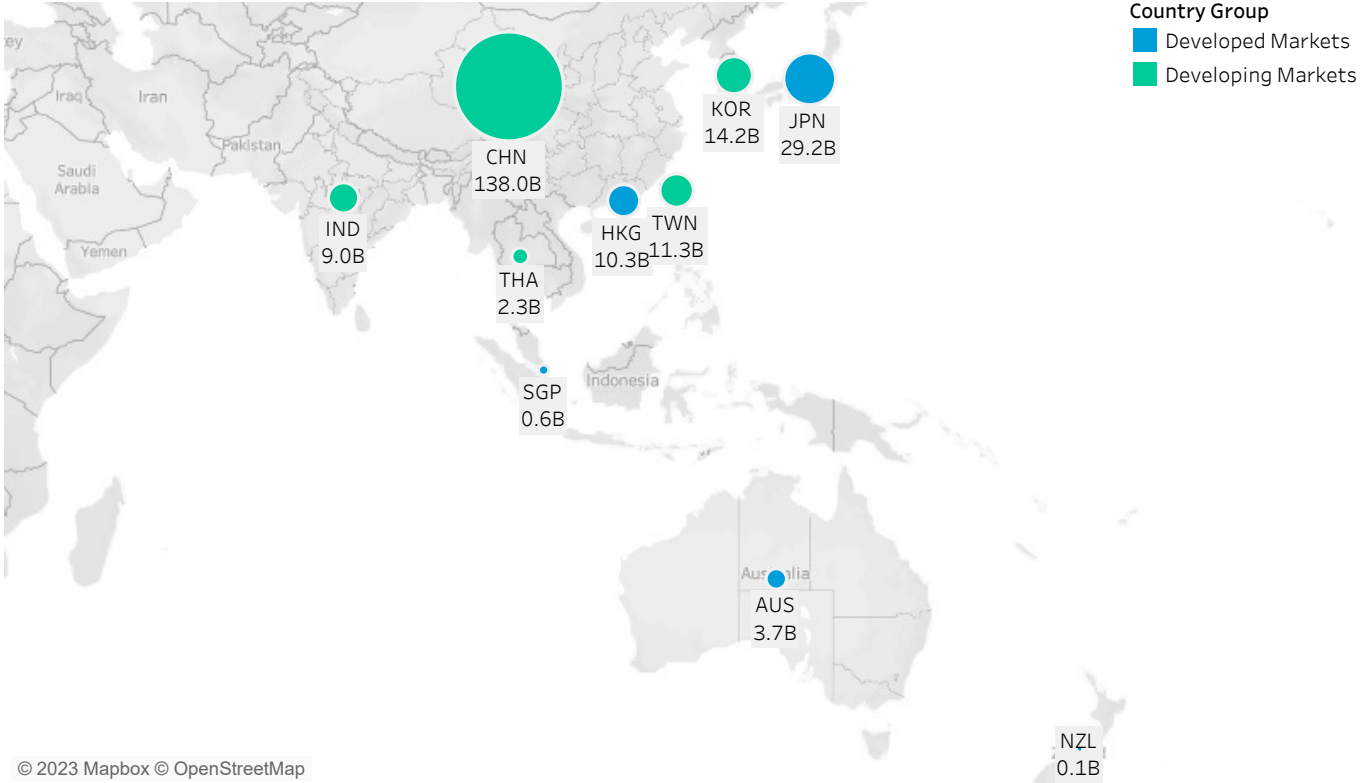


November 2023 APAC Market Structure Monthly

Average Daily Turnover (Notional USD)



Country Breakdowns

Hong Kong

China

Japan

Australia

South Korea

Taiwan

India

Thailand

New Zealand

Singapore

Nov 2023

AP Market Structure Monthly

MICROSTRUCTURE OBSERVATIONS

- Overall trading activity rebounded from year low prior month as 8 out of 10 countries in our equities universe saw higher month-over-month (MoM) average daily turnover (ADT); Hong Kong led the sharpest increase in ADT amongst developed markets, up +24.6% MoM, followed by +7.6% in Singapore and +5% in Japan. Australia and Thailand were exceptions with ADT down -0.8% and -7.1% MoM respectively.
- More adverse trading conditions observed in Australia as intraday spread and volatility hiked up ~10% compared with the YTD average. Conversely, the average quote-size in the first half-hour of the trading day fell to year low levels.

AP MARKET STRUCTURE NEWS

[Korea Bans Stock Short Selling Until June 2024 and Seek Measures to Improve the System](#)

The Financial Services Commission of Korea held a meeting on November 5 where the authorities decided to ban all stock short selling in domestic markets (all KOSPI, KOSDAQ and KONEX listed items) effective from November 6 until the end of June 2024. According to the FSC, this comes after rising market uncertainties and recent illegal short selling which could potentially weaken the market's fair pricing function. According to Nikkei Asia, analysts caution that the short sell ban may increase market volatility and inefficiency by removing opportunities to adjust overvalued stocks. Bloomberg News also reported that investor risk-hedging is causing futures for some South Korean companies to be discounted to their spot prices by up to 6%.

<https://asia.nikkei.com/Spotlight/Market-Spotlight/South-Korea-s-stock-short-selling-ban-raises-political-questions>

[Hong Kong Exchange Adds Indonesia Stock Exchange As Recognized Stock Exchange](#)

On November 24, The Hong Kong Exchange (HKSE) announced that it has added the Indonesia Stock Exchange (IDX) as a Recognized Stock Exchange. This will allow companies with a primary listing on IDX's main market to apply for a secondary listing in Hong Kong. According to HKEX, this recognition follows a Memorandum of Understanding signed in July between HKEX and IDX, aimed at exploring cooperation including cross-listing opportunities.

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

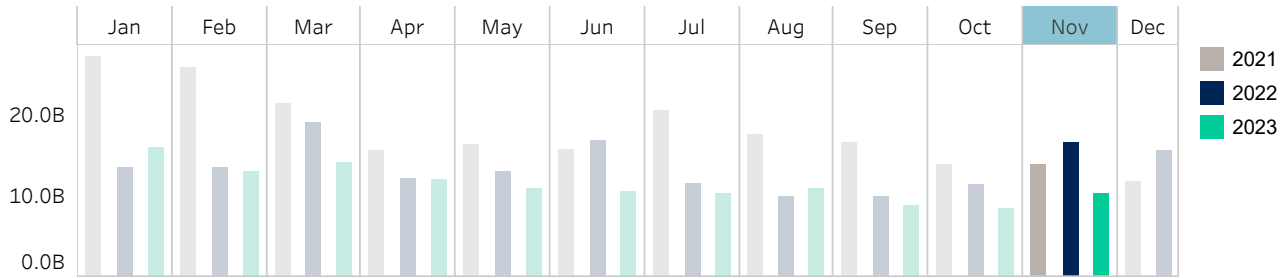
info@virtu.com | www.virtu.com

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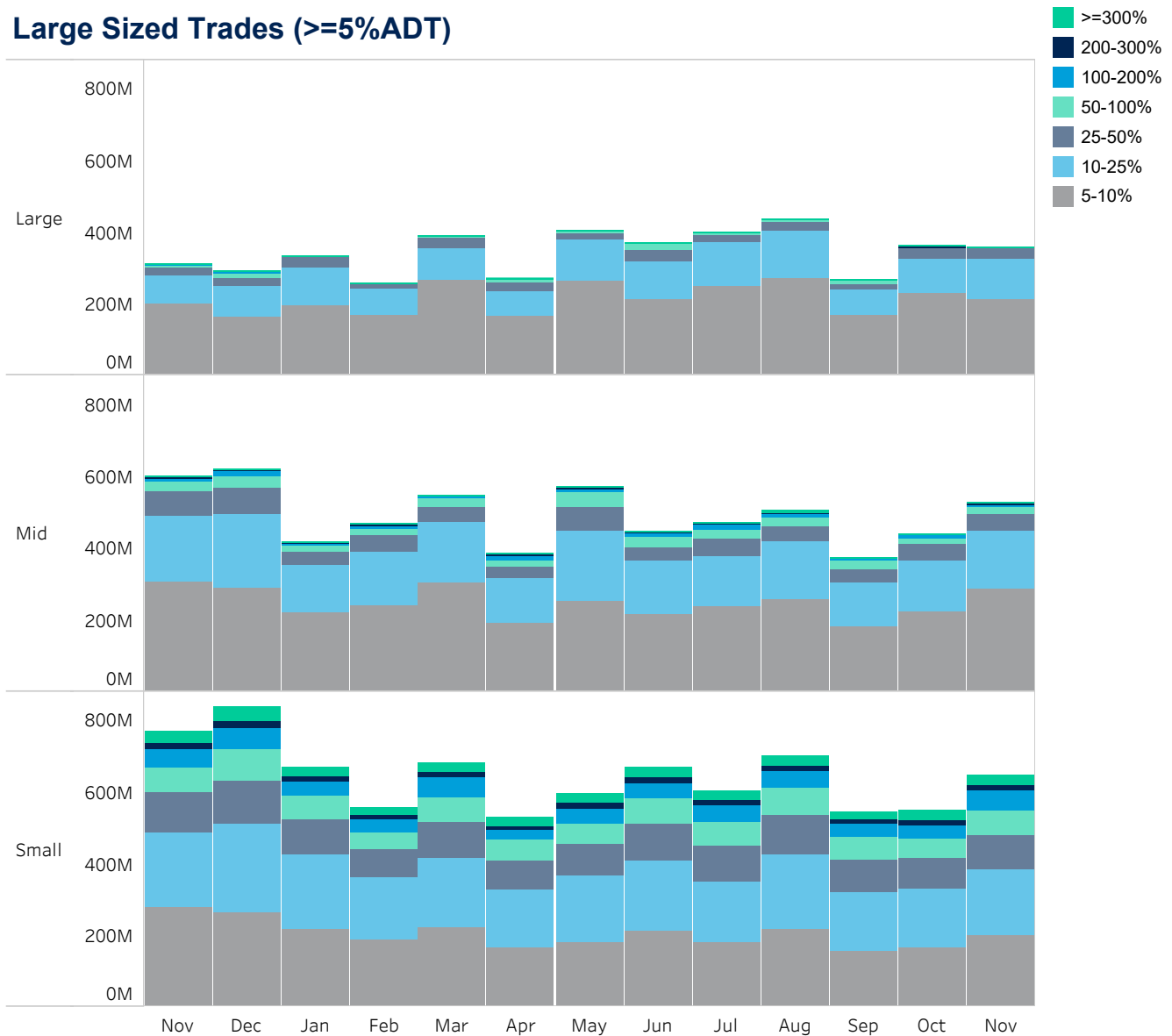
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Hong Kong

Average Daily Turnover (Notional USD)



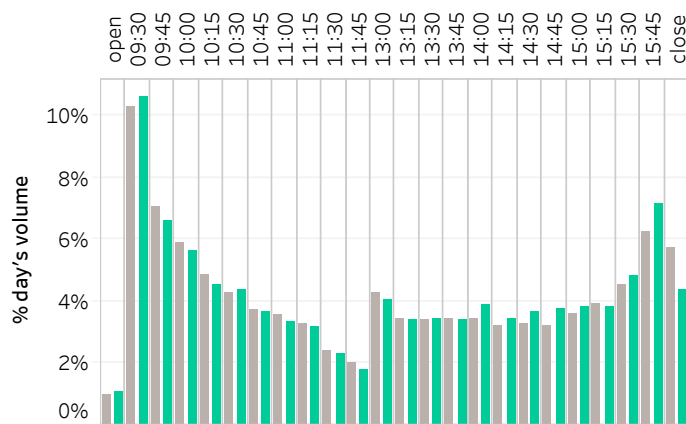
Large Sized Trades (>=5%ADT)



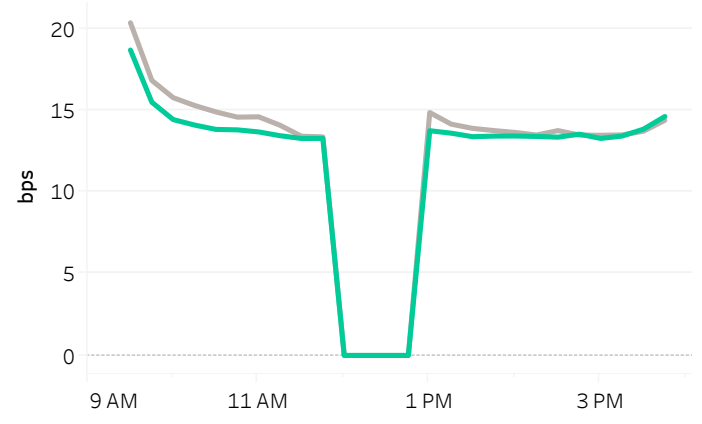
Source data: Virtu Financial

Hong Kong

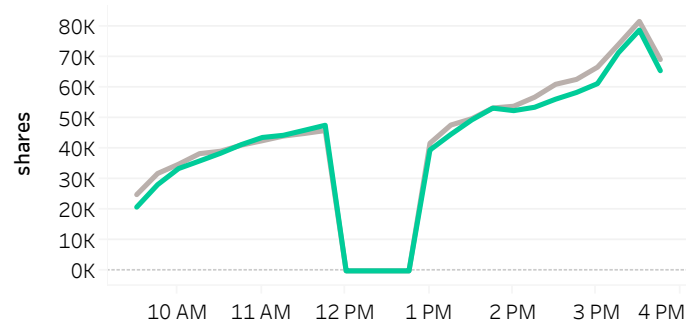
Volume Curve



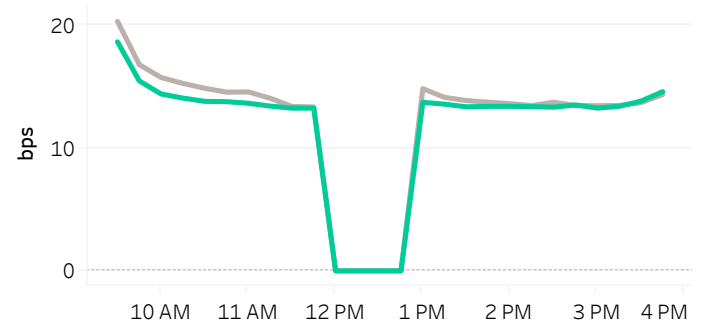
Intraday Spread (bps)



