GLOBAL Insight WEEKLY

Wealth Management

Perspectives from the Global Portfolio Advisory Committee

January 22, 2026

The "Great Narrowing": S&P 500 concentration

Tyler Frawley, CFA – Minneapolis

Over the past decade, the S&P 500, which has historically been viewed as a balanced cross-section of the U.S. economy, has slowly transformed into a tech- and AI-dominated index. As 2026 begins with markets near record highs, we believe this "Great Narrowing" should be top of mind for investors.

Evolution of dominance: From 1990 to the AI era

In 1990, the S&P 500 looked like a far more representative cross-section of the U.S. economy. The 10 largest companies by market cap (including IBM, Exxon, General Electric, and Philip Morris) made up roughly 19 percent of the index. Leadership was spread across multiple sectors, and no single industry dominated overall returns.

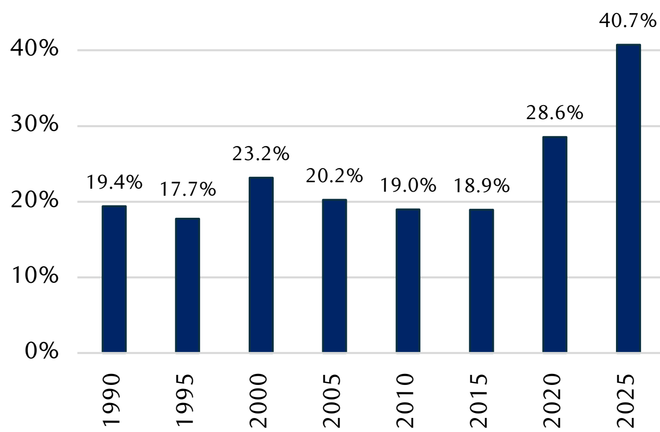
That began to change during the late-1990s technology boom. By the end of 2000, the top 10 accounted for roughly 23 percent of the index (with concentration peaking during the year at about 27 percent), driven by the rise of companies such as Cisco, Microsoft, and Intel. The subsequent unwind was sharp, and the early-2000s reset led to a period where concentration declined as energy and consumer stocks regained prominence.

A more durable shift began after the 2008 financial crisis with the rise of the platform economy, defined by software, cloud computing, and digital advertising, which created business models capable of scaling with minimal marginal cost. Even then, concentration remained relatively modest for a time. By the end of 2015, the top 10 stocks accounted for about 19 percent of the S&P 500's weight and roughly 19 percent of total index earnings, suggesting to us that market value and fundamentals were broadly aligned.

That balance has changed meaningfully over the past decade. By the end of 2025, the 10 largest companies accounted for nearly 41 percent of the S&P 500's total weight, more than doubling in just 10 years.

S&P 500: A trend of rising concentration

Cumulative weighting of 10 largest S&P 500 companies by year



Source - RBC Wealth Management, FactSet; data as of 12/31/25 and reflects year-end weighting for each year

Valuation and performance disparity between cap-weighted and equal-weighted indexes

The effects of rising concentration are most visible when comparing the market-cap-weighted S&P 500 to the S&P

For perspectives on the week from our regional analysts, please see pages 3–4.

For important disclosures, required non-U.S. analyst disclosures, and authors' contact information, see page 6.

Priced (in USD) as of 1/21/26 market close (unless otherwise stated). Produced: 1/22/26, 15:28 ET; Disseminated: 1/22/26, 15:40 ET

500 Equal Weight Index, which assigns each constituent an equal (about 0.2 percent) allocation.

From 2003 through 2022, the equal-weighted index actually outperformed the cap-weighted index by roughly 1.5 percent per year, reflecting size effects and periodic mean reversion among large-cap leaders.

However, this relationship has broken down meaningfully since the beginning of 2023, and over the past three years the market-cap-weighted S&P 500 has outperformed its equal-weighted counterpart by roughly 32 percent. This represents one of the largest three-year relative outperformances on record, exceeding the approximately 31 percent outperformance observed in the late 1990s and early 2000s in the run-up to the tech bubble.

