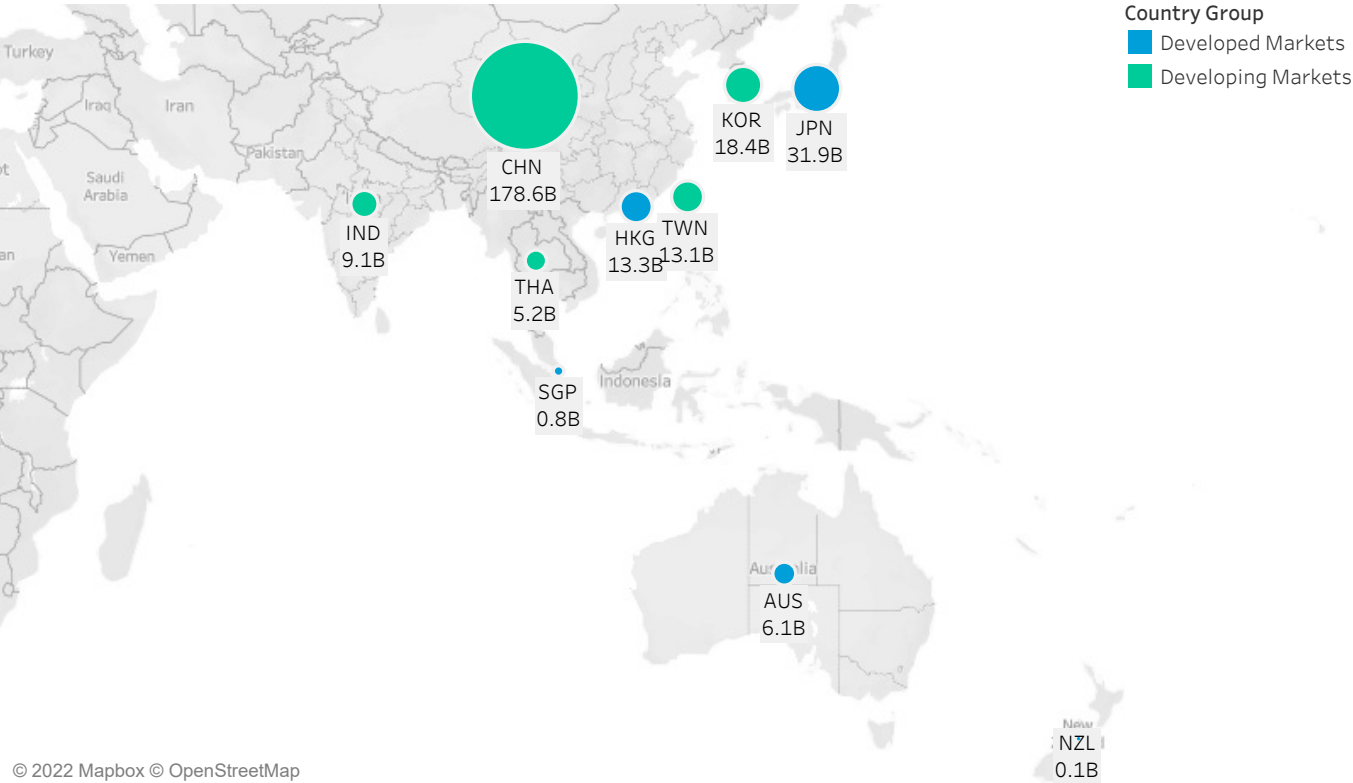


January 2022 APAC Market Structure Monthly

Average Daily Turnover (Notional USD)



© 2022 Mapbox © OpenStreetMap

Country Breakdowns

Hong Kong

China

Japan

Australia

South Korea

Taiwan

India

Thailand

New Zealand

Singapore

January 2022

AP Market Structure Monthly

MICROSTRUCTURE OBSERVATIONS

- Overall regional trading across most countries in our universe recorded higher turnover MoM. Australia had the greatest turnover MoM increases at 39% and 33% respectively. Exception to this was China, South Korea and Taiwan.
- In Australia, intraday turnover remained skewed towards the EoD with 24% of daily turnover completed in the close auction. This figure is up 7% from the 12-month rolling average and 3% from December. In Japan, however, intraday turnover was weighted more towards first half of day as the close auction saw 10% of the day's volume completed, down 4% from 12-month rolling average.
- Intraday spreads and volatility were generally consistent MoM.

AP MARKET STRUCTURE NEWS

Chi-X Australia Rebranding to Cboe Australia

Cboe Global Markets, Inc (Cboe) announced that on 1 February 2022, as part of its post-acquisition integration efforts, Chi-X Australia would be rebranded as Cboe Australia. The change will affect the company website, email addresses and logo but will have no impact on the structure, activities, technology or operation of the Chi-X now Cboe Australia marketplace.

<https://www.cboe.com.au/wp-content/uploads/2022/01/Market-Operations-Notice-0001-22.pdf>

Tokyo Stock Exchange Listed Companies' Market Segment Selection Results

On 11 January 2022, the Tokyo Stock Exchange (TSE) published its listed companies' market segment selection results. On 4 April 2022, the TSE will transform into three distinct markets: Prime Market, Standard Market, and Growth Market. In advance of the transition, listed companies were asked to select the most appropriate market segment to enhance their corporate value: Prime Market for listed companies leading the global economy, Standard Market for listed companies playing a central role in the Japanese economy, and Growth Market for listed companies taking on new challenges.

https://www.jpix.co.jp/english/corporate/news/news-releases/0060/b5b4pj000004npj5-att/20220111_PR_Sentakukokka_E.pdf

<https://www.jpix.co.jp/english/equities/market-restructure/results/index.html>

China to Launch Market Making on Shanghai Stock Exchange's Science and Technology Innovation Board

On 7 January 2022, China Securities Regulatory Commission (CSRC) announced that it would pilot market making on Shanghai Stock Exchange's (SSE) Science and Technology Innovation Board (STAR Board) in a bid to improve liquidity.

Qualified brokerages (minimum of RMB10B (US\$1.57B) net capital along with a series of risk management criteria) are invited to apply as market makers. CSRC also published corresponding draft rules on market making, in which brokerages can actively quote in a security, providing liquidity and depth to markets, while potentially making a profit off the bid-ask spread. According to the draft rules,

market makers can trade using their own shares, as well as borrowed shares. The CSRC said that regulators will closely monitor risk in market making businesses and their effect on market volatility.

<https://www.reuters.com/world/china/china-launch-market-making-star-market-2022-01-07/>

<http://www.csrc.gov.cn/csrc/c100028/c1718988/content.shtml> (Chinese)

<http://www.csrc.gov.cn/csrc/c101981/c1718748/content.shtml> (Chinese)

Hong Kong Exchanges and Clearing Limited Publishes Trading Arrangements for Special Purpose Acquisition Companies, Introduces SPAC Shares and SPAC Warrants

On 14 January 2022, Hong Kong Exchanges and Clearing Limited (HKEX) published its circular on trading related arrangements relating to newly introduced special purpose acquisition companies (SPAC) Shares and SPAC Warrants. The circular also lists the requirements for investor suitability—subscription is limited to only registered SPAC Exchange Participants (SPAC EPs), inclusion under volatility control mechanism (VCM) and offers an optional participant readiness testing session (8-18 February) and practice session (19 February).

For your reference, [HKEX announced the new listing regime for SPAC](#), which took effect on 1 January 2022.

<https://www.hkex.com.hk/-/media/HKEX-Market/Services/Circulars-and-Notices/Participant-and-Members-Circulars/SEHK/2022/CT00322E.pdf>

Singapore Exchange Launches Its First Batch of Special Purpose Acquisition Company Listings

On 20 January 2022, Singapore Exchange (SGX) launched its first SPAC listing for a Singapore-based global venture capital platform—the first among a batch of SPAC listings—and only four months after SGX allowed SPACs to list.

Southeast Asia is experiencing a boom in start-up funding as investors bet on post-pandemic technology plays. Though considered one of Asia's leading financial and business hubs, Singapore has not captured big IPOs and likely fueling SGX's optimism for SPAC listings which it views as complementary to the traditional IPO route. Additionally, SGX's regulatory framework—similar to that of the US—includes retail investor participation—whereas Hong Kong, home to large Chinese SPAC listings, bars retail investors.

<https://www.reuters.com/markets/europe/singapore-makes-bold-foray-into-spac-market-temasek-backed-firm-lists-thursday-2022-01-19/>

<https://www.sgx.com/media-centre/20220120-sgx-welcomes-vertex-technology-acquisition-corporation-ltd-mainboard>

<https://www.sgx.com/media-centre/20220121-sgx-welcomes-pegasus-asia-mainboard>

<https://www.sgx.com/media-centre/20210902-sgx-introduces-spac-listing-framework>

Hong Kong Exchanges and Clearing Limited Finalizes Operational Model for Derivatives Holiday Trading

On 6 January 2022, off the back of strong market support, HKEX announced that it had finalized the operational model for non-Hong Kong Dollar (HKD) denominated futures and options trading and clearing services on Hong Kong public holidays Derivatives Holiday Trading.

Considered a major development for Hong Kong—the region's international risk and derivatives trading center—the Derivatives Holiday Trading will enable international investors to trade non-HKD denominated futures and options products on Hong Kong public holidays, when the markets of their underlying securities may be open.

HKEX plans to add non-HKD denominated futures and options to Derivatives Holiday Trading in batches, with the first batch being all MSCI futures and options contracts. HKEX will a hold market readiness test in late February 2022 ahead of the launch of Derivatives Holiday Trading in April to cover Easter holidays, subject to market readiness and regulatory approval.

https://www.hkex.com.hk/News/Market-Communications/2022/220106news?sc_lang=en

https://www.hkex.com.hk/-/media/HKEX-Market/Services/Circulars-and-Notices/Participant-and-Members-Circulars/HKFE/2022/MO_DT_014_22.pdf

Shanghai International Energy Exchange Released Its Circular on Market Maker Applications for Futures and Options Products

On 18 January 2022, in a bid to enhance the role of market makers, improve the functioning of the futures and options markets and better serve the real economy, the Shanghai International Energy Exchange (INE) announced that it would accept applications for new market makers in accordance with the Market-Making Management Rules of INE. Applicant market makers are required to have minimum net assets of RMB50M (US\$7.9M) or its equivalent foreign currency.

<http://www.shfe.com.cn/en/AnnouncementandNews/SHFEAnnouncement/911341202.html>

Korea Exchange to Launch Market Data System in English

On 10 January 2022, Korea Exchange (KRX) announced the launch of an English service for its market data system. The new English language domestic capital market portal is designed to improve accessibility and convenience for foreign investors—which has continuously increased in lockstep with their influence. This one-stop platform for English disclosures, inquiry or statistical data and investment reference of Korea’s capital market is intended to help ease information asymmetry between domestic and foreign investors and improve market transparency.

<https://global.krx.co.kr/contents/GLB/02/0203/0203000000/GLB0203000000.jsp#ab8758eced0475769e200e7e309baf77=1&view=20646>

The Stock Exchange of Thailand Publishes 2022-2024 Strategic Plan

On 11 January 2022, The Stock Exchange of Thailand (SET) published its three-year (2022-2024) Strategic Plan, to goal-set how it intends to develop the current capital market and connect to the future world to ensure growth and sustainability aspects for both Thai business and society. Key highlights include: Educational programs for domestic investors; SET’s Thai Digital Assets Exchange—a new platform that will link the trading of traditional assets to digital assets (expected 3Q 2022); further develop capital-raising for social enterprises small and medium enterprises and startups through its LIVE Platform into LiVE Exchange (expected 1Q 2022); and efforts that encourage Thai-listed companies to adopt ESG practices in support of future inclusion in global sustainability indices.

<https://www.set.or.th/set/newsdetails.do?newsId=16418574292830&sequence=2022003099&language=en&country=US>

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

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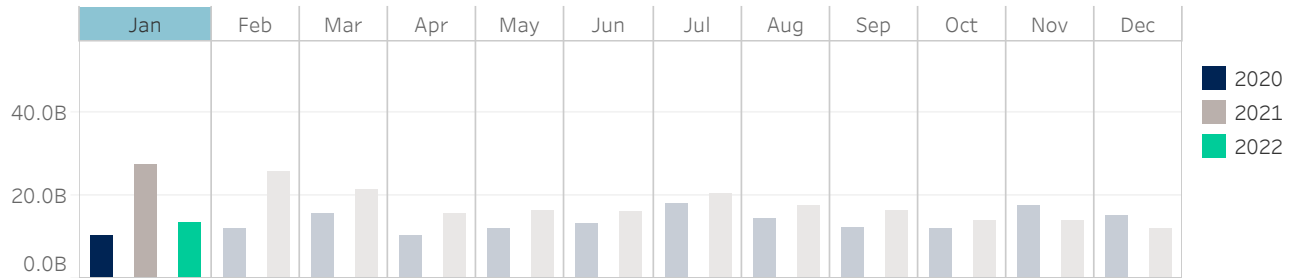
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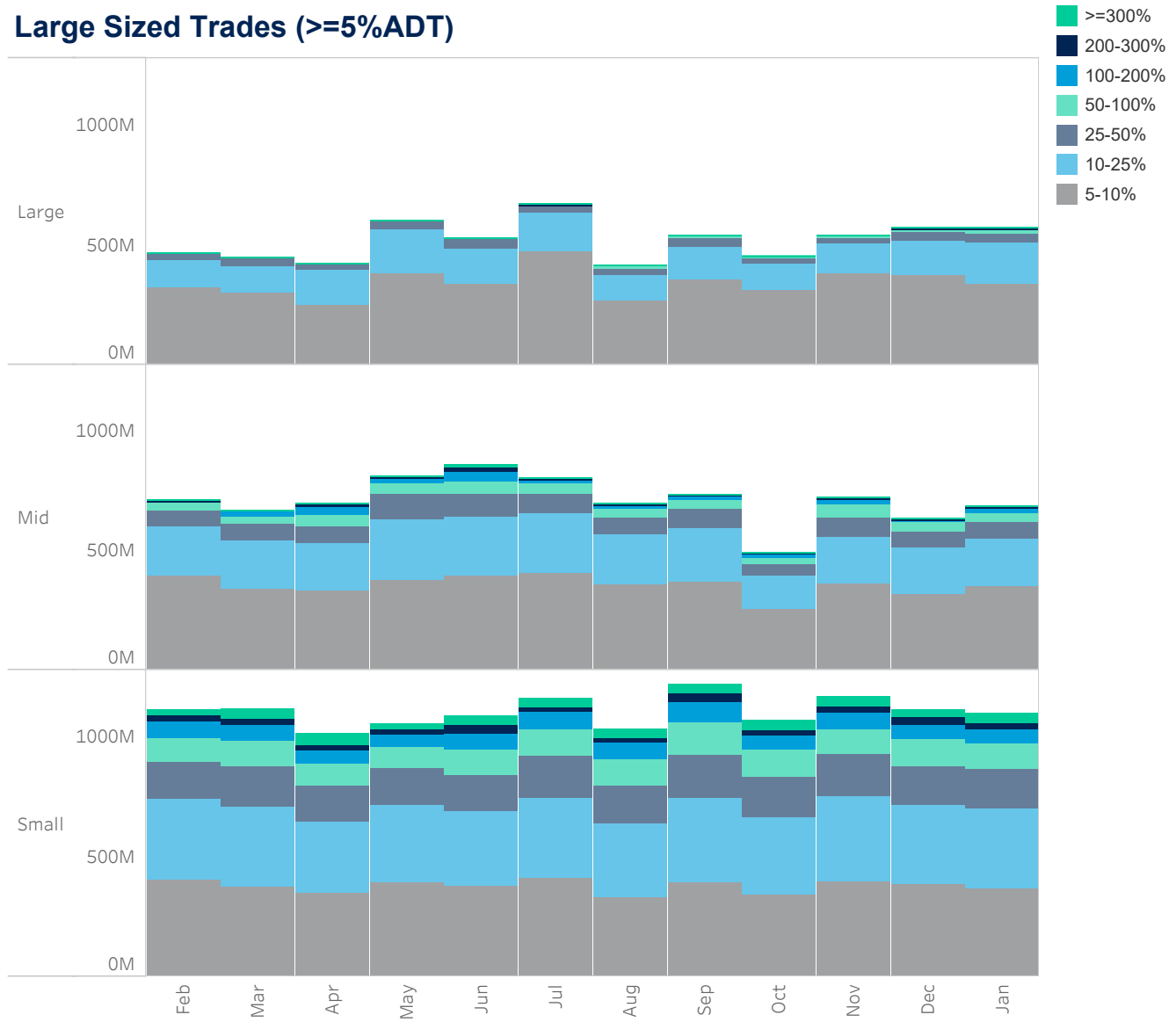
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Hong Kong