Intraday Quotesize (Shares)



Intraday Volatility (bps)



Rolling 12 Months Avg November 2023

Spread Bps

	2023										
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov
FirstHalfHour	18.3	18.0	19.3	19.5	19.5	19.6	18.3	18.7	18.1	18.4	17.1
MidDay	13.1	12.8	13.7	14.5	14.0	14.6	13.5	14.0	14.4	14.7	13.4
LastHalfHour	13.0	13.2	14.0	14.1	14.1	14.9	13.8	13.9	14.8	15.0	14.3

One Minute Volatility Bps

FirstHalfHour	26.4	25.3	28.1	25.8	25.2	24.1	23.6	25.8	23.8	24.3	24.3
MidDay	17.0	15.9	16.2	16.1	15.7	16.2	15.4	15.8	15.6	16.0	15.2
LastHalfHour	16.5	16.7	17.3	16.4	16.3	17.2	15.7	16.1	16.5	16.6	16.9

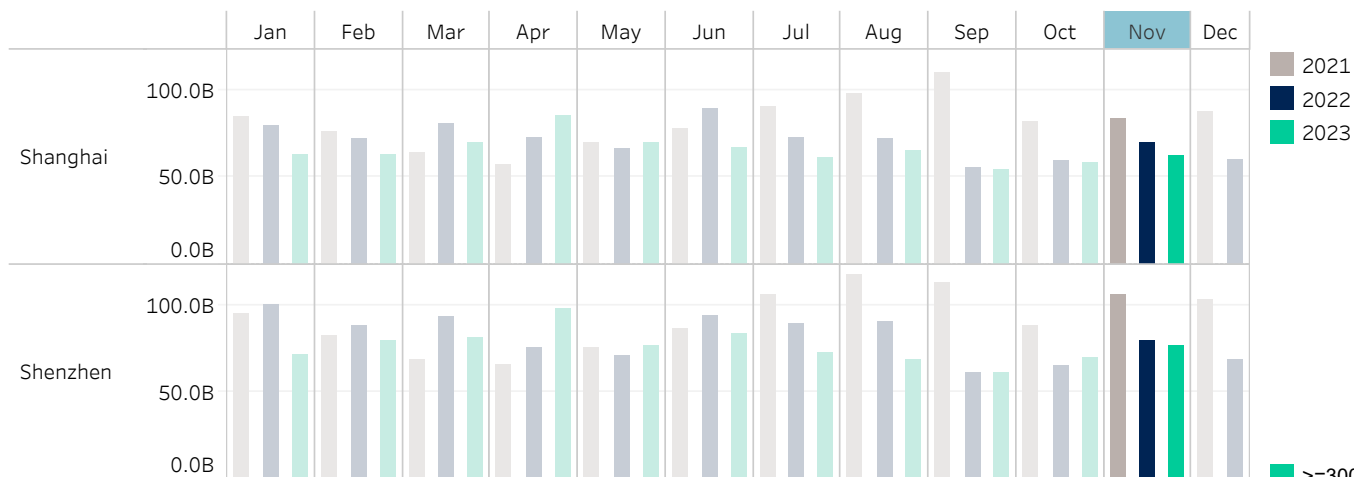
Quotesize (shares)

FirstHalfHour	29,622	27,296	30,646	31,145	29,974	26,818	25,478	27,693	28,391	27,601	23,593
MidDay	46,105	44,622	43,572	50,780	47,975	41,143	42,053	45,912	52,298	46,953	46,472
LastHalfHour	78,406	74,936	77,473	76,329	74,417	64,333	69,285	74,613	78,499	77,442	72,387

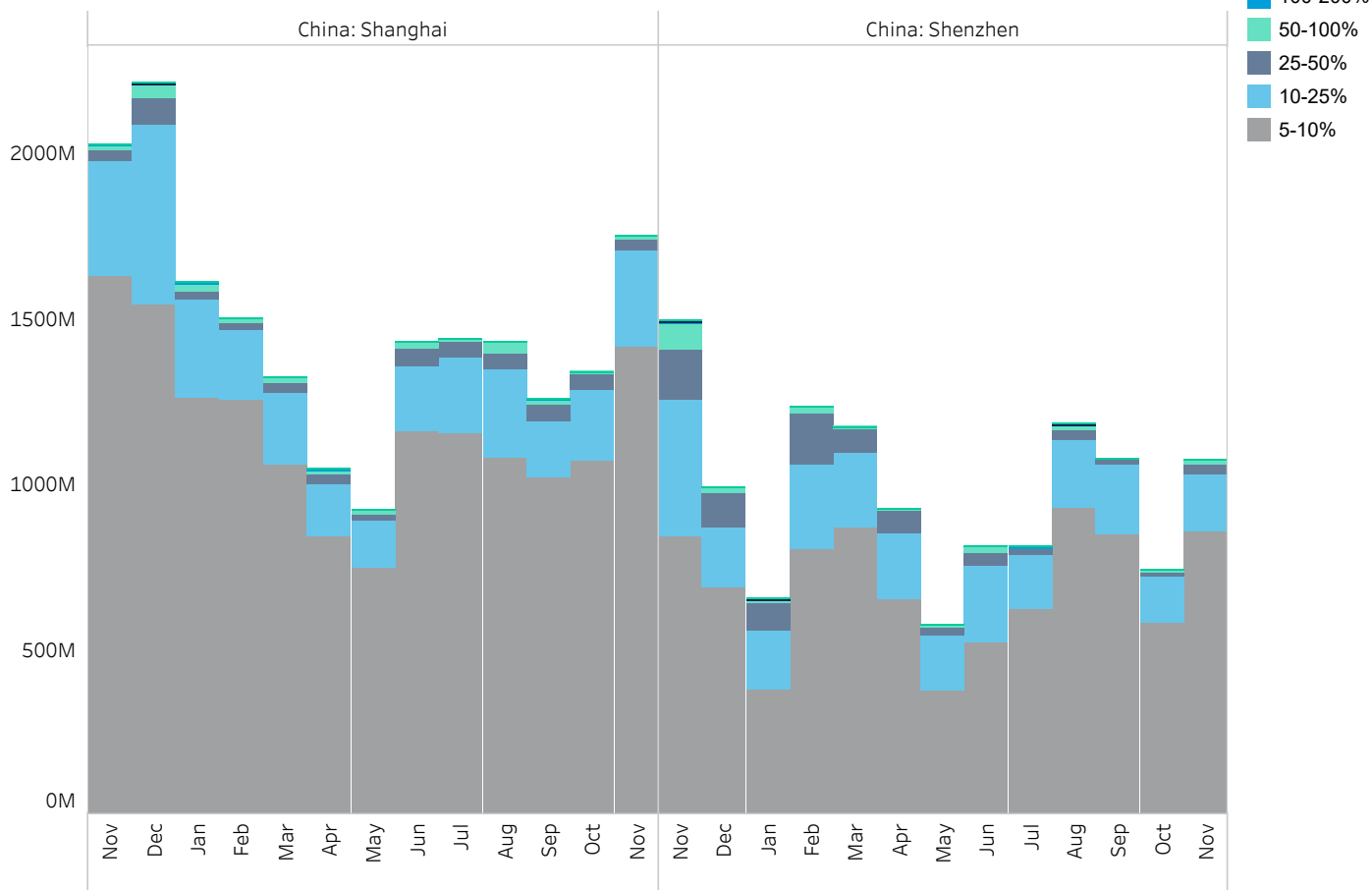
Median used for all metrics
 One minute volatility is calculated using the difference between the high and low price within a one minute time bin, divided by that bin's VWAP
 Source data: Virtu Financial

China

Average Daily Turnover (Notional USD)



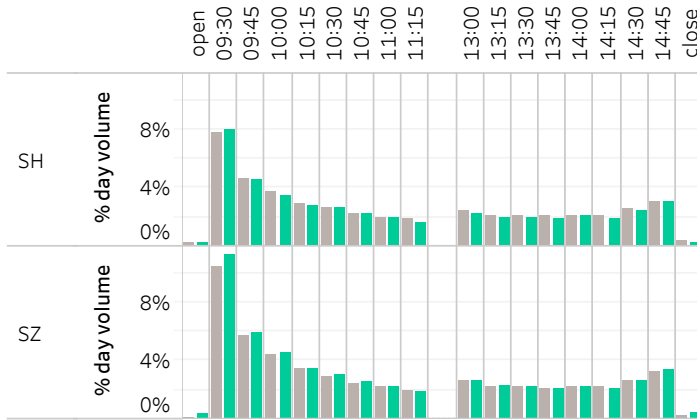
Large Sized Trades (>=5%ADT)



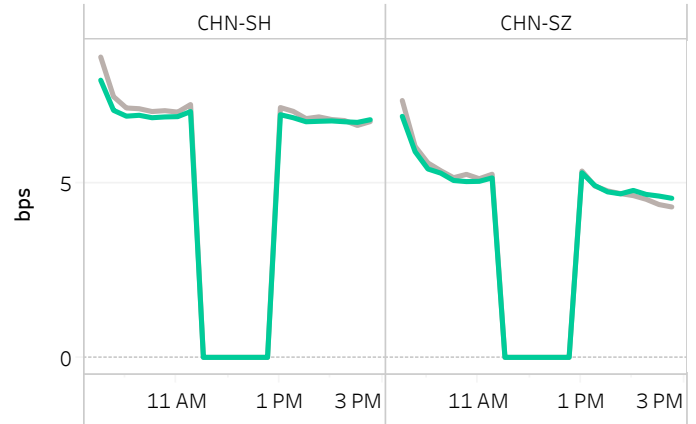
Source data: Virtu Financial

China

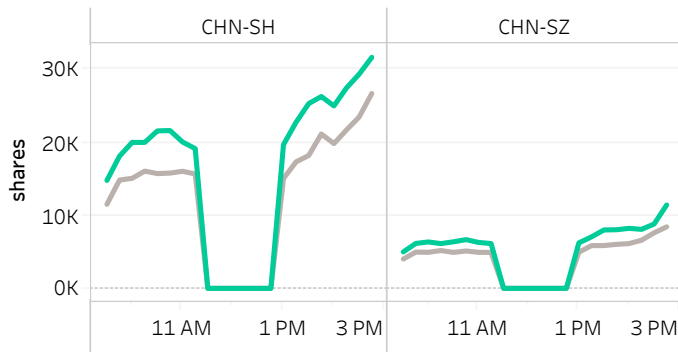
Volume Curve



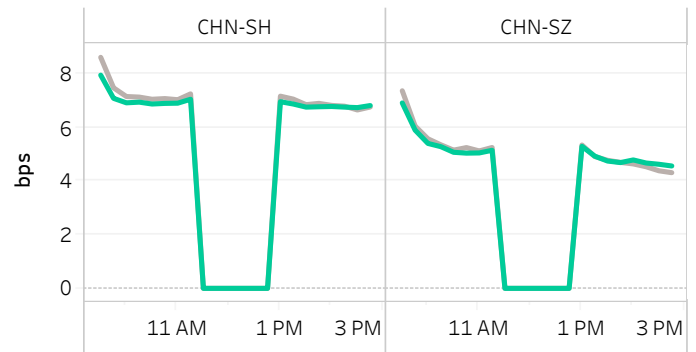
Intraday Spread (bps)



Intraday Quotesize (Shares)



Intraday Volatility (bps)



■ Rolling 12 Months Avg ■ November 2023

Spread Bps

	CHN-SH									CHN-SZ						
	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov
FirstHalfHo..	8.1	8.2	8.3	8.0	8.1	7.6	8.2	7.5	7.0	7.0	7.1	6.8	6.9	6.3	7.0	6.4
MidDay	7.1	7.2	7.3	7.0	7.1	6.8	7.1	6.9	5.3	5.3	5.5	5.1	5.5	5.0	5.4	5.1
LastHalfHo..	6.5	6.7	6.7	6.6	6.9	6.7	7.1	6.8	4.3	4.4	4.3	4.3	4.8	4.6	5.0	4.7

One Minute Volatility Bps

FirstHalfHo..	24.0	26.8	21.8	29.2	29.5	27.0	25.6	21.2	24.8	26.4	22.6	30.3	27.5	28.3	28.2	23.2
MidDay	13.8	15.3	13.1	15.8	15.5	14.7	13.9	13.0	11.7	13.3	10.9	14.5	13.2	13.6	13.0	11.3
LastHalfHo..	13.1	14.9	13.2	14.2	14.1	13.8	14.2	12.8	10.4	12.3	10.8	11.8	11.3	11.3	12.7	10.7

Quotesize (shares)

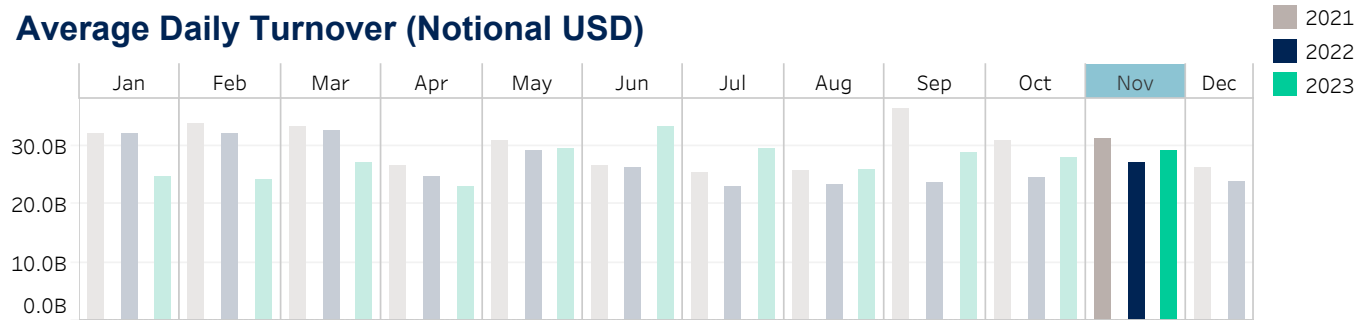
FirstHalfHo..	13,565	11,717	11,880	13,213	12,047	13,236	12,742	16,573	4,663	4,290	4,454	4,893	4,432	4,575	5,099	5,595
MidDay	15,771	13,954	14,210	17,111	14,014	16,898	16,209	21,210	5,174	4,869	5,189	5,637	4,897	5,593	5,775	6,549
LastHalfHo..	26,364	22,269	25,362	27,475	21,342	25,276	23,440	30,704	7,784	7,398	8,597	9,319	7,434	8,373	8,647	10,309