The outperformance has coincided with a dramatic widening of the valuation gap, as the market-cap-weighted S&P 500 now trades at a nearly 30 percent premium to its equal-weighted counterpart, up from approximately 13 percent just prior to the pandemic, and sharply higher than the near-parity levels seen a decade ago.

This reflects, in part, how index concentration has risen significantly faster than earnings contribution. In 2025, the top 10 stocks represented roughly 41 percent of the index's total weight but were expected to generate only about 32 percent of its earnings. That gap has widened meaningfully since 2015, when weight and earnings contribution were more closely aligned. While the largest companies remain highly profitable, market value concentration has increasingly run ahead of fundamental profitability.

Concentration doesn't automatically mean bubble

It is important to acknowledge that today's concentration is not purely speculative and, unlike prior market peaks, the largest constituents of the S&P 500 are highly profitable businesses with strong balance sheets, durable competitive advantages, and substantial free cash flow generation. Many are returning capital to shareholders while continuing to invest heavily in growth, particularly in AI-related products and infrastructure.

Elevated concentration alone is not sufficient evidence of a bubble. Market leadership has narrowed in part because earnings, margins, and cash flow have narrowed. That distinction matters and helps explain why valuations have been elevated for longer than many investors anticipated.

The risks of a top-heavy market

Even so, we believe the current structure introduces several risks worth monitoring.

First, **idiosyncratic shock risk** is materially higher. In 1990, an earnings miss at a top holding would have had a limited index-level impact. Today, with NVIDIA alone representing nearly eight percent of the index, a single company can meaningfully influence index returns, affecting portfolios that assume broad diversification.

Performance gap nearing unprecedented levels as megacaps dominate

S&P 500 vs. S&P 500 Equal Weight

Source - RBC Wealth Management, FactSet; data as of 12/31/25, monthly price return data

Second, there is the **passive concentration trap**. Many investors believe an S&P 500 fund offers wide diversification. But, more than $40 of every $100 invested flows into just 10 companies, creating a feedback loop where passive inflows disproportionately support the largest stocks, increasing their weights and reinforcing performance leadership regardless of fundamentals.

Third, **correlation risk tied to AI exposure has increased**. Unlike past periods when the top 10 spanned unrelated industries, today's leaders are closely linked by a common theme—AI. That effectively turns the index into a directional bet on AI adoption and monetization. If expectations slip or timelines extend, there are fewer offsetting exposures within the index to absorb the impact.

What does this mean for investors?

The "Great Narrowing" of the S&P 500 reflects a structural shift, where a handful of technology and AI-driven giants now dominate the index's composition, performance, and risk profile. While current leaders boast robust fundamentals, strong profitability, competitive advantages, and growth trajectories, the sheer concentration of market value in a narrow cohort introduces new risk. The disconnect between weight and earnings contribution, outsized influence of individual stocks, and passive inflows amplifying this dynamic underscore a critical reality—what appears as broad diversification increasingly functions as a concentrated allocation in a single thematic outcome.

For investors, this evolution requires a recalibration of assumptions. The index has been a resilient benchmark, but its top-heavy structure warrants scrutiny. Understanding embedded risks, from idiosyncratic volatility to thematic correlation, is more essential than ever, in our view.

UNITED STATES

Michael Roedl – Minneapolis

■ **Global bond markets have been under pressure this week** fueled by concerns about Japan's fiscal outlook and heightened tensions between Europe and the U.S. over the control of Greenland. In U.S. Treasury markets, while yields have increased across the entire curve this week, longer-dated maturities experienced the most selling pressure with 10- and 30-year yields testing their four-month highs. Concerns about Japan's fiscal outlook pushed yields on 40-year Japanese government bonds (JGBs) to over 4.2% on Tuesday, the highest on record as Japan's Prime Minister Sanae Takaichi plans to cut taxes and boost spending. Meanwhile, President Donald Trump's goal of controlling Greenland fueled debate over whether European countries may weaponize their holdings of U.S. Treasuries—a scenario that could drive up borrowing costs—considering European countries hold about 40% of U.S. Treasuries owned by foreigners. However, tensions eased later in the week after Trump and the chief of NATO reached a tentative deal on the framework for Greenland, offering respite to EU leaders who discussed retaliatory action against the U.S.

