GLOBAL Insight

Special Report

February 16, 2022

Spheres of influence

The bigger reason geopolitical risks are affecting markets

With the clock ticking on a diplomatic solution, RBC Wealth Management's Global Portfolio Advisory Committee discusses how the crux of the current geopolitical tensions goes far beyond Russia and Ukraine.

Kelly Bogdanova

For important disclosures, see page 13.
All values in U.S. dollars and priced as of market close, February 14, 2022 unless otherwise stated.
Produced: Feb. 16, 2022 1:00 pm ET; Disseminated: Feb. 16, 2022 3:25 pm ET

Special Report

Spheres of influence

The bigger reason geopolitical risks are affecting markets

Kelly Bogdanova
San Francisco, United States
kelly.bogdanova@rbc.com

With the clock ticking on a diplomatic solution, we discuss how the crux of the current geopolitical tensions goes far beyond Russia and Ukraine. This is part of a much wider dispute between the U.S./NATO and Russia, which is coming to a head. The report examines equity market vulnerabilities during previous geopolitical hostilities and military conflicts. It also addresses the region that could become a flashpoint in Ukraine, sanctions and counter-sanctions risks, and Russia's potential to accelerate its pivot toward Asia, regardless of whether ties with the West deteriorate further.

Western media have been focusing their geopolitical coverage on a potential "imminent Russian invasion of Ukraine"—repeating and amplifying strong statements and warnings of leaders in the U.S. and other countries, and setting and then resetting potential "invasion" dates.

This has impacted energy markets for the past two months, boosting crude oil and European natural gas prices. More recently, financial markets have started to take notice, as war-related headlines have contributed to equity market volatility.

We think the issues at stake are much greater, wider, and deeper than the conflict between Russia and Ukraine, and go back decades.

From our vantage point, the crux of the dispute is between the U.S./NATO and Russia. It's about spheres of influence between major military powers, NATO's expansion eastward and involvement in the former-Soviet space since the end of the Cold War, deployments and flight times of advanced missile systems, locations of short- and intermediate-range nuclear weapons, energy sector competition, and more. We think the ultimate outcome of the dispute could establish European security parameters for decades to come.

There are certainly scenarios in which Russia and Ukraine could clash militarily—we address the most likely one below, in eastern Ukraine.

Regardless of what occurs in Ukraine, Russia is focused on the bigger issues surrounding its conflict with the U.S. and NATO as it pertains to security in Europe, as evidenced by the formal security proposals Moscow gave to those two parties in December 2021, and the diplomatic full-court press that has taken place since then.

Diplomatic initiatives and dialogues are ongoing between the U.S./NATO and Russia, and leaders from the UK, France, Germany, Hungary, and Turkey have also engaged. Meaningful progress has not yet materialized.

SPECIAL REPORT

Spheres of influence

The Russian ruble has become a proxy for the current geopolitical risks

The ruble has been weak recently, and is at the upper end of the broad range that has been established since late 2014 when tensions began to escalate with the U.S. and sanctions started being imposed with greater force.

Source - RBC Wealth Management, Bloomberg; data through 2/14/22

Russia recently said its primary concerns about security guarantees are still not being addressed: the non-expansion of NATO, the non-deployment of strike weapons systems near Russia's borders, and a return to the 1997 configuration for the deployment of foreign forces, equipment, and weapons on the territories of countries that were not NATO members at that time.

While we see scope for a few more brief rounds of discussions—Russia is currently in the process of finalizing another substantive diplomatic document for the U.S. and NATO—the clock is ticking on the diplomatic front.

Markets tend to bounce back even in the face of serious hostilities and wars

Before looking at one of the specific military risks in Ukraine surrounding this complex geopolitical situation and related sanctions risks, it's important to consider the market's past performance during previous wars and high-stakes confrontations.

Historically, military clashes have had limited impact on equity markets both in magnitude and duration—even when the U.S. and Soviet Union were embroiled in the Cuban Missile Crisis.