Median used for all metrics

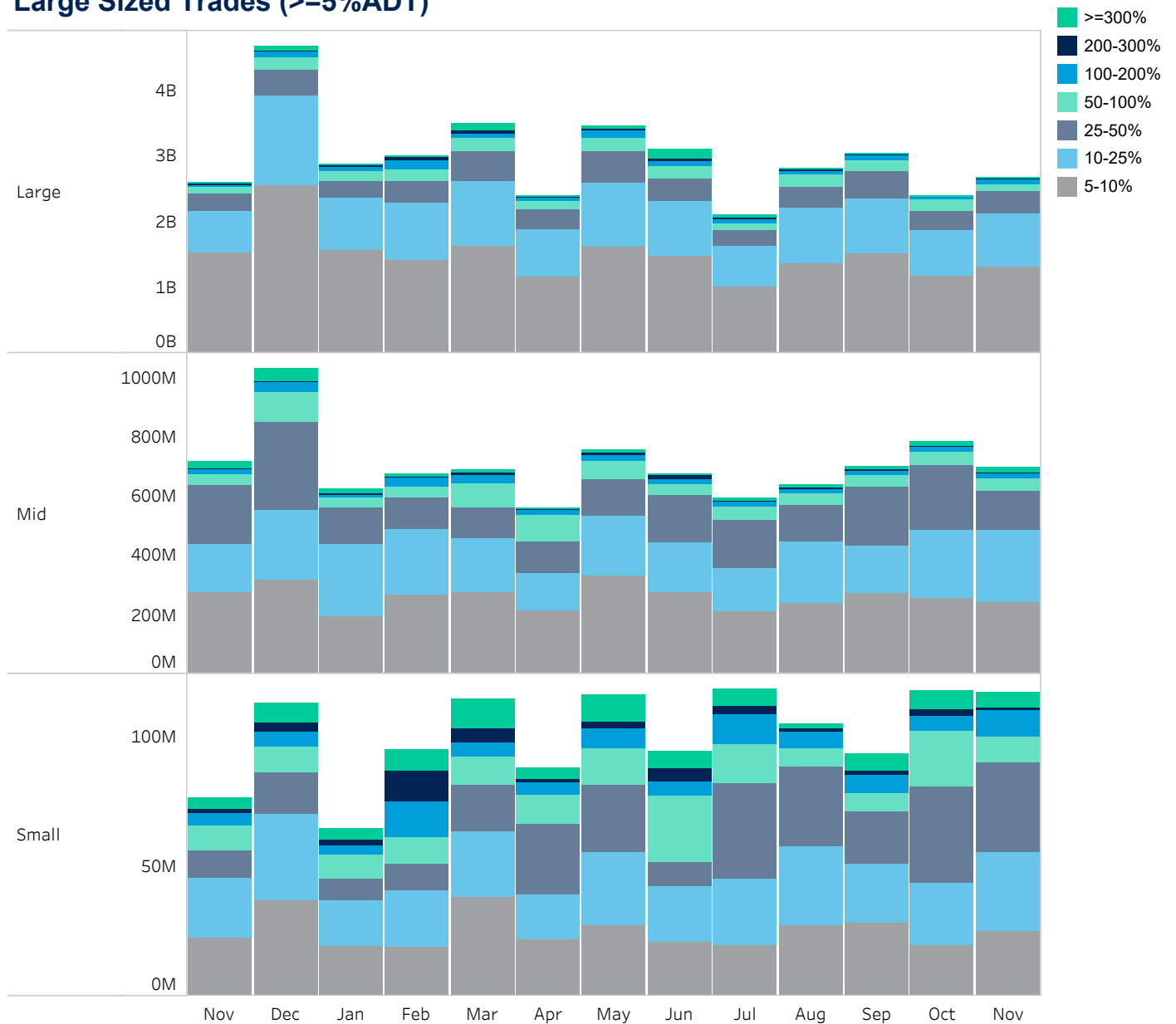
One minute volatility is calculated using the difference between the high and low price within a one minute time bin, divided by that bin's VWAP..

Japan

Average Daily Turnover (Notional USD)



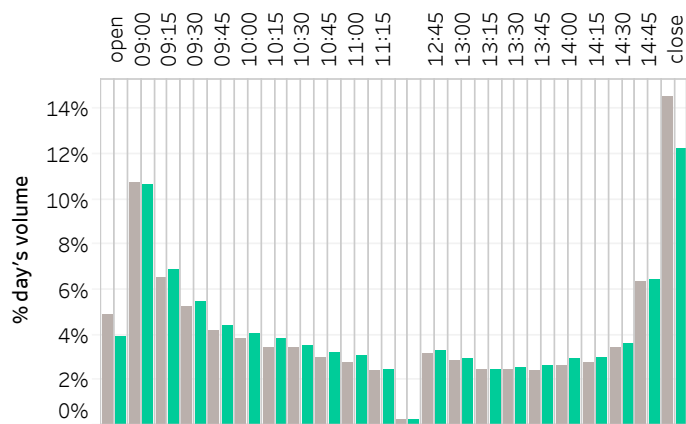
Large Sized Trades (>=5%ADT)



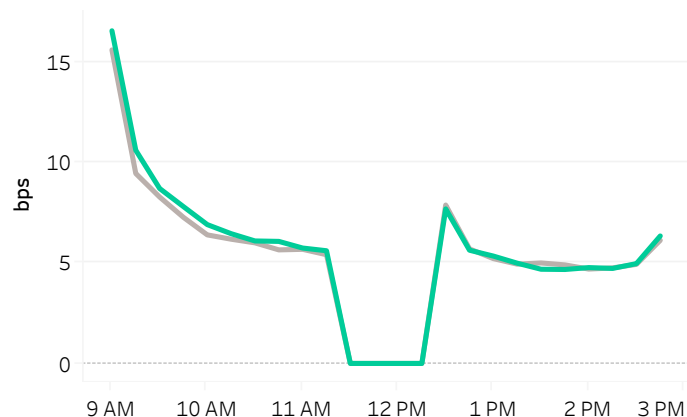
Source data: Virtu Financial

Japan

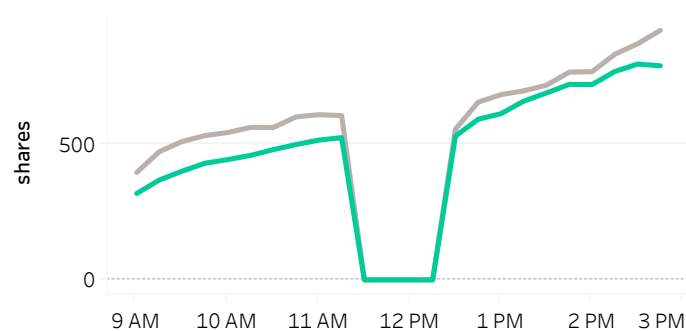
Volume Curve



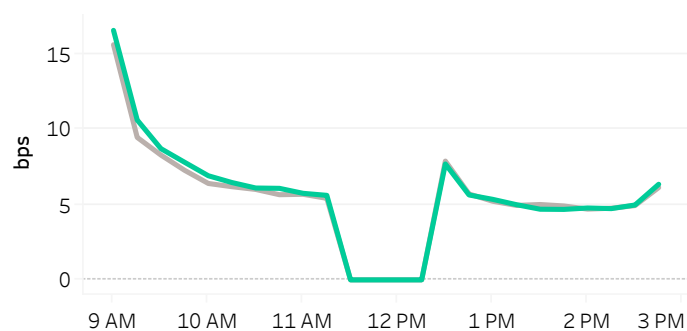
Intraday Spread (bps)



Intraday Quotesize (Shares)



Intraday Volatility (bps)



■ Rolling 12 Months Avg ■ November 2023

Spread Bps

	2023										
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov
FirstHalfHour	15.6	15.3	16.0	15.3	15.5	12.4	11.7	12.2	11.4	13.0	13.5
MidDay	8.6	8.8	9.1	8.5	8.9	5.7	5.2	5.4	5.2	5.8	6.0
LastHalfHour	9.1	9.1	9.5	9.2	9.2	5.4	5.0	4.9	5.1	5.7	5.5

One Minute Volatility Bps

FirstHalfHour	16.2	16.1	16.3	15.4	16.4	14.8	14.2	14.8	14.1	16.0	16.8
MidDay	8.0	8.3	8.4	7.7	8.5	6.7	5.9	6.1	6.0	7.1	7.3
LastHalfHour	9.3	9.3	9.4	8.9	9.3	7.1	6.6	6.4	6.8	7.9	7.5

Quotesize (shares)

FirstHalfHour	550	593	556	564	569	427	386	379	388	340	340
MidDay	897	1,012	891	951	968	582	569	575	580	494	526
LastHalfHour	1,414	1,620	1,387	1,495	1,578	860	855	882	829	694	779

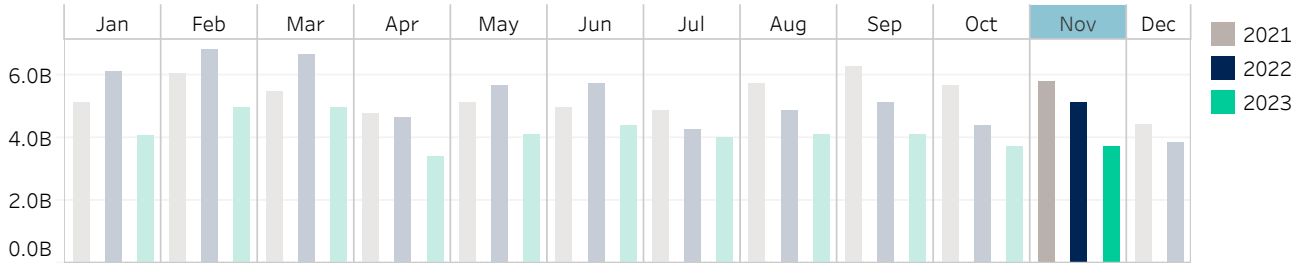
Median used for all metrics

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

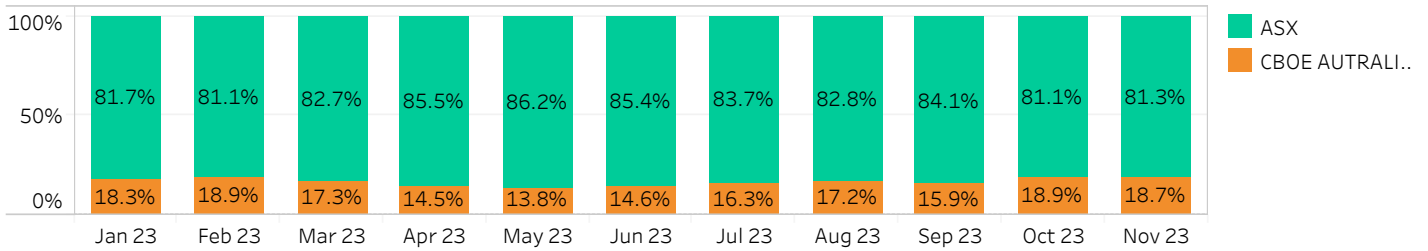
Source data: Virtu Financial

Australia

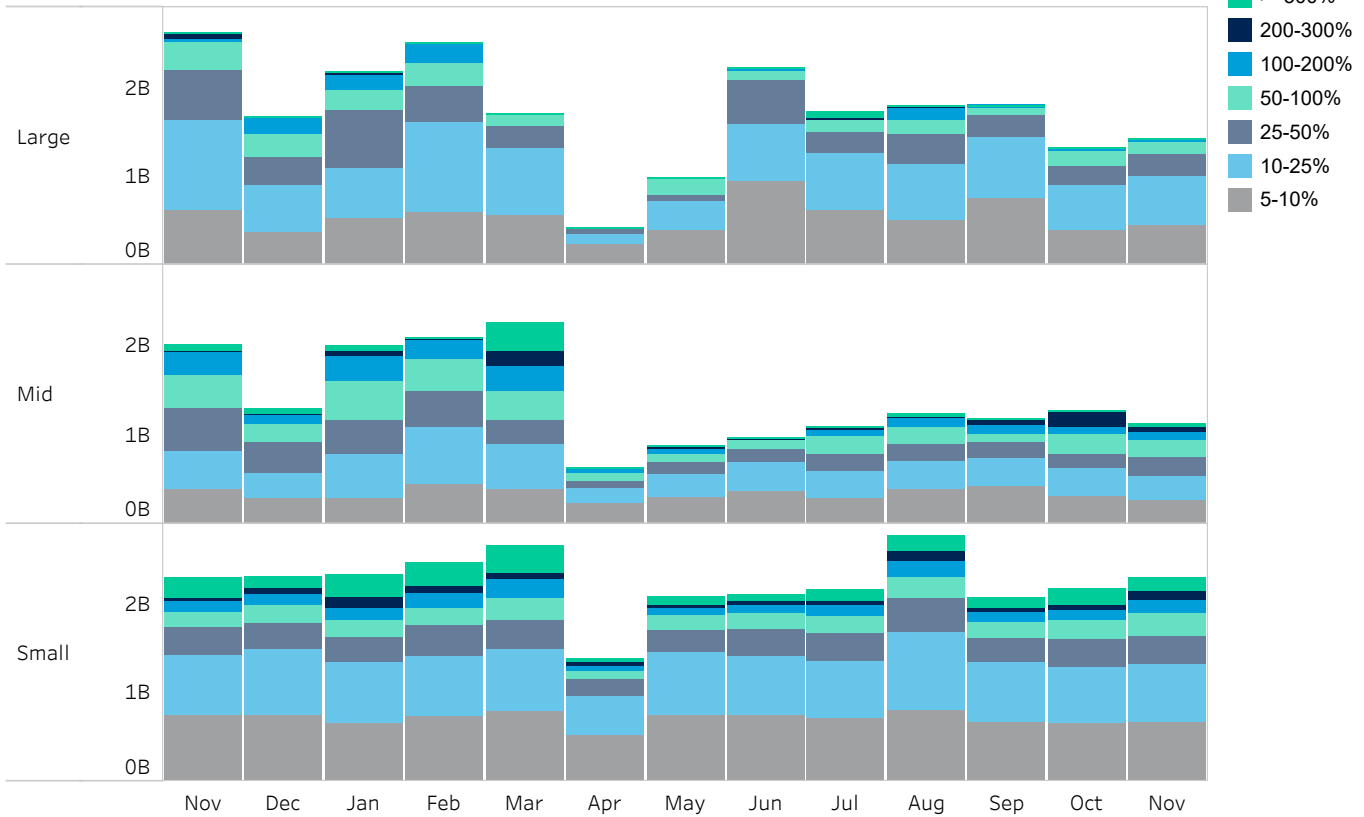
Average Daily Turnover (Notional USD)



