April 2, 2020

RBC WEALTH MANAGEMENT

Global Insight Weekly

Exposed and vulnerable

Kelly Bogdanova – San Francisco

COVID-19's humbling of the world's economies and financial markets has been startling. And what's certain is more uncertainty lies ahead. We explore the economic scenarios that could unfold depending on the path the virus takes and look at the different ways the recovery could play out in 2021.

The onslaught of negative COVID-19 economic data has begun. Nearly 10 million U.S. workers filed for unemployment benefits in the past two weeks. Canada's manufacturing activity slid to 46.1 in March, deep into contraction territory. This is the tip of the iceberg, as plenty of data will be released in the weeks ahead.

We believe poor economic data is largely reflected in the rapid and deep equity selloff of the past month as COVID-19 infections and deaths climbed in North America and Europe, and "stay at home" orders spread to about half of the world's population. We think it's reasonable to assume that equity markets are already factoring in deep (and brief) contractions for the global and developed economies, including the U.S.

But the difficult question is, just *how deep and how long* will the economic downturns be? The numerous uncertainties are a key reason we recently lowered our equity weighting to Underweight from Market Weight.

From our vantage point, there are more uncertainties during this COVID-19 downturn than there were during the financial crisis, the post-9/11 period, and the bursting of the tech bubble. We think a wide range of economic scenarios are worth evaluating, especially for the world's largest economy.

2020 downturn: How deep, how long?

The inputs of economic forecasting during this pandemic can change just about as fast as the so-called "models" of the virus that are being used by public health officials.

They are highly dependent on the ever-changing path of the virus and on governments' related shutdowns of day-to-day life (and, importantly, the extension of shutdowns). They are also dependent on just how quickly the fiscal aid packages and central bank mechanisms will be rolled out and how effective they will be in tiding over households and businesses—open questions at this stage. These and other factors, and the unprecedented nature of this crisis, are why we think it's prudent to consider a wide range of economic scenarios for 2020.

RBC Global Asset Management has developed a matrix of nine economic scenarios that vary by depth and duration of the COVID-19 downturn. The scenarios evaluate a shallow, medium, and deep economic contraction, and also consider a contraction that is short, medium, and long in duration.

Market pulse

Click here for authors' contact information. Priced (in USD) as of 4/2/20 market close, ET (unless otherwise stated). **For important disclosures and required non-U.S. analyst disclosures, see page 6.**
Produced: Apr 2, 2020 18:34; Disseminated: Apr 2, 2020 18:45ET

The nine scenarios are shown in the top table. They range from a shallow and short downturn resulting in 2020 GDP growth of 0.9 percent (no recession), all the way to a deep and long-lasting downturn producing a severe 16.5 percent decline in annual GDP growth. And there are various scenarios in between.

At this stage, RBC Global Asset Management Inc. Chief Economist Eric Lascelles' preferred scenario is right in the middle of the matrix: A downturn that is medium in depth and medium in duration.

He estimates this medium/medium scenario would result in a 3.2 percent decline in U.S. GDP growth in 2020 (this is down from his previous estimate of a 2.8 percent drop, which was penciled in before the virus penetrated deeper into the U.S.). The updated forecast incorporates a sharp and brief peak-to-trough decline in output of 15 percent, followed by stabilization and then improvement. Even though his forecast is in the middle of the matrix, it is a serious hit to output. A 3.2 percent annual decline in GDP growth would be deeper than the financial crisis and the biggest retrenchment since 1946.

In order for one of the better scenarios to occur, we think there would need to be a meaningful decline in infection rates, treatment breakthroughs, or significant progress on vaccines over the near term.

One of the worse economic outcomes could arise if the virus becomes more acute than health models are currently indicating and/or if the infection and shutdown periods last for months rather than weeks.

2021 recovery: What will the way back look like?

We do not believe COVID-19 will cause permanent damage to the U.S. economy or the profits of most companies. We continue to view this as a transitory crisis. Not even the Spanish Flu of 1918—a much more deadly pandemic that killed more than 40 million mostly young adults worldwide with three rounds of mass infection—resulted in enduring damage to global economic growth.