The S&P 500 fell 6.2 percent, on average, in 18 major post-WWII military conflicts or hostilities that we evaluated. That nearly matches the decline the market suffered when U.S. President John Kennedy and Soviet Premier Nikita Khrushchev were at the brink of war.

While that level of decline is nothing to dismiss, it's well within the bounds of a typical, modest pullback in many scenarios that often confront markets, including those that have nothing to do with military risks.

SPECIAL REPORT

Spheres of influence

S&P 500 responses to select acts of war or hostilities since World War II

Event	Start date	Trading days to trough	% change to trough	Trading days back to even
U.S.				
U.S. spy plane shot down in USSR	May 7, 1960	2	-0.6%	4
Bay of Pigs invasion	Apr 15, 1961	6	-3.0%	14
Cuban Missile Crisis	Oct 16, 1962	6	-6.3%	13
Gulf of Tonkin Incident (Vietnam)	Aug 2, 1964	4	-2.2%	29
Tet Offensive (Vietnam)	Jan 29, 1968	25	-6.0%	46
Cambodian Campaign (Vietnam)	May 1, 1970	18	-14.9%	86
U.S. invades Grenada	Oct 25, 1983	11	-2.8%	15
Lead-up to U.S. Panama invasion	Dec 15, 1989	2	-2.2%	8
Lead-up to Gulf War (Desert Storm)	Jan 1, 1991	6	-5.7%	13
U.S.-led NATO bombs Yugoslavia	Mar 24, 1999	3	-4.1%	11
U.S. spy plane captured in China	Apr 1, 2001	3	-4.9%	7
War in Afghanistan	Oct 7, 2001	1	-0.8%	3
Lead-up to Iraq War	Feb 5, 2003	24	-5.6%	28
External				
N. Korea invades S. Korea	Jun 25, 1950	15	-12.9%	56
Lead-up to Six-Day War (June 6)	May 14, 1967	15	-5.6%	20
Yom Kippur War, Arab oil embargo	Oct 6, 1973	42	-16.1%	6 years*
Soviet-Afghan War	Dec 24, 1979	7	-2.3%	10
Iraq invades Kuwait, oilfields seized	Aug 2, 1990	50	-15.9%	131
Average		**13**	**-6.2%**	**30**

* Other economic and monetary policy factors negatively influenced the number of days it took the market to get back to even; this is not counted in the average number of trading days back to even.

Source - RBC Wealth Management, RBC Global Asset Management, Wikipedia, National Security Archive at George Washington University, U.S. Naval Institute; data attempts to capture any pre-event impact

Our study of previous geopolitical conflicts indicates the market's reaction lasted an average of only 30 days before it was able to climb back to even. This occurred despite the fact that many of the actual events lasted longer—sometimes much, much longer.

At times equities weakened during the run-up to a geopolitical conflict as tensions mounted, and at other times the weakness began with direct military clashes. In most instances, markets recovered soon after hostilities began.

However, as the table above shows, four prior events were more difficult for the market to absorb, with the S&P 500 declining in the low-to-mid-double digits. In these instances, which are highlighted in orange, two of the four acts of war were in the Middle East: in 1990 when Iraq invaded Kuwait and seized its oilfields, and back in 1973 during the Yom Kippur War and Arab oil embargo.

What's notable about these two events, as it pertains to today's geopolitical risks, is that those conflicts impacted global energy markets. The geopolitical risks surrounding the U.S./NATO and Russia conflict do not *directly* put oil and natural gas supplies at risk at this stage (unless the West sanctions Russian oil and gas, or Russia restricts supplies in counter-sanctions). But European natural gas prices could be vulnerable to further increases if the West follows through with its threat to stop the Nord Stream 2 pipeline from becoming operational should Russia and Ukraine clash directly.

In general, when it comes to wars and serious geopolitical disputes, our long-standing advice is that investors should assume that such events can push the equity market into a temporary five percent to 10 percent pullback or, in rarer cases, into a longer-lasting correction of greater magnitude—especially when energy markets are widely affected such that they put medium- and long-term economic growth at risk.