Venue Market Share (Notional USD)



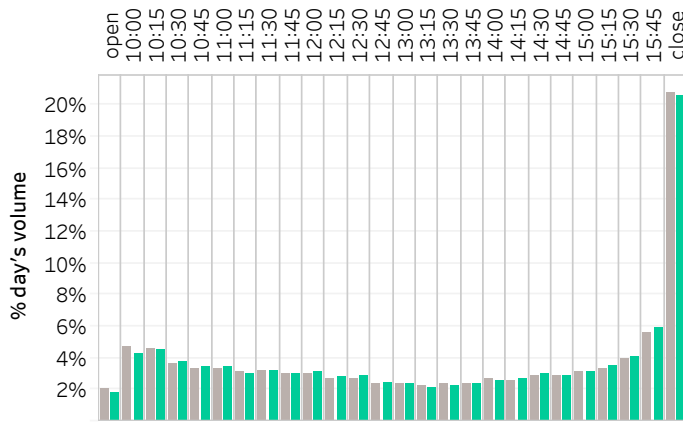
Large Sized Trades (>=5%ADT)



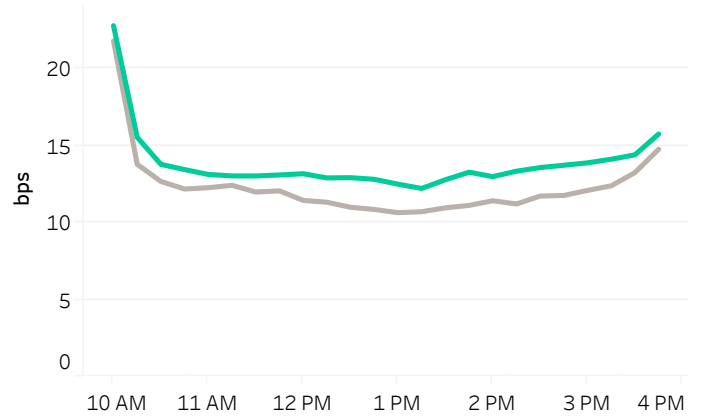
Source data: Virtu Financial

Australia

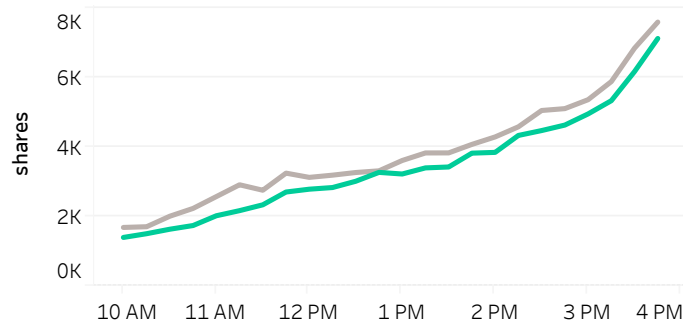
Volume Curve



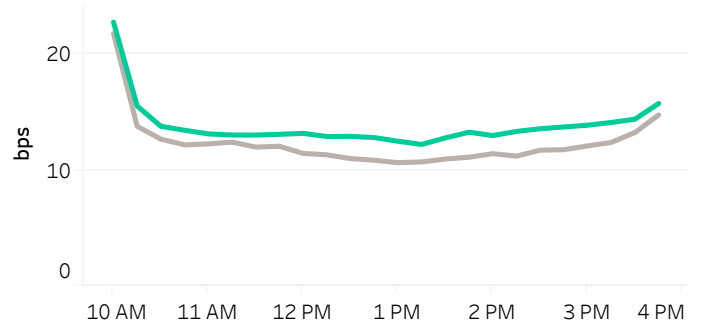
Intraday Spread (bps)



Intraday Quotesize (Shares)



Intraday Volatility (bps)



■ Rolling 12 Months Avg ■ November 2023

Spread Bps

	2023										
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov
FirstHalfHour	15.9	16.8	17.4	17.4	17.0	16.6	16.6	16.6	17.0	18.7	18.1
MidDay	11.1	11.6	12.4	12.1	11.6	11.8	11.3	11.1	12.3	13.1	13.1
LastHalfHour	13.1	13.8	14.3	14.3	13.7	14.0	13.9	14.1	14.7	15.4	15.1

One Minute Volatility Bps

FirstHalfHour	19.1	21.3	21.7	20.6	19.1	18.7	18.0	18.9	17.9	19.4	18.7
MidDay	9.9	10.3	10.7	9.5	9.2	9.8	9.5	9.7	9.6	10.6	10.8
LastHalfHour	12.2	12.5	13.2	12.4	11.9	12.5	11.9	12.4	12.7	13.5	13.3

Quotesize (shares)

FirstHalfHour	1,629	1,640	1,864	2,108	1,897	1,901	1,672	1,703	1,756	1,601	1,443
MidDay	3,279	3,260	3,759	3,968	3,313	3,860	3,520	3,310	3,720	3,289	3,147
LastHalfHour	6,643	7,185	8,215	8,141	7,163	8,042	7,173	7,405	7,388	7,156	6,633

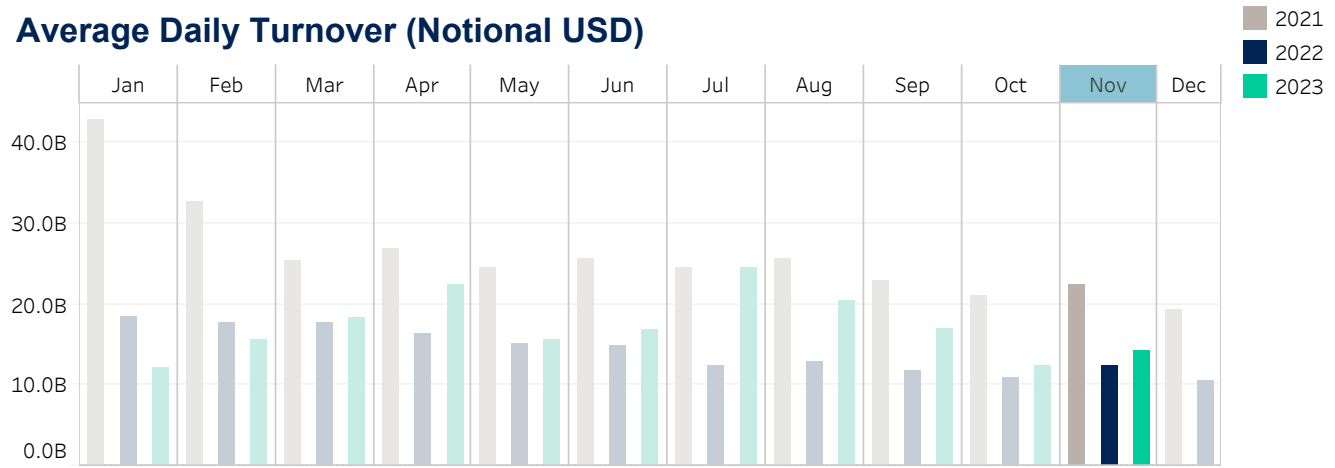
Median used for all metrics

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

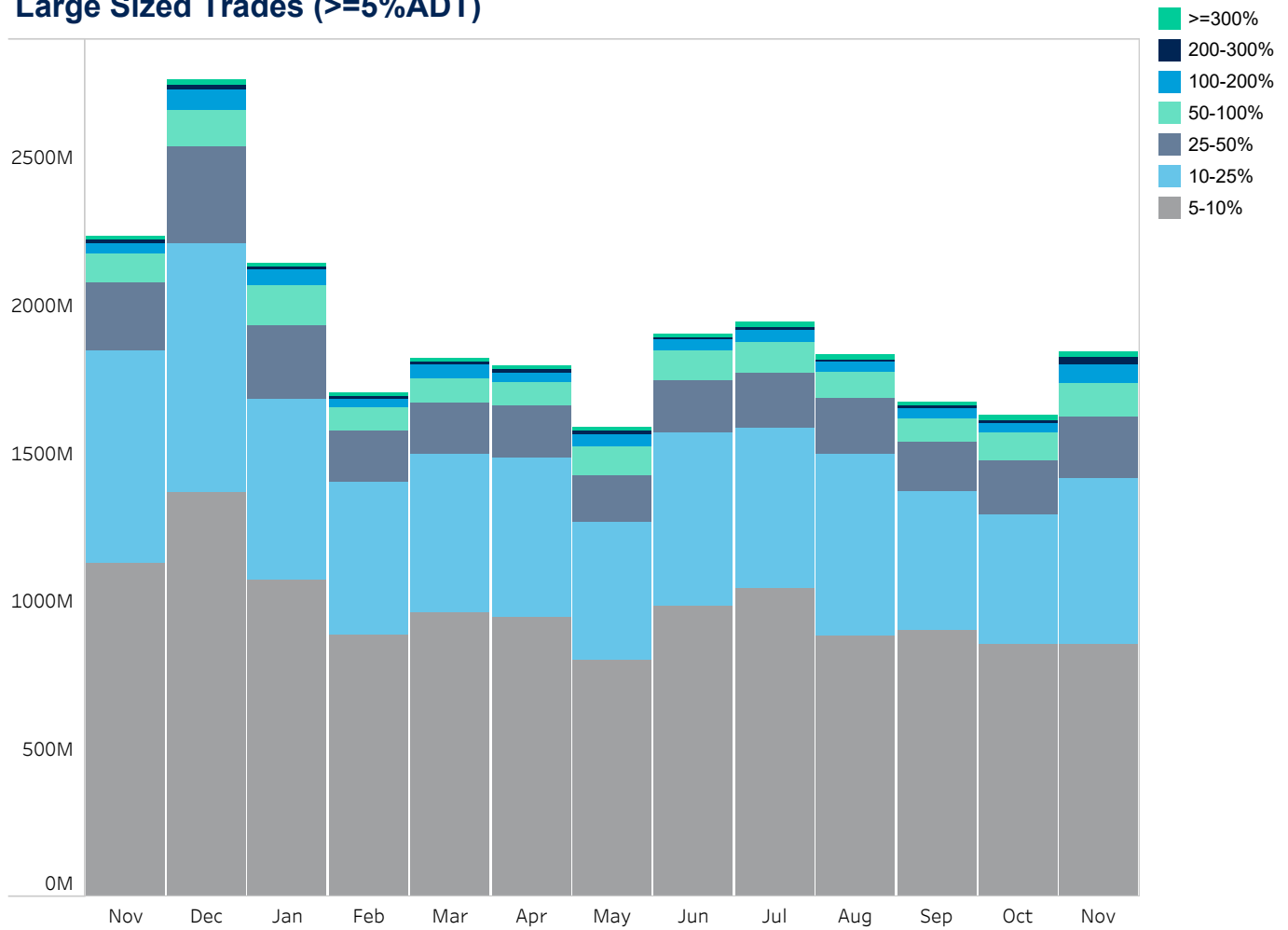
Source data: Virtu Financial

South Korea

Average Daily Turnover (Notional USD)



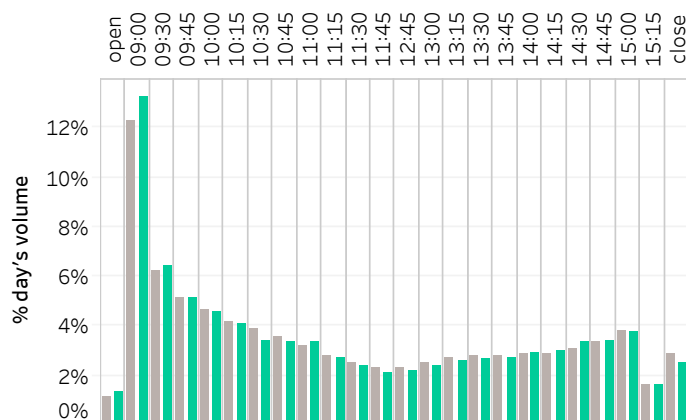
Large Sized Trades (>=5%ADT)



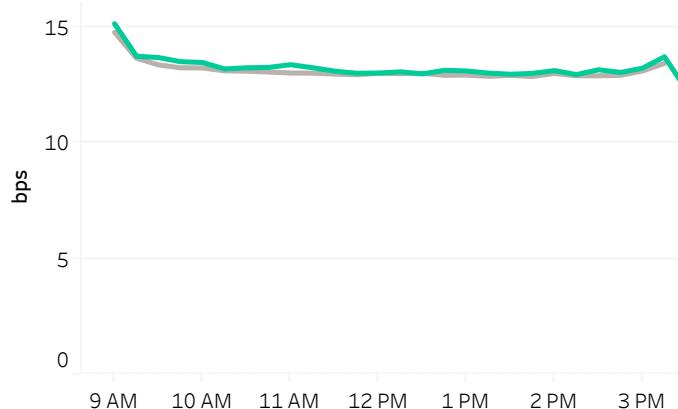
Source data: Virtu Financial

Korea

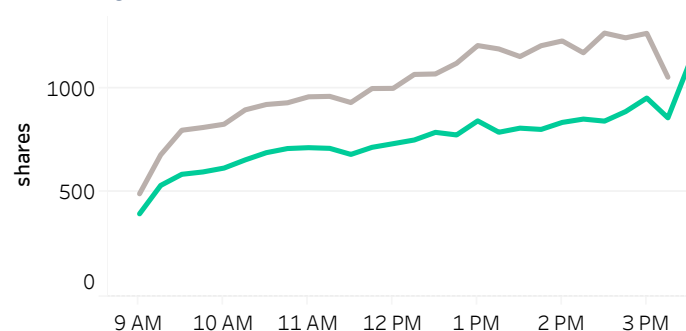
Volume Curve



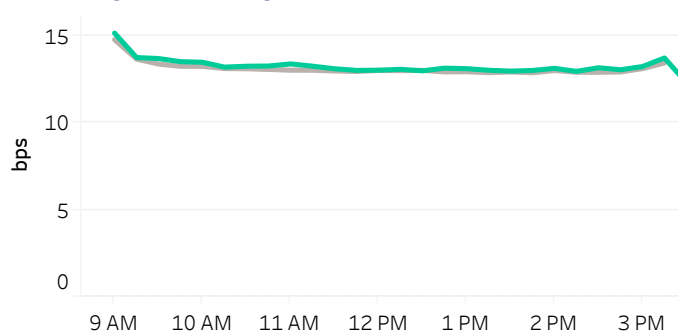
Intraday Spread (bps)



