Sep 2023

CA Market Structure Monthly

MICROSTRUCTURE OBSERVATIONS

- In September 2023, the average daily volume for TSX listed securities was 629 million shares, up 19% compared to August 2023 and down 5% compared to September 2022. Liquidity, spread and volatility conditions were flat as compared to August 2023.
- In non-TSX listed securities, the average daily volume was 308 million shares in September 2023, up 20% compared to August 2023 and up 9% compared to September 2022. While spread and volatility conditions were flat, liquidity conditions improved compared to August 2023.
- TSX-listed block volumes remained flat in September 2023 as compared to August 2023. Dark market volumes decreased slightly compared to August 2023 while remaining near the 12-month high.

CA MARKET STRUCTURE NEWS

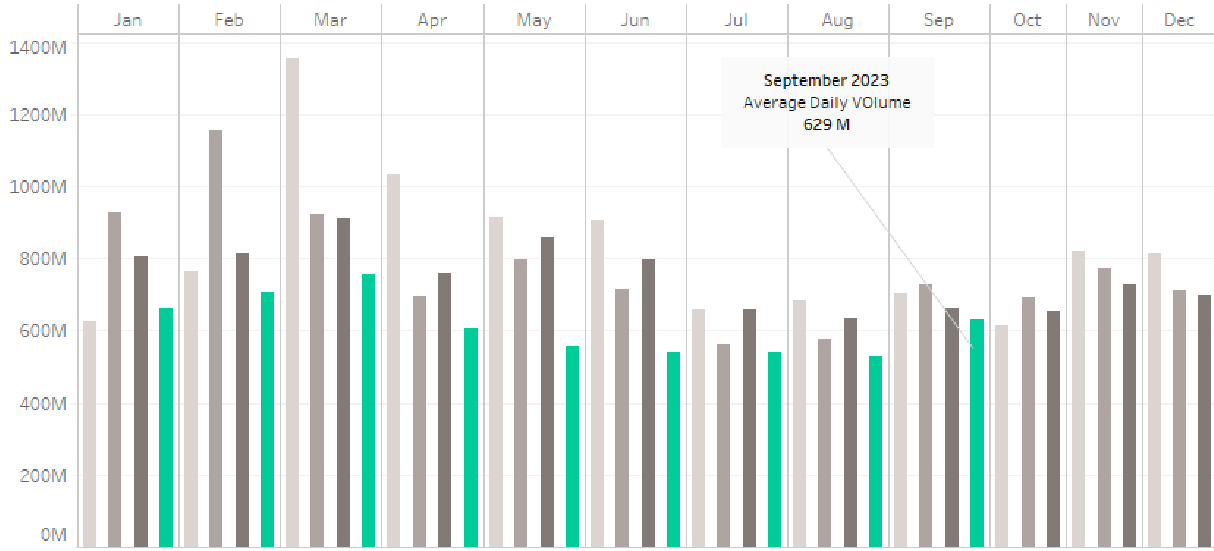
NASDAQ CXC Limited Notice of Proposed Changes and Request for Comment

Nasdaq CXC Limited (Nasdaq Canada) has announced plans to implement new functionality changing the way PureStream LTR orders currently operate. Currently, matches are being generated in real-time in response to Reference Trades, resulting in a significant number of small Odd Lot trades and adding to increased trading costs for market participants. In the proposed changes, the system will wait until a minimum aggregated volume level is reached ("Minimum Stream Quantity") at which point it will calculate the Volume Weighted Average Price for this aggregated volume and execute at the calculated price. This change is subject to regulatory approval.

Notice of Withdrawal of Proposed Amendments to Lynx ATS – Tradelogiq Markets Inc.