Donbass: The region that could be a flashpoint

Currently, the area of greatest tension within this wider U.S./NATO and Russia dispute is the Donbass region of eastern Ukraine, where the Armed Forces of Ukraine and the military forces of the self-proclaimed Lugansk and Donetsk People's Republics (LDPR) have been facing off for nearly eight long and painful years. If fighting escalates in Donbass (or occurs anywhere else in Ukraine), we think equity markets would be vulnerable to at least a short-term pullback.

Donbass is a dispute in which the U.S., other NATO countries, Russia, and Belarus have had vested interests from day one.

The internal conflict began soon after the Euromaidan (Maidan) protests and related events in February 2014 led to the ousting of Ukraine's president and administration, which were friendly toward Moscow. Russian-speaking Ukrainians in the Donbass cities of Lugansk and Donetsk and surrounding areas opposed the abrupt change in government and the new direction of the country. Following self-determination referendums, they declared their independence from Ukraine in May 2014. Their independence was not recognized by Ukraine, Western nations, Russia, nor Belarus; however, a process has recently been put in place by which Russia could formally recognize them.

Donbass is a dispute in which the U.S., other NATO countries, Russia, and Belarus have had vested interests from day one.

One side of the dispute (including every Ukrainian leader since the uprising and Western officials) considers Maidan to be a "revolution of dignity" and an important pivot by Ukraine toward independence, democracy, freedom, and liberal Western values and culture, with the potential for further EU and NATO integration down the line upon implementing various reforms. Ukrainian nationalism has been encouraged and promoted during the post-Maidan period.

The other side (including LDPR and Russia) considers Maidan to be a Western-backed coup d'état aimed at turning Ukraine into an externally controlled state in order to disrupt fraternal relations between Russia and Ukraine, suppress Ukraine's large Russian-speaking population, and upend Ukraine's historical culture—with the ultimate goal of destabilizing Russia's national security due to the involvement of NATO and some of its member states in post-Maidan Ukraine.

At times the fighting in Donbass has been full on, especially in 2014 and early 2015. At other times it has been less intense but with regular shelling of villages and drone and sniper attacks, and there have also been periodic cease-fires, albeit not very effective ones. The UN estimates up to 13,300 people have died during the clashes since they began in April 2014, with at least 25 percent being civilians, including children and the elderly. Currently, a state of cease-fire technically exists, but there are regular violations and the situation is now extremely tense.

In February 2015, Ukraine, LDPR, Russia, and the Organization for Security and Co-operation in Europe (OSCE) jointly signed the Minsk agreements, which lay out a step-by-step process to end the fighting and restore the non-recognized republics as part of Ukraine, with special status. But none of the steps have been implemented thus far. The likelihood the Minsk agreements will remain in force has diminished in recent months. Progress at the most recent negotiations in the Normandy Four format (France, Germany, Russia, and Ukraine) on February 10 was nonexistent.

Currently, an estimated 130,000 Ukrainian troops, including combat-ready formations with heavy artillery and tanks—with nationalist battalions among them—are deployed near the contact line (demarcation line) that runs between Ukraine- and LDPR-controlled areas of Donbass. Weapons from NATO countries continue to flow to the Armed Forces of Ukraine. At least 43 cargo flights landed in Ukraine with weapons and other military equipment from January 15 through February 13, according to flight monitoring systems.

On the other side of the contact line, the Armed Forces of Donbass (LDPR's joint military) now have 150,000 troops available. This contact line is only 100 kilometers west of the Ukrainian-Russian border. Russian troops and heavy equipment are located on Russian territory about 200–400 kilometers east of that border. (Additionally, Russia is conducting major military exercises in other parts of its territory, in the Black Sea and Sea of Azov, and in Belarus with the Belarusian Armed Forces. Exercises in Belarus are scheduled to end on February 20, and some of these troops have already begun their pre-scheduled process of returning to their permanent deployment locations in Russia.)

If the major population centers of LDPR, including the cities of Lugansk and Donetsk, come under threat from an offensive by the Ukrainian Army or nationalist battalions, one of the two LDPR leaders recently told Reuters he may ask Russia for military support. Roughly 3.66 million people live in LDPR, 860,000 of whom have become Russian citizens since April 2019 when a special simplified procedure was established, and more are in the queue.