Intraday Quotesize (Shares)



Intraday Volatility (bps)



■ Rolling 12 Months Avg ■ November 2023

Spread Bps

	2023										
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov
FirstHalfHour	17.4	14.7	14.7	14.3	14.0	13.7	14.3	14.2	13.9	14.5	14.5
MidDay	16.5	13.5	13.4	12.9	12.9	12.9	13.2	12.8	12.5	12.8	13.1
LastHalfHour	16.5	13.7	13.5	13.1	13.0	13.0	13.3	12.8	12.6	13.2	13.4

One Minute Volatility Bps

FirstHalfHour	29.4	23.6	24.9	25.6	22.7	21.5	27.1	26.7	23.3	27.5	25.1
MidDay	18.1	14.9	15.0	14.8	14.2	14.0	14.9	14.3	14.0	14.6	15.1
LastHalfHour	18.9	15.6	16.0	15.9	14.9	14.8	16.2	15.2	15.3	16.1	14.9

Quotesize (shares)

FirstHalfHour	727	655	595	579	580	634	563	491	491	444	458
MidDay	1,396	1,188	1,025	1,014	1,166	1,249	1,024	875	923	808	760
LastHalfHour	1,506	1,447	1,390	1,189	1,277	1,444	1,164	1,108	1,066	912	921

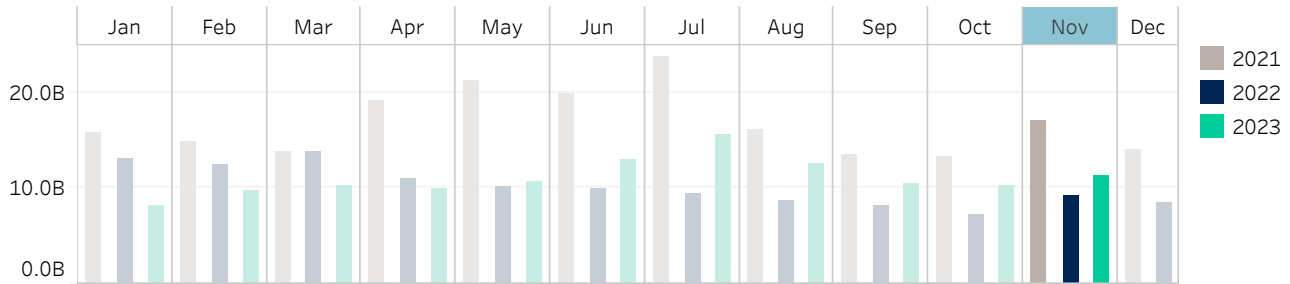
Median used for all metrics

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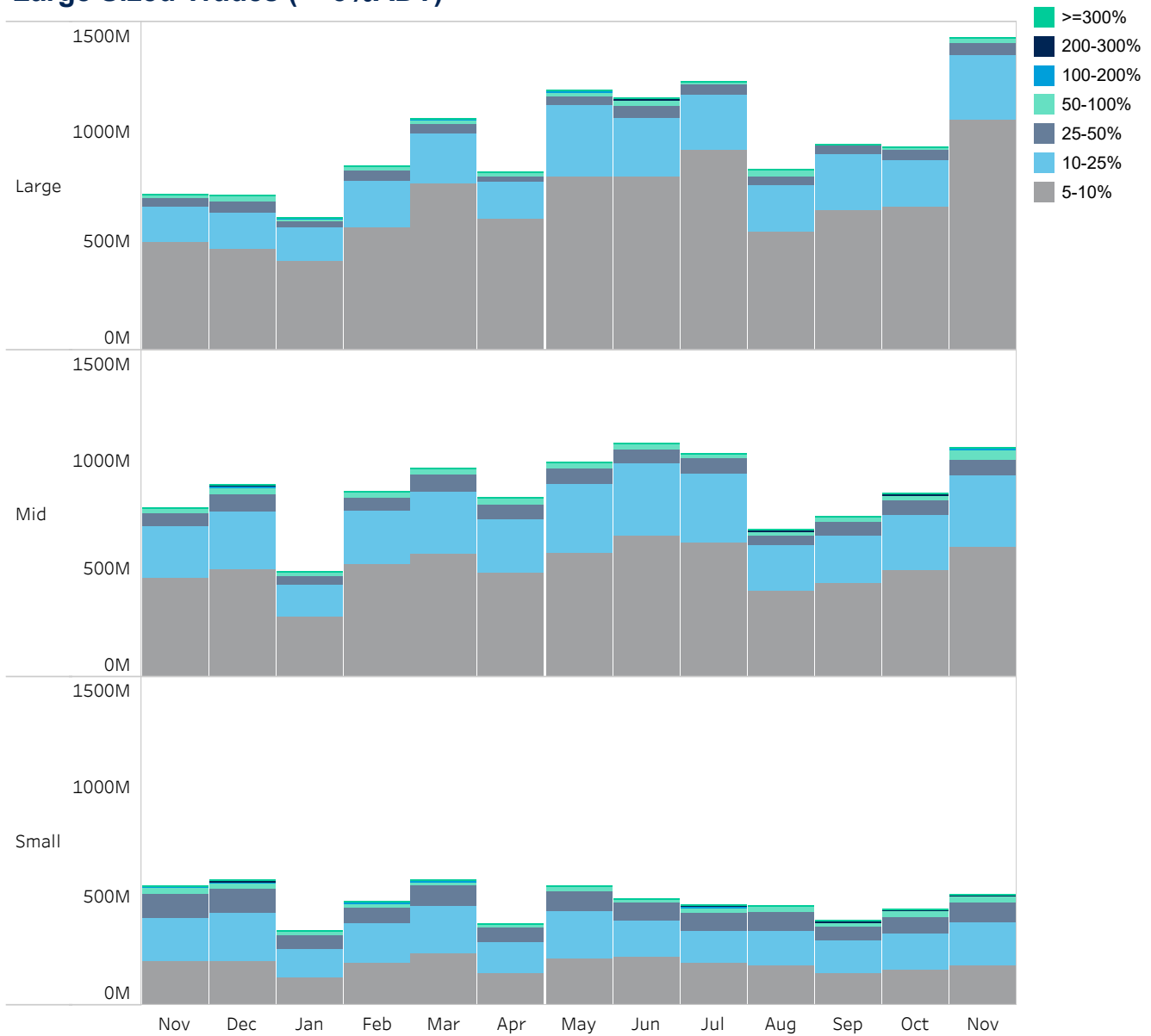
Source data: Virtu Financial

Taiwan

Average Daily Turnover (Notional USD)



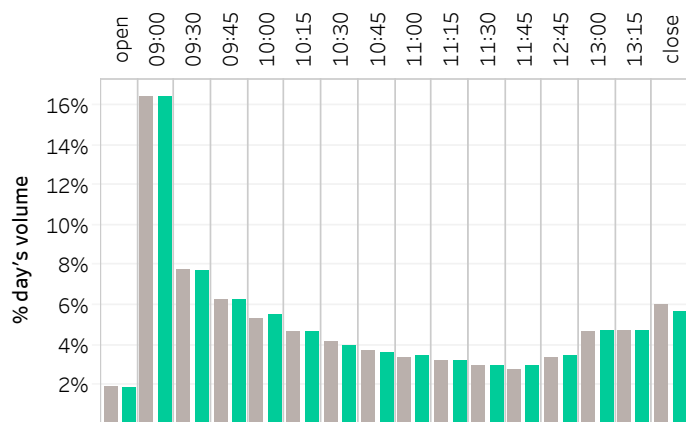
Large Sized Trades (>=5%ADT)



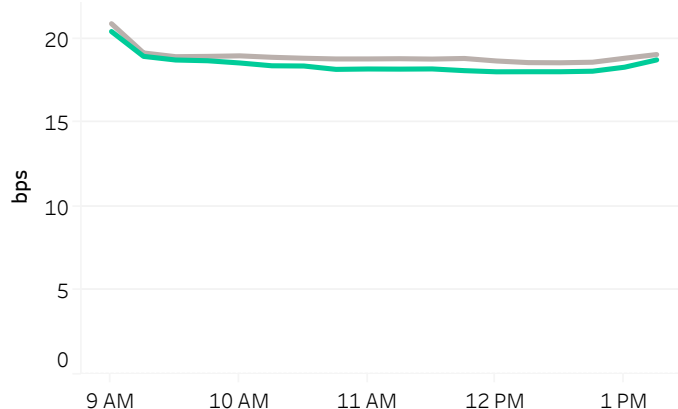
Source data: Virtu Financial

Taiwan

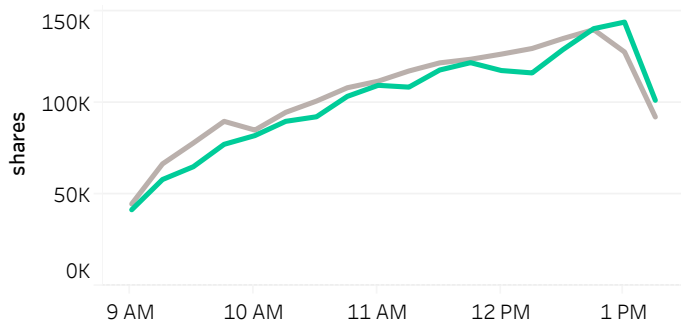
Volume Curve



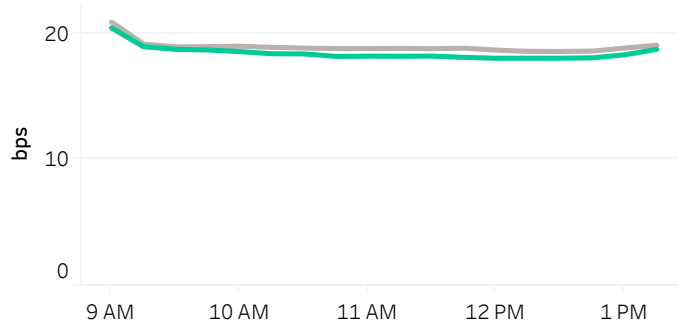
Intraday Spread (bps)



Intraday Quotesize (Shares)



Intraday Volatility (bps)



Rolling 12 Months Avg (Grey line) November 2023 (Green line)

Spread Bps

	2023										
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov
FirstHalfHour	20.2	20.6	20.1	19.9	19.8	19.3	19.6	20.5	19.9	20.3	19.6
MidDay	18.5	18.9	19.0	18.9	18.2	17.8	18.0	18.8	18.8	19.0	18.2
LastHalfHour	18.7	18.9	19.1	19.0	18.3	18.1	18.3	18.8	19.0	19.1	18.6

One Minute Volatility Bps

FirstHalfHour	31.1	31.3	31.6	30.3	31.3	31.2	34.5	37.1	32.6	33.3	29.9
MidDay	28.9	28.9	29.1	28.8	28.1	28.4	31.5	36.4	29.8	31.1	26.4
LastHalfHour	29.0	28.9	29.6	29.2	28.3	28.9	32.6	34.4	29.9	31.5	27.6

Quotesize (shares)

FirstHalfHour	59,008	57,971	61,802	53,240	60,150	57,819	51,257	44,628	44,984	46,915	50,161
MidDay	118,834	117,559	138,448	125,681	133,760	139,513	105,466	95,368	103,352	109,280	111,917
LastHalfHour	113,870	116,979	124,571	121,314	127,420	122,742	102,051	100,542	105,527	109,997	124,934