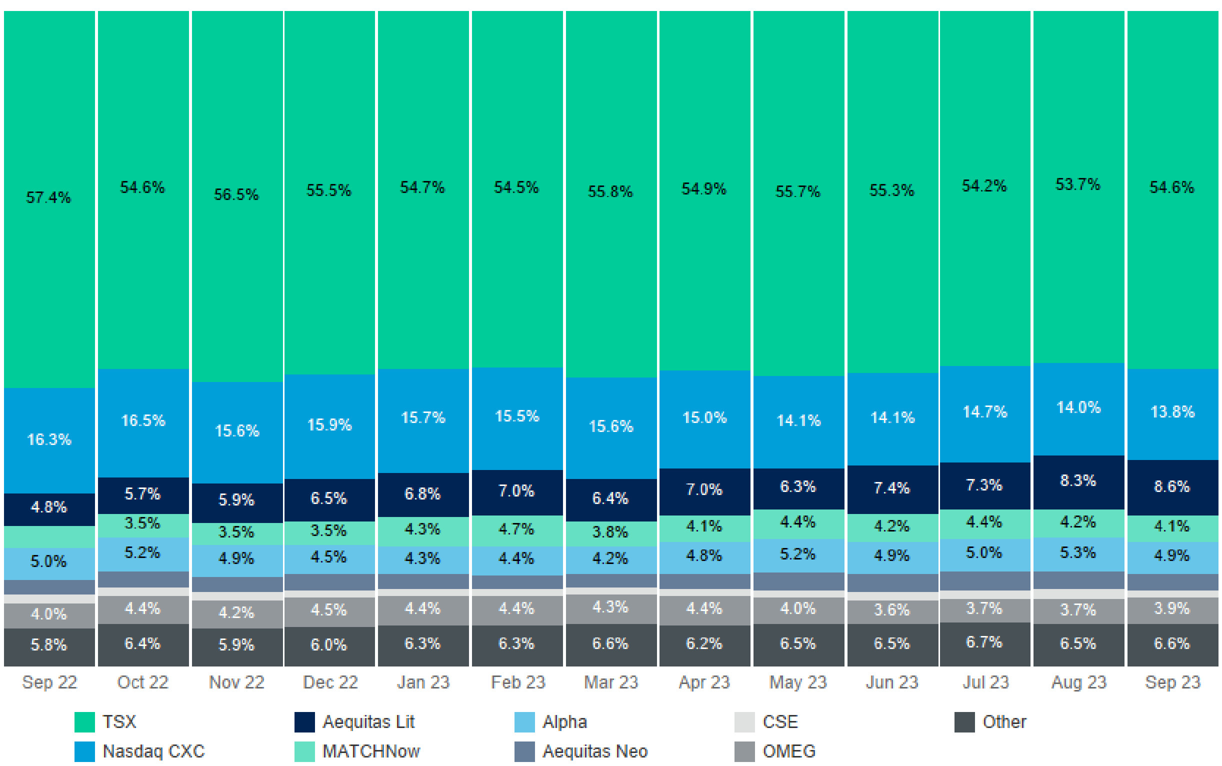
On October 28, 2021, the Ontario Securities Commission (**OSC**) published a Notice of Approval concerning approved amendments to Tradelogiq Markets Inc.'s (**TMI**) Lynx ATS (**Lynx**) trading book in relation to the creation of a latency sensitive trader (**LST**) definition category and application of a speed bump on certain orders that originate from LST traders. However, on September 28, 2023, the approved amendments were withdrawn and will not be implemented.

Average Daily Market Volume (Shares, TSX Listed)



