

CIBC CAPITAL MARKETS

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Sector: Information Technology

EQUITY RESEARCH

September 7, 2023

Industry Update

Back To School – Bits & Bytes Weekly

A Look At The Use Of AI In The Classroom

Our Conclusion

The 2023-2024 school year marks the first full school year where generative AI technologies such as ChatGPT are widely accessible, making it a pivotal year for determining what role AI will play in education. Although many school districts throughout the US banned ChatGPT shortly after its public launch, most later lifted the bans, with NYC encouraging teachers and students to explore the technology. Viewpoints among educators remain divided on whether AI will have an adverse impact on students' critical-thinking/creativity skills or whether it can be used to enhance learning. Within this context, Canadian educators now face the decision either to ban the technology, or embrace it.

Key Points

No Formal Policies: The Canadian Press asked 10 school boards across Canada whether they would implement formal policies around teacher and student use of AI; none of the surveyed boards said they had a specific policy in place for the 2023-2024 school year. Most school boards indicated they are either applying their existing codes of conduct to AI tools or undergoing consultations on how to address the issue. The Saskatoon Public School division stated more research was needed on the benefits and impacts of AI before policy development can be explored. Some experts have pointed out that board-wide or school-wide umbrella policies are unlikely to work, and would also be difficult to apply given the technology's rapid evolvement.

Some Teachers Already Embracing AI: Some teachers have already incorporated AI into their day-to-day, using generative AI tools to help create quizzes, tests and lesson plans. In terms of student usage, while some educators are concerned about the use of technology as a tool to cheat and plagiarize, others are advocating for its use. Those educators believe the technology is here to stay, and rather than ban it, hope to help students learn to use it in a meaningful way. Despite fears, this is not the first time new tech innovations have disrupted education. The graphing calculator, Google search, Wikipedia and the Internet itself all created similar panics when first introduced.

ChatGPT Gives Its Opinion: Last week, OpenAI released a guide for teachers on effectively incorporating ChatGPT into student learning. The guide includes suggested prompts, an explanation of how ChatGPT works and its limitations, as well as the effectiveness of AI detectors, and a discussion on biases. OpenAI also shared examples of how teachers and professors are already using ChatGPT to assist them, including a quote from a teacher who stated that she advises students to remember that responses from ChatGPT may not always be credible or accurate.

All figures in U.S. unless otherwise stated.

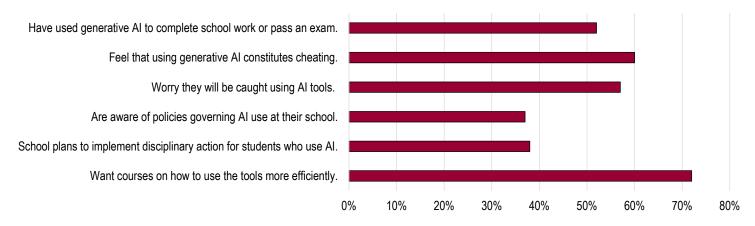
Post-secondary Pushes Back

Beyond grades K-12, post-secondary education is also going head-to-head with ChatGPT. Since the release of the technology to the public, chatbots have posed a threat to integrity in post-secondary education, with plagiarism a primary concern.

While most higher education institutions have declined to ban OpenAl's chatbot outright, professors are looking into how to "ChatGPT proof" assignments and tests. How this is achieved appears to be left to the individual instructor's discretion, with some returning to paper exams and reports and others requiring students to produce drafts along with their final submissions to show their progress. In an article from the New York Times published in January, one professor from Northern Michigan University spoke of potentially eliminating essays entirely, as well as incorporating ChatGPT into lessons by having students evaluate its responses. These and other large overhauls to learning are occurring at universities across the globe as the world responds to the Al wave.

In Canada, no post-secondary institutions appear to have campus-wide AI bans. A research group at the University of Calgary is currently trying to conduct a study on the use of AI in education; however, the group observed that its study has struggled to keep up with the rapid advancement of the technology. Meanwhile, a recent survey conducted by KPMG (see bar graph, Exhibit 1) revealed that more than half of Canadians over 18 (with respondents representing 46% university, 28% college and 13% high school) have used generative AI to complete their school work or pass an exam.

Exhibit 1: Summary Of Select Results From KPMG Survey Conducted In May 2023



Source: KPMG and CIBC World Markets.