The West promises punitive sanctions, but there are mixed signals

Officials in the U.S., other Western countries, and EU structures have repeatedly stressed that any actions by the Russian military in Donbass or anywhere else in Ukraine—even if limited—would be considered an "invasion" of Ukraine, and would trigger harsh, punitive economic sanctions against Russia.

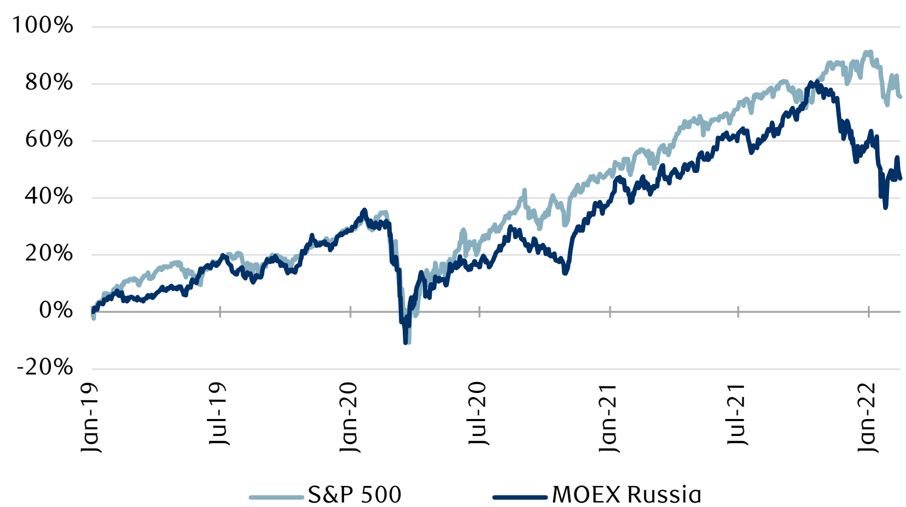
Thus far, the hundreds of sanctions—some small, others large—that the U.S. has imposed against the Russian state, its businesses, and certain citizens since 2014, and the related sanctions by the EU and UK, have constrained the Russian economy and weakened the ruble notably. But overall, they have had a limited detrimental impact as Russia has achieved greater self-sufficiency and development of certain sectors during this time, especially in agriculture.

If the situation in Ukraine escalates militarily and Russia intervenes, U.S. senators are promising a much bigger response—legislation vividly characterized as the "mother of all sanctions" or "sanctions from hell" with the goal of isolating and effectively blockading the Russian economy.

The mere threat of this and the heightened tensions in Donbass dented the Russian stock market. Its main index, made up largely of natural resource companies and banks, plunged 25 percent from its October 2021 peak to its January 2022 trough—despite the fact that crude oil and natural gas prices rallied sharply during the same period.

Russian equities have corrected sharply since geopolitical tensions began to heat up

S&P 500 and MOEX Russia performance since 2019 (%)



Source - RBC Wealth Management, Bloomberg; indexes measured in local currencies; data through 2/14/22

Thus far, there have been mixed signals about just exactly which types of sanctions the West would impose—with some officials threatening to cut off Russia from the international financial payments network known as SWIFT, and others saying that move would be too risky for the global financial system and Europe's economy. Recently, Western officials have delivered a more consistent message about potential harsh sanctions on Russia's largest banks, including restricting them from dollar-based transactions.

There have been similar mixed messages related to Russia's oil and gas and agriculture sectors, with some preferring to avoid sanctioning these areas due to the potential boomerang effect on Western economies, particularly during this inflationary period.

Most Western officials, including more recently some German officials, have threatened that the Nord Stream 2 pipeline would not be allowed to become operational if Russia intervenes militarily in Ukraine. However, the EU's chief diplomat Josep Borrell recently said that even if the pipeline were to be halted due to a war between Ukraine and Russia, "it doesn't mean that Nord Stream 2 will stop working forever." Russia points out that the construction of the pipeline itself has already been paid for due to relatively high gas prices. Furthermore, in recent years Russia has signed contracts with China that can supply more pipeline gas than Nord Stream 2, and another potential pipeline project is being considered that is almost as large as Nord Stream 2.