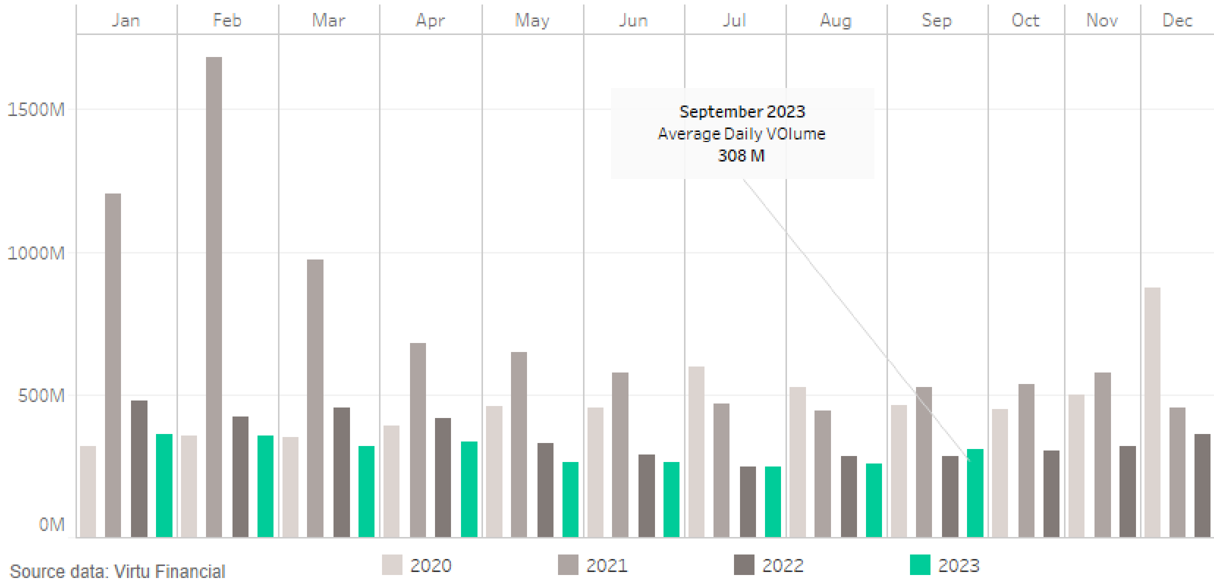
Source data: Virtu Financial

Venue Market Share (TSX Listed)



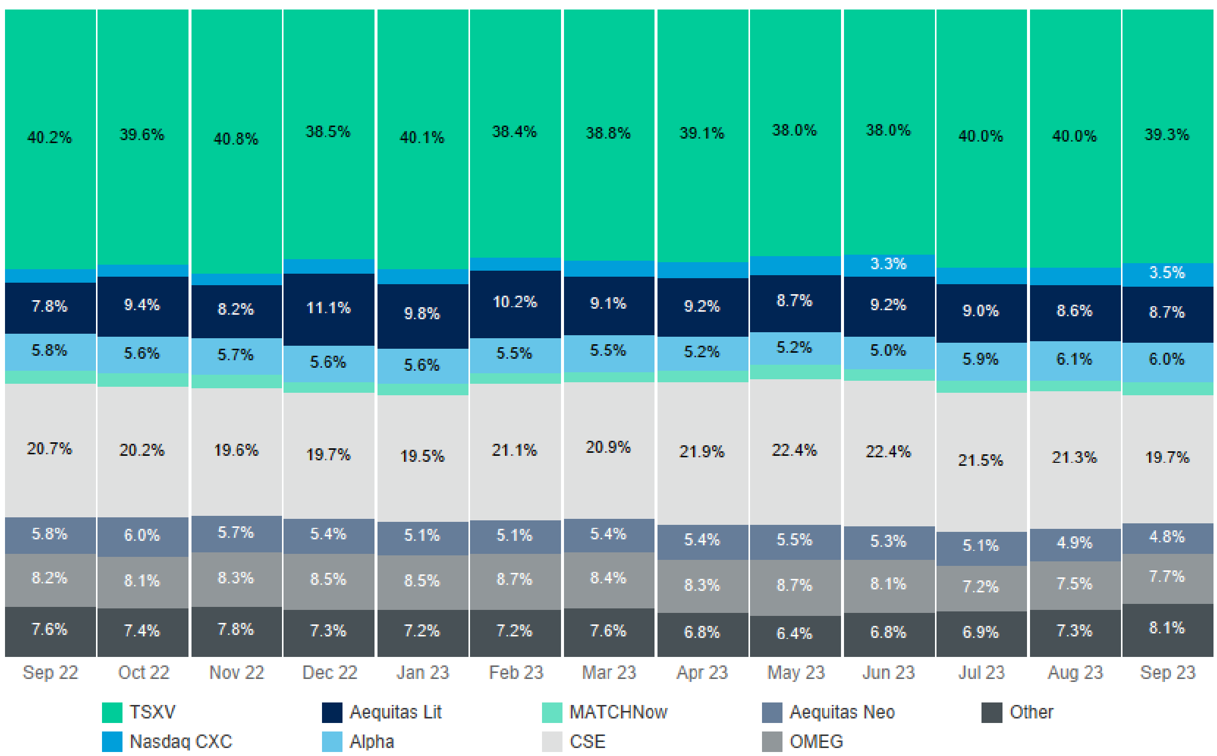
Source data: Virtu Financial

Average Daily Market Volume (Shares, Non-TSX Listed)