■ **The stock market also wobbled on the Greenland conflict.** The S&P 500 fell 2.1% on Tuesday, during the holiday-shortened week, when tensions were most acute. However, stock prices recovered much of that lost ground thereafter as the situation de-escalated and the Q4 earnings season and economic data came back into focus. The Health Care, Energy, and Materials sectors are leading so far this week.

■ **The U.S. economy expanded in Q3 2025 due to stronger exports and less drag from inflated inventories.** According to the Bureau of Economic Analysis, inflation-adjusted gross GDP increased at an annualized rate of 4.4%, the fastest pace in two years. Consumer spending—the main growth engine of the U.S. economy—advanced at a 3.5% annualized pace, reflecting strong services activity while spending on goods also accelerated from the prior quarter. Against the backdrop of robust economic growth, a steadier labor market, and inflation remaining above the Fed's target, we expect policymakers to keep rates on hold at next week's Federal Open Market Committee meeting.

30-year Treasury yield tests four-month high

Source - RBC Wealth Management, Bloomberg; data as of 1/20/26

CANADA

David Iacono, CFA & Shizhe Zhong – Toronto

■ **Canadian headline CPI growth rose to 2.4% y/y in December, exceeding the consensus expectations of 2.2% y/y, which was also the prior month's reading.** However, the Bank of Canada's (BoC) preferred core inflation measures—median and trimmed-mean CPI—showed signs of easing, coming in at 2.5% y/y (consensus was 2.7% y/y) and 2.7% y/y (consensus was 2.7% y/y), respectively. On a three-month annualized basis, both measures declined significantly: trimmed-mean CPI dropped to 1.9%, and median CPI fell to 1.5%. Notably, this marked the first time since April 2024 that both indicators fell below 2.0%, though their 12-month growth rates remained above the BoC's 2.0% inflation target, as highlighted by RBC Economics. December CPI data remained consistent with RBC Economics' baseline forecast that the BoC has concluded its easing cycle and will hold rates steady through 2026, with a gradual hiking cycle expected to begin in Q1 2027.

■ **Business confidence edged higher in Q4, according to the BoC's quarterly Business Outlook Survey.** Most exporting firms surveyed reported that they remained exempt from tariffs under CUSMA. However, industries heavily affected by tariffs, such as metals and automotive, continued to report weaker outlooks, highlighting ongoing sector-specific challenges. The balance of opinion on future sales indicators turned positive for the first time in three quarters, signalling that firms expect conditions to stabilize further. On the labour front, most businesses plan to maintain or reduce current staffing levels slightly. While investment intentions improved, firms are prioritizing spending on routine maintenance, partly due to lingering trade-related uncertainty. Companies' inflation expectations remain elevated at 3.0% for 2026 but are better anchored over the long term, stabilizing between 2.5% and 3.0%.

EUROPE

Frédérique Carrier & Rufaro Chiriseri, CFA – London

■ **In Europe, the week was dominated by U.S. President Donald Trump's threat to impose additional tariffs on eight European countries,** including the UK, which had opposed his plan to annex Greenland, the Danish-controlled island.