This is why the scenarios for a 2021 economic recovery are just as important to consider as the 2020 downturn scenarios.

In the same matrix format, RBC Global Asset Management has developed nine scenarios for the U.S. economic rebound, which are shown in the bottom table. The scenarios range from a shallow and short downturn producing a 2.7 percent rebound in 2021, to a deep and long downturn generating a massive 19.5 percent economic rebound—and all of the combinations in between. Each 2021 recovery scenario is contingent on the depth and duration of the corresponding downturn in 2020.

COVID-19 crisis: What are the various economic scenarios?

RBC Global Asset Management's U.S. real GDP growth estimates under nine different scenarios that vary by the duration and depth of the COVID-19 economic contraction

Current forecast highlighted: Medium depth and medium duration contraction would result in a 3.2% decline in 2020 GDP growth

2020 GDP growth scenarios				
		Duration		
Depth		Short 4-week trough	Medium 10-week trough	Long 26-week trough
Shallow	-5% trough	0.9%	0.4%	-0.9%
Medium	-15% trough	-1.7%	-3.2%	-7.2%
Deep	-30% trough	-5.5%	-8.5%	-16.5%

Current forecast highlighted: Medium depth and medium duration contraction in 2020 would be followed by a 5.6% increase in 2021 GDP growth

2021 GDP growth scenarios				
		Duration		
Depth		Short 4-week trough	Medium 10-week trough	Long 26-week trough
Shallow	-5% trough	2.7%	3.2%	4.5%
Medium	-15% trough	4.1%	5.6%	9.9%
Deep	-30% trough	6.3%	9.6%	19.5%

Source - RBC Global Asset Management; forecasts as of 3/27/20. Data show average annual percentage change. Assumes a rapid decline into the trough versus a much lengthier recovery period.

Lascelles' forecast of a medium in depth and medium in duration contraction in 2020 would lead to a 5.6 percent GDP rebound in 2021, he estimates. This is his base-case scenario.

Recalibration

Developments in the coming weeks and months should provide a better indication of the outstanding risks for the U.S. economy. The depth and duration of COVID-19 impacts the depth and duration of the downturn, which in turn should impact the depth and duration of the equity market correction.

As some combination of an easing in the progress of the pandemic and signs the policy responses are having the desired effect begins to materialize, we think the market will regain its composure and permit investors to focus on improving prospects for 2021.

United States

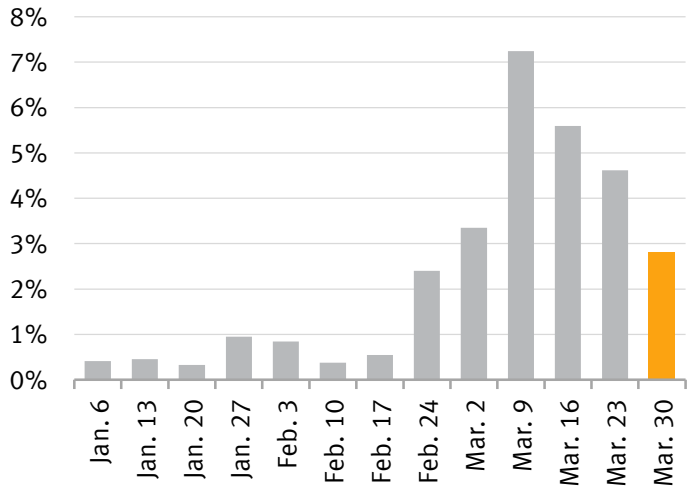
Ben Graham, CFA – Minneapolis

- **U.S. equity markets continue to bounce around, but the average daily move**, regardless of direction, this week to date **is smaller than in the last five weeks**. In fact, we're on track for the first weekly average movement below 3% since the week of Feb. 24. The year's highest weekly volatility, seen during the week of Mar. 9, was 7.2% with several days approaching or surpassing 10% on both the up and down days, and the best comp for the week was none other than the Great Depression. Fortunately, daily volatility has been falling since then, and barring a spike on Friday, Apr. 3, investors should see the third consecutive week of declines for this measure.

