April 2023





MARKET MICROSTRUCTURE OBSERVATIONS

- In April 2023, the average daily volume for TSX listed securities was 607 million shares, down 20% compared to March 2023 and down 20% compared to April 2022. Liquidity, spread, and volatility conditions improved compared to March 2023.
- In non-TSX listed securities, the average daily volume was 336 million shares, up 5% compared to March 2023 and down 19% compared to April 2022. Liquidity, spread and volatility conditions improved compared to March 2023.
- Dark venue market share increased in April 2023 and returned to near the 12-month high. This increase in market share occurred primarily at MATCHNow with an increase of 0.3%.

CANADA MARKET STRUCTURE NEWS

New SRO Members Approve New Name

On April 24 th, 2023 Members of the New Self-Regulatory Organization of Canada (New SRO) approved the new name of the organization to be the Canadian Investment Regulatory Organization (CIRO). The name still requires approval by provincial and territorial security regulators, and it is expected that the new name will be in use by June 2023. https://www.iiroc.ca/news-and-publications/notices-and-guidance/new-sro-members-approve-new-name

Amendments to facilitate the investment industry's move to T+1 settlement

On April 20 th, 2023 the New Self-Regulatory Organization of Canada (New SRO) proposed amendments to the Universal Market Integrity Rules (UMIR) and Investment Dealer and Partially Consolidated Rules (IDPC Rules) to facilitate the investment industry's move from a trade date plus two business days (T+2) settlement cycle to a trade date plus one business day (T+1) settlement cycle.

https://www.iiroc.ca/media/21516/download?inline

Notice of Approval - Amendments to CSE Trading Rule 4 -Odd Lots

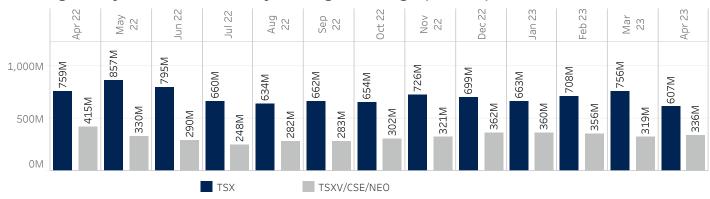
On April 27th, 2023 the Ontario Securities Commission and British Columbia Securities Commission have approved significant changes (the "Amendments") to the CSE Trading rule 4. The comment period ended March 20th, 2023, and the CSE received no comments. The Amendments will take effect later in Q2 of 2023 and the CSE will disseminate a separate notice confirming that date.

With the implementation of the Amendments, CSE will amend the treatment of odd lots such that where there is no National Best Bid and Offer price ("NBBO"), or if there is only a best bid or best offer displayed, odd lots will not be auto-executed against the assigned Market Maker for the symbol. Odd lots entered in the absence of an NBBO will still book and potentially trade against each other at the Single Odd Lot Price ("SOP") where there is a match. If the board lot portion of a mixed lot order takes out one side of the market for stocks with an assigned Market Maker, the odd lot will still be guaranteed a fill by the Market Maker at the same price that the first board lot portion was filled at. If there is a best bid and a best offer, odd lots will auto-execute.

 $\underline{https://www.osc.ca/en/industry/market-regulation/marketplaces/exchanges/recognized-exchanges/canadian-securities-exchange-cse-rule-review-notices/notice-approval-1}$

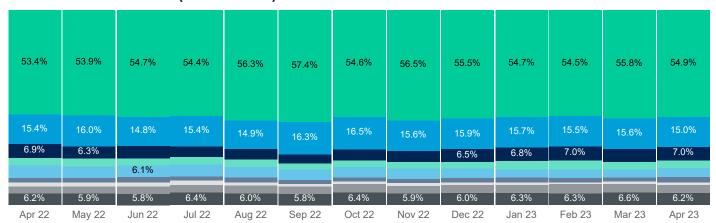


Average Daily Market Volume By Listing Exchange (Shares)

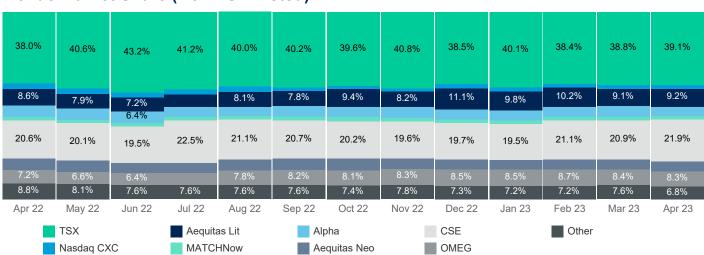


Source data: Virtu Financial

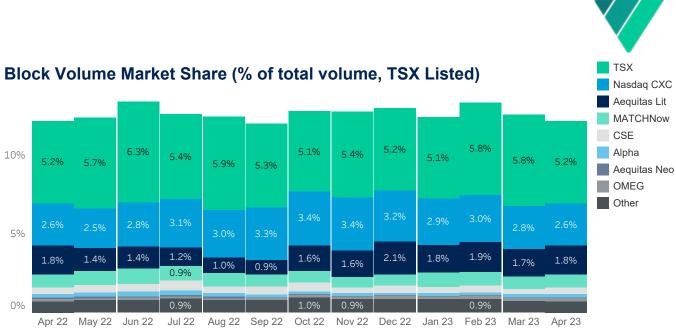
Venue Market Share (TSX-Listed)

