

Geopolitical risk dashboard

BlackRock®

April 2022

Geopolitical Risks – April update

The Russian invasion of Ukraine is the largest, most dangerous military mobilization in Europe since WWII. It has upended the geopolitical order, with profound implications for financial markets and the global economy.

Indeed, our overall geopolitical risk indicator has spiked to its highest level in more than a year. This is driven by elevated market attention to conflict-related risks generally, and *Russia-NATO conflict* specifically. We see geopolitics as a key risk factor for the foreseeable future.

The Ukraine war is likely to drive geopolitical fragmentation and the emergence of blocs, in our view. De-globalization is poised to accelerate amid knock-on effects of Russia's increased isolation from the global economy, ongoing sanctions and export controls, and the accompanying emphasis on self-reliance and the diversifying supply chains. These forces are likely to reduce economic growth and increase inflation – and reverberate across the globe. Food and energy inflation, in particular, elevate the risk of social instability in emerging markets.

This month, we maintain the likelihood of a *Russia-NATO conflict* at a high level, even as the U.S. and its allies are working hard to prevent it. The conflict inside Ukraine is likely to last for an extended period, with on-and-off negotiations, ceasefires and breached stand-downs. The West is unlikely to lift sanctions on Russia anytime soon, in our view.

Our dashboard features both data-driven market attention barometers and judgment-based assessments of our top risks. We show market attention to each risk, assess the likelihood of it occurring over a six-month horizon and analyze its potential market impact.

We note three areas where market attention and our views diverge: *Gulf tensions*, *North Korea conflict* and *Climate policy gridlock*. In each instance, we believe markets are underappreciating the potential risks.

Our BlackRock Geopolitical Risk Indicators (BGRIs) track market attention to each risk using mentions in brokerage reports and financial news stories. They integrate the latest advancements in natural language processing and machine learning. This assessment helps determine when geopolitical risks start to appear on investor radar screens – and when they start fading. See our methodology for details.

We also have developed a market movement measure that we believe gives us insights into how asset prices are responding to risks. It integrates analysis from our Risk & Quantitative Analysis (RQA) team and its Market-Driven Scenarios (MDS) for each risk.

The gauge's score is based on how similar the market environment is to MDS' assumptions and how much MDS-related asset prices have moved over the past month. See the "How it works" section. We also list the three assets that we see as the key variables of each MDS.

We believe tracking geopolitical risks' market impact is as much an art as a science. We are continuously updating our risk scenarios and refining our methodologies. Our scenarios are hypothetical and do not reflect all possible outcomes as geopolitical risks are ever-evolving. Our market movement analyses are not recommendations to invest in any specific investment strategy or product.