Average Daily Turnover (Notional USD)



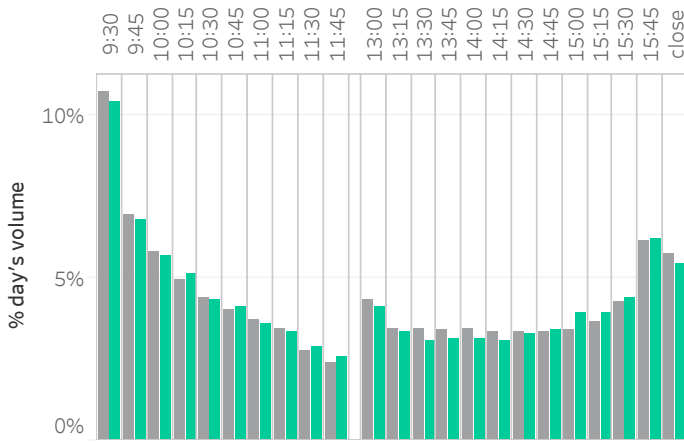
Large Sized Trades (>=5%ADT)



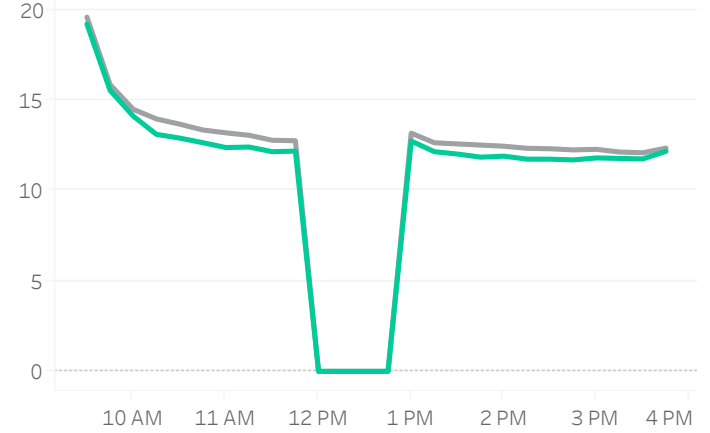
Source data: Virtu Financial

Hong Kong

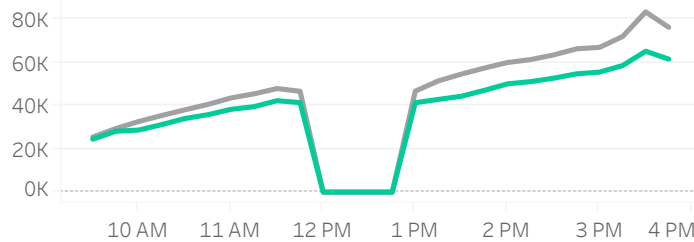
Volume Curve



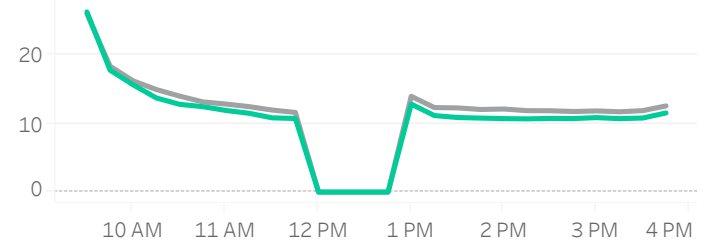
Intraday Spread (bps)



Intraday Quotesize (Shares)



Intraday Volatility (bps)



■ Rolling 12 Months Avg ■ January 2022

Spread Bps

	21 Q1			21 Q2			21 Q3			21 Q4			22 Q1
	Jan 21	Feb 21	Mar 21	Apr 21	May 21	Jun 21	Jul 21	Aug 21	Sep 21	Oct 21	Nov 21	Dec 21	Jan 22
firstHalfHour	16.9	16.6	16.9	15.8	15.4	15.6	16.9	18.4	18.1	18.5	17.3	17.3	16.2
midday	13.4	13.0	12.5	12.4	11.7	11.9	13.1	13.7	12.9	12.7	12.8	12.5	11.9
lastHalfHour	12.5	12.1	11.7	11.7	11.3	11.5	12.3	12.6	12.3	12.3	12.5	12.4	11.6

One Minute Volatility Bps

firstHalfHour	17.6	16.8	18.5	12.2	11.8	11.6	15.8	16.7	17.5	18.2	13.8	14.7	15.5
midday	8.1	8.8	8.7	6.0	6.0	5.8	7.8	7.0	7.5	6.7	6.1	6.3	6.4
lastHalfHour	6.9	6.9	7.3	6.5	6.6	6.1	8.1	6.7	6.5	6.5	6.0	5.8	6.1

Quotesize in Shares

firstHalfHour	29,369	28,259	24,138	24,880	28,539	27,890	26,823	27,946	28,697	26,921	27,455	23,936	28,480
midday	52,420	49,671	39,835	49,281	59,450	57,843	49,961	47,200	49,020	47,554	47,292	35,935	47,428
lastHalfHour	80,787	82,321	70,652	79,757	92,195	85,221	76,912	80,882	77,790	75,001	72,389	54,283	70,843

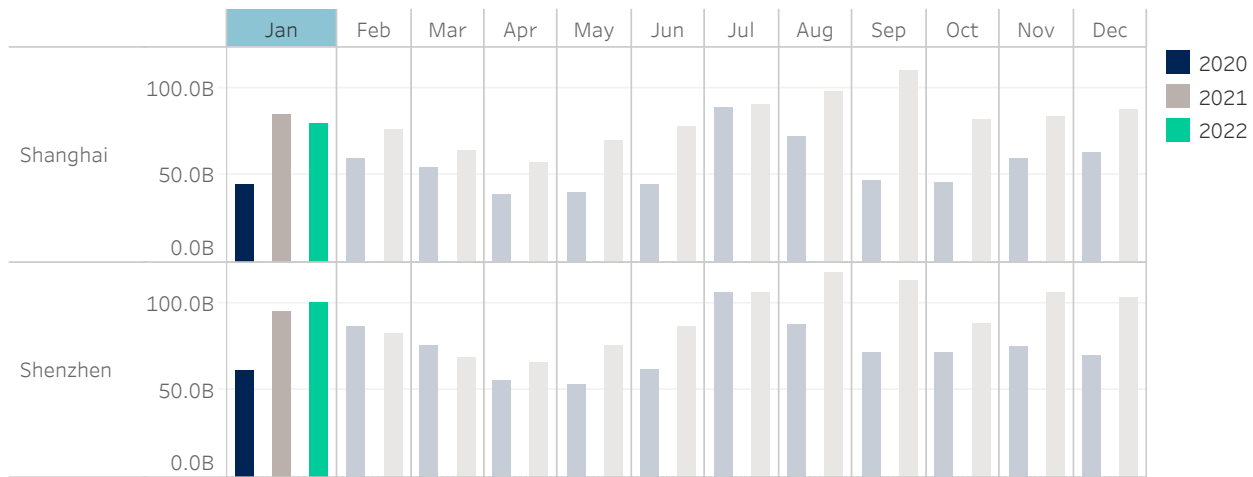
Median used for all metrics

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

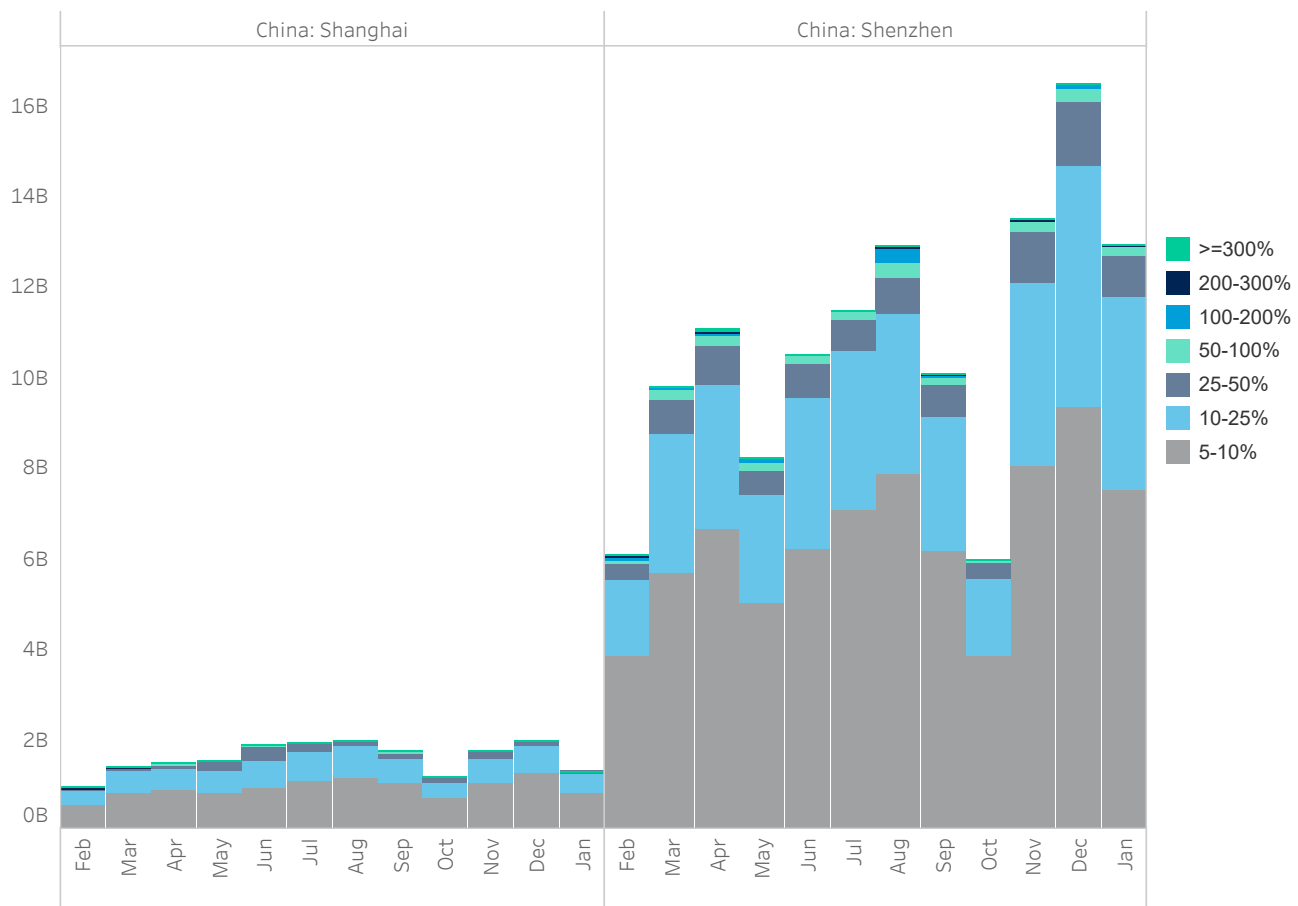
Source data: Virtu Financial

China

Average Daily Turnover (Notional USD)



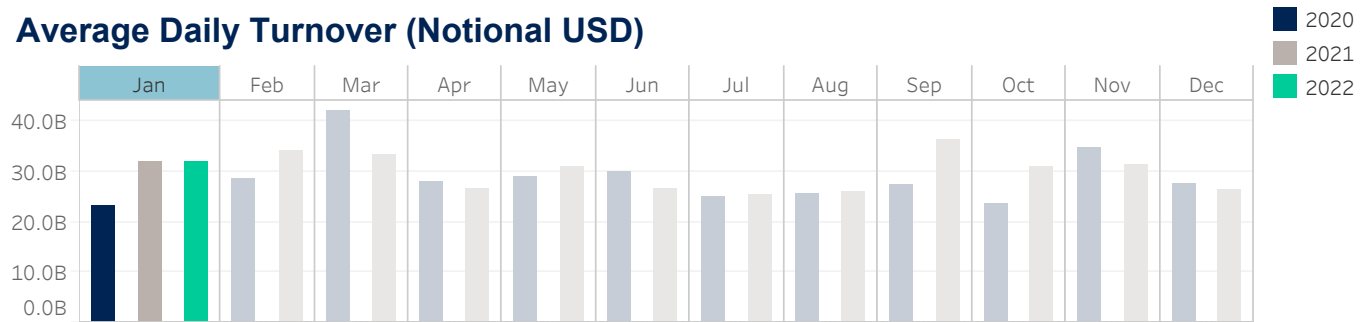
Large Sized Trades (>=5%ADT)