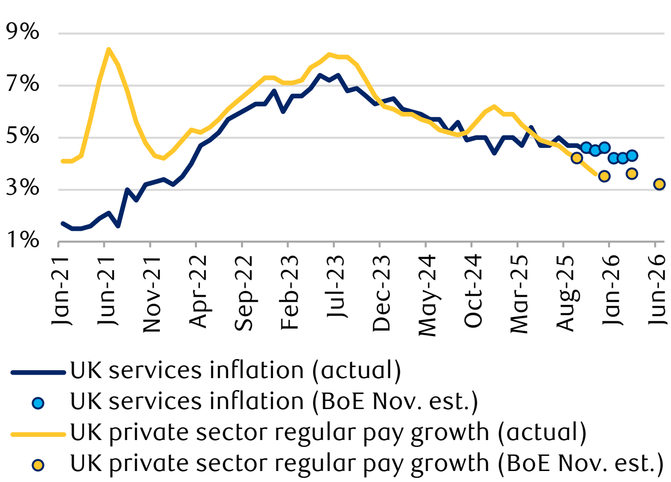
- Though the threat was rescinded after a meeting with NATO Secretary General Mark Rutte where a potential framework deal to de-escalate the crisis was discussed, **the events reignited U.S.-Europe tensions.** Ahead of the Trump-Rutte meeting, European lawmakers decided to suspend the implementation of last year's trade deal that gave the U.S. tariff-free access to the European markets while subjecting European products entering the U.S. to 15% tariffs. An emergency EU leaders summit is taking place at the time of writing.

- Though Western Europe weathered trade tensions surprisingly well last year, the transatlantic rift adds to uncertainty and is a potential headwind for the economy, with wider implications across many areas including support for Ukraine and national defense policies. **We think this episode provides an additional incentive for European nations to work more closely together, despite differing political agendas.** For now, we expect volatility in financial markets to continue.

- **In the UK, December headline CPI inflation rose to 3.4% y/y from 3.2% y/y in November, slightly above the consensus forecast.** However, we think one upward contributor—airfares—should largely reverse in next month's data due to the year-on-year comparison. Another notable upward surprise came from the food category, where inflation rebounded after November's slowdown. This may raise concern amongst Bank of England (BoE) hawks due to the potential negative effects on household inflation expectations. **Crucially, services inflation—a key indicator of domestic inflation—came in at 4.5% y/y, undershooting the BoE's November projection of 4.6% y/y.**

- **UK labour market weakness persisted in November** with unemployment steady at 5.1%. Private-sector wage growth surprised to the downside, slowing to 3.6% in November from 3.9% in October. While inflation and wage growth were below the central bank's projections, we are not anticipating a rapid pace of interest rate cuts. We continue to expect a 25 basis point cut in Q1; meanwhile, current market pricing indicates only around a 2% probability of easing at the February meeting, and 30% at the March meeting.

Services inflation and wage growth on track with BoE forecasts



Source - RBC Wealth Management, Bank of England, Bloomberg

ASIA-PACIFIC

Belmen Woo – Singapore

- **Much of the focus this week has been on the extreme volatility in Japanese government bonds (JGBs)** as Prime Minister Sanae Takaichi's pledge to cut food taxes and her decision to call a snap election triggered a surge in long-end yields. Japan's 40-year bond yield spiked as much as 27 basis points (bps) to 4.215% as liquidity deteriorated to record levels as buyers retreated due to mounting fiscal concerns. Other bond markets were naturally unnerved by the JGB selloff with U.S. Treasury yields also spiking 7–9 bps while macro sentiment was dented.

- **The extreme volatility prompted Japan's Finance Minister Satsuki Katayama to urge calm** amongst market participants and reiterate that the government's fiscal policy is and will be responsible and sustainable. This helped to stabilize markets with long-end JGBs rebounding back to 3.99% as of the time of this writing. **However, we think Katayama's verbal intervention is likely only a stop-gap measure until the government unveils more concrete details** on how the consumption tax cuts will be funded. As such, we believe the risks are skewed toward the upside for JGB long-end yields. Our local research correspondent expects the Bank of Japan to keep its benchmark rate unchanged at its next board meeting on Friday (Jan. 23), though we think the meeting will come under intense scrutiny on the back of this week's extreme JGB volatility. Investors will likely focus on Governor Kazuo Ueda's speech to see if Ueda refrains from clearly communicating forthcoming hikes in order to avoid a political backlash ahead of the Feb. 8 snap election.