Tom Donilon
Chairman – BlackRock Investment Institute



Stephanie Lee

Portfolio Manager – BlackRock Systematic Active Equities

Catherine Kress

Advisor to the Chairman of the BlackRock Investment Institute



Carl Patchen

Multi-Asset Risk & Quantitative Analysis

Andrew Fischer

Investment Strategist, BlackRock Systematic Active Equities

Contents

Risk summary **2-3**

Framework **4**

Scenario variables **5**

Appendix: How it works **6**

BlackRock
Investment
Institute

Top 10 risks by likelihood

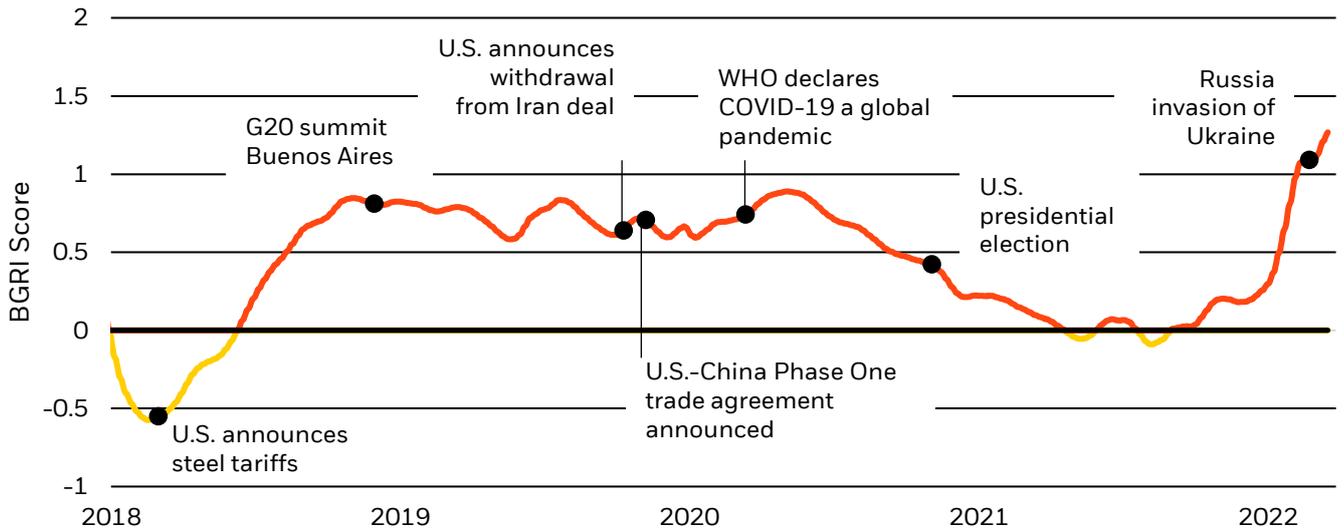
Risk	Description	Market attention since 2019	Likelihood	Our view
1 Russia-NATO conflict	Russian troops launch a large-scale invasion of Ukraine. The U.S. and EU respond with harsh financial, energy, and technology sanctions on Russia.		High	Russia's invasion of Ukraine is the largest, most dangerous military mobilization in Europe since WWII. Russian President Vladimir Putin has failed in his initial plan to quickly take the capital of Kyiv, decapitate the government and replace it with one loyal to him. We are now in a more aggressive and destructive phase of the Russian operation. This is taking a devastating humanitarian toll. We do not see a settlement of the conflict as likely at this point, despite peace talks. Rather, the most likely scenario in our view is an extended conflict in Ukraine, with a long-term political, economic, and military standoff between the West and Russia.
2 Major cyberattack(s)	Cyberattacks cause sustained disruption in the operation of critical physical or digital infrastructure.		High	The Ukraine war has significantly increased the cyber threat to the West. It has become clear that critical government and private sector networks and infrastructure across the globe are vulnerable to hacking and spying. Financial market reactions, however, have been muted. Attacks are increasing in scope, scale and sophistication, with the U.S. facing an "epidemic" of ransomware. Repeated attacks could cause significant damage and sustained disruption, which may spill over to financial markets and the economy.
3 Global technology decoupling	Technology decoupling between the U.S. and China significantly accelerates in scale and scope.		High	Strategic competition between the U.S. and China is driving global fragmentation as both countries focus on boosting self-reliance, reducing vulnerabilities and managing a decoupling of their tech sectors. Western sanctions on Russian technology imports will exacerbate fragmentation and deepen the global focus on self-reliance and reliable supply chains. In the U.S., Congress is moving on industrial policy legislation aimed at boosting competitiveness in critical technologies. The administration is pursuing "Buy American" initiatives. And the SEC is increasing disclosure requirements for Chinese companies listing in the U.S. The U.S. has also threatened sanctions against Chinese companies that undermine U.S. export controls on Russia and is considering controls on outbound investment into China either by legislation or executive action.
4 Major terror attack(s)	A terror attack leads to significant loss of life and commercial disruption.		Medium	The Taliban takeover and the accompanying release of prisoners in Afghanistan may increase the risk of international terrorism, even as U.S. counter-terrorism capabilities have improved. The insurrection at the U.S. Capitol underscores the significant and growing risk of domestic terrorism, which the Biden administration has called the most serious and persistent terrorist threat to the U.S.
5 Emerging markets political crisis	Failure to arrest the COVID-19 pandemic severely stresses EM political systems and institutions.		Medium	Spillover effects from the Ukraine crisis will amplify challenges for emerging economies. EMs were already struggling with fast-rising inflation and a slow economic rebound from the pandemic. They now are set to face compounded pressure from rising food and energy prices, exacerbated shortages, and higher U.S. interest rates. Social unrest, already noticeable in various fragile countries, will remain a risk well into 2022. There is a long history of food shortages and inflation causing instability in EMs. We worry about a potential wave of sovereign defaults in the years ahead.
6 U.S.-China strategic competition	China takes military action to accelerate reunification with Taiwan or more forcefully assert claims in the South China Sea.		Medium	Taiwan has become a flashpoint in the U.S.-China relationship. China has sent record numbers of aircraft near the island and reiterated Beijing's commitment to achieving "complete unification" with Taiwan. The U.S. has called for Taiwan's increased participation in UN activities and approved the possible sale to Taiwan of \$100 million of military equipment and services. We do not see a military confrontation as an imminent threat, but believe the risk will increase as the decade wears on. Any Chinese action to directly support Russia's invasion of Ukraine – particularly through military aid – would put China at risk of significant sanctions and threaten its Western relationships.