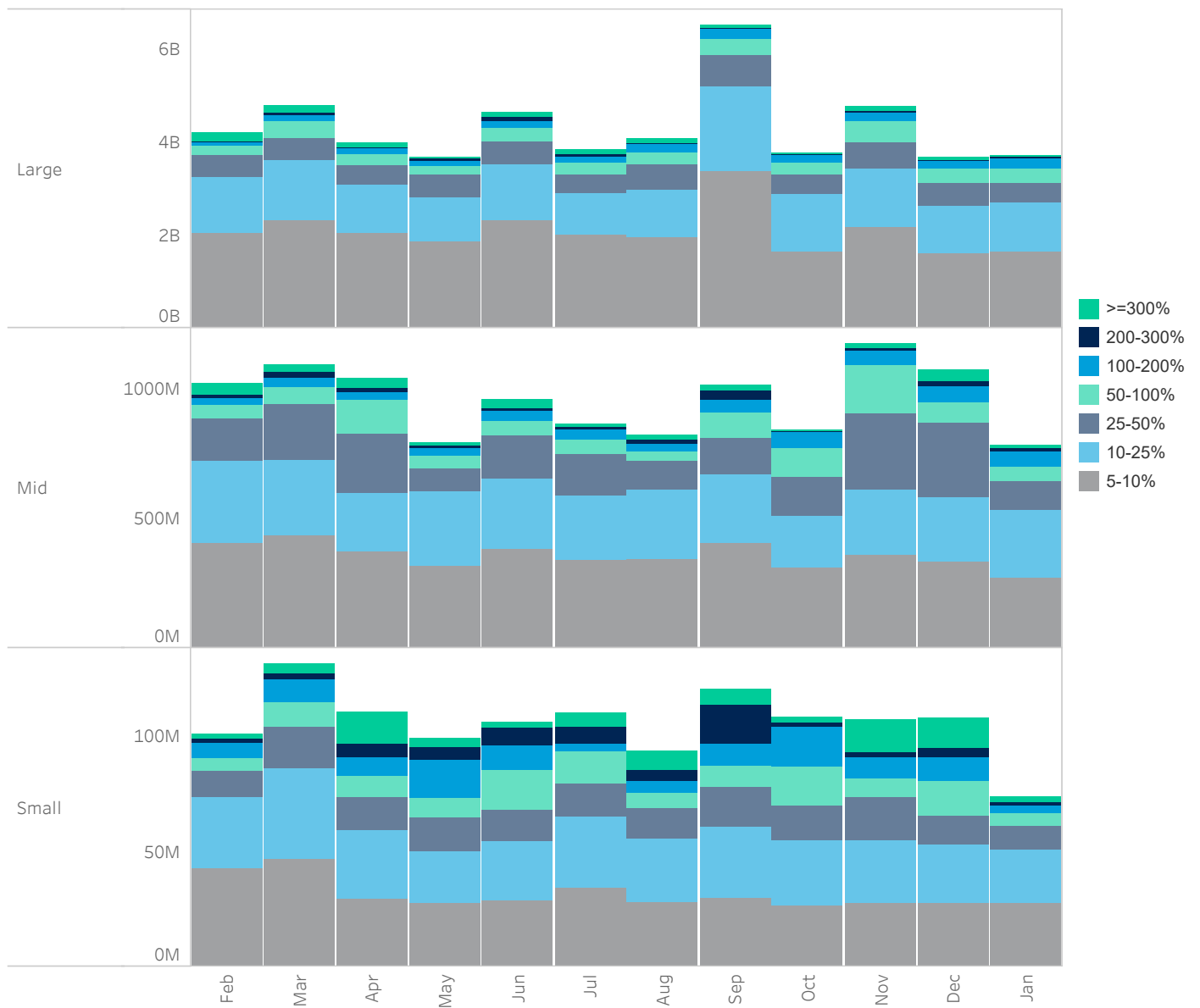
Source data: Virtu Financial

Japan

Average Daily Turnover (Notional USD)



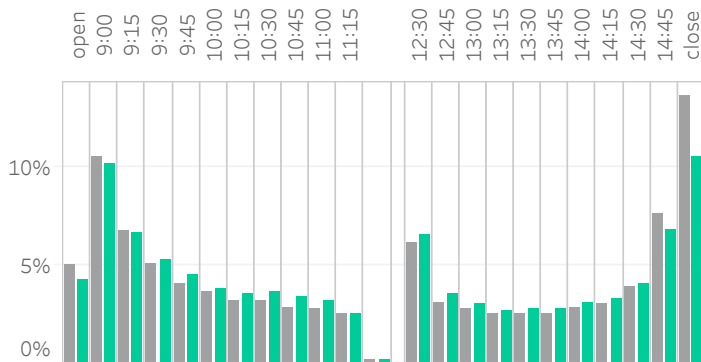
Large Sized Trades (>=5%ADT)



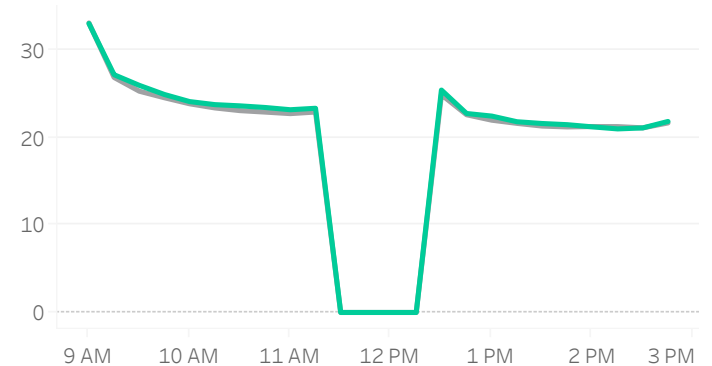
Source data: Virtu Financial

Japan

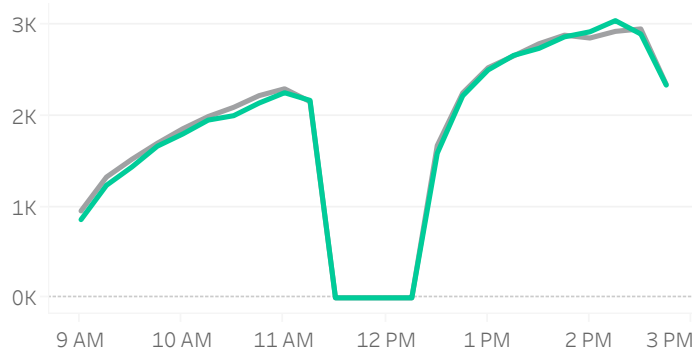
Volume Curve



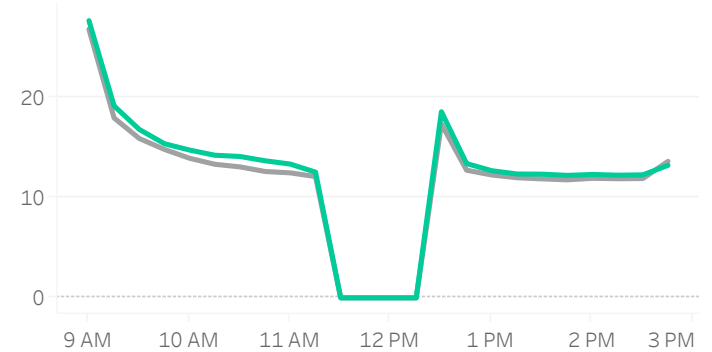
Intraday Spread (bps)



Intraday Quotesize (Shares)



Intraday Volatility (bps)



■ Rolling 12 Months Avg ■ January 2022

Spread Bps

	21 Q1			21 Q2			21 Q3			21 Q4			22 Q1
	Jan 21	Feb 21	Mar 21	Apr 21	May 21	Jun 21	Jul 21	Aug 21	Sep 21	Oct 21	Nov 21	Dec 21	Jan 22
firstHalfHour	29.3	33.1	32.7	29.4	28.2	26.6	25.6	27.3	25.8	26.7	27.2	28.7	29.4
midday	22.9	24.6	24.8	22.9	21.7	21.0	20.7	21.4	21.1	21.9	22.1	22.5	23.3
lastHalfHour	21.7	22.6	22.5	21.1	20.5	19.8	19.6	19.9	19.8	19.7	20.2	20.7	21.6

One Minute Volatility Bps

firstHalfHour	15.1	15.7	15.9	14.7	15.9	13.0	12.1	12.6	12.4	14.5	13.2	14.6	16.5
midday	6.8	6.5	6.9	6.3	6.8	5.9	6.2	5.9	6.0	7.1	6.1	6.4	7.7
lastHalfHour	7.3	6.7	6.6	6.5	7.0	6.5	11.5	7.9	7.9	6.8	10.1	6.1	6.5

Quotesize in Shares

firstHalfHour	1,202	1,248	1,170	1,198	1,120	1,295	1,334	1,280	1,380	1,263	1,289	1,136	1,084
midday	2,260	2,167	1,921	2,163	2,147	2,573	2,700	2,525	2,630	2,521	2,700	2,453	2,128
lastHalfHour	2,814	2,559	2,177	2,622	2,582	3,165	3,218	3,328	3,397	3,161	3,282	2,896	2,602

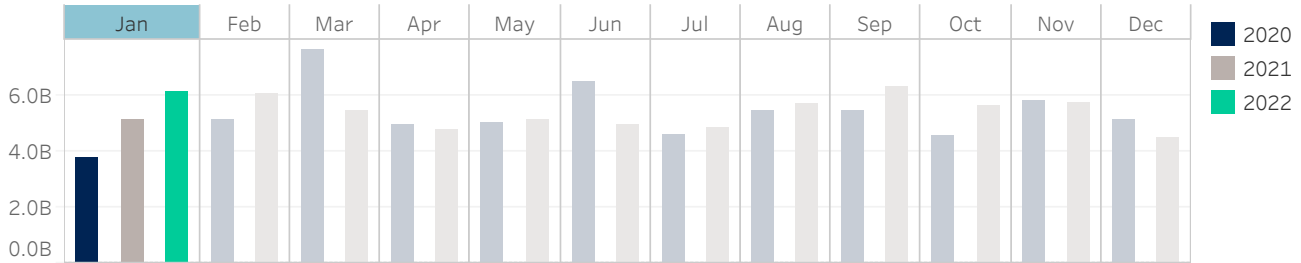
Median used for all metrics

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

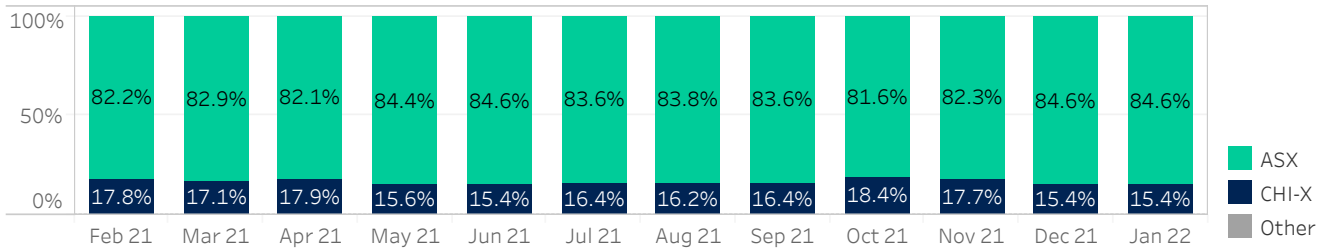
Source data: Virtu Financial

Australia

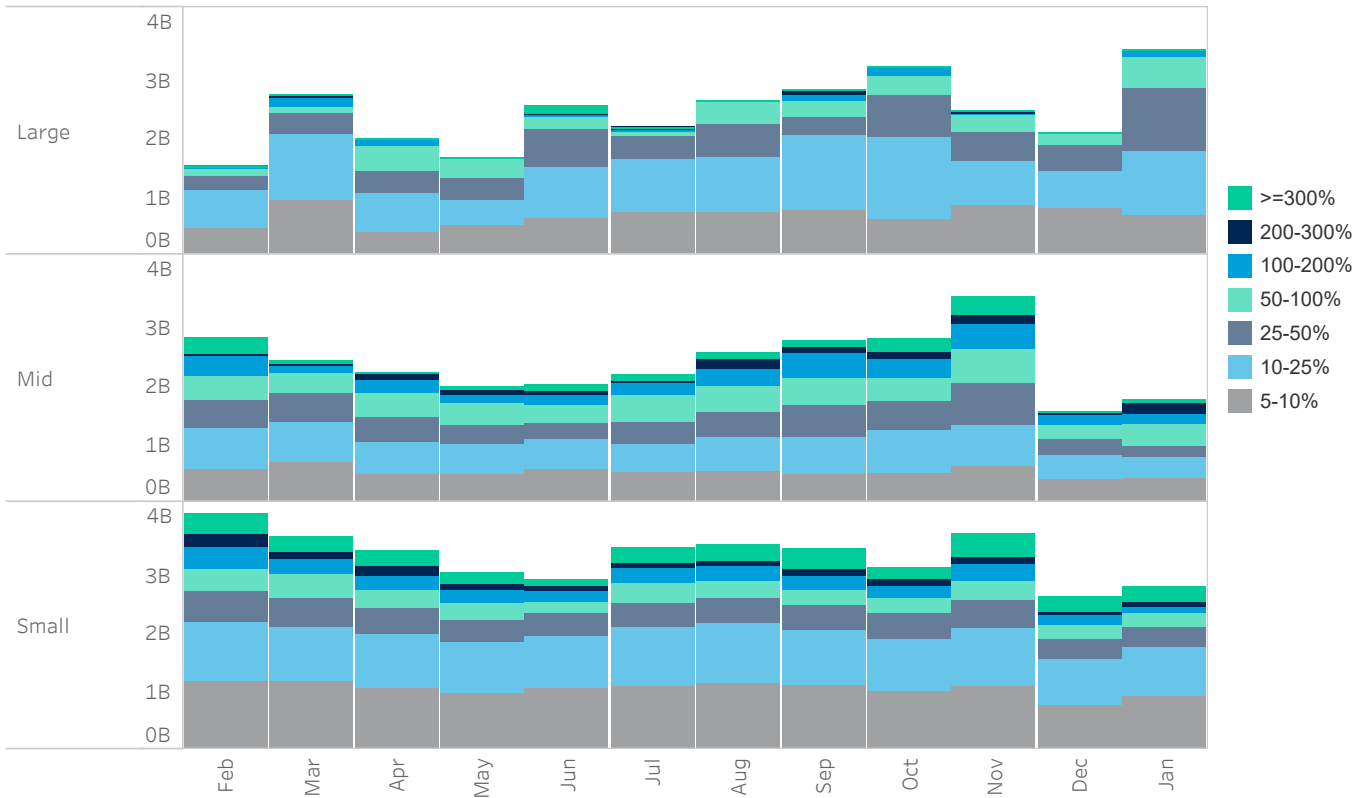
Average Daily Turnover (Notional USD)