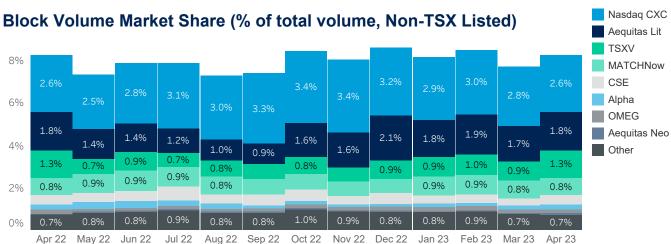


Venue Market Share (Non-TSX-Listed)

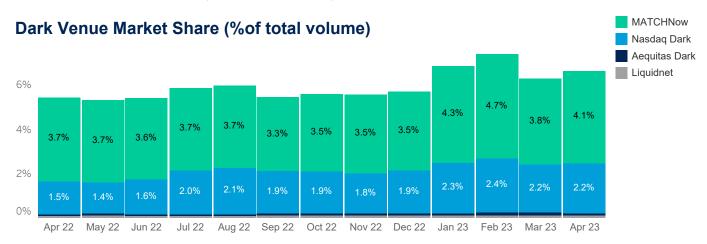


Source data: Virtu Financial





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



TSX listed securities only; Source data: Virtu Financial



Quotesize in Shares

			2Q 22			3Q 22			4Q 22			1Q 23		2Q 23
		Apr 22	May 22	Jun 22	Jul 22	Aug 22	Sep 22	Oct 22	Nov 22	Dec 22	Jan 23	Feb 23	Mar 23	Apr 23
First 30 Min	S&P/TSX 60	790	762	851	892	795	780	823	855	916	854	798	840	892
	S&P/TSX Composite	988	958	1,067	1,106	960	943	1,023		1,097	1,118	997	1,049	1,114
	Non-TSX-Listed	5,540	5,120	4,698	4,334	4,388	4,500	4,599	4,778	4,969	4,945	4,969	4,763	6,191
Mid Day	S&P/TSX 60	905	899		1,068	980	954	964	1,007	1,057	1,025	953	1,017	1,104
	S&P/TSX Composite	1,129	1,138	1,246	1,309	1,181	1,164	1,211	1,271	1,319	1,345	1,215	1,287	1,417
	Non-TSX-Listed	5,170	4,828	4,748	4,459	4,771	4,609	4,418	4,419	4,650	4,650	4,475	4,462	5,649
Last 30 Min	S&P/TSX 60	956	962	1,092	1,187	1,198	1,151	1,169	1,178	1,171	1,203	1,090	1,156	1,229
	S&P/TSX Composite	1,248	1,238	1,366		1,395	1,382	1,468	1,491	1,476	1,558	1,411	1,494	1,596
	Non-TSX-Listed	5,300	5,103	4,752	4,428	4,486	4,394	4,158	4,417	4,605	4,598	4,653	4,846	6,000

Spread Bps

First 30 Mir	n S&P/TSX 60	6.0	6.5	6.0	6.6	6.1	6.1	6.5	6.6	6.2	6.2	6.1	6.1	5.3
1 1131 30 14111														
	S&P/TSX Composite	12.2	14.2		14.8	13.9	14.4	14.8	14.0	13.4	13.4	13.2	13.4	11.7
	Non-TSX-Listed	170.5	204.9	215.7	229.8	201.2	220.6	219.5	218.1	215.1	210.5	203.5	212.6	198.5
Mid Day	S&P/TSX 60	3.5	4.1	3.9	4.1	3.9	4.0	3.9		3.7	3.6	3.7	3.7	3.3
	S&P/TSX Composite	7.5	9.0	8.3	8.6	8.1	8.7	8.6		8.3	8.4	8.4	8.2	7.6
	Non-TSX-Listed	129.0	145.0	152.7	163.9	143.0	148.3	151.6	156.4	156.9	149.3	137.0		138.9
Last 30 Mir	n S&P/TSX 60	2.7	3.1	3.0	3.0	2.9	3.0	2.9	2.9	2.8	2.8	2.9	2.9	2.6
	S&P/TSX Composite	6.5	7.5		7.5	7.2	7.8	7.5	7.1	7.2	7.4	7.4	7.2	6.8
	Non-TSX-Listed	129.0	147.1	144.9	155.4	140.9	140.7	150.4	147.7	145.5	140.1	135.2	141.2	134.3