- Elsewhere in fixed income markets, **credit held up well despite the macro and rates volatility**, with various global indexes such as the JP Morgan Emerging Markets Bond Index and Bloomberg Asia USD IG Index tightening 3–6 bps week over week. Credit bond prices outperformed the corresponding drop in U.S. Treasuries, resulting in credit spreads grinding further to all-time tight levels as the asset class benefits from healthy corporate fundamentals and robust demand for yield. We believe the market will continue to focus on all-in yields which are at historically attractive levels, instead of credit spreads. Therefore, **we favor positioning in high-quality and high-carry 3-10 year duration bonds** that allow investors to focus on coupon clipping and minimize volatility due to any structural shifts in monetary and fiscal policy.

MARKET
Scorecard

Equities (local currency)	Level	MTD	YTD	1 yr	2 yr
S&P 500	6,875.62	0.4%	0.4%	13.7%	42.1%
Dow Industrials (DJIA)	49,077.23	2.1%	2.1%	11.5%	29.6%
Nasdaq	23,224.82	-0.1%	-0.1%	17.6%	51.7%
Russell 2000	2,698.17	8.7%	8.7%	16.4%	38.8%
S&P/TSX Comp	32,851.53	3.6%	3.6%	29.9%	57.1%
FTSE All-Share	5,465.36	2.1%	2.1%	17.7%	34.0%
STOXX Europe 600	602.67	1.8%	1.8%	14.6%	28.4%
EURO STOXX 50	5,882.88	1.6%	1.6%	13.9%	32.2%
Hang Seng	26,585.06	3.7%	3.7%	32.2%	73.7%
Shanghai Comp	4,116.94	3.7%	3.7%	27.0%	45.4%
Nikkei 225	52,774.64	4.8%	4.8%	35.2%	46.7%
India Sensex	81,909.63	-3.9%	-3.9%	8.0%	14.3%
Singapore Straits Times	4,809.88	3.5%	3.5%	26.7%	52.6%
Brazil Ibovespa	171,816.67	6.6%	6.6%	39.3%	34.6%
Mexican Bolsa IPC	68,003.06	5.7%	5.7%	34.8%	22.6%
Gov't bonds (bps change)	**Yield**	**MTD**	**YTD**	**1 yr**	**2 yr**
U.S. 10-Yr Treasury	4.245%	7.8	7.8	-33.2	12.2
Canada 10-Yr	3.415%	-1.8	-1.8	15.0	-7.7
UK 10-Yr	4.458%	-2.1	-2.1	-13.2	52.9
Germany 10-Yr	2.882%	2.7	2.7	37.2	54.0
Fixed income (returns)	**Yield**	**MTD**	**YTD**	**1 yr**	**2 yr**
U.S. Aggregate	4.42%	-0.3%	-0.3%	6.6%	9.8%
U.S. Investment-Grade Corp	4.91%	-0.3%	-0.3%	7.0%	11.2%
U.S. High-Yield Corp	6.71%	0.4%	0.4%	7.9%	18.8%
Commodities (USD)	**Price**	**MTD**	**YTD**	**1 yr**	**2 yr**
Gold (spot $/oz)	4,837.07	12.0%	12.0%	76.2%	138.3%
Silver (spot $/oz)	93.22	30.1%	30.1%	202.9%	312.1%
Copper ($/metric ton)	12,855.34	3.2%	3.2%	40.2%	55.4%
Oil (WTI spot $/bbl)	60.66	5.6%	5.6%	-20.1%	-17.4%
Oil (Brent spot $/bbl)	65.25	7.2%	7.2%	-17.7%	-16.9%
Natural Gas ($/mmBtu)	5.01	36.0%	36.0%	33.5%	99.0%
Currencies	**Rate**	**MTD**	**YTD**	**1 yr**	**2 yr**
U.S. Dollar Index	98.7940	0.5%	0.5%	-8.6%	-4.4%
CAD/USD	0.7231	-0.8%	-0.8%	3.6%	-2.9%
USD/CAD	1.3829	0.8%	0.8%	-3.4%	3.0%
EUR/USD	1.1690	-0.5%	-0.5%	12.1%	7.3%
GBP/USD	1.3432	-0.3%	-0.3%	8.8%	5.7%
AUD/USD	0.6765	1.4%	1.4%	7.8%	2.5%
USD/JPY	158.2800	1.0%	1.0%	1.8%	6.9%
EUR/JPY	185.0300	0.6%	0.6%	14.1%	14.6%
EUR/GBP	0.8703	-0.2%	-0.2%	3.1%	1.4%
EUR/CHF	0.9297	-0.1%	-0.1%	-1.6%	-1.7%
USD/SGD	1.2845	-0.1%	-0.1%	-5.0%	-4.2%
USD/CNY	6.9648	-0.3%	-0.3%	-4.1%	-3.2%
USD/MXN	17.4872	-2.9%	-2.9%	-15.2%	2.4%
USD/BRL	5.3166	-2.9%	-2.9%	-11.8%	7.8%