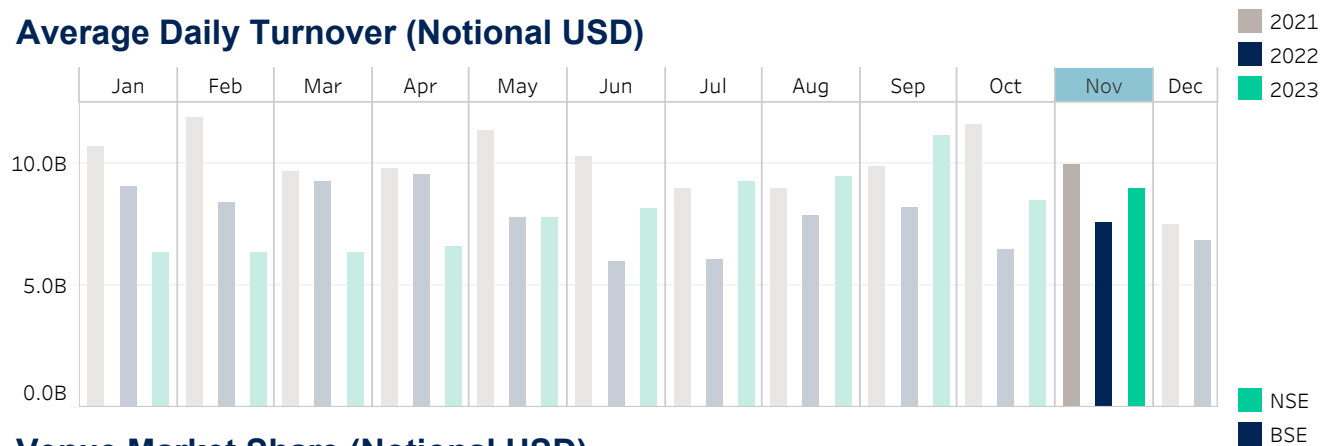
Median used for all metrics

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

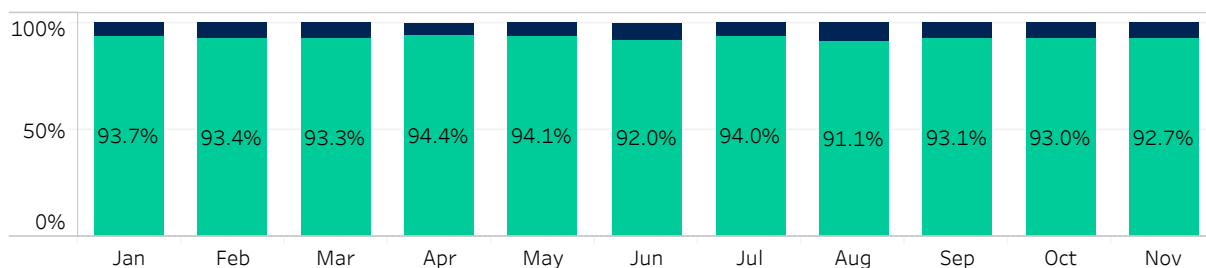
Source data: Virtu Financial

India

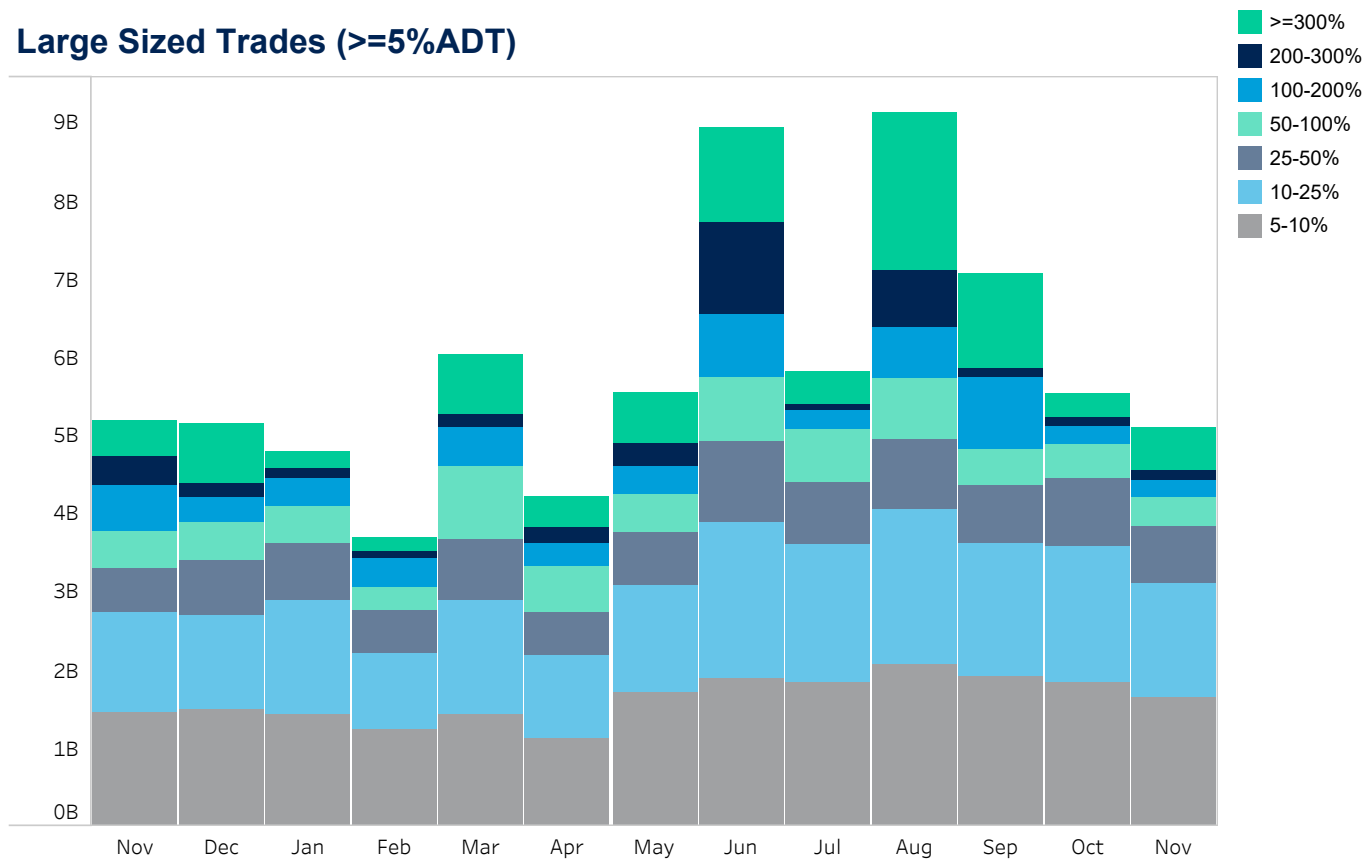
Average Daily Turnover (Notional USD)



Venue Market Share (Notional USD)



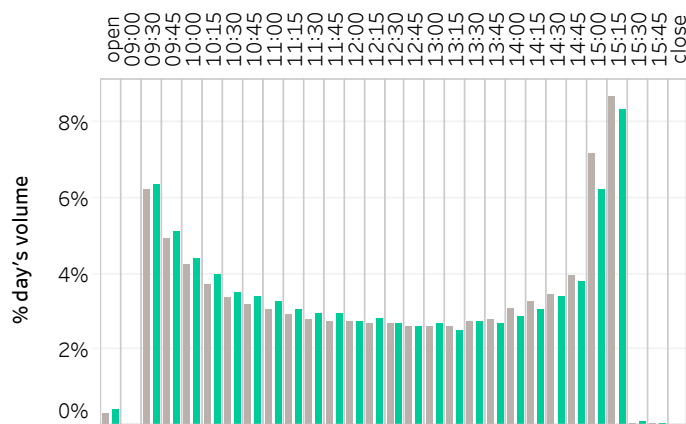
Large Sized Trades (>=5%ADT)



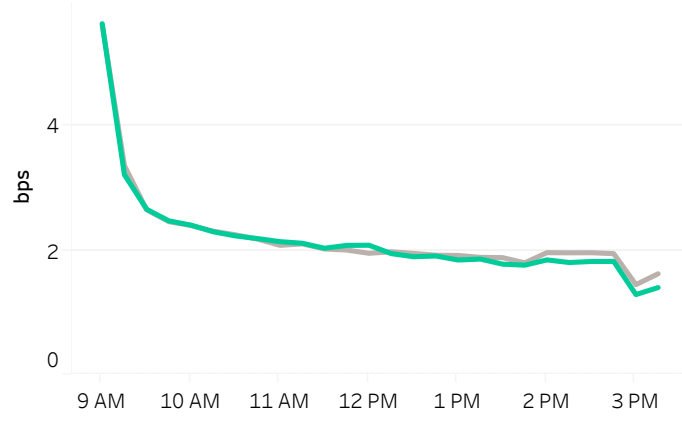
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India

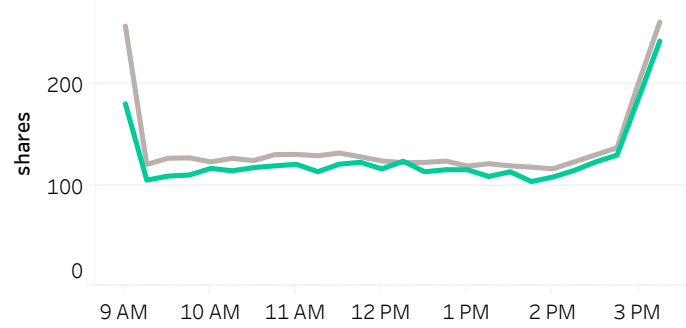
Volume Curve



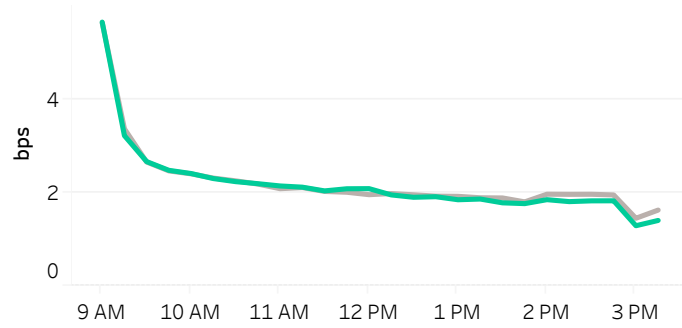
Intraday Spread (bps)



Intraday Quotesize (Shares)



Intraday Volatility (bps)



■ Rolling 12 Months Avg ■ November 2023

Spread Bps

	2023										
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov
FirstHalfHour	3.5	3.7	3.4	3.4	3.3	3.1	3.5	3.5	3.5	3.4	3.2
MidDay	2.1	2.2	2.1	2.1	2.0	1.9	1.9	1.9	2.0	1.8	2.0
LastHalfHour	1.7	1.8	1.7	1.7	1.6	1.5	1.5	1.5	1.4	1.4	1.4

One Minute Volatility Bps

FirstHalfHour	17.6	16.2	16.3	18.8	19.7	19.1	17.2	16.6	15.2	17.3	14.7
MidDay	7.7	7.4	7.6	8.2	8.4	8.2	7.1	7.0	6.8	7.6	7.1
LastHalfHour	9.9	9.6	9.6	10.1	10.3	10.5	9.1	9.2	9.1	9.5	8.7

Quotesize (shares)

FirstHalfHour	121.8	119.8	123.5	133.9	142.2	143.1	131.7	114.8	117.2	112.5	108.1
MidDay	128.7	124.1	124.2	143.1	151.0	151.7	124.1	118.6	120.7	108.5	116.7
LastHalfHour	228.8	249.5	253.0	256.4	262.0	268.0	231.3	206.0	230.8	197.4	229.1

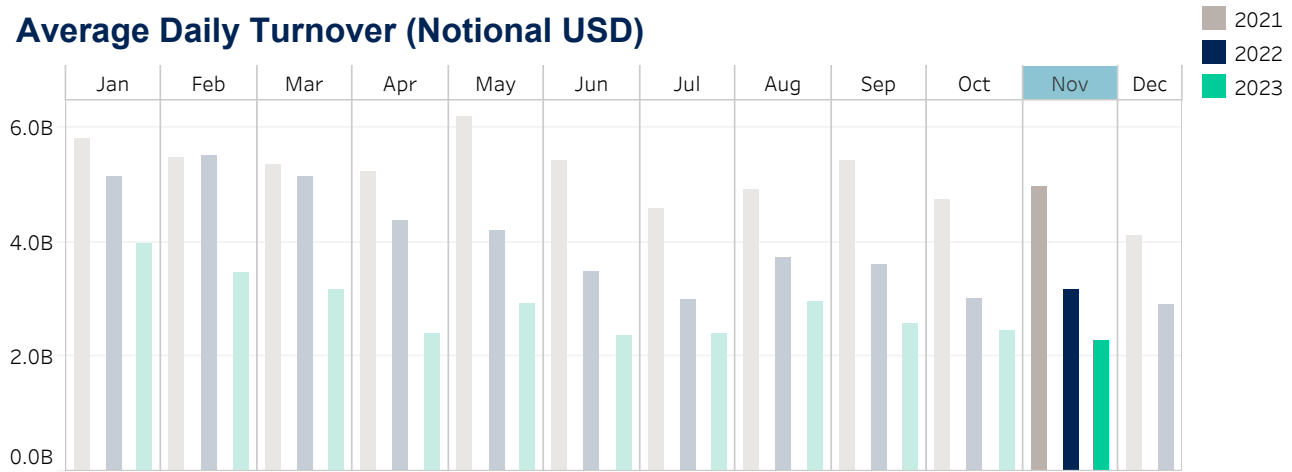
Median used for all metrics

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

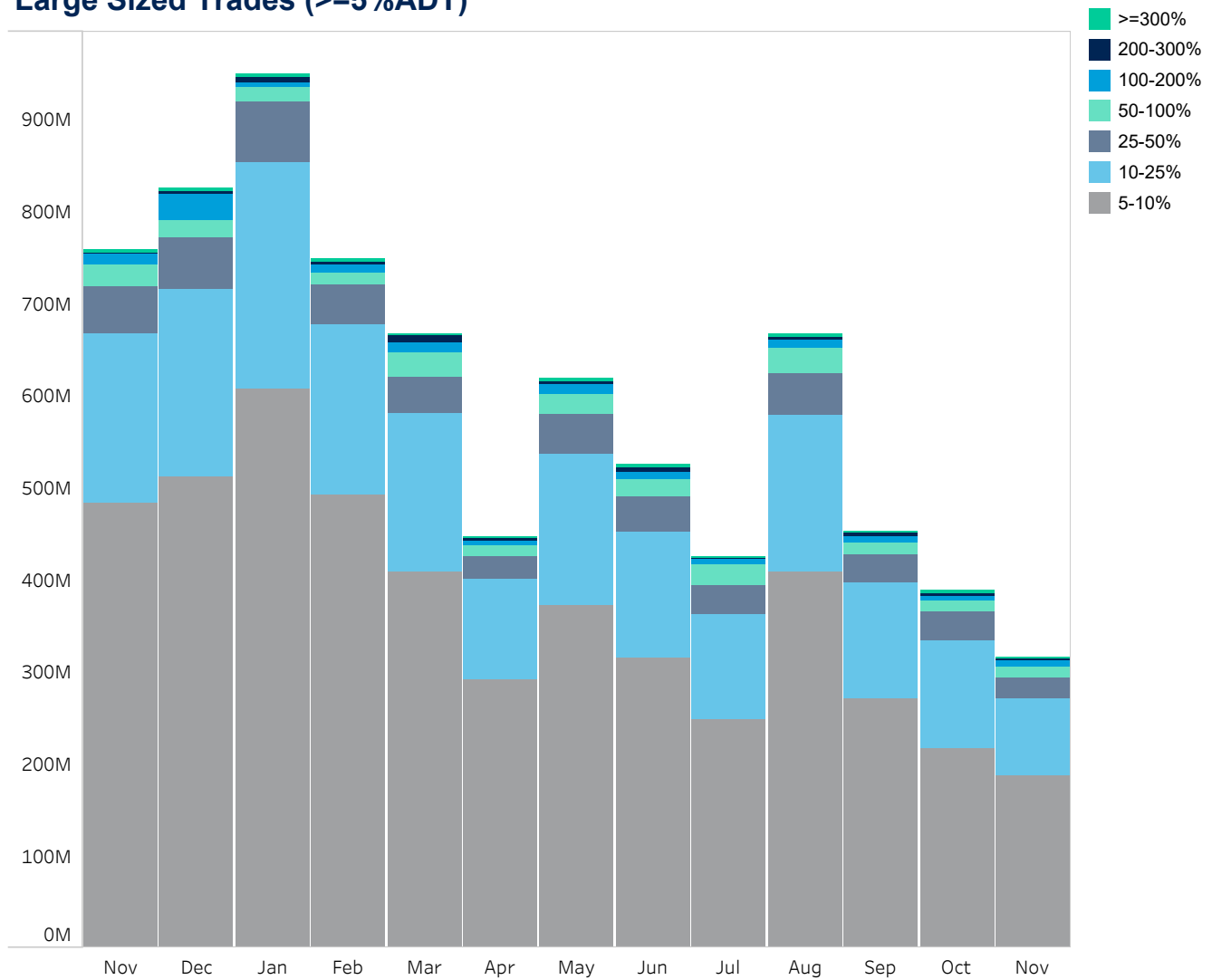
Source data: Virtu Financial

Thailand

Average Daily Turnover (Notional USD)