Risk	Description	Market attention since 2019	Likelihood	Our view
7 North Korea conflict	North Korea continues its nuclear buildup and takes provocative actions, such as ballistic missile launches.		Medium	North Korea's nuclear program continues unabated across all its dimensions, with more missile tests in January than in all of 2021. North Korea has rebuffed talks with the U.S. and significantly escalated provocations – including resuming work on its main nuclear test site and conducting its first ICBM test since 2017. We do not see an imminent threat of regional conflict. Yet tensions will increase in 2022, in our view. We will likely see additional long-range missile tests and possibly a nuclear test. We believe markets are underappreciating this risk.
8 Gulf tensions	Iran nuclear talks collapse, and tensions escalate, raising the risk of a regional conflict.		Medium	A revival of the 2015 nuclear deal is more uncertain after Iran's insistence that the US remove the terrorist organization designation of Iran's Revolutionary Guard Corps as a condition for agreement. Should a deal be agreed, it would be formally implemented in a multi-month process whereby Iran returns to its compliance with its nuclear obligations, while receiving sanctions relief in phases. An agreement would be controversial in Washington, but we do not see Congressional review as an ultimate risk to the deal's implementation. Without a deal, we see increasing risk of military action, as well as additional pressure on oil prices. Outside of Iran, there has been a general de-escalation of tensions among the Gulf oil producers who are benefiting from high energy prices. Continued attacks by Houthi rebels on Saudi Arabia and Abu Dhabi are an ongoing source of regional tensions.
9 Climate policy gridlock	Developed economies fail to increase public investment and regulatory action in pursuit of their stated ambitions for net zero emissions.		Medium	The crisis in Ukraine has brought energy security to the forefront. The world will need more non-Russian fossil fuels in the short term, and we think the crisis will make the world's transition to net zero carbon emissions more regionally divergent. The energy shock is essentially acting as a carbon tax for consumers. In Europe, this will likely boost decarbonization plans and make clean energy more competitive as the region is a net importer of fossil fuels seeking greater energy security. In the U.S., by contrast, there is less incentive for the world's largest fossil fuel producer to transition. Benefits for producers are higher, and the burden of higher energy costs on U.S. consumers will be lower than in the EU.
10 European fragmentation	Ongoing COVID and inflationary pressures lead to a populist resurgence and economic volatility.		Low	The Ukraine crisis has triggered a strong impulse toward European unity. European governments have come together to impose harsh economic and financial sanctions on Russia. They also are now focused on greater self-reliance in energy and defense. Europe's current dependence on Russian energy presents challenges. Additional fiscal easing is likely to counter higher energy costs, fund increased defense spending and respond to the growing humanitarian crisis. This could prove inflationary, but we expect the ECB to normalize cautiously. If the EU coordinates another centralized response, as it did during the pandemic, this would represent a further step toward fiscal union in Europe.