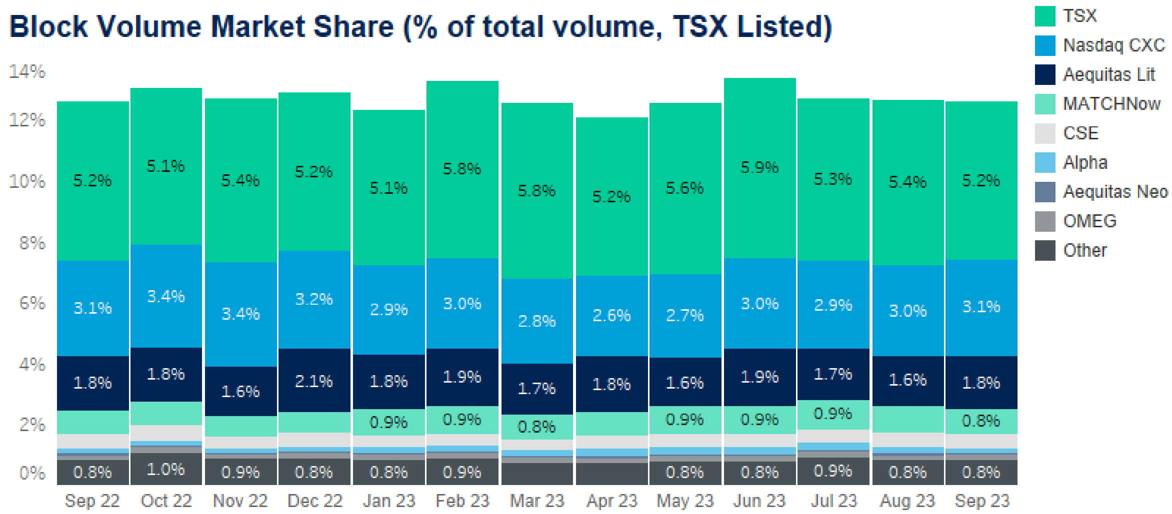
Source data: Virtu Financial

Venue Market Share (Non-TSX Listed)

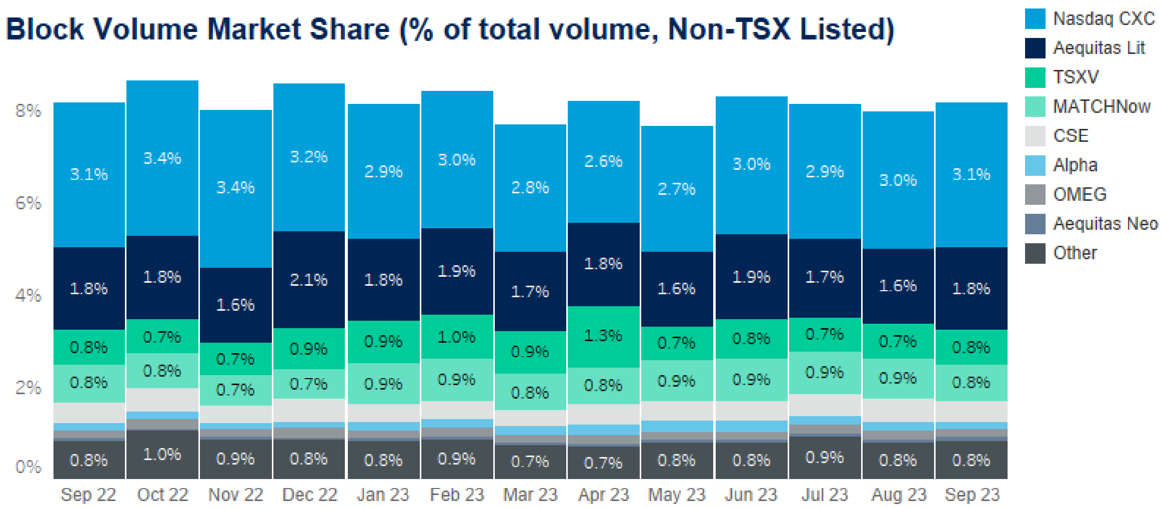


Source data: Virtu Financial

Block Volume Market Share (% of total volume, TSX Listed)