Equity returns do not include dividends, except for the Brazilian Ibovespa. Bond yields in local currencies. Copper Index data and U.S. fixed income returns as of Tuesday's close. Dollar Index measures USD vs. six major currencies. Currency rates reflect market convention (CAD/USD is the exception). Currency returns quoted in terms of the first currency in each pairing.

Examples of how to interpret currency data: CAD/USD 0.72 means 1 Canadian dollar will buy 0.72 U.S. dollar. CAD/USD -0.8% return means the Canadian dollar has fallen 0.8% vs. the U.S. dollar year to date. USD/JPY 158.28 means 1 U.S. dollar will buy 158.28 yen. USD/JPY 1.0% return means the U.S. dollar has risen 1.0% vs. the yen year to date.

Source - Bloomberg; data as of 1/21/26

Authors

Frédérique Carrier – London, United Kingdom
frederique.carrier@rbc.com; RBC Europe Limited

Rufaro Chiriseri, CFA – London, United Kingdom
rufaro.chiriseri@rbc.com; RBC Europe Limited

Tyler Frawley, CFA – Minneapolis, United States
tyler.frawley@rbc.com; RBC Capital Markets, LLC

David Iacono, CFA – Toronto, Canada
david.iacono@rbccm.com; RBC Dominion Securities, Inc.

Michael Roedl – Minneapolis, United States
michael.roedl@rbc.com; RBC Capital Markets, LLC

Belmen Woo – Singapore
belmen.woo@rbc.com; Royal Bank of Canada, Singapore Branch

Shizhe Zhong – Toronto, Canada
shizhe.zhong@rbccm.com; RBC Dominion Securities, Inc.

Important Disclosures

In the U.S., RBC Wealth Management operates as a division of RBC Capital Markets, LLC. In Canada, RBC Wealth Management includes, without limitation, RBC Dominion Securities Inc., which is a foreign affiliate of RBC Capital Markets, LLC. This report has been prepared by RBC Capital Markets, LLC which is an indirect wholly-owned subsidiary of the Royal Bank of Canada and, as such, is a related issuer of Royal Bank of Canada.

Non-U.S. Analyst Disclosure

One or more research analysts involved in the preparation of this report (i) may not be registered/qualified as research analysts with the NYSE and/or FINRA and (ii) may not be associated persons of the RBC Wealth Management and therefore may not be subject to FINRA Rule 2241 restrictions on communications with a subject company, public appearances and trading securities held by a research analyst account.

In the event that this is a compendium report (covers six or more companies), RBC Wealth Management may choose to provide important disclosure information by reference. To access current disclosures, clients should refer to https://www.rbccm.com/GLDisclosure/PublicWeb/DisclosureLookup.aspx?EntityID=2 to view disclosures regarding RBC Wealth Management and its affiliated firms. Such information is also available upon request to RBC Wealth Management Publishing, 250 Nicollet Mall, Suite 1800, Minneapolis, MN 55401-1931.