- **Performance has trended slightly lower so far this week**, with a sharp divergence in the size trade. The S&P 500 is on track for modest losses of approximately 1% while small caps, as measured by the Russell 2000, are on track for nearly 4% declines. **Leadership is evident in Health Care, Consumer Staples, and Energy**, with the latter showing surprising strength after reports from CNBC and others that a U.S.-brokered deal between Russia and Saudi Arabia on oil production may be in the works. While there is no hard evidence at this time, the pressure on Energy stocks has been so great that the press reports alone are acting as a buoy. However, the Energy sector remains approximately 50% below its year-end 2019 levels.

Calmest week for U.S. stock market in over a month

Average daily move of the S&P 500 for each week in 2020



Note: Daily moves calculated with absolute values
Source - RBC Wealth Management, FactSet; data through 4/2/20 at 12:55pm ET

- Economic data on COVID-19 impacts has started to flow in, as investors attempt to gauge the depth and duration of the pending economic disruption. Given that the U.S. appears to be still in the early stages of "flattening the curve," and despite incremental progress on that front, **economic data has been, to use the term du jour, fluid**. The ISM Manufacturing Purchasing Managers' Index (PMI) came in at 49.1 for March, much higher than expected, but there were some distortions in the data due to the health crisis. The Chicago Fed PMI was also better than expected at 47.8. However, Kansas City and Dallas Fed measures of economic activity were sharply lower, and worse than expected.

- Attention was also focused on **weekly unemployment claims data released Apr. 2 for the week ending Mar. 28**. **The number of new claims was the highest on record at 6.65 million**, well ahead of consensus expectations of 4.0 million. This spike was largely attributable to coronavirus-related layoffs. RBC Capital Markets, LLC Chief U.S. Economist Tom Porcelli says unemployment claims are largely related to what he's seeing in working hours of employees at small businesses. He notes that the total hourly headcount was sharply lower—down nearly 50% for the country, with the sharpest declines in the Beauty and Personal Care, Leisure and Entertainment, and Food and Drink industries.

Canada

Carolyn Schroeder & Ryan Harder – Toronto

- **Canadian companies are facing a new set of financial and operational challenges** amid the global pandemic. These challenges are certain to have significant near-term impacts. Moreover, the time required to reach a "new normal" and the more lasting consequences of this crisis are also currently very difficult to predict. Appropriately, Canadian companies have been swift to withdraw previous earnings guidance, cut capital expenditure programs, and prioritize debt capital management and corporate liquidity initiatives. RBC Capital Markets recently evaluated issuers under its research coverage and considered the sustainability of each company's current dividend or distribution rate over the 2020–2021 period in the context of a deep contraction in economic activity over the next three to six months, followed by a gradual recovery. **Sectors and industries that RBC Capital Markets expects to be able to sustain dividends with a higher degree of confidence** include Consumer Staples, various Diversified Industrials, Energy Infrastructure, Fertilizers, Financials, Technology, and Telecommunication Services.

- **The Bank of Canada (BoC) cut its policy rate by 50 basis points (bps) to 0.25% on March 27, while committing to CA$5 billion in asset purchases every week** until the economy's recovery is "well underway." The central bank also initiated the Commercial Paper Purchase Program, which aims to alleviate stress in short-term lending markets by extending credit to companies through the purchase of commercial paper. **These steps mark a notable shift in strategy by the BoC**, which had until now resisted the quantitative easing-style policies adopted by other monetary policymakers around the world. Combined with the federal government's wage subsidy expansion from 10% to 75%, **last week's actions have added even more monetary and fiscal stimulus to unprecedented spending programs**.