Suffice it to say, we think it's safe to assume that a package of punitive sanctions from the West would be just that—punitive—and would damage the Russian economy, at least in the short run.

Russia would likely respond to sanctions symmetrically and asymmetrically

For financial markets, we think widespread sectoral sanctions raise uncertainties and risks because of the intricate linkages in the global financial system and supply chains, and due to Russia's dominance in natural resource and agriculture markets.

While Russia's economy is no match for that of the U.S. or Germany, and is smaller than Italy's, it is the fifth-largest in Europe based on GDP in U.S. dollars. On a purchasing power parity basis—which incorporates currency exchange rates—it is the sixth-largest economy in the world, according to the World Bank.

Russia's economy is the 11th-largest in U.S. dollar terms, but the sixth-largest in PPP terms

GDP rank (trillions of U.S. dollars)

Rank	Country	GDP
1	United States	20.9
2	China	14.7
3	Japan	5.1
4	Germany	3.8
5	United Kingdom	2.8
6	India	2.7
7	France	2.6
8	Italy	1.9
9	Canada	1.6
10	South Korea	1.6
11	**Russian Federation**	**1.5**
12	Brazil	1.4
13	Australia	1.3
14	Spain	1.3
15	Mexico	1.1

GDP rank based on purchasing power parity (trillions of U.S. dollars)

Rank	Country	GDP
1	China	24.3
2	United States	20.9
3	India	9.0
4	Japan	5.3
5	Germany	4.5
6	**Russian Federation**	**4.1**
7	Indonesia	3.3
8	Brazil	3.2
9	France	3.1
10	United Kingdom	3.1
11	Italy	2.5
12	Mexico	2.4
13	Turkey	2.4
14	South Korea	2.2
15	Canada	1.8

Note: Ranking based on 2020 GDP data. Purchasing power parity takes into account the influence of exchange rates.

Source - RBC Wealth Management, World Bank

SPECIAL REPORT

Spheres of influence

In addition to consistently being a top-three global producer of crude oil, related petrochemical products, and natural gas, Russia is among the three leading producers of wheat, barley, aluminum, gold, platinum, diamonds, and wood products. Moreover, it is a top-six producer of titanium, iron ore, steel, and coal, as well as potash, nitrogen, and phosphate used for fertilizer production. It also has large reserves of rare-earth minerals.

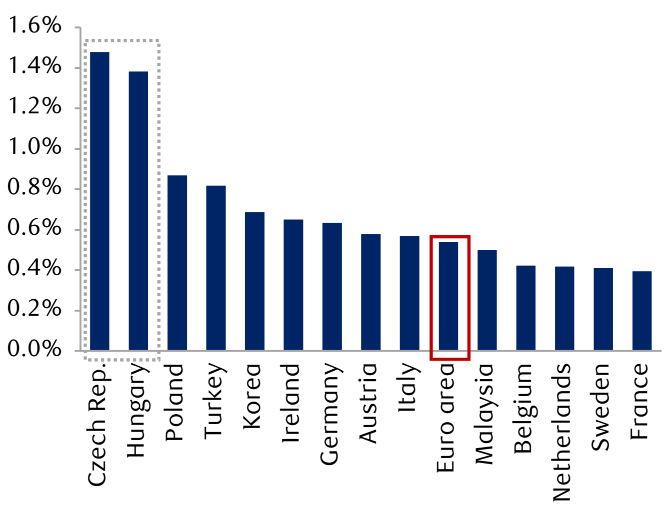
In the past, Russia has responded to Western sanctions by symmetric and asymmetric means. Thus far, there have been little-to-no hints from the Russian government about counter-sanctions or actions it could potentially impose, although on multiple occasions officials have stressed that they view Russian companies' commercial energy supply contracts with Europe as nearly sacrosanct.