Sources: BlackRock Investment Institute, with data from Refinitiv. Data as of April 2022. Notes: The "risks" column lists the 10 key geopolitical risks that we track. The "description" column defines each risk. "Market attention" is a graphical snapshot of recent movement in the BlackRock Geopolitical Risk Indicator (BGRI) for each risk. The BGRI measures the degree of the market's attention to each risk, as reflected in brokerage reports and financial media. See the "how it works" section on p.7 for details. The table is sorted by the "Likelihood" column which represents our fundamental assessment, based on BlackRock's subject matter experts, of the probability that each risk will be realized – either low, medium or high – in the near term. The "our view" column represents BlackRock's most recent view on developments related to each risk. This is not intended to be a forecast of future events or a guarantee of future results. This information should not be relied upon by the reader as research or investment advice regarding any funds or security in particular. Individual portfolio managers for BlackRock may have opinions and/or make investment decisions that may, in certain respects, not be consistent with the information contained herein.

Geopolitical risk framework

BlackRock Geopolitical Risk Indicator

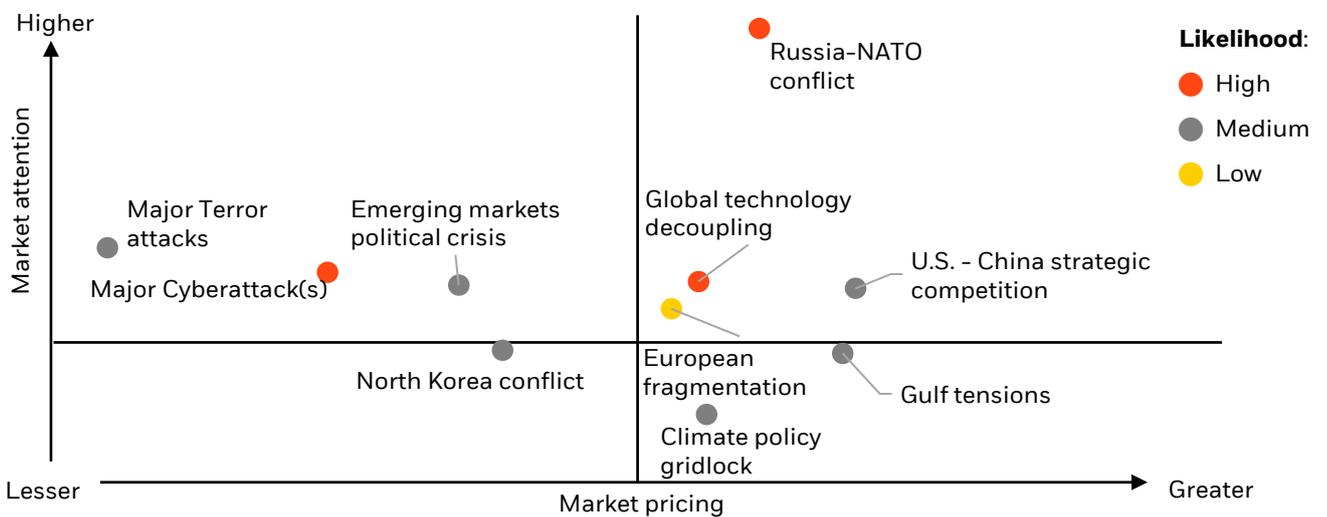


Forward-looking estimates may not come to pass. Source: BlackRock Investment Institute. April 2022. Notes: The BlackRock Geopolitical Risk Indicator (BGRI) tracks the relative frequency of brokerage reports (via Refinitiv) and financial news stories (Dow Jones News) associated with specific geopolitical risks. We adjust for whether the sentiment in the text of articles is positive or negative, and then assign a score. This score reflects the level of market attention to each risk versus a 5-year history. We use a shorter historical window for our COVID risk due to its limited age. We assign a heavier weight to brokerage reports than other media sources since we want to measure the market's attention to any particular risk, not the public's.