Venue Market Share (Notional USD)



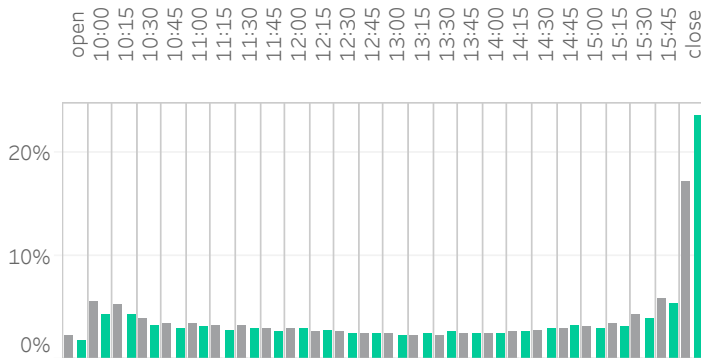
Large Sized Trades (>=5%ADT)



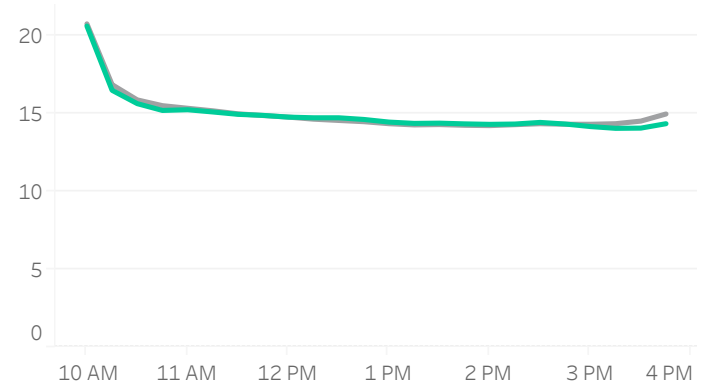
Source data: Virtu Financial

Australia

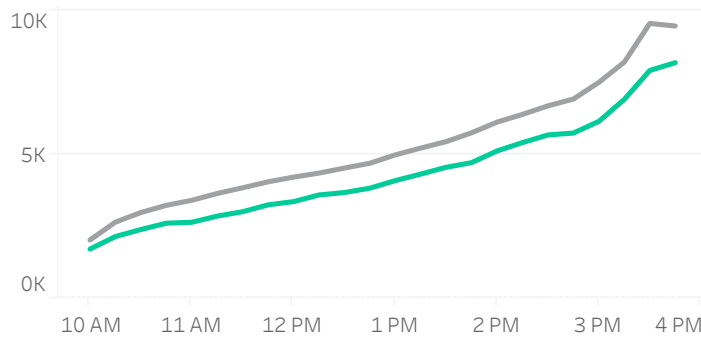
Volume Curve



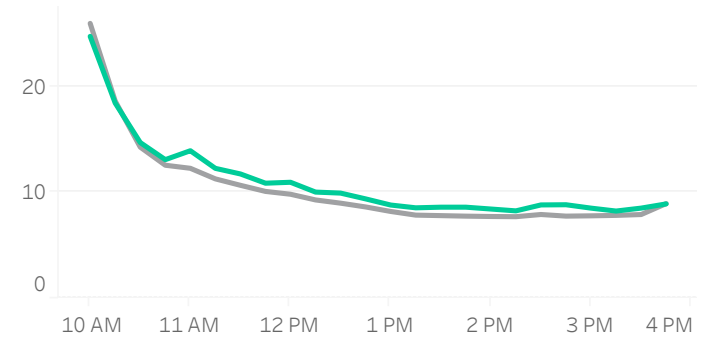
Intraday Spread (bps)



Intraday Quotesize (Shares)



Intraday Volatility (bps)



■ Rolling 12 Months Avg ■ January 2022

Spread Bps

	21 Q1			21 Q2			21 Q3			21 Q4			22 Q1
	Jan 21	Feb 21	Mar 21	Apr 21	May 21	Jun 21	Jul 21	Aug 21	Sep 21	Oct 21	Nov 21	Dec 21	Jan 22
firstHalfHour	19.8	20.2	20.0	18.3	18.9	17.5	17.1	16.5	16.9	16.9	17.1	17.7	18.0
midday	15.0	15.5	15.6	14.7	14.9	14.1	13.7	13.7	14.2	14.0	14.1	14.5	14.6
lastHalfHour	15.0	15.5	15.6	14.9	14.9	14.2	13.9	13.8	14.3	13.9	14.1	14.2	14.1

One Minute Volatility Bps

firstHalfHour	14.4	16.6	16.8	16.0	17.5	17.3	15.5	15.4	16.9	15.6	15.7	16.0	16.5
midday	4.1	4.6	4.8	3.7	3.9	3.8	3.6	3.6	4.0	4.4	4.3	4.3	5.5
lastHalfHour	3.7	3.4	3.7	3.4	3.6	3.1	3.3	2.7	3.7	4.0	3.6	3.2	4.9

Quotesize in Shares

firstHalfHour	2,583	2,326	2,194	2,218	2,190	2,326	2,425	2,398	2,375	2,178	2,129	1,938	1,994
midday	5,358	4,931	4,686	4,526	4,489	4,746	4,620	4,845	4,604	4,298	4,450	4,134	3,969
lastHalfHour	11,014	9,734	9,100	8,141	8,231	9,221	8,999	9,113	8,565	9,226	9,302	8,480	8,111

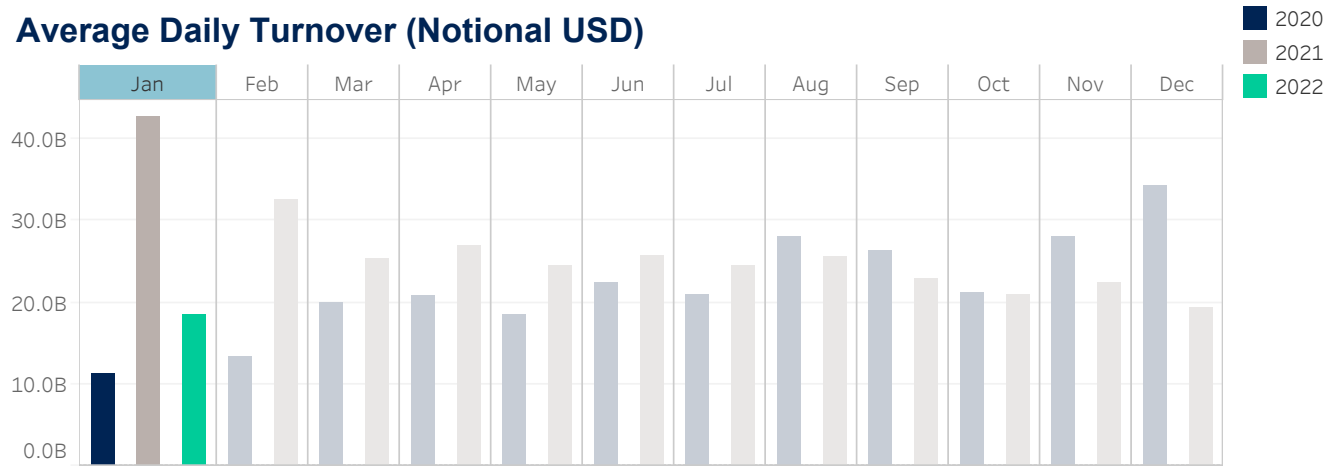
Median used for all metrics

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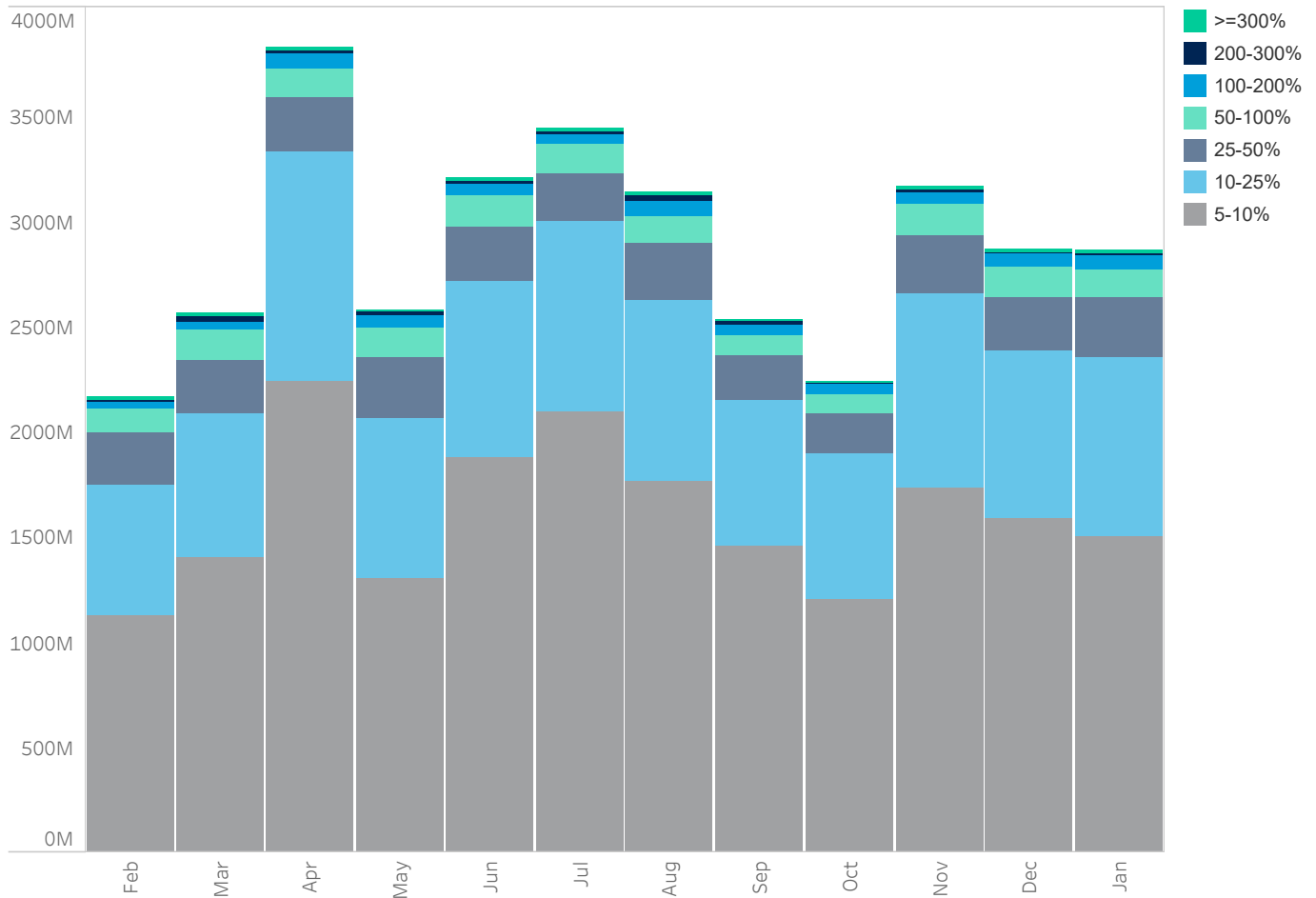
Source data: Virtu Financial

South Korea

Average Daily Turnover (Notional USD)



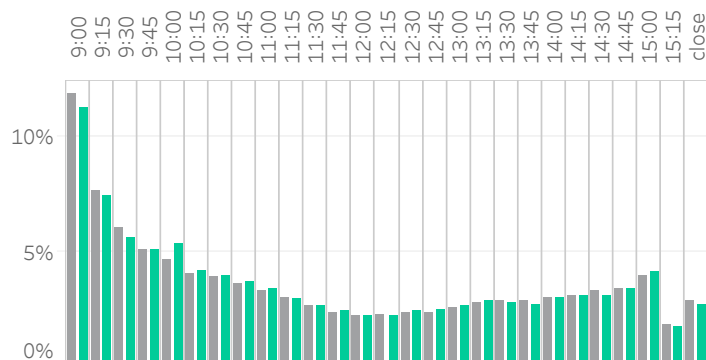
Large Sized Trades (>=5%ADT)