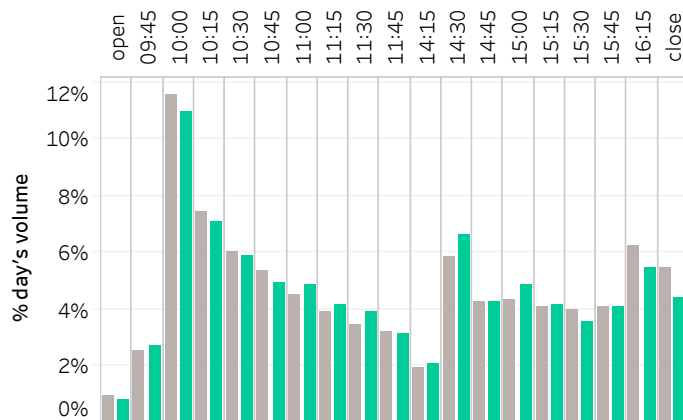
Large Sized Trades (>=5%ADT)



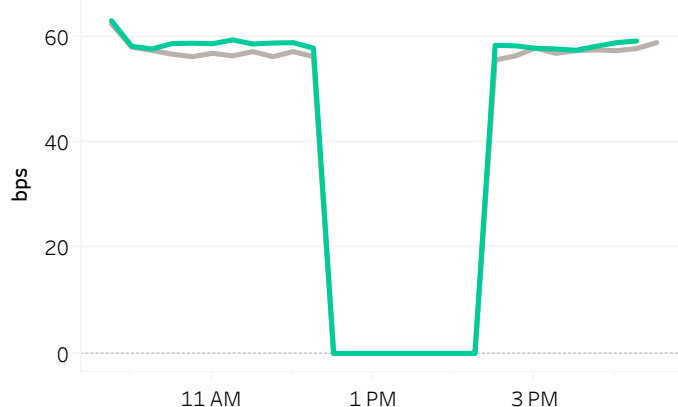
Source data: Virtu Financial

Thailand

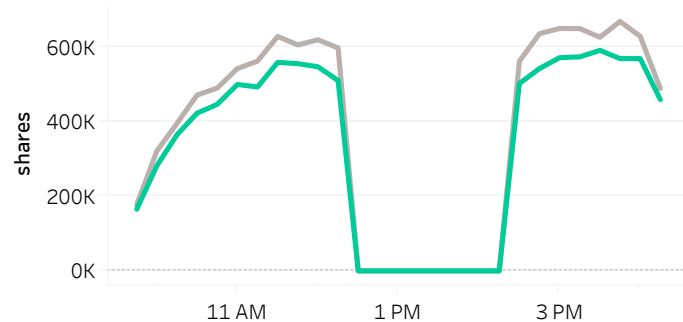
Volume Curve



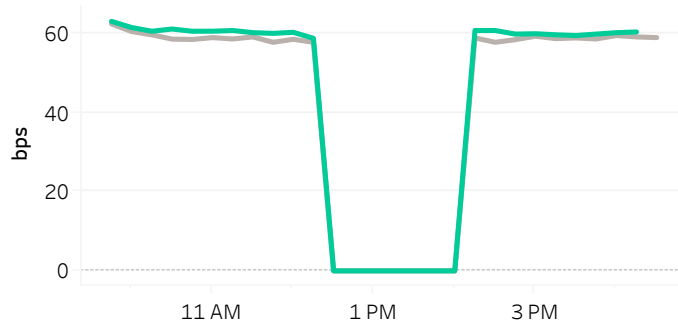
Intraday Spread (bps)



Intraday Quotesize (Shares)



Intraday Volatility (bps)



■ Rolling 12 Months Avg ■ November 2023

Spread Bps

	2023										
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov
FirstHalfHour	58.0	56.4	59.5	59.2	65.1	65.6	61.9	62.3	61.9	64.3	62.7
MidDay	54.1	54.1	56.0	55.8	58.4	59.3	56.7	56.3	58.7	59.3	58.3
LastHalfHour	54.2	54.8	56.7	56.0	58.7	59.3	58.0	57.0	59.0	59.3	59.0

One Minute Volatility Bps

FirstHalfHour	64.3	61.9	67.8	60.8	63.9	63.5	60.4	61.7	61.2	64.3	63.5
MidDay	55.4	55.4	57.6	57.0	60.4	60.8	58.7	58.3	60.1	60.4	60.4
LastHalfHour	56.0	56.0	58.3	57.6	60.1	60.8	59.0	58.7	59.0	60.8	60.4

Quotesize (shares)

FirstHalfHour	284,548	236,082	219,491	200,957	156,753	157,282	170,264	205,336	202,658	146,123	160,913
MidDay	865,107	737,967	634,271	624,930	536,008	510,989	542,854	699,283	749,767	485,941	528,048
LastHalfHour	812,231	679,491	552,716	570,432	472,021	490,710	518,167	619,275	626,196	465,624	501,806

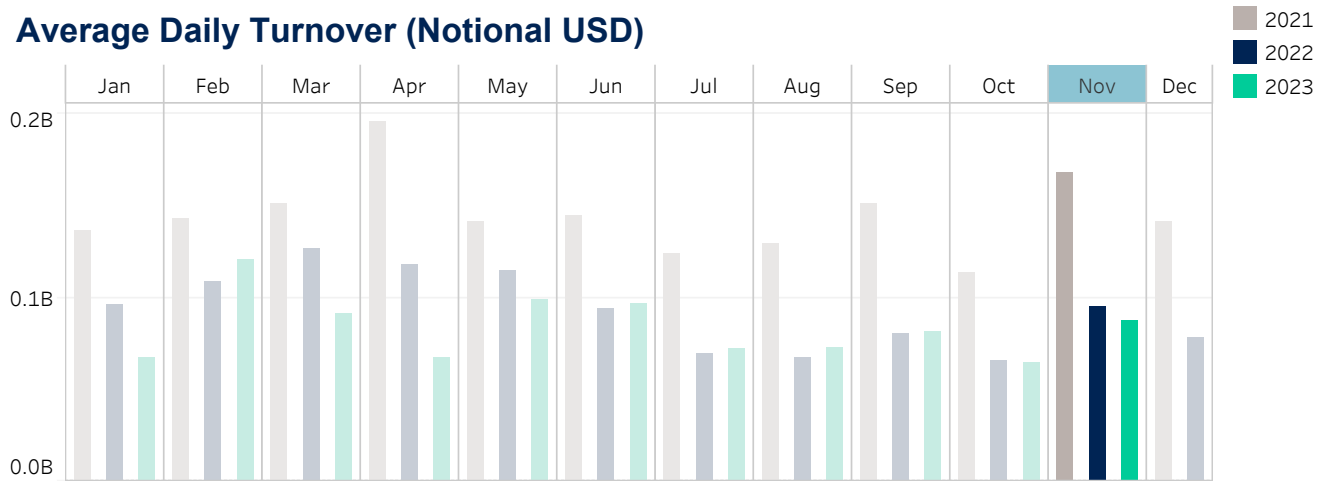
Median used for all metrics

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

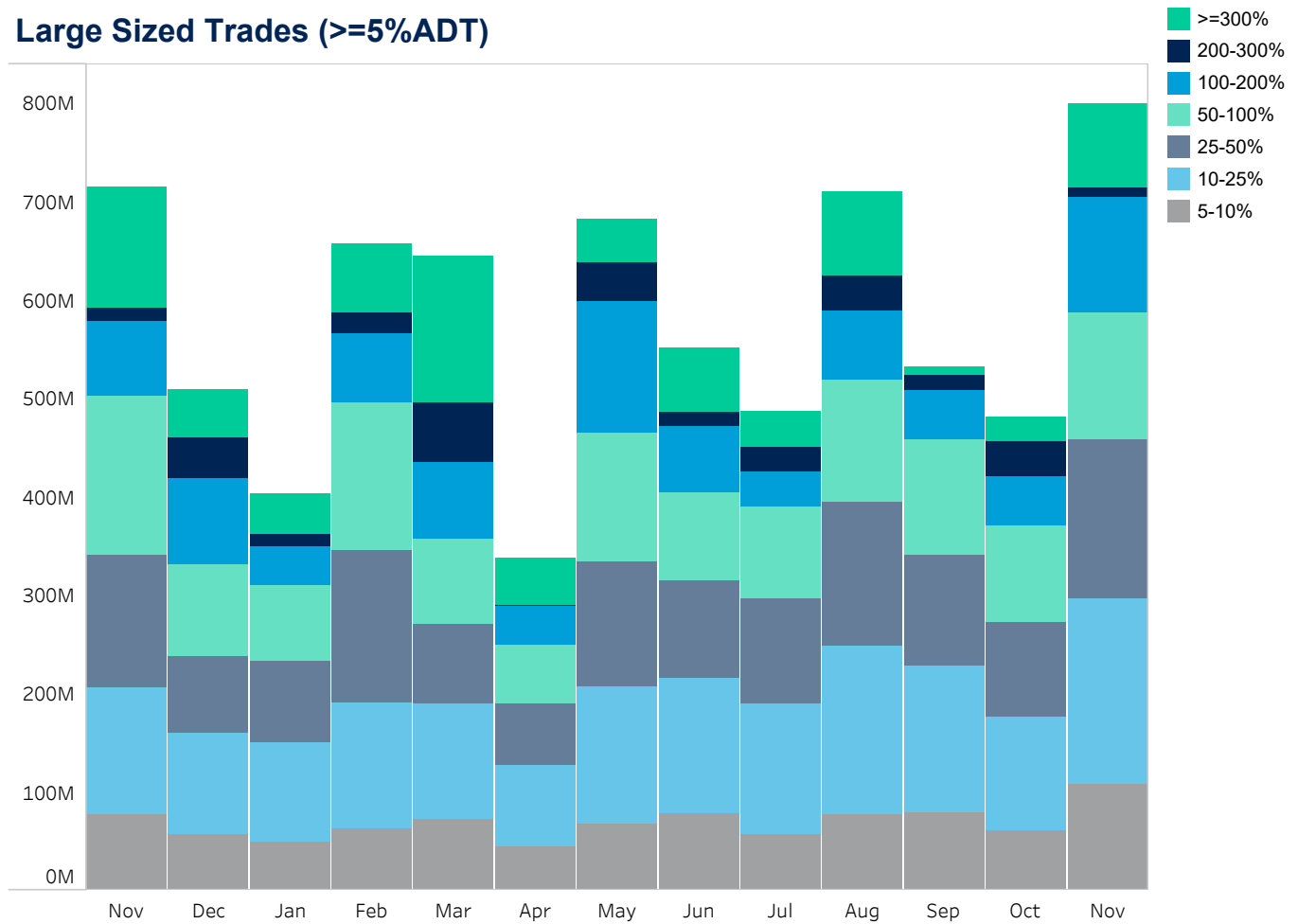
Source data: Virtu Financial

New Zealand

Average Daily Turnover (Notional USD)



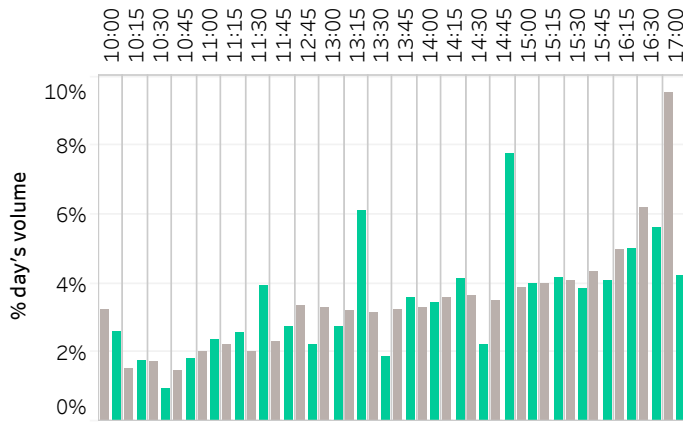
Large Sized Trades (>=5%ADT)