The global BlackRock Geopolitical Risk Indicator (BGRI) aims to capture market attention to our geopolitical risks. The indicator has spiked in recent months amid high market attention to *Russia-NATO conflict*, *U.S.-China strategic competition*, *Major cyber attack(s)* and *Major terror attack(s)*. Market attention to *North Korea conflict* is ticking up. The gauge is now well above its historic average, meaning investors are paying heightened attention to geopolitical risk. We see this level of attention as well-justified given high levels of geopolitical competition and potential conflict in the world.

Risk map

BlackRock Geopolitical market attention, market movement and likelihood



Forward-looking estimates may not come to pass. Source: BlackRock Investment Institute. April 2022. Notes: The vertical axis depicts the market attention to each of our top-10 risks, as reflected in brokerage reports and financial media and measured by the BlackRock Geopolitical Risk Index (BGRI). The horizontal axis shows our estimate of the degree to which asset prices have moved in accordance with our risk scenarios (horizontal axis). See the "How it works" section on p.7 for details. The color of the dots indicates our fundamental assessment of the relative likelihood of the risk - low, medium or high, as per the legend. Some of the scenarios we envision do not have precedents - or only imperfect ones. The scenarios are for illustrative purposes only and do not reflect all possible outcomes as geopolitical risks are ever-evolving. The chart is meant for illustrative purposes only. This material represents an assessment of the market environment at a specific time and is not intended to be a forecast of future events or a guarantee of future results. This information should not be relied upon by the reader as research or investment advice regarding any funds, strategy or security in particular.

Key scenario variables

How to gauge the potential market impact of each of our top-10 risks? We have identified three key “scenario variables” for each – or assets that we believe would be most sensitive to a realization of that risk. The chart below shows the direction of our assumed price impact.

Geopolitical risk	Asset	Direction of assumed price impact
Russia-NATO conflict	Russian equities	▼
	Russian ruble	▼
	Brent crude oil	▲
Major cyberattack(s)	U.S. high yield utilities	▼
	U.S. dollar	▲
	U.S. utilities sector	▼
Global technology decoupling	Chinese yuan	▼
	U.S. investment grade	▼
	Asia ex-Japan electrical	▼
Major terror attack(s)	Germany 10-year government bond	▲
	Japanese yen	▲
	Europe airlines sector	▼
Emerging markets political crisis	Latin America consumer staples sector	▲
	Emerging vs. developed equities	▼
	Brazil debt	▼
U.S.-China strategic competition	Taiwanese dollar	▼
	Taiwanese equities	▼
	China high yield	▼
North Korea conflict	Japanese yen	▲
	South Korean won	▼
	South Korean equities	▼
Gulf tensions	Brent crude oil	▲
	VIX volatility index	▲
	U.S. high yield credit	▼
Climate policy gridlock	U.S. building products sector	▼
	U.S. construction materials sector	▼
	U.S. utilities sector	▲
European fragmentation	Italy 10-year government debt	▼
	EMEA hotels and leisure	▼
	Russian ruble	▼

Source: BlackRock Investment Institute, with data from BlackRock’s Aladdin Portfolio Risk Tools application, April 2022. Notes: The table depicts the three assets that we see as key variables for each of our top-10 geopolitical risks – as well as the direction of the assumed shocks for each in the event of the risk materializing. The up arrow indicates a rise in prices (corresponding to a decline in yields for bonds); the down arrow indicates a fall in prices. Our analysis is based on similar historical events and current market conditions such as volatility and cross-asset correlations. See the “implied stress testing framework” section of the 2018 paper Market-Driven Scenarios: An Approach for Plausible Scenario Construction for details. For illustrative purposes only. The scenarios are for illustrative purposes only and do not reflect all possible outcomes as geopolitical risks are ever-evolving. This material represents an assessment of the market environment at a specific time and is not intended to be a forecast of future events or a guarantee of future results. This information should not be relied upon by the reader as research or investment advice regarding any funds, strategy or security in particular.

Appendix: How it works

The quantitative components of our geopolitical risk dashboard incorporate two different measures of risk: the first based on the market attention to risk events, the second on the market movement related to these events.