News Impacting Our Coverage

Research Highlight: <u>Constellation Software – Adding Scale In Mortgage Software</u> With Intercontinental Exchange's (ICE) acquisition of Black Knight (BKI), we expect Constellation's acquisitions of Empower and Optimal Blue to close shortly. The \$700MM Optimal Blue deal is one of Constellation's largest acquisitions, adding significant scale to Perseus' mortgage operations. We believe that Constellation benefited from a motivated seller, with FTC approval of the ICE/BKI merger held up by concerns related to concentration issues within the loan origination system (LOS) and product, pricing & eligibility (PPE) groups. With the Constellation acquisitions, these concentration issues are removed, paving the way for FTC approval of the \$11.7B ICE/BKI merger. Constellation acquired Optimal Blue at a valuation of ~6.3x EBITDA, a significant discount from the ~24x EBITDA multiple at which BKI acquired the asset in 2019.

Research Highlight: Descartes Systems – FQ2/2024 Slightly Mixed Amid A Muted

Freight Environment Descartes reported a slightly mixed FQ2, with revenue 3% above expectations but adj. EBITDA in line. Margins were 100 bps below consensus as Descartes continues to integrate its GroundCloud acquisition. Organic constant currency Services growth remained stable sequentially at 9% Y/Y, although overall constant currency revenue growth dipped to 6% given Y/Y declines in non-core license revenue. Management noted the possibility of a more muted holiday season and provided a calibration that suggests slower Q/Q growth. With Descartes trading at a ~1.5x EV/S premium to logistics peers, we see the stock as relatively fairly valued at these levels and retain our Neutral rating and \$76 price target.

Research Highlight: Thomson Reuters - Selling 15 Million LSEG Shares For ~\$1.5

Billion Thomson Reuters announced an agreement to sell 15 million shares of its stake in the London Stock Exchange Group (LSEG) through a private placement. Expected gross proceeds from the sale are \$1.5 billion. TRI will sell just under half of the remainder of its 31.9 million share stake in LSEG that initially resulted from the sale of Refinitiv in 2019. The shares are being sold ahead of schedule, as only 2.1 million shares had been eligible to be sold in 2023. The sale appears to have eliminated the lockup on a portion of the stake that had previously been eligible to be sold in 2024. No specific use of proceeds was disclosed but TRI's capital allocation priorities remain on its Build, Partner, Buy AI strategy, strategic M&A, and returning value to shareholders. After the transaction, TRI will own ~16.9 million shares, with a current market value of \$1.7 billion and we expect monetization of this stake to continue, potentially at an accelerated pace.

OpenText Appoints Shannon Bell As EVP And Chief Digital Officer

OpenText announced the appointment of Shannon Bell as the Chief Digital Officer and new member of OpenText's Executive Leadership team. Ms. Bell will be responsible for all IT and digital systems, data platforms, networks and communications, commercial and corporate cloud operations at OpenText. Previously, Ms. Bell led aspects of IT, digital, cloud and data at Rogers Communications.

Exhibit 2: CIBC Coverage – Price Returns, For The Period Ending September 7, 2023

Software & Systems	Price	1 Week	1 Month	3 Month	6 Month	1 Year	YTD	52W High	52W Low
Constellation Software Inc	2,745.12	(1.1)	2.1	1.0	22.3	41.5	32.5	2859.57	1747.83
Descartes Systems	72.81	(0.5)	(2.3)	(3.1)	(3.7)	5.2	4.5	82.02	61.26
Enghouse Systems Limited	28.99	0.0	3.0	(19.9)	(33.4)	(10.1)	(19.4)	44.59	27.30
Open Text Corp	39.58	0.3	8.2	(5.2)	13.9	33.9	33.5	43.25	24.91
Kinaxis	159.87	(3.4)	(5.8)	(10.8)	(6.3)	10.7	5.2	191.80	124.90
Docebo, Inc.	55.68	(2.6)	11.4	16.6	13.8	40.3	24.5	62.95	31.66
Dye & Durham	17.31	(2.0)	(8.6)	10.4	(9.3)	26.6	5.5	23.14	11.62
Altus Group	52.07	(0.7)	16.2	10.7	(13.3)	5.2	(3.6)	61.60	40.00
Q4 Inc.	4.05	0.5	(4.7)	19.1	62.0	NA	26.2	4.59	1.88
Average		(1.1)	2.2	2.1	5.1	19.2	12.1		