Europe

Frédérique Carrier & Thomas McGarrity, CFA – London

- **Overall dividends are at risk as companies may cut them to preserve cash flow and shore up their balance sheets** given activity levels have dropped sharply due to COVID-19. Companies will also likely feel the **pressure to prioritise their corporate social responsibility** to employees and broader stakeholders over that to their shareholders given the huge government support being provided. For a frame of reference, in 2008–09 the dividends of companies on the STOXX Europe 600 Index (includes UK and Europe) fell by 35%, while just under two-thirds of companies cut dividends. Prospective dividend yields may be elevated, but they will likely prove to be too high; we believe it is paramount to look at dividend coverage.

- Banks across UK and European markets have suspended dividends at the request of regulators. The Bank of England's Prudential Regulation Authority (PRA) wrote to the **seven largest UK banks** on Mar. 31 requesting them to **cancel payments on outstanding FY2019 dividends as well as suspend dividends and share buybacks on ordinary shares until the end of 2020**, to which all seven agreed. The PRA's statement was slightly more stringent than the stance adopted by the European Central Bank, which requested banks not to pay dividends until at least October 2020.

- While this is disappointing for income-oriented equity investors given the high yields on bank stocks, ultimately it is a sensible decision in this environment, in our view. These actions will mean the banks are **better equipped to weather the downturn by boosting their loss-absorbing capacity and supporting lending activity**. Moreover, it will hopefully reduce the risk of banks being forced to undertake rights issues to recapitalize their balance sheets as a result of the likelihood of higher loan impairments in the months ahead.

- **We continue to recommend being Underweight UK and European banks** given the impact of the COVID-19 outbreak remains highly uncertain and it is especially difficult to gauge the direct and indirect implications for banks.

Asia Pacific

Jasmine Duan – Hong Kong & Nicholas Gwee, CFA – Singapore

- **China's official manufacturing Purchasing Managers' Index (PMI) for March increased to 52.0** from 35.7 in February. The non-manufacturing PMI also rebounded, to 52.3 from 29.6. We think the data suggests that economic activity has improved modestly from February, **but does not indicate output is back to its pre-virus trend**. Bloomberg estimates that more than 90% of China's business activities have resumed. However, weak external demand adds uncertainties to capacity recovery.

- **HSBC (5 HK) and other large UK banks have been asked by UK regulators to cancel their dividends and share buybacks until the end of 2020**. The Hong Kong Monetary Authority later said there is no need to order Hong Kong banks to suspend dividend payouts or share buybacks. The average capital adequacy ratio of the banks is more than 20%, well above the minimum regulatory level, according to the regulator. After HSBC said it would suspend its dividend, some investors who seek high yield may have switched to other local banks and Hong Kong telecom players for yield, as we have seen those share prices rise in the past two days.

- **Japan's ruling Liberal Democratic Party proposed a ¥60 trillion ($554 billion) stimulus package, the largest in the country's history**. The package includes ¥20 trillion in aid that combines fiscal measures with private sector initiatives. More than ¥10 trillion would be handed out to the public in a combination of cash, subsidies, and coupons. The stimulus shows the government's determination to blunt the impact from COVID-19, and there could be more stimulus depending on how long the outbreak lasts. **Business sentiment among large Japanese manufacturers dropped to -8 in March**, according to the Bank of Japan's Tankan survey. This was the **lowest level since 2013**, with shipbuilders, automakers, and metal producers showing the worst readings.