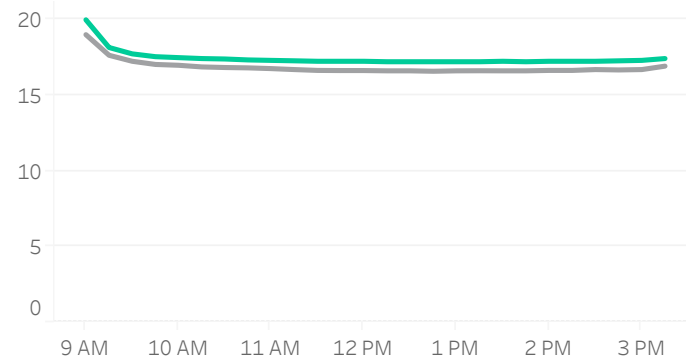
Source data: Virtu Financial

South Korea

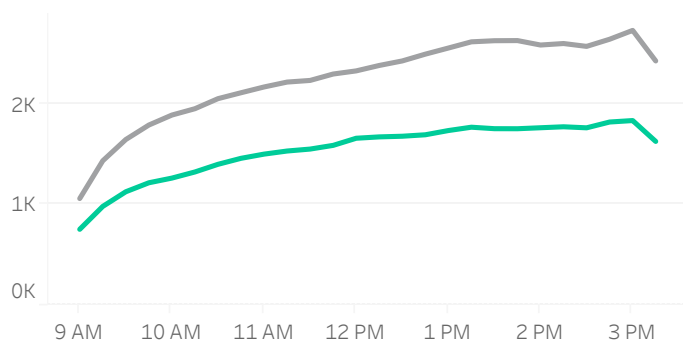
Volume Curve



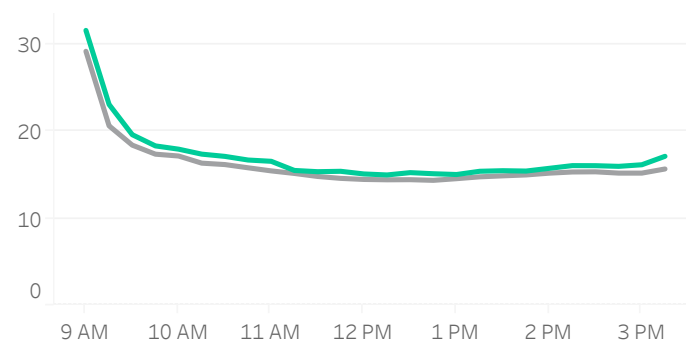
Intraday Spread (bps)



Intraday Quotesize (Shares)



Intraday Volatility (bps)



■ Rolling 12 Months Avg ■ January 2022

Spread Bps

	21 Q1			21 Q2			21 Q3			21 Q4			22 Q1
	Jan 21	Feb 21	Mar 21	Apr 21	May 21	Jun 21	Jul 21	Aug 21	Sep 21	Oct 21	Nov 21	Dec 21	Jan 22
firstHalfHour	18.0	17.4	17.1	17.1	18.3	18.3	18.3	18.5	18.7	18.9	19.8	18.3	18.9
midday	15.9	15.6	15.8	16.2	17.2	17.6	17.7	17.3	17.6	17.2	17.9	17.2	17.4
lastHalfHour	15.8	15.6	15.8	16.3	17.2	17.6	17.8	17.3	17.6	17.2	17.9	17.3	17.4

One Minute Volatility Bps

firstHalfHour	20.9	18.0	15.1	12.7	15.6	13.2	13.0	15.8	15.1	16.5	16.9	14.9	18.2
midday	11.4	11.1	11.0	10.5	10.9	10.5	10.5	11.1	10.1	10.7	11.2	10.6	11.9
lastHalfHour	11.3	11.2	14.2	19.7	16.7	26.5	22.9	15.0	19.0	12.7	15.6	25.1	13.0

Quotesize in Shares

firstHalfHour	1,352	1,140	1,138	1,384	1,302	1,675	1,526	1,053	1,012	890	909	899	813
midday	2,400	1,995	1,986	2,504	2,462	3,161	2,812	2,004	2,023	1,653	1,773	1,608	1,528
lastHalfHour	2,905	2,454	2,358	2,702	2,864	3,744	3,230	2,336	2,362	1,871	2,018	1,807	1,727

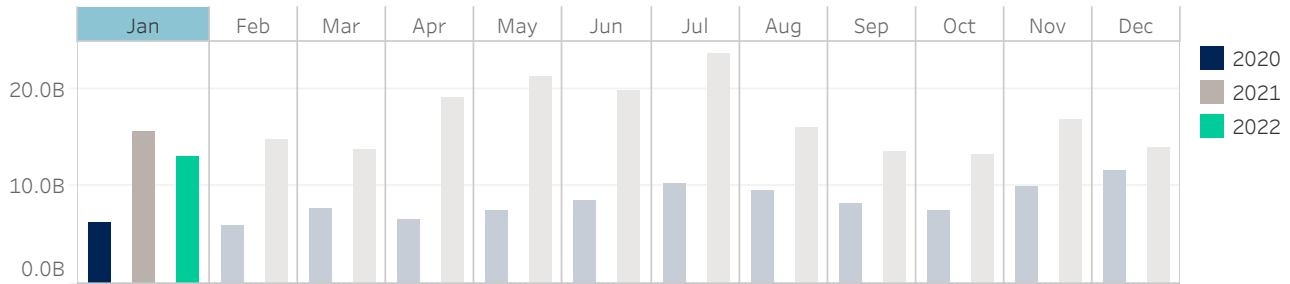
Median used for all metrics

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

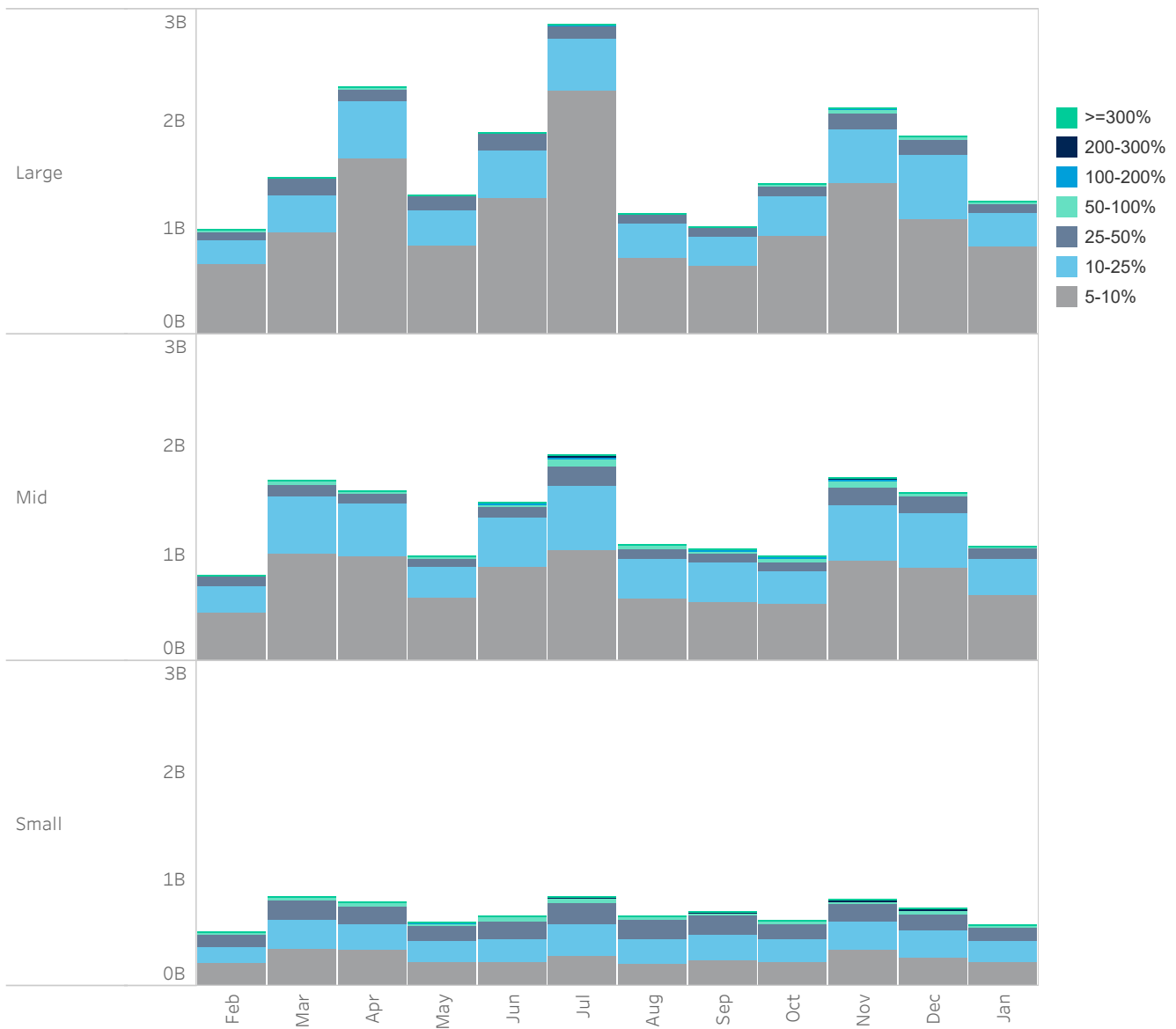
Source data: Virtu Financial

Taiwan

Average Daily Turnover (Notional USD)



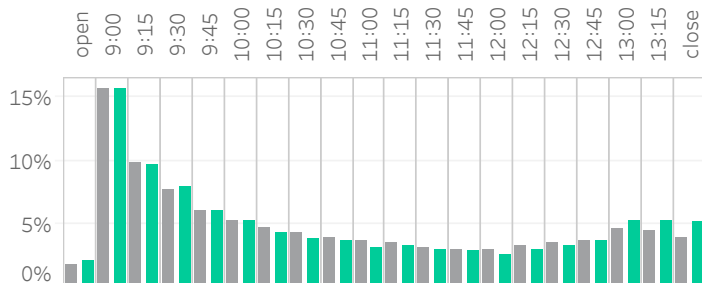
Large Sized Trades (>=5%ADT)



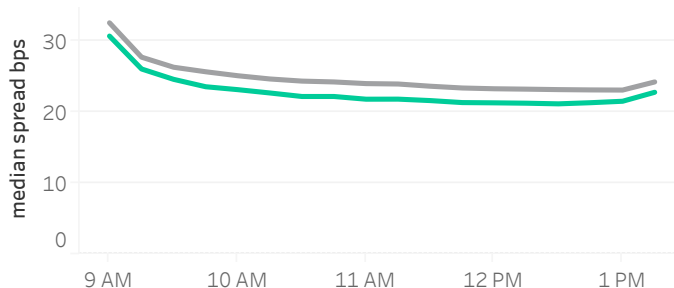
Source data: Virtu Financial

Taiwan

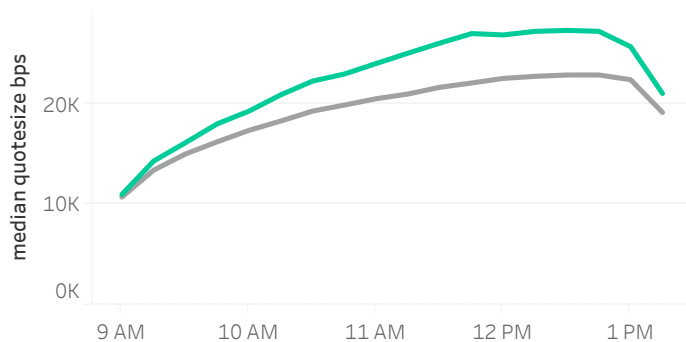
Volume Curve



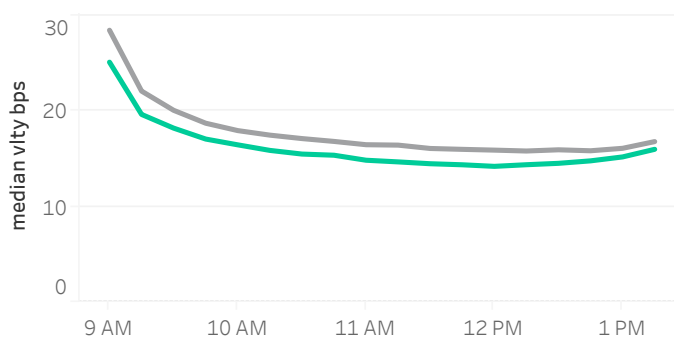
Intraday Spread (bps)



Intraday Quotesize (Shares)



Intraday Volatility (bps)



■ Rolling 12 Months Avg ■ January 2022

Spread Bps

	21 Q1			21 Q2			21 Q3			21 Q4			22 Q1
	Jan 21	Feb 21	Mar 21	Apr 21	May 21	Jun 21	Jul 21	Aug 21	Sep 21	Oct 21	Nov 21	Dec 21	Jan 22
firstHalfHour	28.5	28.3	26.1	27.4	35.2	28.7	29.0	30.1	29.1	30.4	28.0	26.5	28.6
midday	24.0	23.3	22.2	22.9	27.8	23.4	23.6	24.1	23.2	24.2	22.5	21.7	22.2
lastHalfHour	24.1	23.1	22.0	22.3	27.0	23.2	22.7	23.8	23.4	23.8	22.4	21.6	22.6

One Minute Volatility Bps

firstHalfHour	15.5	15.7	12.5	16.2	27.1	15.6	17.1	17.1	14.7	15.5	14.4	11.7	13.6
midday	7.2	6.8	6.6	8.2	11.2	7.6	7.5	7.6	6.8	7.2	6.6	6.6	7.6
lastHalfHour	7.7	8.4	8.4	9.0	10.4	6.7	7.9	7.8	7.9	8.1	9.3	9.2	7.8

Quotesize in Shares

firstHalfHour	12,798	12,216	14,419	14,883	9,069	12,568	12,027	10,553	11,061	10,944	12,921	13,588	12,185
midday	20,042	21,454	25,453	24,145	13,090	21,194	18,860	17,088	19,152	18,385	22,487	24,891	22,588
lastHalfHour	20,321	22,767	26,000	24,740	13,874	21,503	20,270	17,592	18,484	18,001	22,498	24,520	21,888