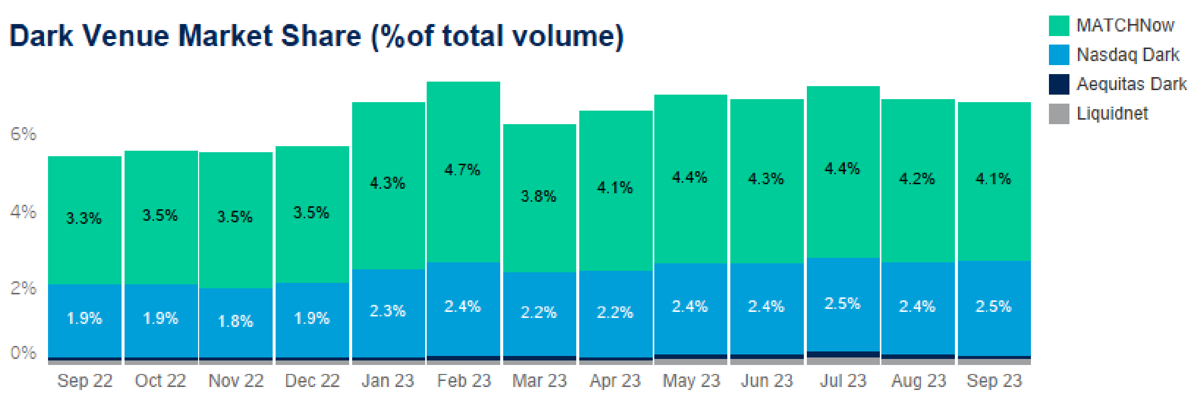


Block Volume Market Share (% of total volume, Non-TSX Listed)



Blocks defined as >5100 shares and > $30,000 CAD or >=$100K CAD; Source data: Virtu Financial

Dark Venue Market Share (%of total volume)



TSX listed securities only; Source data: Virtu Financial

VIRTU FINANCIAL

Quotesize in Shares

		3Q 22	4Q 22			1Q 23			2Q 23			3Q 23		
		Sep 22	Oct 22	Nov 22	Dec 22	Jan 23	Feb 23	Mar 23	Apr 23	May 23	Jun 23	Jul 23	Aug 23	Sep 23
First 30 Min	S&P/TSX 60	780	823	855	916	854	798	840	892	877	889	897	895	911
	S&P/TSX Composite	951	1,028	1,053	1,099	1,123	1,002	1,058	1,123	1,081	1,094	1,041	1,016	1,028
	Non-TSX-Listed	4,500	4,599	4,778	4,969	4,945	4,969	4,763	6,191	5,930	5,259	5,021	5,261	6,182
Mid Day	S&P/TSX 60	955	965	1,008	1,057	1,025	953	1,017	1,104	1,106	1,112	1,114	1,100	1,115
	S&P/TSX Composite	1,174	1,221	1,280	1,326	1,351	1,223	1,296	1,426	1,361	1,365	1,326	1,256	1,283
	Non-TSX-Listed	4,610	4,421	4,421	4,650	4,650	4,477	4,464	5,650	5,631	5,000	4,583	4,875	5,498
Last 30 Min	S&P/TSX 60	1,143	1,165	1,174	1,165	1,192	1,084	1,150	1,222	1,191	1,209	1,280	1,245	1,268
	S&P/TSX Composite	1,392	1,476	1,500	1,484	1,568	1,420	1,501	1,600	1,538	1,543	1,583	1,509	1,529
	Non-TSX-Listed	4,365	4,127	4,394	4,586	4,582	4,634	4,803	5,988	5,747	5,000	4,456	4,781	5,494