Market attention

The BlackRock Geopolitical Risk Indicator (BGRI) tracks the relative frequency of brokerage reports (via Refinitiv) and financial news stories (Dow Jones News) associated with specific geopolitical risks. We adjust for whether the sentiment in the text of articles is positive or negative, and then assign a score. This score reflects the level of market attention to each risk versus a 5-year history. We use a shorter historical window for our COVID-19 risk due to its limited age. We assign a heavier weight to brokerage reports than other media sources since we want to measure the market's attention to any particular risk, not the public's.

Our updated methodology improves upon traditional "text mining" approaches that search articles for predetermined key words associated with each risk. Instead, we take a big data approach based on machine-learning. Huge advances in computing power now make it possible to use language models based on neural networks. These help us sift through vast data sets to estimate the relevance of every sentence in an article to the geopolitical risks we measure.

How does it work? First we augment a pre-trained language model with broad geopolitical content and articles representative of each individual risk we track. The fine-tuned language model then focuses on two tasks when trawling through millions of brokerage reports and financial news stories:

- classifying the relevance of each sentence to the individual geopolitical risk to generate an attention score
- classifying the sentiment of each sentence to produce a sentiment score

The attention and sentiment scores are aggregated to produce a composite geopolitical risk score. A zero score represents the average BGRI level over its history. A score of one means the BGRI level is one standard deviation above its historical average, implying above-average market attention to the risk. We weigh recent readings more heavily in calculating the average. The level of the BGRIs changes slowly over time even if market attention remains constant. This is to reflect the concept that a consistently high level of market attention eventually becomes "normal."

Our language model helps provide more nuanced analysis of the relevance of a given article than traditional methods would allow. Example: Consider an analyst report with boilerplate language at the end listing a variety of different geopolitical risks. A simple keyword-based approach may suggest the article is more relevant than it really is; our new machine learning approach seeks to do a better job at adjusting for the context of the sentences – and determining their true relevance to the risk at hand.

Market movement

In the market movement measure, we use Market-Driven Scenarios (MDS) associated with each geopolitical risk event as a baseline for how market prices would respond to the realization of the risk event.

Our MDS framework forms the basis for our scenarios and estimates of their potential one-month impact on global assets. The first step is a precise definition of our scenarios – and well-defined catalysts (or escalation triggers) for their occurrence. We then use an econometric framework to translate the various scenario outcomes into plausible shocks to a global set of market indexes and risk factors.

The size of the shocks is calibrated by various techniques, including analysis of historical periods that resemble the risk scenario. Recent historical parallels are assigned greater weight. Some of the scenarios we envision do not have precedents – and many have only imperfect ones. This is why we integrate the views of BlackRock's experts in geopolitical risk, portfolio management, and Risk and Quantitative Analysis into our framework. See the 2018 paper [Market Driven Scenarios: An Approach for Plausible Scenario Construction](#) for details. MDS are for illustrative purposes only and do not reflect all possible outcomes as geopolitical risks are ever-evolving.

We then compile a market movement index for each risk.* This is composed of two parts:

1. Similarity: This measures how "similar" the current market environment is to our expectation of what it would look like in the event the particular MDS was realized. We focus on trailing one-month returns of the relevant MDS assets.
2. Magnitude: this measures the magnitude of the trailing one-month returns of the relevant MDS assets.

These two measures are combined to create an index that works as follows:

- A value of 1 would mean that asset prices reacted in an identical way as our MDS indicated.
- A value of zero would indicate that the pattern of asset prices bears no resemblance at all to what the MDS for a particular risk would indicate.
- A value of -1 would indicate that asset prices are moving in the opposite direction to what the MDS would indicate. Markets are effectively betting against the risk.

*This material represents an assessment of the market environment at a specific time and is not intended to be a forecast of future events or a guarantee of future results. This information should not be relied upon by the reader as research or investment advice regarding any funds, strategy or security in particular. The scenarios are for illustrative purposes only and do not reflect all possible outcomes as geopolitical risks are ever-evolving.

BlackRock Investment Institute

The BlackRock Investment Institute (BII) leverages the firm's expertise and generates proprietary research to provide insights on the global economy, markets, geopolitics and long-term asset allocation – all to help our clients and portfolio managers navigate financial markets. BII offers strategic and tactical market views, publications and digital tools that are underpinned by proprietary research.