These contracts are long-term in nature and are not highly impacted by fluctuations in European natural gas spot market prices, but some do have exposure to market-based crude oil prices. The contracts are important to Russia's economy and, after all, Russia's grievances are mostly with the U.S. government and the NATO military bloc, not individual Western and Central European countries or their European commercial partners. Countries that do not have long-term contracts with Russia, such as Poland, would be at the mercy of natural gas spot market prices.

Overall, European economies could be more detrimentally impacted by Western sanctions and Russia's counter-sanctions than those in North America due to Europe's stronger trade and investment ties with Russia. RBC Capital Markets points out, however, that Europe's trade exposures—goods exports (shown in the left chart) and services exports—are not particularly large. Foreign direct investment by the euro area into Russia is also relatively moderate, as shown in the right chart.

Central European goods exports are most exposed to Russia, but even this exposure is not significant

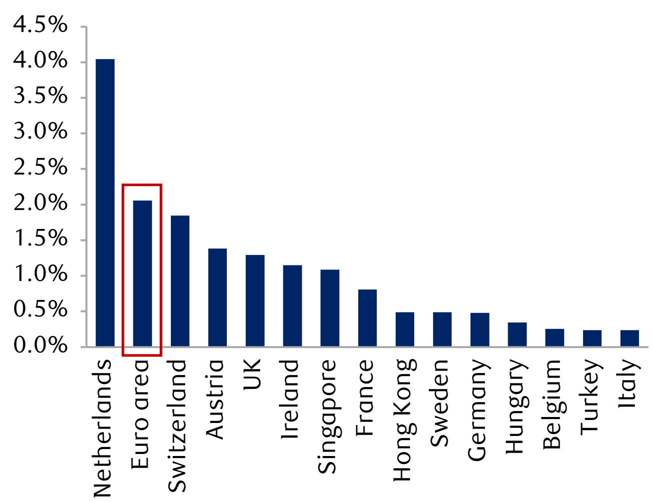
Major economies' goods exports to Russia (as a percentage of exporter GDP)



Source - RBC Capital Markets, Bloomberg, Haver Analytics, International Monetary Fund; data based on the sum of Q4 2020 to Q3 2021

The euro area's direct investment into Russia is moderate

Major economies' foreign direct investment (FDI) into Russia (stock, as a percentage of country investor's GDP)



Source - RBC Capital Markets, Bloomberg, Central Bank of Russia, Haver Analytics; data as of the end of June 2021

Russia's pivot toward Asia likely to accelerate, regardless of what happens with the West

In a scenario of harsh sanctions, the level of isolation that Russia might face is uncertain because in recent years the country has pivoted its economy more toward Asia, particularly China. Some prominent Russian economists believe punitive sanctions would hasten the country's long-discussed internal development plans, including the building of new southern Siberian agglomerations (scientific-industrial and economic centers) and development of its Far East region. In other words, if severe Western sanctions are imposed, Russia's internal development and Asia pivot would likely accelerate sharply.

Given Russia's low government debt and significant reserves, it has the financial wherewithal to pull off such a development strategy, but it would require significant and laborious restructuring of its current economic policies and, perhaps, a reconfiguration of its central bank mandates. The proposals are already in the works—and a number of key officials and thought leaders recommend this direction regardless of whether ties with the West are damaged further.

Along the lines of an eastern pivot, one thing to pay attention to is China's reaction to the ongoing U.S./NATO and Russia geopolitical dispute, and how it would respond if sweeping Western sanctions are imposed against Russia.

On February 4, following discussions between President Xi Jinping and President Vladimir Putin ahead of the Beijing Olympics opening, China's official readout of the meeting stated, "The two sides need to keep up their close high-level exchanges, follow their four-point agreement on firm mutual support, strongly support each other in upholding sovereignty, security and development interests, effectively counter external interference and threats to regional security, and maintain international strategic stability."

Equity market vulnerability is typically limited and short-lived

The risks in Eastern Europe, and those associated with Ukraine more specifically, become more understandable when viewed through the wider lens of the ongoing geopolitical dispute between the U.S./NATO and Russia.