References to a Recommended List in the recommendation history chart may include one or more recommended lists or model portfolios maintained by RBC Wealth Management or one of its affiliates. RBC Wealth Management recommended lists include the Guided Portfolio: Prime Income (RL 6), the Guided Portfolio: Dividend Growth (RL 8), the Guided Portfolio: ADR (RL 10), and the Guided Portfolio: All Cap Growth (RL 12). The abbreviation 'RL On' means the date a security was placed on a Recommended List. The abbreviation 'RL Off' means the date a security was removed from a Recommended List. As of April 3, 2023, U.S. RBC Wealth Management's quarterly reports will serve as the primary communication for its models and will highlight any changes to the model made during the quarter.

RBC Capital Markets Distribution of Ratings

For the purpose of ratings distributions, regulatory rules require member firms to assign ratings to one of three rating categories – Buy, Hold/Neutral, or Sell – regardless of a firm's own rating categories. Although RBC Capital Markets' ratings of Outperform (O), Sector Perform (SP), and Underperform (U) most closely correspond to Buy, Hold/Neutral and Sell, respectively, the meanings are not the same because RBC Capital Markets ratings are determined on a relative basis.

Distribution of ratings – RBC Capital Markets Equity Research
As of December 31, 2025

			Investment Banking Services Provided During Past 12 Months	
Rating	Count	Percent	Count	Percent
Buy [Outperform]	884	58.31	282	31.90
Hold [Sector Perform]	586	38.65	160	27.30
Sell [Underperform]	46	3.03	3	6.52

Explanation of RBC Capital Markets Equity Rating System

An analyst's "sector" is the universe of companies for which the analyst provides research coverage. Accordingly, the rating assigned to a particular stock represents solely the analyst's view of how that stock will perform over the next 12 months relative to the analyst's sector average.

Ratings: Outperform (O): Expected to materially outperform sector average over 12 months. **Sector Perform (SP):** Returns expected to be in line with sector average over 12 months. **Underperform (U):** Returns expected to be materially below sector average over 12 months. **Restricted (R):** RBC policy precludes certain types of communications, including an investment recommendation, when RBC is acting as an advisor in certain merger or other strategic transactions and in certain other circumstances. **Not Rated (NR):** The rating, price targets and estimates have been removed due to applicable legal, regulatory or policy constraints which may include when RBC Capital Markets is acting in an advisory capacity involving the company.

Risk Rating: The **Speculative** risk rating reflects a security's lower level of financial or operating predictability, illiquid share trading volumes, high balance sheet leverage, or limited operating history that result in a higher expectation of financial and/or stock price volatility.

Valuation and Risks to Rating and Price Target

When RBC Capital Markets assigns a value to a company in a research report, FINRA Rules and NYSE Rules (as incorporated into the FINRA Rulebook) require that the basis for the valuation and the impediments to obtaining that valuation be described. Where applicable, this information is included in the text of our research in the sections entitled "Valuation" and "Risks to Rating and Price Target", respectively.

The analyst(s) responsible for preparing this research report have received (or will receive) compensation that is based upon various factors, including total revenues of RBC Capital Markets, and its affiliates, a portion of which are or have been generated by investment banking activities of RBC Capital Markets and its affiliates.

Other Disclosures

Prepared with the assistance of our national research sources. RBC Wealth Management prepared this report and takes sole responsibility for its content and distribution. The content may have been based, at least in part, on material provided by our third-party correspondent research services. Our third-party correspondent has given RBC Wealth Management general permission to use its research reports as source materials, but has not reviewed or approved this report, nor has it been informed of its publication. Our third-party correspondent may from time to time have long or short positions in, effect transactions in, and make markets in securities referred to herein. Our third-party correspondent may from time to time perform investment banking or other services for, or solicit investment banking or other business from, any company mentioned in this report.

RBC Wealth Management endeavors to make all reasonable efforts to provide research simultaneously to all eligible clients, having regard to local time zones in overseas jurisdictions. In certain investment advisory accounts, RBC Wealth Management or a designated third party will act as overlay manager for our clients and will initiate transactions in the securities referenced herein for those accounts upon receipt of this report. These transactions may occur before or after your receipt of this report and may have a short-term impact on the market price of the securities in which transactions occur. RBC Wealth Management research is posted to our proprietary Web sites to ensure eligible clients receive coverage initiations and changes in rating, targets, and opinions in a timely manner. Additional distribution may be done by sales personnel via e-mail, fax, or regular mail. Clients may also receive our research via third-party vendors. Please contact your RBC Wealth Management Financial Advisor for more information regarding RBC Wealth Management research.