General disclosure: This material is intended for information purposes only, and does not constitute investment advice, a recommendation or an offer or solicitation to purchase or sell any securities to any person in any jurisdiction in which an offer, solicitation, purchase or sale would be unlawful under the securities laws of such jurisdiction. The opinions expressed are as of April 2022 and are subject to change without notice. Reliance upon information in this material is at the sole discretion of the reader. Investing involves risks.

In the **U.S. and Canada**, this material is intended for public distribution. **In EMEA** Until 31 December 2020, issued by BlackRock Investment Management (UK) Limited, authorised and regulated by the Financial Conduct Authority. Registered office: 12 Throgmorton Avenue, London, EC2N 2DL. Tel: + 44 (0)20 774 3 3000. Registered in England and Wales No. 2020394, has issued this document for access by Professional Clients only and no other person should rely upon the information contained within it. For your protection telephone calls are usually recorded. Please refer to the Financial Conduct Authority website for a list of authorised activities conducted by BlackRock. From 1 January 2021, in the event the United Kingdom and the European Union do not enter into an arrangement which permits United Kingdom firms to offer and provide financial services into the European Union, the issuer of this material is: (i) BlackRock Investment Management (UK) Limited for all outside of the European Union; and (ii) BlackRock (Netherlands) B.V. for in the European Union, BlackRock (Netherlands) B.V. is authorised and regulated by the Netherlands Authority for the Financial Markets. Registered office Amstelplein 1, 1096 HA, Amsterdam, Tel: 020 – 549 5200, Tel: 31-20-549-5200. Trade Register No. 17068311 For your protection telephone calls are usually recorded. **In Switzerland**, for qualified investors in Switzerland: This document is marketing material. Until 31 December 2021, this document shall be exclusively made available to, and directed at, qualified investors as defined in the Swiss Collective Investment Schemes Act of 23 June 2006 ("CISA"), as amended. From 1 January 2022, this document shall be exclusively made available to, and directed at, qualified investors as defined in Article 10 (3) of the CISA of 23 June 2006, as amended, at the exclusion of qualified investors with an opting-out pursuant to Art. 5 (1) of the Swiss Federal Act on Financial Services ("FinSA"). For information on art. 8 / 9 Financial Services Act (FinSA) and on your client segmentation under art. 4 FinSA, please see the following website: www.blackrock.com/finsa. **For investors in Israel:** BlackRock Investment Management (UK) Limited is not licensed under Israel's Regulation of Investment Advice, Investment Marketing and Portfolio Management Law, 5755-1995 (the "Advice Law"), nor does it carry insurance thereunder. **In South Africa**, please be advised that BlackRock Investment Management (UK) Limited is an authorized financial services provider with the South African Financial Services Board, FSP No. 43288. **In the DIFC** this material can be distributed in and from the Dubai International Financial Centre (DIFC) by BlackRock Advisors (UK) Limited – Dubai Branch which is regulated by the Dubai Financial Services Authority (DFSA). This material is only directed at 'Professional Clients' and no other person should rely upon the information contained within it. BlackRock Advisors (UK) Limited - Dubai Branch is a DIFC Foreign Recognised Company registered with the DIFC Registrar of Companies (DIFC Registered Number 546), with its office at Unit 06/07, Level 1, Al Fattan Currency House, DIFC, PO Box 506661, Dubai, UAE, and is regulated by the DFSA to engage in the regulated activities of 'Advising on Financial Products' and 'Arranging Deals in Investments' in or from the DIFC, both of which are limited to units in a collective investment fund (DFSA Reference Number F000738). **In the Kingdom of Saudi Arabia**, issued in the Kingdom of Saudi Arabia (KSA) by BlackRock Saudi Arabia (BSA), authorised and regulated by the Capital Market Authority (CMA), License No. 18-192-30. Registered under the laws of KSA. Registered office: 29th floor, Olaya Towers – Tower B, 3074 Prince Mohammed bin Abdulaziz St., Olaya District, Riyadh 12213 – 8022, KSA, Tel: +966 11 838 3600. The information contained within is intended strictly for Sophisticated Investors as defined in the CMA Implementing Regulations. Neither the CMA or any other authority or regulator