Business Services	Price	1 Week	1 Month	3 Month	6 Month	1 Year	YTD	52W High	52W Low
CGI Group Inc	138.38	(1.8)	3.8	(0.5)	12.3	33.9	18.6	142.31	100.74
Converge Technologies	2.80	(2.3)	(14.8)	(20.1)	(37.3)	(49.9)	(39.1)	7.18	2.39
Information Services Corp	23.97	(1.0)	(4.1)	13.9	6.1	3.4	(0.8)	26.98	20.16
Softchoice Corporation	15.83	(5.1)	8.9	(10.3)	(3.8)	(12.8)	(13.3)	21.70	13.57
Telus International	11.35	(4.4)	(9.8)	(46.8)	(62.5)	(70.8)	(57.5)	39.87	11.05
Average		(3.4)	(3.0)	(19.4)	(22.8)	(24.9)	(22.8)		

Indices	Price	1 Week	1 Month	3 Month	6 Month	1 Year	YTD
S&P/TSX Composite Index	20,202.63	(0.4)	(0.2)	1.1	(0.4)	5.0	4.2
S&P 500 Index	4,442.48	(1.4)	(1.7)	4.1	11.4	11.6	15.7
S&P/TSX Software Index	190.18	(2.1)	5.1	2.9	23.3	48.9	39.4
S&P500 Software Index	5,750.20	0.7	2.0	6.5	29.8	30.8	40.4

Exhibit 3: Software Stocks - Return Performance (%), 9/7/2022 - 9/7/2023

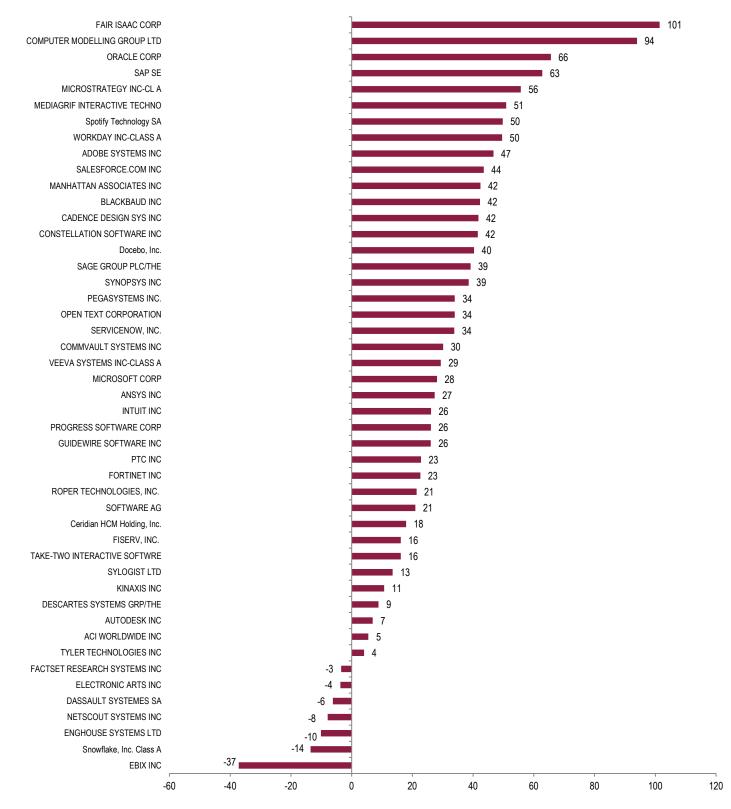


Exhibit 4: Business Services Stocks – Return Performance (%), 9/7/2022 – 9/7/2023