This is not a conflict that developed just recently or even in the past few years. It began decades ago, while NATO expanded eastward and became more involved in the post-Soviet space. Things are now coming to a head.

There is still scope for a diplomatic resolution, and all parties are engaged including European nations, which, in addition to Russia, have the most at stake. But we think time is of the essence. Russia has repeatedly stated it is not interested in lengthy negotiations that fail to address its primary security concerns.

As we have demonstrated, there are risks that fighting could break out in Ukraine before a diplomatic resolution occurs, particularly in the Donbass region, with tensions between the Ukrainian Army and LDPR close to a boiling point.

Because of these uncertainties, we think equity markets remain vulnerable to heightened volatility and downside, and energy markets susceptible to upside pressures, as events unfold. But if history is a guide, the risk associated with wars and geopolitical conflicts for equities is usually limited in magnitude—to around five percent to 10 percent downside for major developed markets—and typically plays out over a brief time frame. Somewhat deeper corrections have been associated with events that meaningfully disrupted energy markets, weighing on economic growth.

At this stage, we do not recommend adjusting long-term portfolio allocations due to these geopolitical risks, which seem to be shorter-term in nature and could be resolved in coming weeks or months, one way or another. But investors should be mindful that the broader U.S./NATO-Russia dispute, and related events in Ukraine, could create volatility or downside for equities over the near term.

Research resources

This document is produced by the Global Portfolio Advisory Committee within RBC Wealth Management's Portfolio Advisory Group. The RBC Wealth Management 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 Global Portfolio Advisory Committee leverages the broad market outlook as developed by the RBC Investment Strategy Committee (RISC), providing additional tactical and thematic support utilizing research from the RISC, RBC Capital Markets, and third-party resources.

The RISC consists of senior investment professionals drawn from individual, client-focused business units within RBC, including the Portfolio Advisory Group. The RISC builds a broad global investment outlook and develops specific guidelines that can be used to manage portfolios. The RISC is chaired by Daniel Chornous, CFA, Chief Investment Officer of RBC Global Asset Management Inc.

Global Portfolio Advisory Committee members

Jim Allworth – Co-chair
Investment Strategist, RBC Dominion Securities Inc.

Kelly Bogdanova – Co-chair
Portfolio Analyst, RBC Wealth Management Portfolio Advisory Group U.S., RBC Capital Markets, LLC

Frédérique Carrier – Co-chair
Managing Director & Head of Investment Strategies, RBC Europe Limited

Mark Bayko, CFA – Head, Portfolio Management, RBC Dominion Securities Inc.

Rufaro Chiriseri, CFA – Head of Fixed Income – British Isles, RBC Europe Limited

Janet Engels – Head, Portfolio Advisory Group U.S., RBC Wealth Management, RBC Capital Markets, LLC

Thomas Garretson, CFA – Fixed Income Senior Portfolio Strategist, RBC Wealth Management Portfolio Advisory Group, RBC Capital Markets, LLC

Ryan Harder, CFA – Fixed Income Portfolio Advisor, Portfolio Advisory Group, RBC Dominion Securities Inc.

Patrick McAllister, CFA – Manager, Equity Advisory & Portfolio Management, Portfolio Advisory Group, RBC Dominion Securities Inc.

Alan Robinson – Portfolio Analyst, RBC Wealth Management Portfolio Advisory Group – U.S. Equities, RBC Capital Markets, LLC

Michael Schuette, CFA – Multi-Asset Portfolio Strategist, RBC Wealth Management Portfolio Advisory Group – U.S., RBC Capital Markets, LLC

David Storm, CFA, CAIA – Chief Investment Officer, BI & Asia, RBC Europe Limited

Tat Wai Toh – Head of Portfolio Management, BI & Asia, Royal Bank of Canada, Singapore Branch

Joseph Wu, CFA – Portfolio Manager, Multi-Asset Strategy, RBC Dominion Securities Inc.

Required disclosures

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.