located in KSA has approved this information. The information contained within, does not constitute and should not be construed as an offer of, invitation or proposal to make an offer for, recommendation to apply for or an opinion or guidance on a financial product, service and/or strategy. Any distribution, by whatever means, of the information within and related material to persons other than those referred to above is strictly prohibited. **In the United Arab Emirates** this material is only intended for -natural Qualified Investor as defined by the Securities and Commodities Authority (SCA) Chairman Decision No. 3/R.M. of 2017 concerning Promoting and Introducing Regulations. Neither the DFSA or any other authority or regulator located in the GCC or MENA region has approved this information. **In the State of Kuwait**, those who meet the description of a Professional Client as defined under the Kuwait Capital Markets Law and its Executive Bylaws. **In the Sultanate of Oman**, to sophisticated institutions who have experience in investing in local and international securities, are financially solvent and have knowledge of the risks associated with investing in securities. **In Qatar**, for distribution with pre-selected institutional investors or high net worth investors. **In the Kingdom of Bahrain**, to Central Bank of Bahrain (CBB) Category 1 or Category 2 licensed investment firms, CBB licensed banks or those who would meet the description of an Expert Investor or Accredited Investors as defined in the CBB Rulebook. The information contained in this document, does not constitute and should not be construed as an offer of, invitation, inducement or proposal to make an offer for, recommendation to apply for or an opinion or guidance on a financial product, service and/or strategy. **In Singapore**, this is issued by BlackRock (Singapore) Limited (Co. registration no. 200010143N). This advertisement or publication has not been reviewed by the Monetary Authority of Singapore. **In Hong Kong**, this material is issued by BlackRock Asset Management North Asia Limited and has not been reviewed by the Securities and Futures Commission of Hong Kong. **In South Korea**, this material is for distribution to the Qualified Professional Investors (as defined in the Financial Investment Services and Capital Market Act and its sub-regulations). **In Taiwan**, independently operated by BlackRock Investment Management (Taiwan) Limited. Address: 28F., No. 100, Songren Rd., Xinyi Dist., Taipei City 110, Taiwan. Tel: (02)23261600. **In Japan**, this is issued by BlackRock Japan Co., Ltd. (Financial Instruments Business Operator: The Kanto Regional Financial Bureau. License No 375, Association Memberships: Japan Investment Advisers Association, the Investment Trusts Association, Japan, Japan Securities Dealers Association, Type II Financial Instruments Firms Association.) For Professional Investors only (Professional Investor is defined in Financial Instruments and Exchange Act). **In Australia**, issued by BlackRock Investment Management (Australia) Limited ABN 13 006 165 975 AFSL 230 523 (BIMAL). The material provides general information only and does not take into account your individual objectives, financial situation, needs or circumstances. **In China**, this material may not be distributed to individuals resident in the People's Republic of China ("PRC", for such purposes, excluding Hong Kong, Macau and Taiwan) or entities registered in the PRC unless such parties have received all the required PRC government approvals to participate in any investment or receive any investment advisory or investment management services. **For Other APAC Countries**, this material is issued for Institutional Investors only (or professional/sophisticated /qualified investors, as such term may apply in local jurisdictions) **In Latin America**, for institutional investors and financial intermediaries only (not for public distribution). This material is for educational purposes only it is your responsibility to inform yourself of, and to observe, all applicable laws and regulations of your relevant jurisdiction. **In Mexico**, these materials are being shared in the understanding that the addressee is an Institutional or Qualified investor as defined under Mexican Securities (*Ley del Mercado de Valores*).

©2021 BlackRock, Inc. All Rights Reserved. BLACKROCK is a trademark of BlackRock, Inc., or its subsidiaries in the United States and elsewhere. All other trademarks are those of their respective owners.

Not FDIC Insured • May Lose Value • No Bank Guarantee

BlackRock