One Minute Volatility Bps

First 30 Min	S&P/TSX 60	14.3	17.1	15.5	15.9	13.9	14.2	16.9	14.2	13.5	11.9	12.1	13.6	11.0
	S&P/TSX Composite	17.7	21.0	20.0	22.4		18.7	20.8	18.2	16.5	15.0	15.4	17.4	13.4
	Non-TSX-Listed	21.3	36.5	33.1	30.9	20.9	22.1	23.2	20.7	22.8	17.7	17.9	21.4	15.7
Mid Day	S&P/TSX 60	5.0	7.3	5.8	5.3	4.6	5.9	6.1		4.7	4.0	4.4	5.4	3.7
	S&P/TSX Composite		8.2	6.9	6.0	5.0	6.3	6.5	5.6	4.8	4.1	4.4	5.7	3.5
	Non-TSX-Listed	7.2	12.5	9.7	8.0	6.2		7.3	6.3	5.7	4.5	5.3	7.3	5.0
Last 30 Min	S&P/TSX 60	4.9	7.4	5.8	5.1	4.3	5.8	5.6	5.1	5.0	4.0	4.7	5.2	3.8
	S&P/TSX Composite	5.1	7.4	5.7	4.8	3.9	5.4	5.2	4.9	4.6	3.8	4.3		3.2
	Non-TSX-Listed	6.6	11.3	7.7	6.4	5.4	6.7	6.7	5.4	5.4	3.8	4.7	6.2	4.0

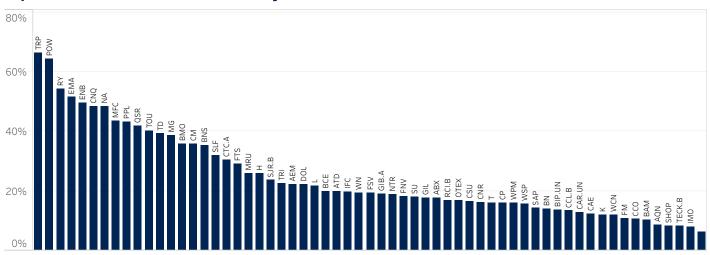
Percent MDV by Time of Day

Percen	וז אט אטוווו או או או	ie of i	Jay											
Open	S&P/TSX 60	0.6%	0.6%	0.7%	0.5%	0.6%	0.5%	0.4%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%
	S&P/TSX Composite	0.5%	0.5%	0.5%	0.5%	0.5%	0.4%	0.4%	0.4%	0.4%	0.4%		0.4%	0.4%
	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	12.5%	12.6%	12.4%	13.0%	13.1%	9.6%	10.4%	10.1%	10.1%	8.9%	9.7%	9.5%	9.4%
	S&P/TSX Composite	12.8%	12.6%	12.8%	13.7%	13.4%		11.4%	11.4%	10.5%	10.0%	10.9%	10.2%	10.1%
	Non-TSX-Listed	18.0%	18.7%	18.9%	19.8%	20.2%	18.5%	18.0%	19.4%	17.4%	17.5%	17.0%	18.0%	18.0%
Last 30 Min	S&P/TSX 60	39.2%	36.1%	40.9%		36.8%	36.3%	31.5%	33.1%	36.7%	34.7%	36.0%	37.2%	39.9%
	S&P/TSX Composite	24.9%	26.3%	24.5%	26.0%	25.7%	26.1%	26.2%	25.5%	27.0%	26.9%	29.0%	28.6%	30.0%
	Non-TSX-Listed	7.6%	7.2%	7.2%	6.7%		6.9%	6.3%	6.0%	6.2%	6.3%	7.4%	5.9%	7.8%
Close	S&P/TSX 60	8.0%	6.7%	7.3%	7.5%	7.4%	16.0%	12.3%	12.8%	18.2%	15.2%	18.5%	18.1%	19.3%
	S&P/TSX Composite	4.2%	3.7%	4.4%	4.5%	4.4%	6.4%	5.6%		7.1%	6.6%	8.1%	7.8%	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%

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



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



Source data: Virtu Financia



ABOUT VIRTU

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

To learn more, contact your sales representative or call our desk at: **APAC**+852.2846.3553 | **CAN**+1.416.874.0800 | **EMEA**+44.20.7670.4066 | **US**+1.646.682.6199 info@virtu.com | www.virtu.com

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

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

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