MARKET SCORECARD

Data as of April 2, 2020

Equities (local currency)	Level	MTD	YTD	1 yr	2 yr
S&P 500	2,526.90	-2.2%	-21.8%	-11.9%	-2.1%
Dow Industrials (DJIA)	21,413.44	-2.3%	-25.0%	-18.2%	-9.4%
NASDAQ	7,487.31	-2.8%	-16.6%	-4.6%	9.0%
Russell 2000	1,085.81	-5.8%	-34.9%	-30.1%	-27.3%
S&P/TSX Comp	13,097.84	-2.1%	-23.2%	-19.5%	-13.9%
FTSE All-Share	2,998.54	-3.5%	-28.5%	-25.7%	-23.0%
STOXX Europe 600	312.08	-2.5%	-25.0%	-18.9%	-15.9%
EURO STOXX 50	2,688.49	-3.5%	-28.2%	-20.8%	-20.0%
Hang Seng	23,280.06	-1.4%	-17.4%	-21.4%	-22.6%
Shanghai Comp	2,780.64	1.1%	-8.8%	-12.5%	-12.1%
Nikkei 225	17,818.72	-5.8%	-24.7%	-17.1%	-16.7%
India Sensex	28,265.31	-4.1%	-31.5%	-27.6%	-15.0%
Singapore Straits Times	2,453.03	-1.1%	-23.9%	-25.2%	-28.5%
Brazil Ibovespa	72,253.50	-1.0%	-37.5%	-24.3%	-14.7%
Mexican Bolsa IPC	33,590.62	-2.8%	-22.9%	-22.5%	-26.7%
Commodities (USD)	**Price**	**MTD**	**YTD**	**1 yr**	**2 yr**
Gold (spot $/oz)	1,614.68	2.4%	6.4%	24.9%	20.4%
Silver (spot $/oz)	14.50	3.7%	-18.8%	-4.1%	-12.6%
Copper ($/metric ton)	4,785.25	-3.1%	-22.2%	-25.4%	-28.4%
Oil (WTI spot/bbl)	24.79	21.0%	-59.4%	-60.4%	-60.7%
Oil (Brent spot/bbl)	29.67	30.5%	-55.0%	-57.2%	-56.1%
Natural Gas ($/mmBtu)	1.55	-5.7%	-29.3%	-42.4%	-42.3%

Govt bonds (bps chg)	Yield	MTD	YTD	1 yr	2 yr
U.S. 10-Yr Tsy	0.597%	-7.3	-132.1	-187.7	-213.3
Canada 10-Yr	0.657%	-4.0	-104.5	-100.7	-145.8
U.K. 10-Yr	0.333%	-2.3	-48.9	-67.1	-101.7
Germany 10-Yr	-0.433%	3.8	-24.8	-38.4	-93.0
Fixed Income (returns)	**Yield**	**MTD**	**YTD**	**1 yr**	**2 yr**
U.S. Aggregate	1.61%	0.1%	3.3%	9.4%	13.9%
U.S. Invest Grade Corp	3.46%	-0.2%	-3.8%	5.1%	9.9%
U.S. High Yield Corp	9.73%	-1.1%	-13.6%	-8.1%	-2.4%
Currencies	**Rate**	**MTD**	**YTD**	**1 yr**	**2 yr**
U.S. Dollar Index	100.1060	1.1%	3.9%	2.8%	11.2%
CAD/USD	0.7073	-0.5%	-8.1%	-5.7%	-8.7%
USD/CAD	1.4138	0.5%	8.8%	6.0%	9.5%
EUR/USD	1.0858	-1.6%	-3.2%	-3.1%	-11.7%
GBP/USD	1.2407	-0.1%	-6.4%	-5.5%	-11.7%
AUD/USD	0.6061	-1.1%	-13.7%	-14.3%	-20.9%
USD/JPY	107.9300	0.4%	-0.6%	-3.0%	1.9%
EUR/JPY	117.1800	-1.2%	-3.8%	-6.1%	-10.0%
EUR/GBP	0.8752	-1.5%	3.5%	2.6%	-0.1%
EUR/CHF	1.0568	-0.3%	-2.6%	-5.5%	-10.0%
USD/SGD	1.4304	0.6%	6.3%	5.6%	9.0%
USD/CNY	7.0858	0.0%	1.8%	5.4%	12.8%
USD/MXN	24.2678	2.5%	28.2%	26.2%	33.0%
USD/BRL	5.2540	0.9%	30.4%	39.0%	58.7%

Source - Bloomberg. Note: 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 Wednesday'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. Data as of 10:05 pm GMT 4/2/20.