Spread Bps

		Sep 22	Oct 22	Nov 22	Dec 22	Jan 23	Feb 23	Mar 23	Apr 23	May 23	Jun 23	Jul 23	Aug 23	Sep 23
First 30 Min	S&P/TSX 60	6.1	6.5	6.6	6.2	6.2	6.1	6.1	5.3	6.2	6.3	5.8	6.3	6.3
	S&P/TSX Composite	14.4	14.8	13.9	13.4	13.4	13.2	13.4	11.7	12.7	12.5	11.9	12.4	12.4
	Non-TSX-Listed	220.6	219.5	218.1	215.1	210.5	203.5	212.6	198.5	184.3	192.3	182.5	180.4	186.6
Mid Day	S&P/TSX 60	4.0	3.9	3.8	3.7	3.6	3.7	3.7	3.3	3.8	3.8	3.5	3.9	3.9
	S&P/TSX Composite	8.7	8.6	8.3	8.3	8.4	8.4	8.3	7.6	8.2	8.1	7.7	8.1	8.2
	Non-TSX-Listed	148.5	151.8	156.6	157.1	149.3	137.1	149.3	138.9	126.0	130.7	124.2	124.9	120.5
Last 30 Min	S&P/TSX 60	3.0	2.9	2.9	2.8	2.8	2.9	2.8	2.5	2.8	2.8	2.6	2.7	2.8
	S&P/TSX Composite	7.8	7.4	7.1	7.2	7.4	7.4	7.2	6.8	7.2	7.4	7.0	7.3	7.5
	Non-TSX-Listed	139.9	149.3	146.4	144.6	137.8	135.0	140.4	133.3	122.8	127.5	123.6	121.2	119.7

One Minute Volatility Bps

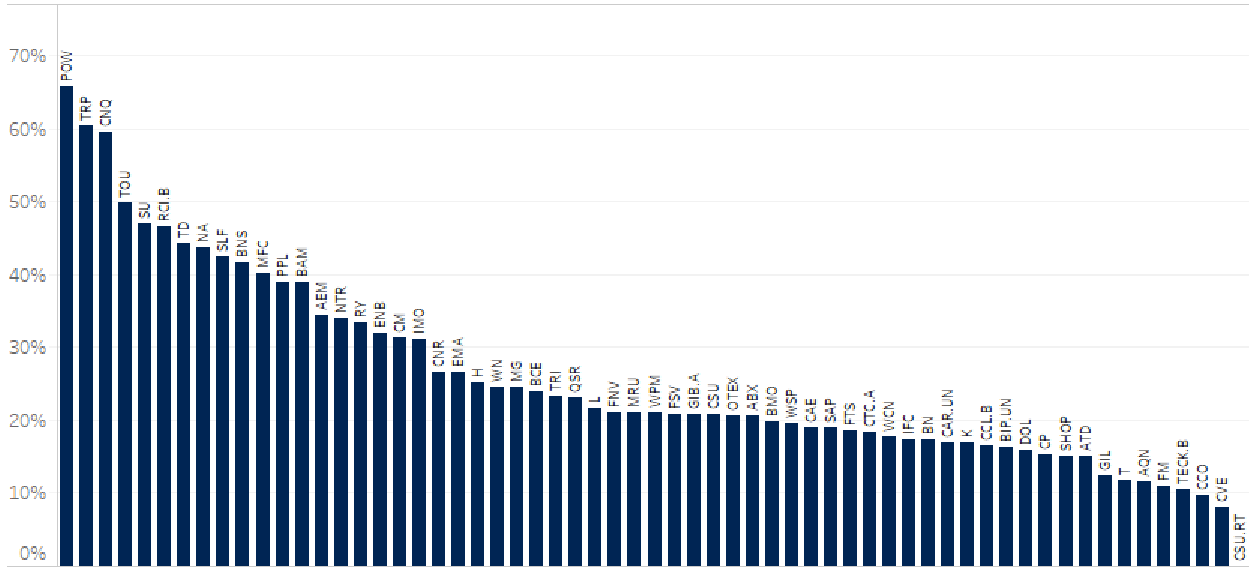
		Sep 22	Oct 22	Nov 22	Dec 22	Jan 23	Feb 23	Mar 23	Apr 23	May 23	Jun 23	Jul 23	Aug 23	Sep 23
First 30 Min	S&P/TSX 60	14.2	16.9	14.2	13.5	11.9	12.1	13.6	11.0	11.8	10.6	9.9	10.9	10.7
	S&P/TSX Composite	18.8	20.8	18.2	16.6	15.1	15.5	17.3	13.5	14.2	12.4	11.9	13.0	12.5
	Non-TSX-Listed	22.1	23.2	20.7	22.8	17.7	17.9	21.4	15.7	15.1	13.6	13.0	14.6	15.6
Mid Day	S&P/TSX 60	5.9	6.1	5.2	4.7	4.0	4.4	5.5	3.7	4.2	3.5	3.2	4.0	3.8
	S&P/TSX Composite	6.4	6.5	5.6	4.8	4.1	4.4	5.7	3.5	3.9	2.9	2.7	3.5	3.3
	Non-TSX-Listed	6.9	7.3	6.3	5.7	4.5	5.3	7.3	5.0	4.8	4.4	4.4	5.0	4.8
Last 30 Min	S&P/TSX 60	5.8	5.5	5.0	4.9	4.0	4.7	5.1	3.8	4.2	3.7	3.4	3.7	3.8
	S&P/TSX Composite	5.3	5.2	4.9	4.5	3.8	4.3	4.7	3.1	3.6	3.0	2.6	3.1	3.1
	Non-TSX-Listed	6.7	6.7	5.4	5.4	3.8	4.7	6.2	4.0	4.0	3.5	2.9	3.8	3.9