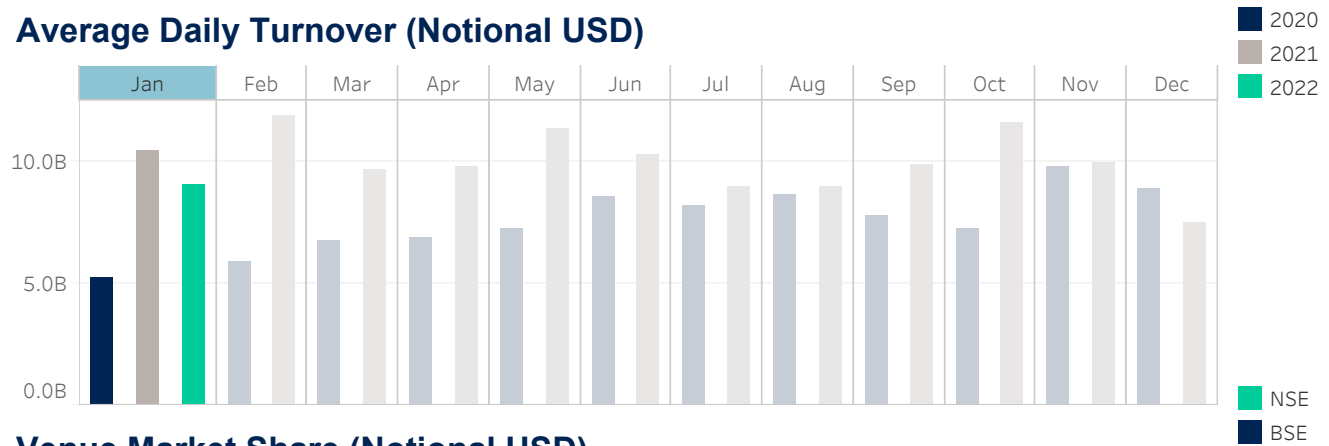
Median used for all metrics

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

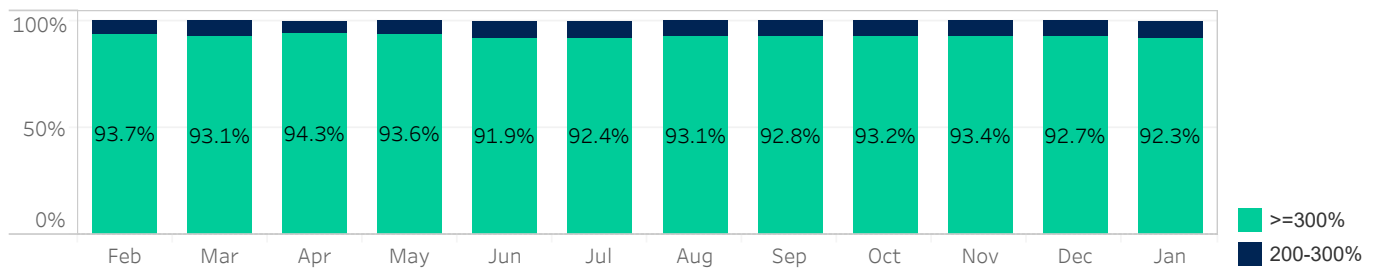
Source data: Virtu Financial

India

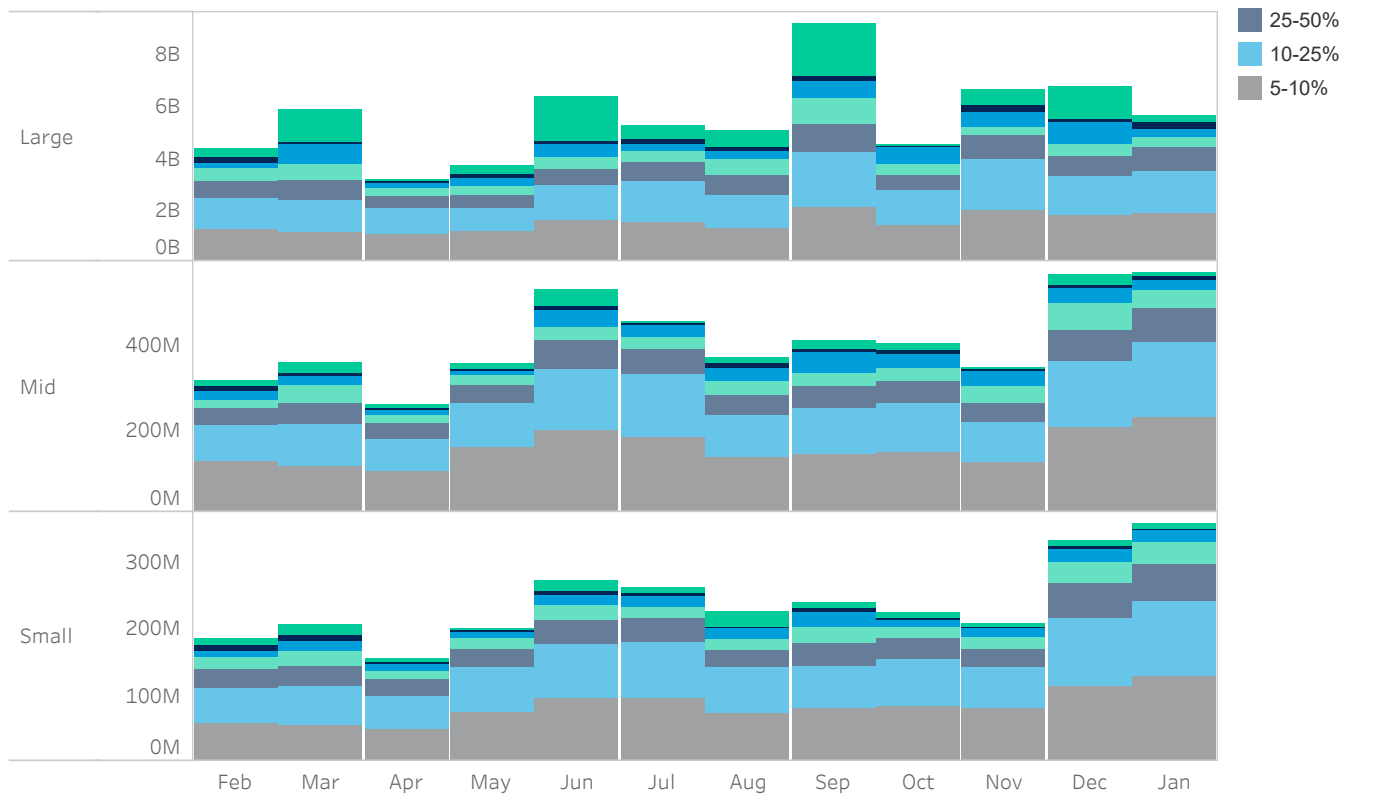
Average Daily Turnover (Notional USD)



Venue Market Share (Notional USD)



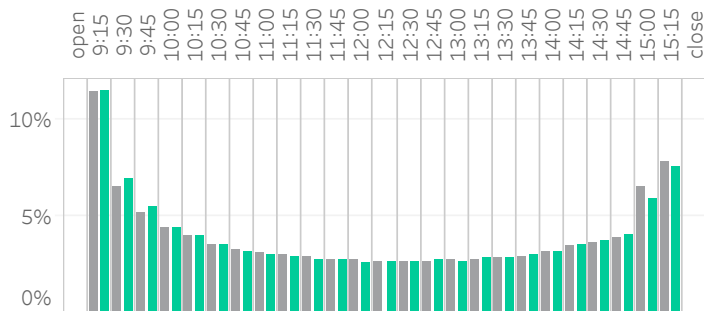
Large Sized Trades (>=5%ADT)



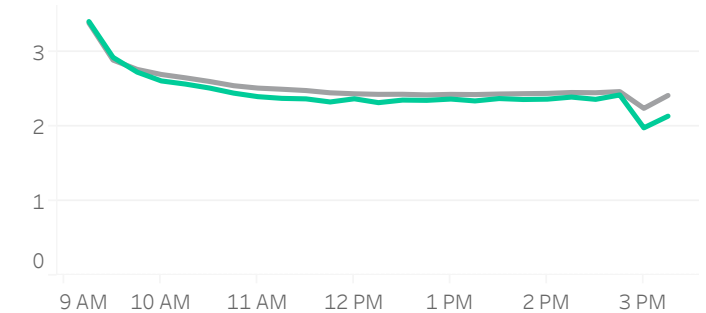
Source data: Virtu Financial

India

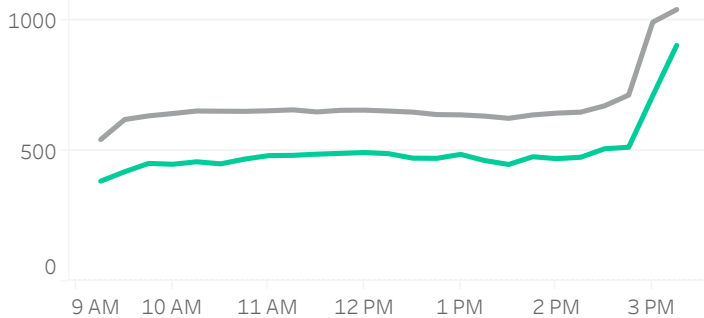
Volume Curve



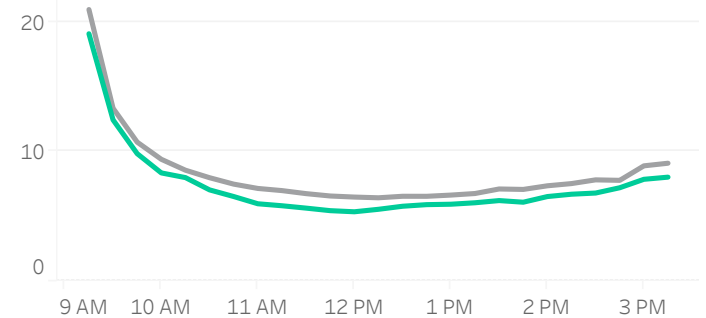
Intraday Spread (bps)



Intraday Quotesize (Shares)



Intraday Volatility (bps)



■ Rolling 12 Months Avg ■ January 2022

Spread Bps

	21 Q1			21 Q2			21 Q3			21 Q4			22 Q1
	Jan 21	Feb 21	Mar 21	Apr 21	May 21	Jun 21	Jul 21	Aug 21	Sep 21	Oct 21	Nov 21	Dec 21	Jan 22
firstHalfHour	3.1	3.2	3.0	3.1	2.9	2.8	2.6	2.8	2.8	3.2	3.1	3.0	3.1
midday	2.7	2.6	2.5	2.5	2.3	2.2	2.2	2.4	2.3	2.6	2.5	2.4	2.4
lastHalfHour	2.5	2.6	2.3	2.3	2.2	2.1	2.0	2.1	1.9	2.1	2.0	2.0	2.0

One Minute Volatility Bps

firstHalfHour	17.3	19.8	17.6	17.7	16.1	12.5	10.5	12.6	12.7	16.9	14.7	13.7	14.7
midday	7.8	8.8	8.2	7.6	6.4	5.3	4.7	5.5	5.8	7.3	6.5	5.6	5.9
lastHalfHour	10.1	11.0	10.6	8.9	8.2	7.1	6.1	6.8	6.4	7.7	7.3	7.0	7.3

Quotesize in Shares

firstHalfHour	684	626	680	559	541	548	533	527	526	425	408	416	394
midday	781	757	695	650	630	584	593	583	540	459	444	502	451
lastHalfHour	1,080	1,041	1,074	974	918	903	952	929	946	780	826	856	736

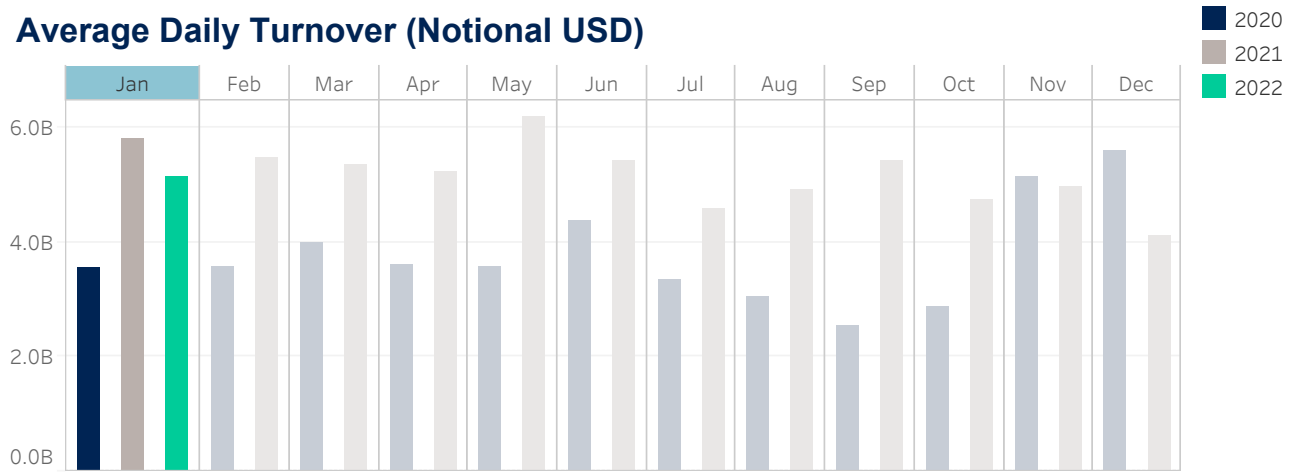
Median used for all metrics

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

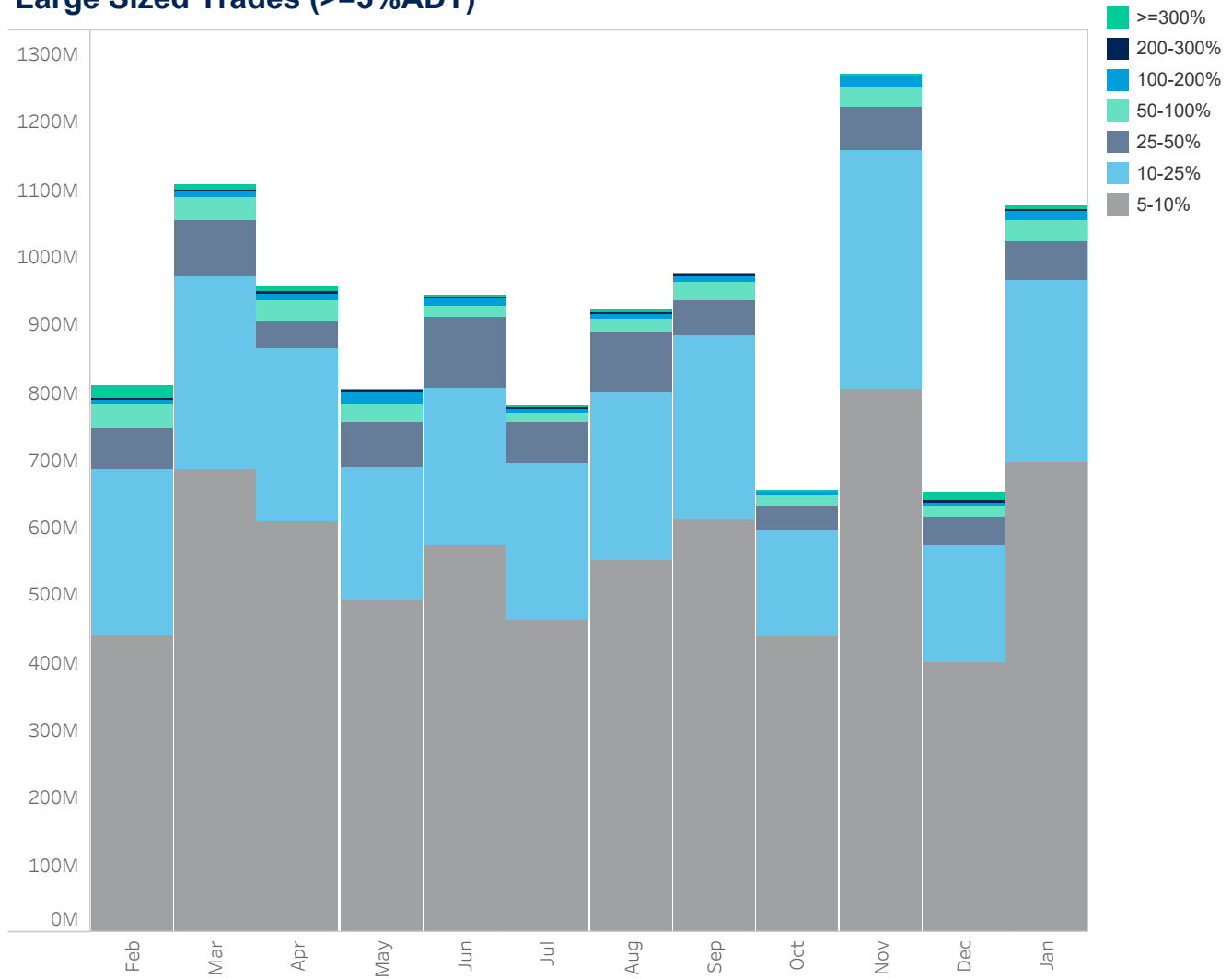
Source data: Virtu Financial

Thailand

Average Daily Turnover (Notional USD)