Conflicts Disclosure: RBC Wealth Management is registered with the Securities and Exchange Commission as a broker/dealer and an investment adviser, offering both brokerage and investment advisory services. RBC Wealth Management's Policy for Managing Conflicts of Interest in Relation to Investment Research is available from us on our website at https://www.rbccm.com/GLDisclosure/PublicWeb/DisclosureLookup.aspx?EntityID=2. Conflicts of interests related to our investment advisory business can be found in Part 2A Appendix 1 of the Firm's Form ADV or the RBC Advisory Programs Disclosure Document. Copies of any of these documents are available upon request through your Financial Advisor. We reserve the right to amend or supplement this policy, Part 2A Appendix 1 of the Form ADV, or the RBC Advisory Programs Disclosure Document at any time.

The authors are employed by one of the following entities: RBC Wealth Management USA, a division of RBC Capital Markets, LLC, a securities broker-dealer with principal offices located in Minnesota and New York, USA; RBC Dominion Securities Inc., a securities broker-dealer with principal offices located in Toronto, Canada; Royal Bank of Canada, Hong Kong Branch which is regulated by the Hong Kong Monetary Authority and the Securities and Futures Commission ("SFC"); Royal Bank of Canada, Singapore Branch, a licensed wholesale bank with its principal office located in Singapore; and RBC Europe Limited, a licensed bank with principal offices located in London, United Kingdom.

Research Resources

This document is produced by the Global Portfolio Advisory Committee within RBC Wealth Management's Portfolio Advisory Group. The RBC WM Portfolio Advisory Group provides support related to asset allocation and portfolio construction for the firm's Investment Advisors / Financial Advisors who are engaged in assembling portfolios incorporating individual marketable securities. The Committee leverages the broad market outlook as developed by the RBC Investment Strategy Committee, providing additional tactical and thematic support utilizing research from the RBC Investment Strategy Committee, RBC Capital Markets, and third-party resources.

Third-party Disclaimers

The Global Industry Classification Standard ("GICS") was developed by and is the exclusive property and a service mark of MSCI Inc. ("MSCI") and Standard & Poor's Financial Services LLC ("S&P") and is licensed for use by RBC. Neither MSCI, S&P, nor any other party involved in making or compiling the GICS or any GICS classifications makes any express or implied warranties or representations with respect to such standard or classification (or the results to be obtained by the use thereof), and all such parties hereby expressly disclaim all warranties of originality, accuracy, completeness, merchantability and fitness for a particular purpose with respect to any of such standard or classification. Without limiting any of the foregoing, in no event shall MSCI, S&P, any of their affiliates or any third party involved in making or compiling the GICS or any GICS classifications have any liability for any direct, indirect, special, punitive, consequential or any other damages (including lost profits) even if notified of the possibility of such damages.

Disclaimer

The information contained in this report has been compiled by RBC Wealth Management, a division of RBC Capital Markets, LLC, from sources believed to be reliable, but no representation or warranty, express or implied, is made by Royal Bank of Canada, RBC Wealth Management, its affiliates or any other person as to its accuracy, completeness or correctness. All opinions and estimates contained in this report constitute RBC Wealth Management's judgment as of the date of this report, are subject to change without notice and are provided in good faith but without legal responsibility. Past performance is not a guide to future performance, future returns are not guaranteed, and a loss of original capital may occur. Every province in Canada, state in the U.S., and most countries throughout the world have their own laws regulating the types of securities and other investment products which may be offered to their residents, as well as the process for doing so. As a result, the securities discussed in this report may not be eligible for sale in some jurisdictions. This report is not, and under no circumstances should be construed as, a solicitation to act as securities broker or dealer in any jurisdiction by any person or company that is not

Wealth Management