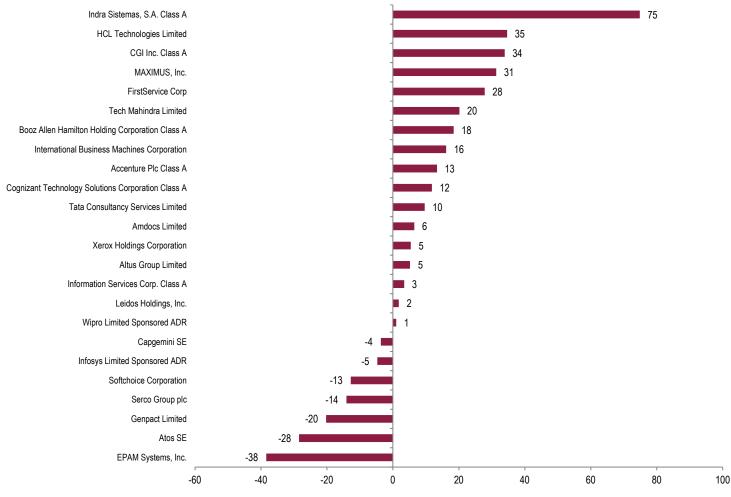


Exhibit 5: Software Stocks – Comp Table, 2022 - 2024E

	Enterprise		EV/S		1	EV/EBITD/	4		P/E	
	Value (\$mins.)	C22	C23E	C24E	C22	C23E	C24E	C22	C23E	C24E
Enterprise Application Software										
Constellation Software Inc.*	44,826	6.8x	5.5x	4.7x	26.4x	21.6x	18.0x	35.2x	37.4x	27.0x
BlackBerry Limited*	2,821	4.2x	2.5x	2.7x	NEG	>50	>50	NEG	NEG	>50
Sage Group plc	11,050	5.5x	5.0x	4.6x	24.1x	21.0x	18.9x	37.3x	31.2x	27.9x
Tyler Technologies, Inc.	17,206	9.3x	8.8x	8.1x	36.2x	35.2x	31.2x	>50	>50	44.7x
Roper Technologies, Inc.	58,774	10.9x	9.7x	9.1x	26.8x	23.7x	22.2x	34.6x	30.0x	27.7x
Enghouse Systems Limited	1,385	3.3x	3.07x	3.06x	10.0x	10.9x	9.91x	14.6x	27.0x	22.49x
Oracle Corporation	420,913	9.0x	8.1x	7.4x	18.1x	15.9x	14.2x	24.6x	23.0x	20.5x
SAP SE	163,362	4.9x	5.2x	4.8x	20.6x	18.1x	15.8x	31.9x	25.4x	21.3x
Enterprise Application Software Avera	age	6.7x	6.0x	5.6x	23.2x	20.9x	18.6x	29.7x	29.0x	27.4x

Extended ERP										
Adobe Incorporated	252,452	14.2x	12.9x	11.5x	29.0x	26.4x	24.1x	40.1x	35.0x	30.9x
Open Text Corporation	18,756	5.3x	3.4x	3.1x	15.1x	11.3x	8.1x	12.5x	12.1x	7.3x
Manhattan Associates, Inc.	12,048	15.7x	13.5x	12.1x	>50	49.4x	43.3x	>50	>50	>50
Pegasystems Inc.	4,406	3.3x	3.2x	2.9x	>50	25.0x	16.8x	>50	34.2x	21.9x
Software AG	2,567	2.7x	2.6x	2.4x	14.4x	14.5x	12.3x	34.8x	22.1x	18.3x
Fiserv, Inc.	96,464	5.8x	5.3x	5.0x	13.4x	12.0x	11.0x	19.0x	16.6x	14.5x
Extended ERP Average		7.8x	6.8x	6.2x	18.0x	23.1x	19.3x	26.6x	24.0x	18.6x

Software As A Service										
Descartes Systems Group Inc.	5,973	12.3x	10.4x	9.5x	27.8x	24.5x	21.6x	>50	>50	48.8x
Kinaxis, Inc.*	3,085	8.4x	7.2x	6.0x	38.8x	48.4x	39.5x	>50	>50	>50
Docebo, Inc.*	1,093	7.6x	6.0x	4.8x	>50	>50	37.5x	>50	NEG	>50
Lightspeed Commerce Inc*	1,632	2.4x	1.9x	1.5x	NEG	NEG	39.7x	NEG	>50	>50
Veeva Systems Inc Class A	32,375	15.2x	13.8x	11.6x	39.4x	39.6x	32.0x	>50	47.6x	40.2x
Shopify, Inc. Class A	78,940	14.1x	11.4x	9.6x	>50	>50	>50	>50	>50	>50
Q4 Inc*	98	1.8x	1.7x	1.6x	NEG	NEG	NEG	NEG	NEG	NEG
Ceridian HCM Holding, Inc.	12,104	9.7x	8.1x	7.0x	48.3x	31.2x	25.7x	>50	>50	44.7x
ServiceNow, Inc.	119,353	16.5x	13.4x	11.0x	>50	42.6x	33.9x	>50	>50	48.5x
Workday, Inc. Class A	61,894	10.1x	8.7x	7.4x	39.4x	32.2x	26.7x	>50	45.6x	38.0x
Software As A Service Average		9.8x	8.3x	7.0x	38.7x	36.4x	32.1x	>50	>50	>50
Infrastructure Vendors										
Microsoft Corporation	2,427,096	11.8x	10.9x	9.6x	24.0x	21.9x	19.1x	34.8x	31.9x	27.9x
Infrastructure Vendors Average		11.8x	10.9x	9.6x	24.0x	21.9x	19.1x	34.8x	31.9x	27.9x
Software Average		8.4x	7.3x	6.5x	26.6x	26.3x	23.7x	29.1x	29.9x	29.6x