Percent MDV by Time of Day

		Sep 22	Oct 22	Nov 22	Dec 22	Jan 23	Feb 23	Mar 23	Apr 23	May 23	Jun 23	Jul 23	Aug 23	Sep 23
Open	S&P/TSX 60	0.5%	0.4%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.4%	0.5%	0.4%	0.5%
	S&P/TSX Composite	0.4%	0.4%	0.4%	0.4%	0.4%	0.5%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.5%
	Non-TSX-Listed	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
First 30 Min	S&P/TSX 60	9.6%	10.4%	10.1%	10.1%	8.9%	9.7%	9.5%	9.4%	9.9%	8.9%	8.9%	8.9%	8.1%
	S&P/TSX Composite	11.4%	11.4%	11.3%	10.5%	10.0%	10.8%	10.2%	10.0%	10.6%	10.1%	9.9%	9.9%	8.9%
	Non-TSX-Listed	18.5%	18.0%	19.4%	17.5%	17.6%	17.0%	18.0%	18.0%	16.4%	17.4%	18.8%	19.2%	17.7%
Last 30 Min	S&P/TSX 60	14.7%	13.5%	13.3%	13.6%	13.3%	13.1%	13.5%	13.1%	15.0%	14.5%	14.1%	14.3%	14.4%
	S&P/TSX Composite	14.4%	14.0%	13.8%	13.7%	13.8%	13.9%	13.8%	13.5%	14.5%	14.6%	14.3%	14.8%	14.6%
	Non-TSX-Listed	11.9%	11.5%	10.9%	10.8%	10.3%	11.3%	10.8%	10.0%	10.7%	11.3%	12.1%	12.4%	12.4%
Close	S&P/TSX 60	16.0%	12.3%	12.8%	18.2%	15.2%	18.5%	18.1%	19.3%	13.8%	19.1%	19.9%	19.3%	21.5%
	S&P/TSX Composite	6.5%	5.7%	6.3%	7.1%	6.5%	8.1%	7.9%	9.1%	6.9%	8.7%	8.2%	7.5%	9.1%
	Non-TSX-Listed	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

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

September 2023 Median MOC % of Daily Volume - S&P/TSX 60



Source data: Virtu Financial

ABOUT VIRTU

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

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