Examples of how to interpret currency data: CAD/USD 0.70 means 1 Canadian dollar will buy 0.70 U.S. dollar. CAD/USD -8.1% return means the Canadian dollar fell 8.1% vs. the U.S. dollar year to date. USD/JPY 107.89 means 1 U.S. dollar will buy 107.89 yen. USD/JPY -0.6% return means the U.S. dollar fell 0.6% vs. the yen year to date.

Authors

Kelly Bogdanova – San Francisco, United States
kelly.bogdanova@rbc.com; RBC Capital Markets, LLC

Ben Graham, CFA – Minneapolis, United States
benjamin.graham@rbc.com; RBC Capital Markets, LLC

Carolyn Schroeder – Toronto, Canada
carolyn.schroeder@rbc.com; RBC Dominion Securities Inc.

Ryan Harder – Toronto, Canada
ryan.harder@rbc.com; RBC Dominion Securities Inc.

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

Thomas McGarrity, CFA – London, United Kingdom
thomas.mcgarrity@rbc.com; RBC Europe Limited

Jasmine Duan – Hong Kong, China
jasmine.duan@rbc.com; RBC Investment Services (Asia) Limited

Nicholas Gwee, CFA – Singapore
nicholas.gwee@rbc.com; Royal Bank of Canada, Singapore Branch

Disclosures and Disclaimer

Analyst Certification

All of the views expressed in this report accurately reflect the personal views of the responsible analyst(s) about any and all of the subject securities or issuers. No part of the compensation of the responsible analyst(s) named herein is, or will be, directly or indirectly, related to the specific recommendations or views expressed by the responsible analyst(s) in this report.

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: Carolyn Schroeder and Ryan Harder, employees of RBC Wealth Management USA's foreign affiliate RBC Dominion Securities Inc.; Frédérique Carrier and Thomas McGarrity, employees of RBC Wealth Management USA's foreign affiliate RBC Europe Limited; Jasmine Duan, an employee of RBC Investment Services (Asia) Limited; and Nicholas Gwee, an employee of Royal Bank of Canada, Singapore Branch contributed to the preparation of this publication. These individuals are not registered with or qualified as research analysts with the U.S. Financial Industry Regulatory Authority ("FINRA") and, since they are not associated persons of RBC Wealth Management, they may not be subject to FINRA Rule 2241 governing communications with subject companies, the making of public appearances, and the trading of securities in accounts held by research analysts.

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, 60 South Sixth St, Minneapolis, MN 55402.

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). RBC Capital Markets recommended lists include the Strategy Focus List and the Fundamental Equity Weightings (FEW) portfolios. 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.

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 our ratings are determined on a relative basis.

Explanation of RBC Capital Markets, LLC 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.

Distribution of Ratings - RBC Capital Markets, LLC Equity Research
As of March 31, 2020

			Investment Banking Services Provided During Past 12 Months	
Rating	Count	Percent	Count	Percent
Buy [Outperform]	755	51.64	220	29.14
Hold [Sector Perform]	619	42.34	126	20.36
Sell [Underperform]	88	6.02	11	12.50

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.

As of March 31, 2020, RBC Capital Markets discontinued its Top Pick rating. Top Pick rated securities represented an analyst's best idea in the sector; expected to provide significant absolute returns over 12 months with a favorable risk-reward ratio. Top Pick rated securities have been reassigned to our Outperform rated securities category, which are securities expected to materially outperform sector average over 12 months.

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 Wealth Management 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, LLC, and its affiliates, a portion of which are or have been generated by investment banking activities of RBC Capital Markets, LLC 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; by RBC Dominion Securities Inc., a securities broker-dealer with principal offices located in Toronto, Canada; by RBC Investment Services (Asia) Limited, a subsidiary of RBC Dominion Securities Inc., a securities broker-dealer with principal offices located in Hong Kong, China; by Royal Bank of Canada, Singapore Branch, a licensed wholesale bank with its principal office located in Singapore; and by 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.

References herein to "LIBOR", "LIBO Rate", "L" or other LIBOR abbreviations means the London interbank offered rate as administered by ICE Benchmark Administration (or any other person that takes over the administration of such rate).

Disclaimer