Software Average *Share Price Converted to USD

Bolded companies are covered by CIBC World Markets. Data for non-covered companies is consensus.

Exhibit 6: Business Services Stocks – Comp Table, 2022 - 2024E

	Enterprise Value		EV/EBITD/	4		P/E		EV/S		
	(\$mIns.)	C22	C23E	C24E	C22	C23E	C24E	C22	C23E	C24E
Business & IT Services										
CGI Inc. Class A	34,865	13.4x	12.1x	11.6x	22.1x	19.5x	18.4x	2.6x	2.4x	2.3x
TELUS International (CDA), Inc.	4,048	6.7x	7.0x	5.8x	6.7x	8.9x	7.3x	1.6x	1.5x	1.4x
Accenture Plc Class A	211,154	18.3x	17.5x	16.2x	29.5x	27.3x	25.3x	3.4x	3.2x	3.0x
Booz Allen Hamilton	17,662	17.8x	16.2x	14.9x	25.6x	23.2x	20.8x	2.0x	1.8x	1.6x
CACI International Inc Class A	9,281	13.7x	12.5x	11.7x	17.5x	16.6x	15.2x	1.4x	1.3x	1.3x
DXC Technology Co.	7,753	3.2x	3.6x	3.6x	6.0x	6.4x	5.5x	0.5x	0.6x	0.6x
Genpact Limited	7,784	9.9x	9.4x	8.4x	13.6x	12.7x	11.3x	1.8x	1.7x	1.5x
International Business Machines	180,156	11.4x	12.2x	11.6x	16.2x	15.5x	14.7x	3.0x	2.9x	2.8x
Atos SE	2,598	3.0x	2.3x	2.3x	NEG	3.3x	2.6x	0.2x	0.2x	0.2x
Capgemini SE	34,497	9.9x	9.5x	8.8x	14.6x	14.9x	13.6x	1.6x	1.5x	1.4x
Sopra Steria Group SA	5,335	9.0x	7.8x	7.2x	14.6x	11.7x	10.1x	1.0x	0.9x	0.9x
Converge Technology Solutions Cor	923	6.5x	5.5x	4.9x	26.5x	>50	21.1x	0.4x	0.4x	0.4x
Business & IT Services Average		10.6x	10.0x	9.3x	16.6x	14.5x	13.2x	1.7x	1.6x	1.6x

HR Outsourcing			EV/EBITD	4		P/E			EV/S	
Ceridian HCM Holding, Inc.	12,104	48.3x	31.2x	25.7x	>50	>50	44.7x	9.7x	8.1x	7.0x
Willis Towers Watson	25,640	10.8x	10.9x	10.1x	15.3x	14.8x	12.9x	2.9x	2.7x	2.6x
Aon Plc Class A	78,262	19.7x	18.1x	16.8x	24.9x	23.5x	20.8x	6.3x	5.9x	5.6x
Automatic Data Processing, Inc.	104,961	22.7x	20.0x	18.3x	33.0x	29.0x	26.2x	6.1x	5.7x	5.3x
Paychex, Inc.	42,901	20.0x	18.5x	17.2x	29.8x	26.9x	24.8x	8.9x	8.3x	7.8x
HR Outsourcing Average		24.3x	19.7x	17.6x	25.7x	23.5x	25.9x	6.8x	6.1x	5.7x