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, 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 December 31, 2021

			Investment Banking Services Provided During Past 12 Months	
Rating	Count	Percent	Count	Percent
Buy [Outperform]	831	57.59	365	43.92
Hold [Sector Perform]	557	38.60	180	32.32
Sell [Underperform]	55	3.81	3	5.45

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; RBC Dominion Securities Inc., a securities broker-dealer with principal offices located in Toronto, Canada; RBC Investment Services (Asia) Limited, a subsidiary of RBC Dominion Securities Inc., a securities broker-dealer with principal offices located in Hong Kong, China; 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.

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 legally permitted to carry on the business of a securities broker or dealer in that jurisdiction. Nothing in this report constitutes legal, accounting or tax advice or individually tailored investment advice. This material is prepared for general circulation to clients, including clients who are affiliates of Royal Bank of Canada, and does not have regard to the particular circumstances or needs of any specific person who may read it. The investments or services contained in this report may not be suitable for you and it is recommended that you consult an independent investment advisor if you are in doubt about the suitability of such investments or services. To the full extent permitted by law neither Royal Bank of Canada nor any of its affiliates, nor any other person, accepts any liability whatsoever for any direct, indirect or consequential loss arising from, or in connection with, any use of this report or the information contained herein. No matter contained in this document may be reproduced or copied by any means without the prior written consent of Royal Bank of Canada in each instance. 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. Additional information is available upon request.

To U.S. Residents: This publication has been approved by RBC Capital Markets, LLC, Member NYSE/FINRA/SIPC, which is a U.S. registered broker-dealer and which accepts responsibility for this report and its dissemination in the United States. RBC Capital Markets, LLC, is an indirect wholly-owned subsidiary of the Royal Bank of Canada and, as such, is a related issuer of Royal Bank of Canada. Any U.S. recipient of this report that is not a registered broker-dealer or a bank acting in a broker or dealer capacity and that wishes further information regarding, or to effect any transaction in, any of the securities discussed in this report, should contact and place orders with RBC Capital Markets, LLC. International investing involves risks not typically associated with U.S. investing, including currency fluctuation, foreign taxation, political instability and different accounting standards.

To Canadian Residents: This publication has been approved by RBC Dominion Securities Inc. RBC Dominion Securities Inc.* and Royal Bank of Canada are separate corporate entities which are affiliated. * Member Canadian Investor Protection Fund. ® Registered trademark of Royal Bank of Canada. Used under license. RBC Wealth Management is a registered trademark of Royal Bank of Canada. Used under license.

RBC Wealth Management (British Isles): This publication is distributed by RBC Europe Limited and RBC Investment Solutions (CI) Limited. RBC Europe Limited is authorised by the Prudential Regulation Authority and regulated by the Financial Conduct Authority and the Prudential Regulation Authority (FCA registration number: 124543). Registered office: 100 Bishopsgate, London, EC2N 4AA, UK. RBC Investment Solutions (CI) Limited is regulated by the Jersey Financial Services Commission in the conduct of investment business in Jersey. Registered office: Gaspé House, 66-72 Esplanade, St Helier, Jersey JE2 3QT, Channel Islands, registered company number 119162.

To Hong Kong Residents: This publication is distributed in Hong Kong by Royal Bank of Canada, Hong Kong Branch which is regulated by the Hong Kong Monetary Authority and the Securities and Futures Commission ('SFC'), and RBC Investment Services (Asia) Limited, which is regulated by the SFC.

To Singapore Residents: This publication is distributed in Singapore by the Royal Bank of Canada, Singapore Branch, a registered entity licensed by the Monetary Authority of Singapore. This material has been prepared for general circulation and does not take into account the objectives, financial situation, or needs of any recipient. You are advised to seek independent advice from a financial adviser before purchasing any product. If you do not obtain independent advice, you should consider whether the product is suitable for you. Past performance is not indicative of future performance. If you have any questions related to this publication, please contact the Royal Bank of Canada, Singapore Branch. Royal Bank of Canada, Singapore Branch accepts responsibility for this report and its dissemination in Singapore.

Wealth Management