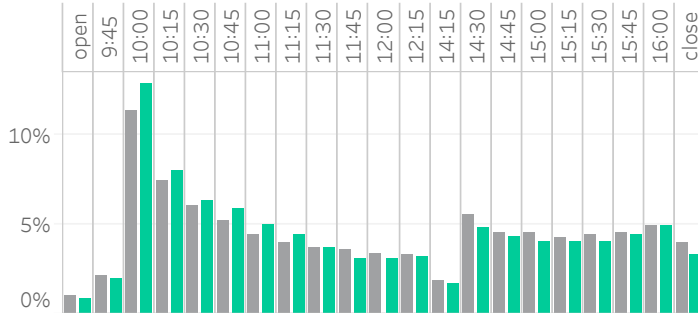
Large Sized Trades (>=5%ADT)



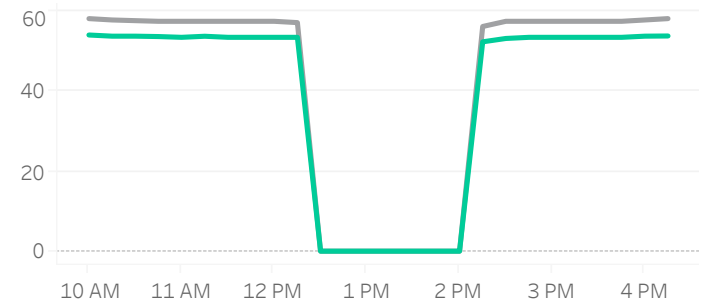
Source data: Virtu Financial

Thailand

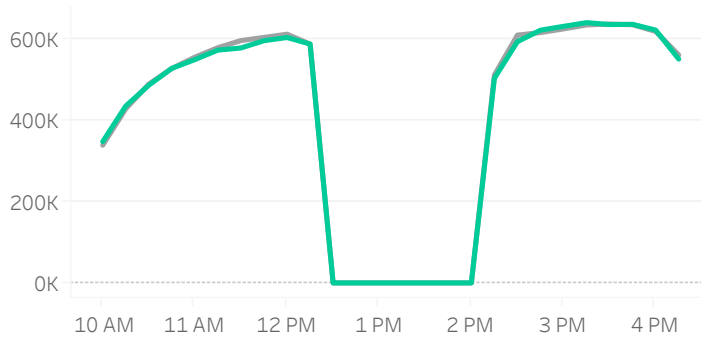
Volume Curve



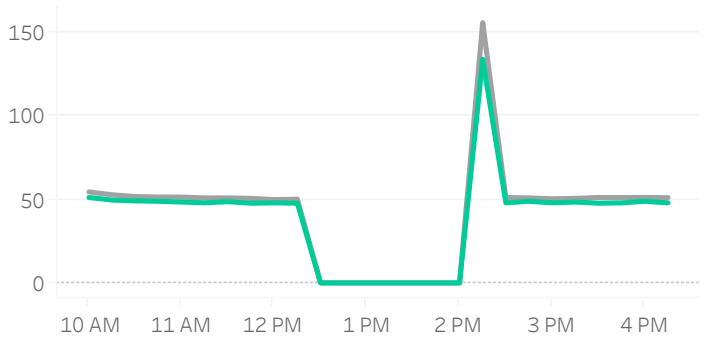
Intraday Spread (bps)



Intraday Quotesize (Shares)



Intraday Volatility (bps)



■ Rolling 12 Months Avg ■ January 2022

Spread Bps

	21 Q1			21 Q2			21 Q3			21 Q4			22 Q1
	Jan 21	Feb 21	Mar 21	Apr 21	May 21	Jun 21	Jul 21	Aug 21	Sep 21	Oct 21	Nov 21	Dec 21	Jan 22
firstHalfHour	59.5	61.8	58.7	57.6	58.1	57.0	58.5	57.3	55.9	56.3	55.0	53.8	54.3
midday	58.8	61.3	58.4	57.5	57.4	56.5	58.0	56.8	55.6	56.2	54.4	53.2	54.1
lastHalfHour	59.5	61.5	58.6	57.8	57.6	56.9	58.7	57.1	55.9	56.5	54.9	53.6	54.2

One Minute Volatility Bps

firstHalfHour	163.6	249.4	233.7	232.1	230.9	177.0	159.4	162.4	168.7	180.7	179.3	120.6	143.8
midday	229.8	231.9	224.9	223.9	223.2	164.5	130.5	159.5	164.4	167.5	158.7	152.8	151.5
lastHalfHour					11.0								

Quotesize in Shares

firstHalfHour	329,239	333,863	415,974	396,954	369,050	405,115	327,728	343,555	393,145	415,379	402,678	363,207	388,450
midday	511,597	531,652	673,700	702,142	632,652	659,585	550,461	566,015	644,261	663,065	654,635	569,102	618,574
lastHalfHour	524,220	541,490	680,594	713,523	624,167	686,033	542,139	571,302	629,320	657,872	643,271	564,619	611,447

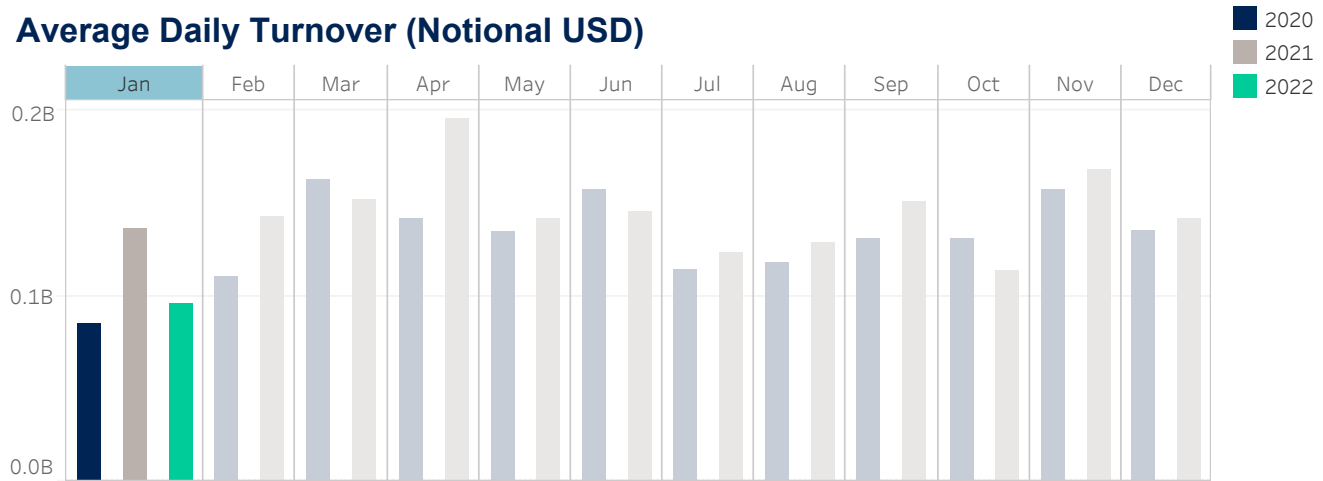
Median used for all metrics

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

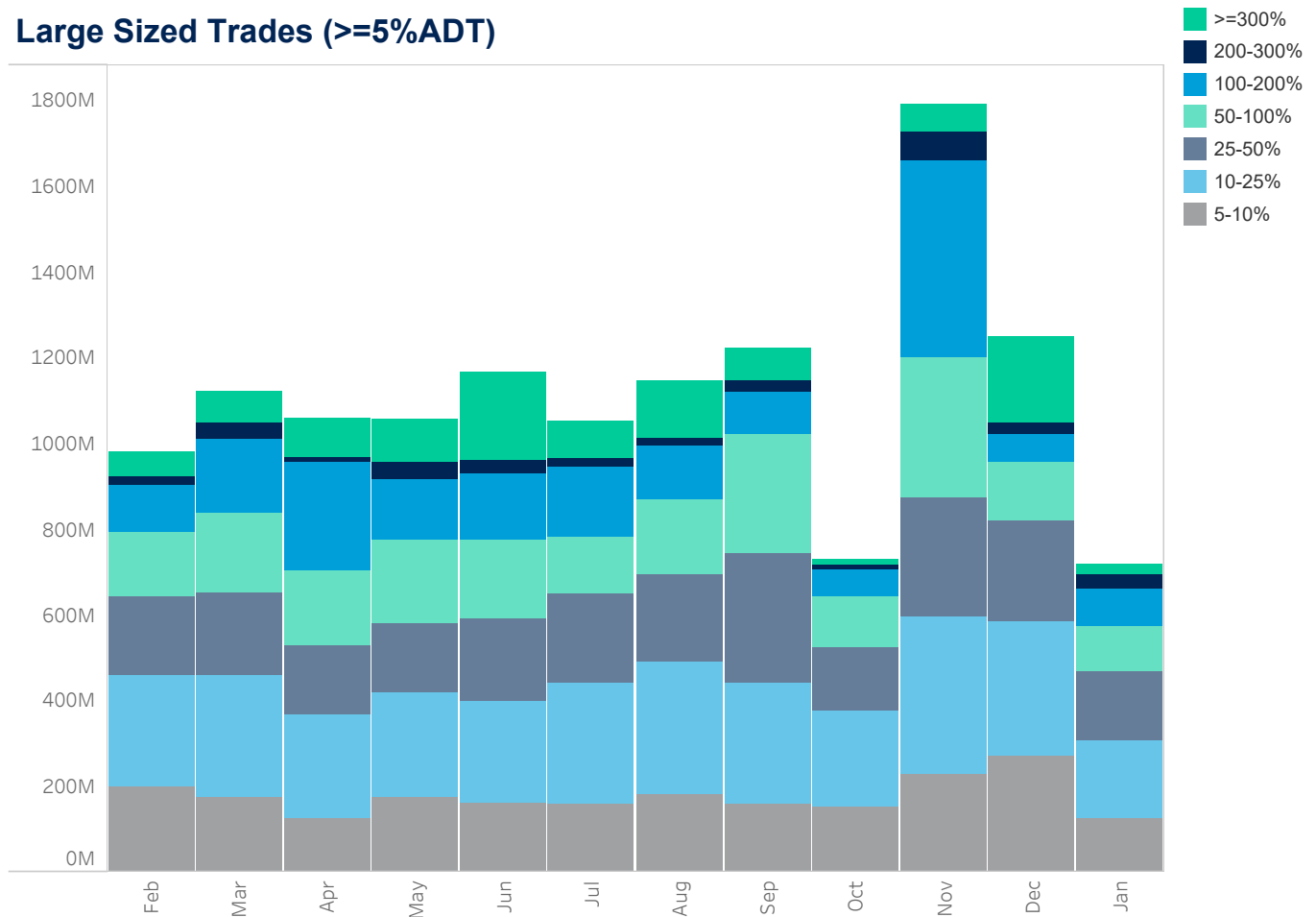
Source data: Virtu Financial

New Zealand

Average Daily Turnover (Notional USD)



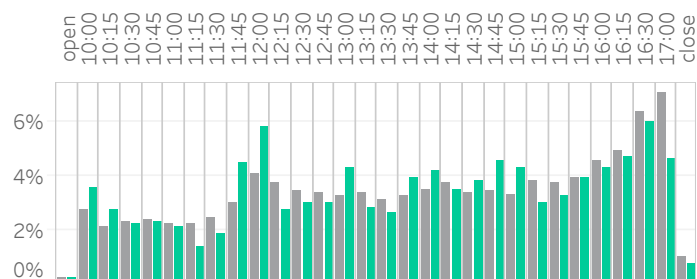
Large Sized Trades (>=5%ADT)