Information Services			EV/EBITD/	A		P/E			EV/S	
Broadridge Financial Solutions, Inc.	25,326	19.2x	17.5x	16.2x	27.6x	25.3x	23.0x	4.3x	4.0x	3.8x
Dye & Durham Ltd.	2,200	13.9x	12.5x	11.3x	>50	NEG	NEG	4.6x	4.8x	4.6x
Deluxe Corporation	2,218	5.3x	5.4x	5.4x	4.8x	6.0x	5.9x	1.0x	1.0x	1.0x
Information Services Corp	465	7.2x	6.5x	5.2x	11.9x	11.8x	9.6x	2.4x	2.2x	2.0x
Information Services Average		11.4x	10.5x	9.5x	14.8x	14.4x	12.8x	3.1x	3.0x	2.9x
Financial Services Technology			EV/EBITD/	4		P/E			EV/S	
Financial Services Technology			EV/EBITD/	4		P/E			EV/S	
Fidelity National Information Services	50,949	8.2x	8.3x	8.0x	8.3x	9.1x	8.5x	3.5x	3.5x	3.4x
Fiserv, Inc.	96,464	13.4x	12.0x	11.0x	19.0x	16.6x	14.5x	5.8x	5.3x	5.0x
Jack Henry & Associates, Inc.	11,367	18.1x	17.1x	15.9x	30.8x	30.8x	28.9x	5.7x	5.3x	4.9x
ACI Worldwide, Inc.	3,556	9.5x	9.2x	8.5x	18.7x	24.2x	16.0x	2.5x	2.4x	2.3x
T	5,682	15.5x	14.6x	13.0x	23.3x	21.4x	18.8x	6.0x	5.8x	5.3x
Temenos AG	0,002									
Global Payments Inc.	45,518	11.7x	10.5x	9.7x	13.6x	12.2x	10.7x	5.6x	5.2x	4.9x

Diversified Real Estate Services			EV/EBITDA			P/E			EV/S	
Colliers International Group Inc.	7,353	11.7x	11.0x	9.9x	16.5x	17.2x	15.0x	1.6x	1.7x	1.5x
Altus Group Limited	2,532	18.7x	17.4x	14.5x	27.3x	28.8x	27.7x	3.4x	3.2x	2.9x
CBRE Group, Inc. Class A	28,679	9.8x	11.7x	10.1x	15.0x	19.6x	15.5x	0.9x	0.9x	0.8x
Jones Lang LaSalle Incorporated	10,611	8.5x	11.4x	8.3x	10.8x	17.5x	11.0x	0.5x	0.5x	0.5x
Diversified Real Estate Services Average		12.2x	12.9x	10.7x	17.4x	20.8x	17.3x	1.6x	1.6x	1.4x

9.5x 17.1x	9.1x	8.1x	14.5x	14.9x	12.8x	2.5x	2.4x	2.2x
17 1							2 . 7A	2.27
17.1X	15.3x	13.9x	22.8x	21.3x	20.0x	7.1x	6.0x	5.5x
>50	>50	>50	>50	>50	>50	19.6x	16.6x	14.3x
15.8x	14.0x	12.3x	21.2x	19.7x	17.7x	NA	NA	NA
14.1x	12.8x	11.4x	19.5x	18.6x	16.8x	9.7x	8.3x	7.3x
	15.8x	15.8x 14.0x	15.8x 14.0x 12.3x	15.8x 14.0x 12.3x 21.2x	15.8x 14.0x 12.3x 21.2x 19.7x	15.8x 14.0x 12.3x 21.2x 19.7x 17.7x	15.8x 14.0x 12.3x 21.2x 19.7x 17.7x NA	15.8x 14.0x 12.3x 21.2x 19.7x 17.7x NA NA

Business Services Average

*Share Price Converted to USD

**Software Focused IT Solutions/VARs uses EV/GP metric.

Bolded companies are covered by CIBC World Markets. Data for non-covered companies is consensus.

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Outperformer	OP	Stock is expected to outperform similar stocks in the coverage universe during the next 12-18 months.
Neutral	NT	Stock is expected to perform in line with similar stocks in the coverage universe during the next 12-18 months.
Underperformer	UN	Stock is expected to underperform similar stocks in the coverage universe during the next 12-18 months.
Tender	TR	Shareholders are advised to tender shares to a specific offer as we do not believe a superior offer will materialize.
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Sector Ratings	Abbreviation	Description
Overweight	0	Sector is expected to outperform the broader market averages.

Sector is expected to equal the performance of the broader market averages.

Sector is expected to underperform the broader market averages.

None NA Sector rating is not applicable.

Note: Broader market averages refer to S&P 500 in the U.S. and S&P/TSX Composite in Canada.

Marketweight

Underweight

Μ

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CIBC World Markets Inc. Price Chart

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