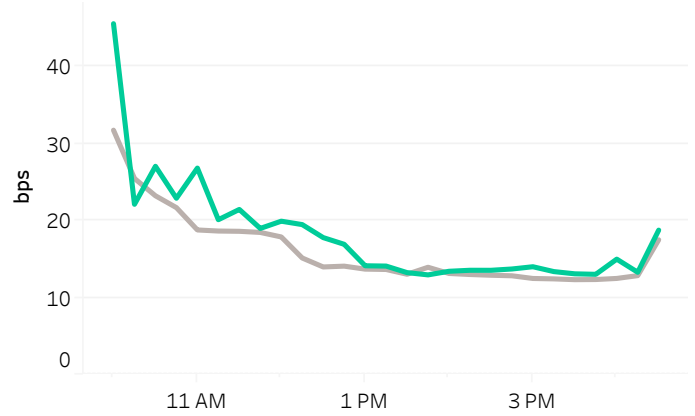
Source data: Virtu Financial

New Zealand

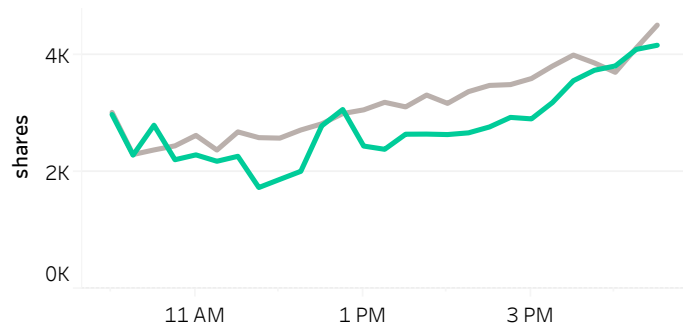
Volume Curve



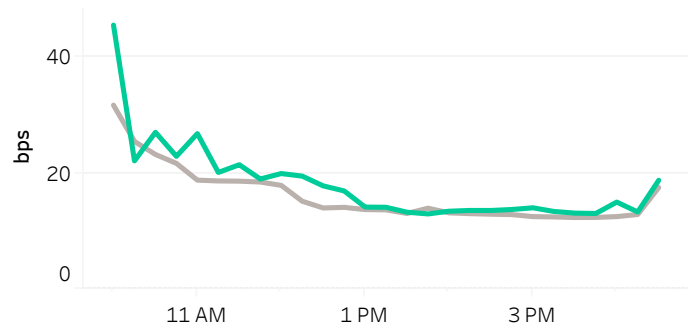
Intraday Spread (bps)



Intraday Quotesize (Shares)



Intraday Volatility (bps)



■ Rolling 12 Months Avg ■ November 2023

Spread Bps

	2023										
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov
FirstHalfHour	28.6	36.2	32.4	23.3	33.5	23.1	27.3	26.0	30.3	28.2	28.9
MidDay	13.0	14.2	13.5	13.8	13.7	13.3	13.5	14.5	12.4	14.7	14.3
LastHalfHour	17.6	19.1	17.5	18.4	17.4	17.7	17.9	18.0	16.3	19.7	18.1

One Minute Volatility Bps

FirstHalfHour	19.2	20.9	23.1	19.0	18.6	15.9	18.4	19.0	20.9	23.1	19.9
MidDay	12.9	15.1	13.8	15.2	13.3	13.3	12.8	13.7	12.5	15.0	14.6
LastHalfHour	18.7	23.1	19.7	19.0	18.2	18.5	18.3	18.4	19.4	20.8	19.6

Quotesize (shares)

FirstHalfHour	2,352	2,572	2,470	2,669	2,496	2,658	2,980	2,981	2,681	3,043	2,397
LastHalfHour	5,554	6,137	4,537	5,071	4,691	5,091	4,326	4,567	3,988	4,171	4,335
MidDay	2,964	3,634	3,092	3,102	3,512	3,372	3,016	3,363	3,098	3,456	2,624

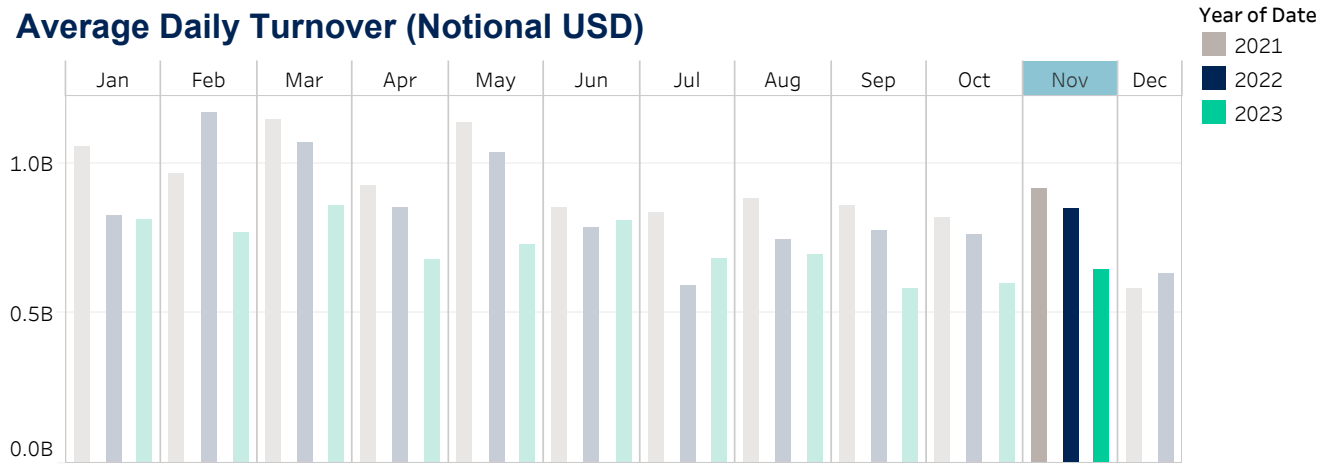
Median used for all metrics

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

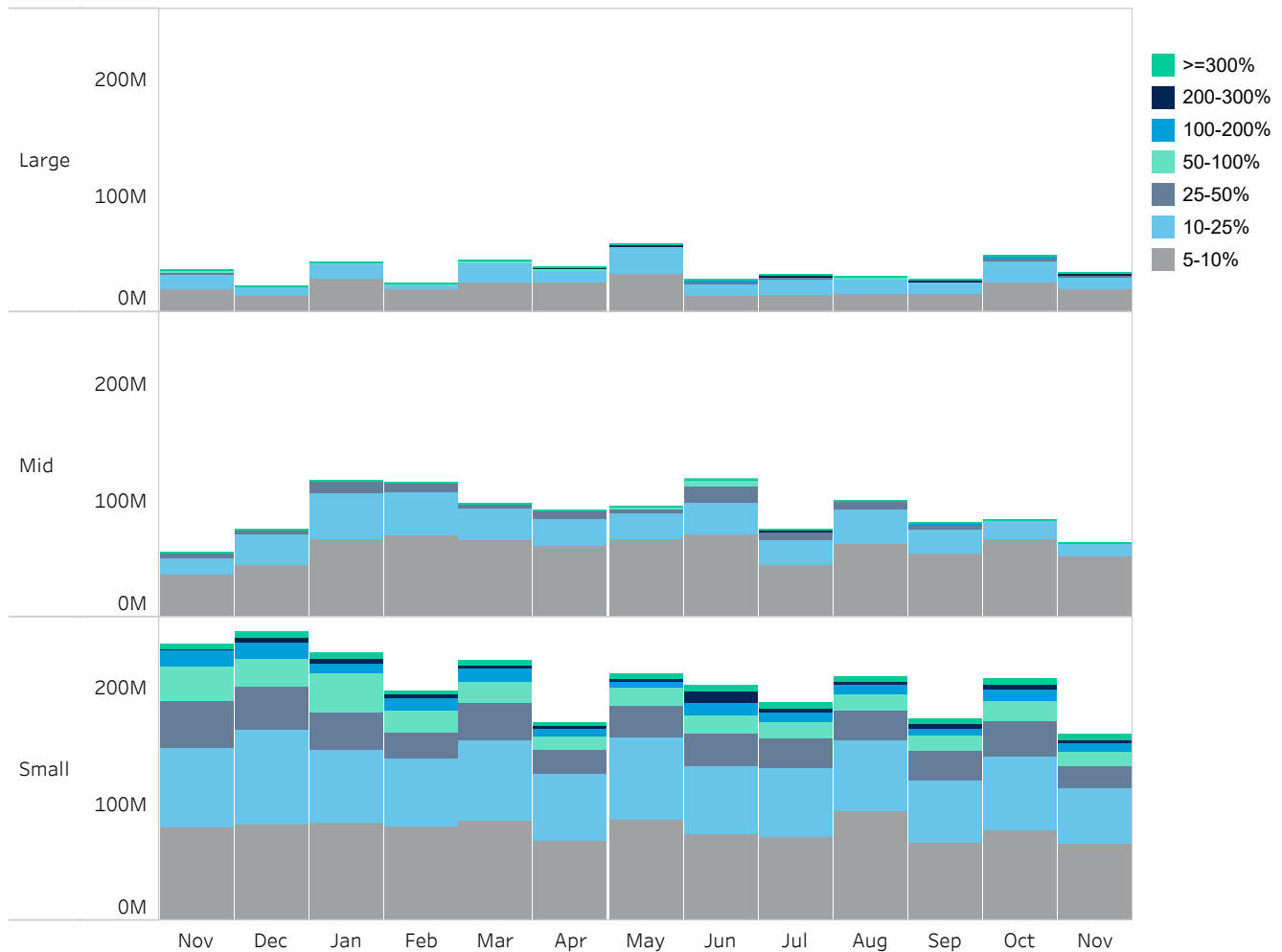
Source data: Virtu Financial

Singapore

Average Daily Turnover (Notional USD)



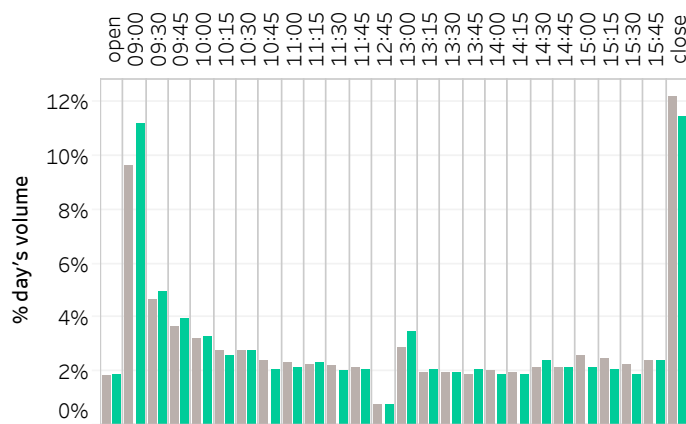
Large Sized Trades (>=5%ADT)



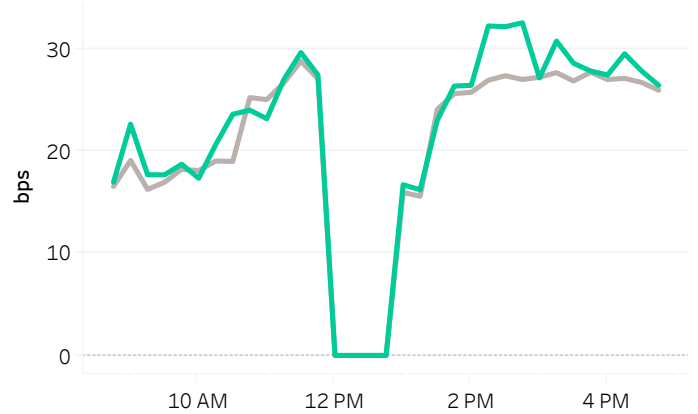
Source data: Virtu Financial

Singapore

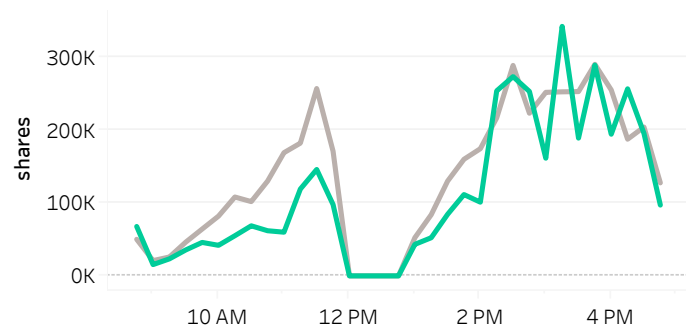
Volume Curve



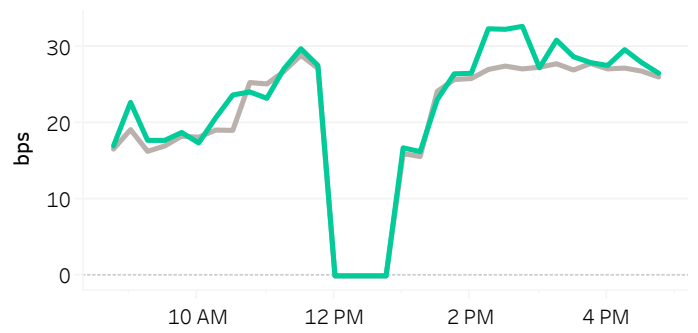
Intraday Spread (bps)



Intraday Quotesize (Shares)



Intraday Volatility (bps)



■ Rolling 12 Months Avg ■ November 2023

Spread Bps

	2023										
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov
FirstHalfHour	19.8	14.5	16.6	14.2	16.4	16.6	14.6	19.1	16.2	15.8	16.8
MidDay	24.3	25.0	27.2	27.0	27.0	24.5	17.5	27.1	26.7	28.5	26.5
LastHalfHour	24.2	25.1	25.3	26.8	26.3	25.8	26.4	26.3	26.9	29.5	27.1

One Minute Volatility Bps

FirstHalfHour	37.7	43.5	34.5	34.4	35.7	41.7	41.7	51.4	31.3	50.6	52.8
MidDay	25.2	25.4	28.4	27.6	27.5	26.9	26.3	27.6	27.0	31.3	27.3
LastHalfHour	24.8	25.5	27.6	27.1	26.8	27.4	27.1	28.0	27.4	32.6	27.9

Quotesize (shares)

FirstHalfHour	55,481	49,035	126,098	48,869	57,725	86,605	39,923	30,361	36,050	50,518	72,786
MidDay	140,704	159,315	169,961	327,685	231,700	112,054	126,638	232,427	176,852	239,708	89,777
LastHalfHour	109,921	138,744	141,752	256,196	170,897	139,765	143,803	181,844	179,377	226,408	119,166

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

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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