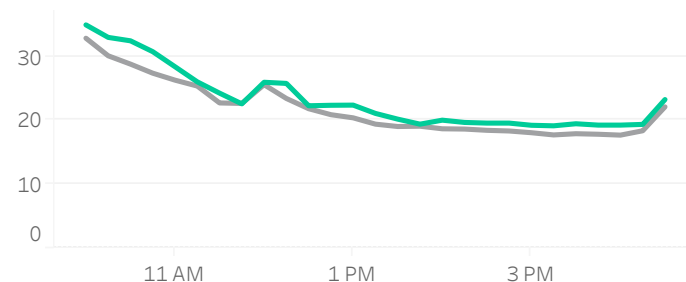
Source data: Virtu Financial

New Zealand

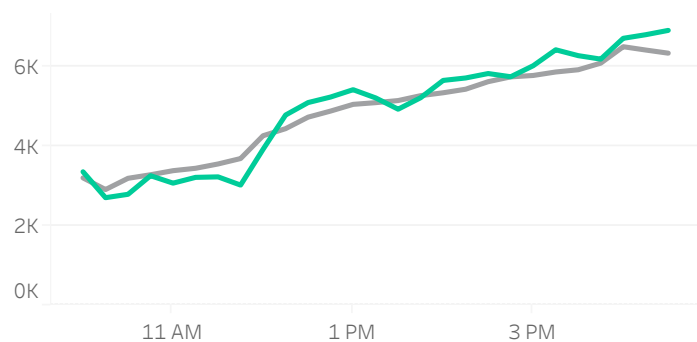
Volume Curve



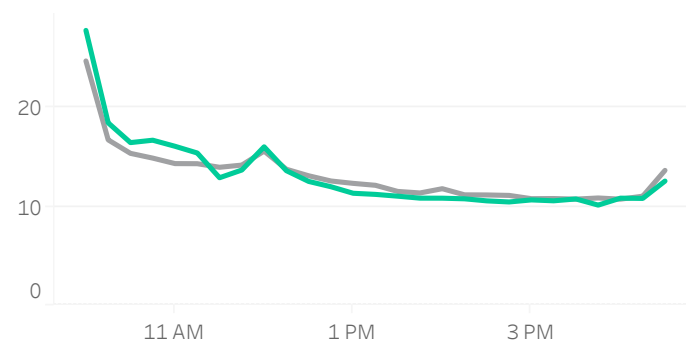
Intraday Spread (bps)



Intraday Quotesize (Shares)



Intraday Volatility (bps)



■ Rolling 12 Months Avg ■ January 2022

Spread Bps

	21 Q1			21 Q2			21 Q3			21 Q4			22 Q1
	Jan 21	Feb 21	Mar 21	Apr 21	May 21	Jun 21	Jul 21	Aug 21	Sep 21	Oct 21	Nov 21	Dec 21	Jan 22
firstHalfHour	33.6	32.4	32.9	29.1	30.1	29.9	30.8	31.6	29.0	29.1	31.3	34.0	33.3
midday	22.0	22.2	21.3	19.3	20.5	18.4	19.0	21.0	19.5	18.2	20.0	21.7	21.6
lastHalfHour	22.0	22.2	21.1	21.1	19.6	17.7	19.0	20.0	19.7	18.3	18.7	20.5	21.3

One Minute Volatility Bps

firstHalfHour	6.0	7.4	7.2	5.7	6.8	5.7	6.1	7.0	6.0	7.5	7.4	9.1	9.6
midday	3.7	3.6	3.5	3.6	3.5	3.5	3.4	3.6	3.3	3.3	4.0	4.2	4.3
lastHalfHour	4.7	4.4	6.7	4.0	5.3	4.4	4.0	3.8	3.6	4.3	3.5	4.1	3.3

Quotesize in Shares

firstHalfHour	2,934	2,863	3,226	3,083	2,848	2,985	2,792	3,149	3,533	3,090	3,356	3,316	2,843
midday	4,261	4,306	4,708	5,232	5,145	5,287	5,453	5,494	5,752	5,679	5,456	5,315	5,011
lastHalfHour	5,198	5,319	6,011	6,862	6,538	6,859	7,213	6,762	7,042	7,910	6,898	7,038	6,831

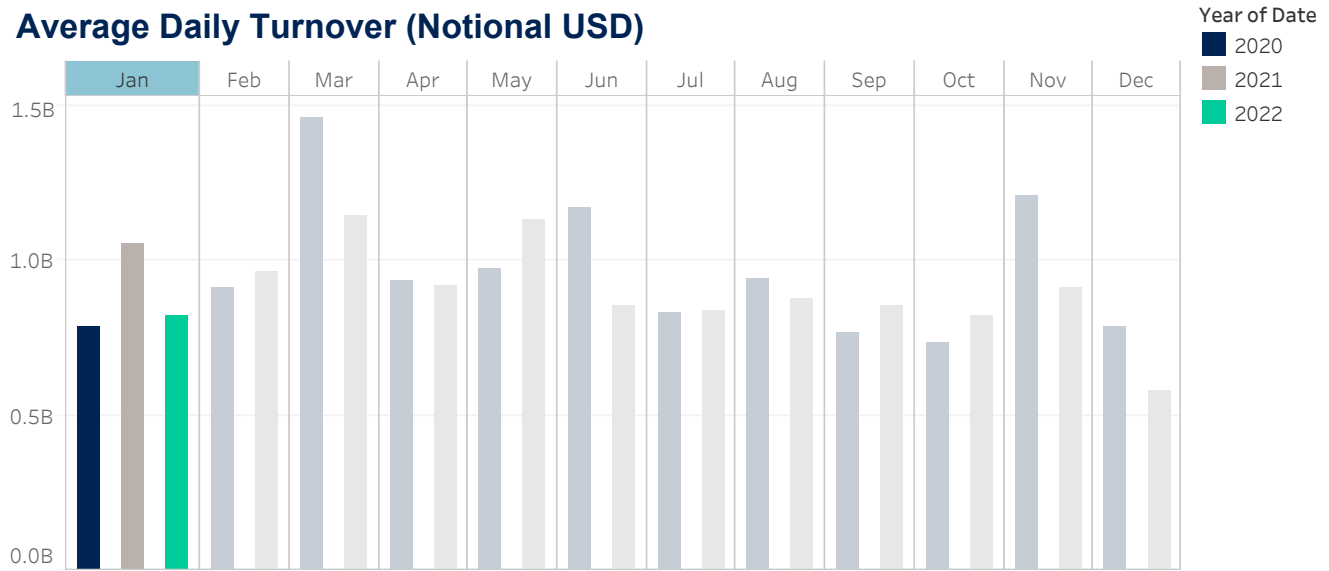
Median used for all metrics

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

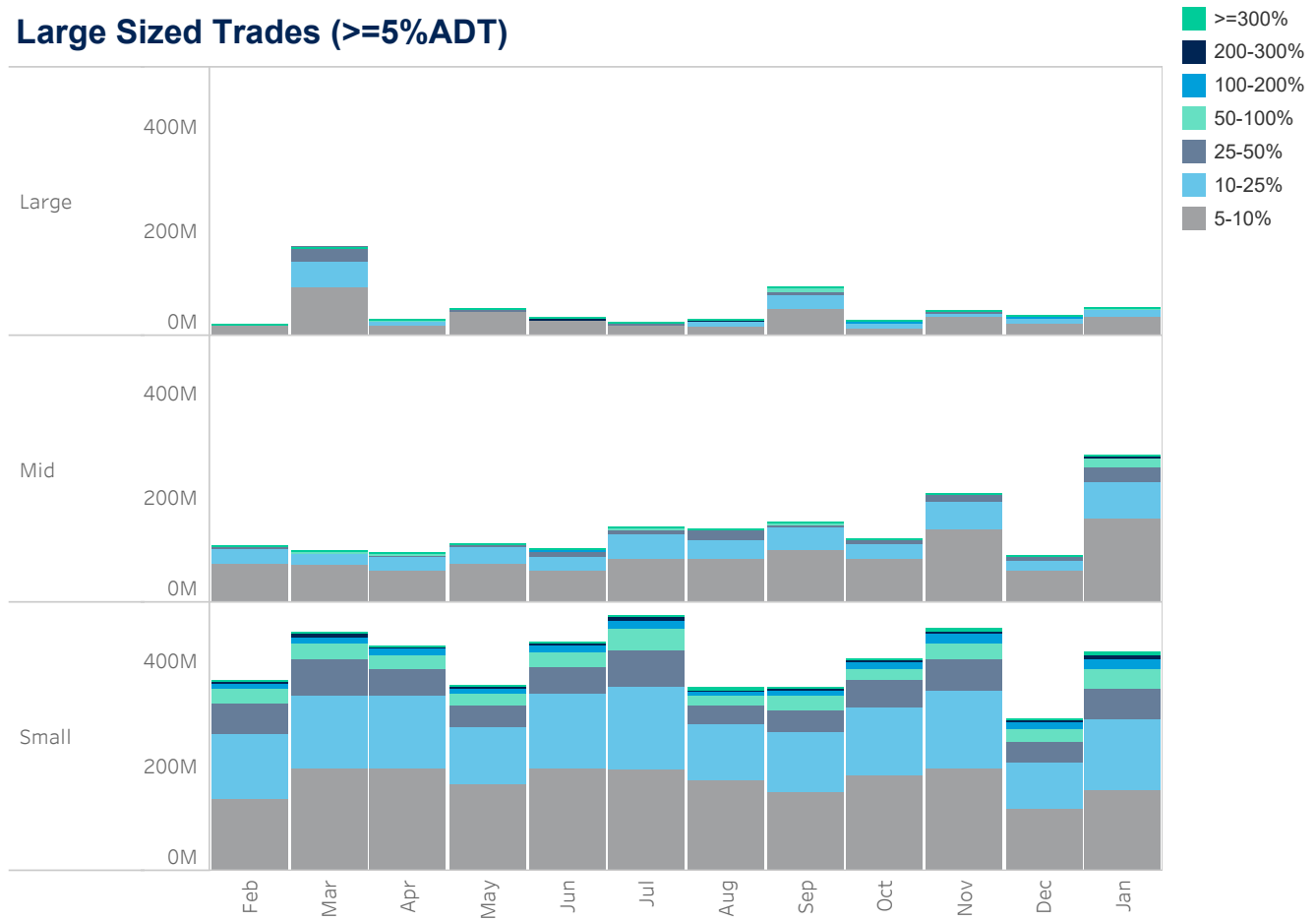
Source data: Virtu Financial

Singapore

Average Daily Turnover (Notional USD)



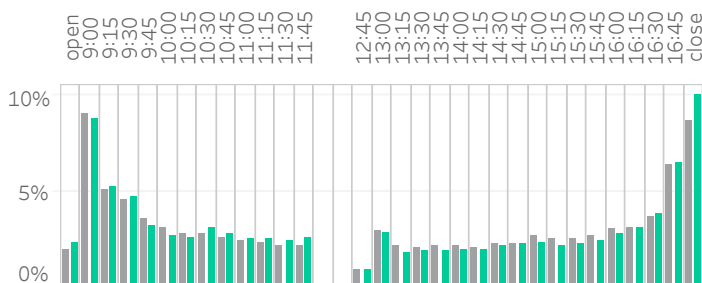
Large Sized Trades (>=5%ADT)



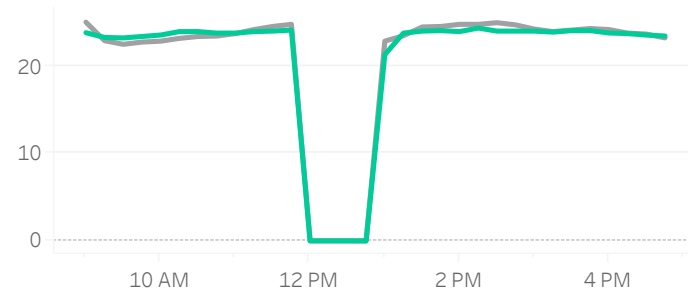
Source data: Virtu Financial

Singapore

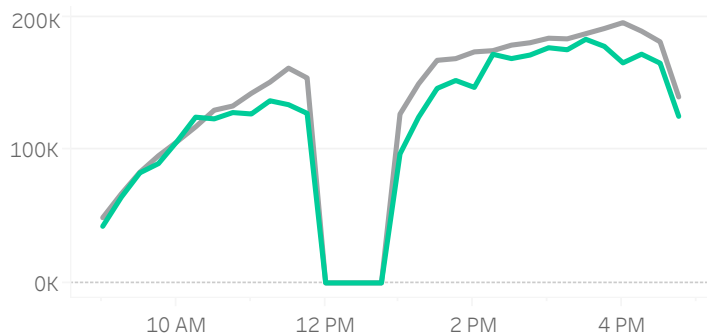
Volume Curve



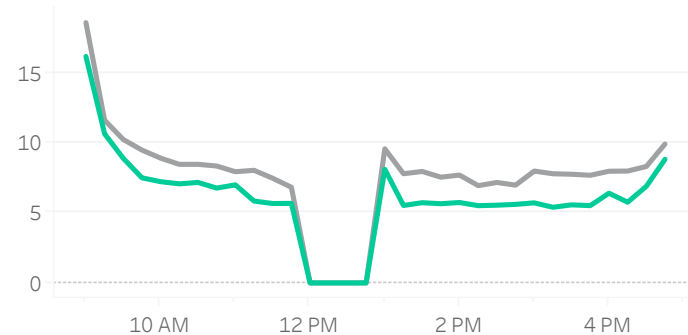
Intraday Spread (bps)



Intraday Quotesize (Shares)



Intraday Volatility (bps)



■ Rolling 12 Months Avg ■ January 2022

Spread Bps

	21 Q1			21 Q2			21 Q3			21 Q4			22 Q1
	Jan 21	Feb 21	Mar 21	Apr 21	May 21	Jun 21	Jul 21	Aug 21	Sep 21	Oct 21	Nov 21	Dec 21	Jan 22
firstHalfHour	23.4	24.7	22.2	21.8	24.1	23.0	22.9	21.6	23.3	22.7	21.6	23.6	22.5
midday	24.4	25.3	22.6	22.5	24.5	22.5	22.7	22.4	24.1	22.8	22.2	24.2	23.4
lastHalfHour	24.3	24.0	22.2	21.0	23.3	21.4	22.3	22.5	23.1	22.0	22.1	22.7	21.9

One Minute Volatility Bps

firstHalfHour	7.1	7.7	6.1	5.1	7.2	6.7	6.6	7.7	6.6	7.3	6.4	5.3	5.5
midday	5.4	5.7	4.5	5.6	6.6	4.1	4.5	3.9	3.3	3.3	5.5	3.7	4.1
lastHalfHour	5.7	3.9	5.2	5.3	6.6	3.8	4.9	1.6	3.4	4.8	4.0	2.9	4.6

Quotesize in Shares

firstHalfHour	59,630	65,948	58,395	76,129	61,752	55,719	51,982	58,984	61,969	54,873	78,883	58,696	57,597
midday	161,583	189,564	171,200	197,195	181,346	141,942	122,557	127,510	145,217	150,127	165,639	146,991	140,047
lastHalfHour	180,964	195,173	162,162	180,880	165,147	134,075	118,307	142,612	146,413	158,656	183,894	150,357	134,260

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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