Capital Markets Strategy
Essential inCights for the C-Suite

MUFG

Russia-Ukraine

A Brief Assessment & Update on the Crisis

MAR 2022

"Ukraine is not just a neighbor. It is an inherent part of our history, culture and spiritual space."

President Vladimir Putin
(on February 21, 2022)

Global Corporate & Investment Banking
Capital Markets StrategyTeam

Tom Joyce

Managing Director
Capital Markets Strategist
New York, NY

Tom.Joyce@mufgsecurities.com
(212) 405-7472

Hailey Orr

Director
Capital Markets Strategist
New York, NY

Hailey.Orr@mufgsecurities.com
(212) 405-7429

Stephanie Kendal

Associate
Capital Markets Strategist
New York, NY

Stephanie.Kendal@mufgsecurities.com
(212) 405-7443

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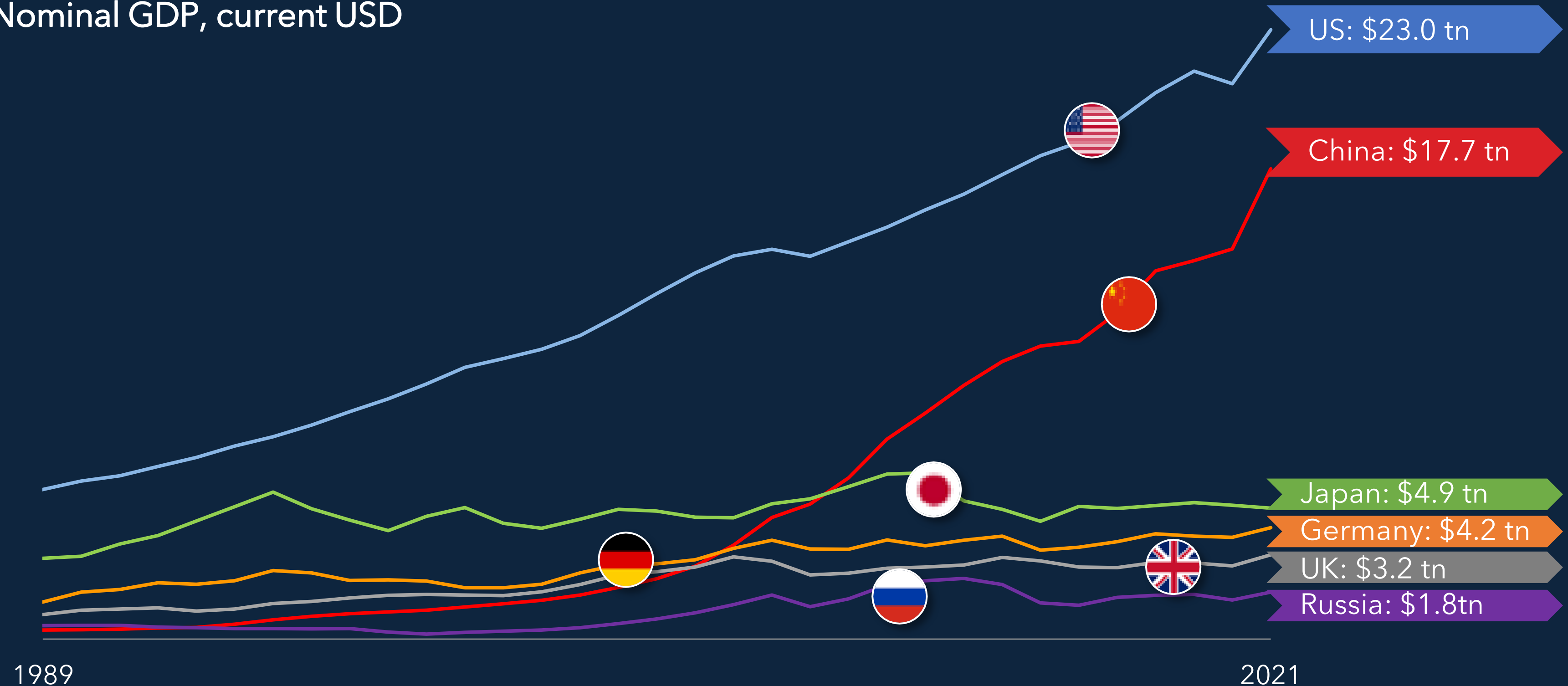
1 Situation Analysis

The Post Cold War Era is Over

BERLIN WALL FALLS
November 9, 1989

RUSSIA INVADES UKRAINE
February 24, 2022

Nominal GDP, current USD

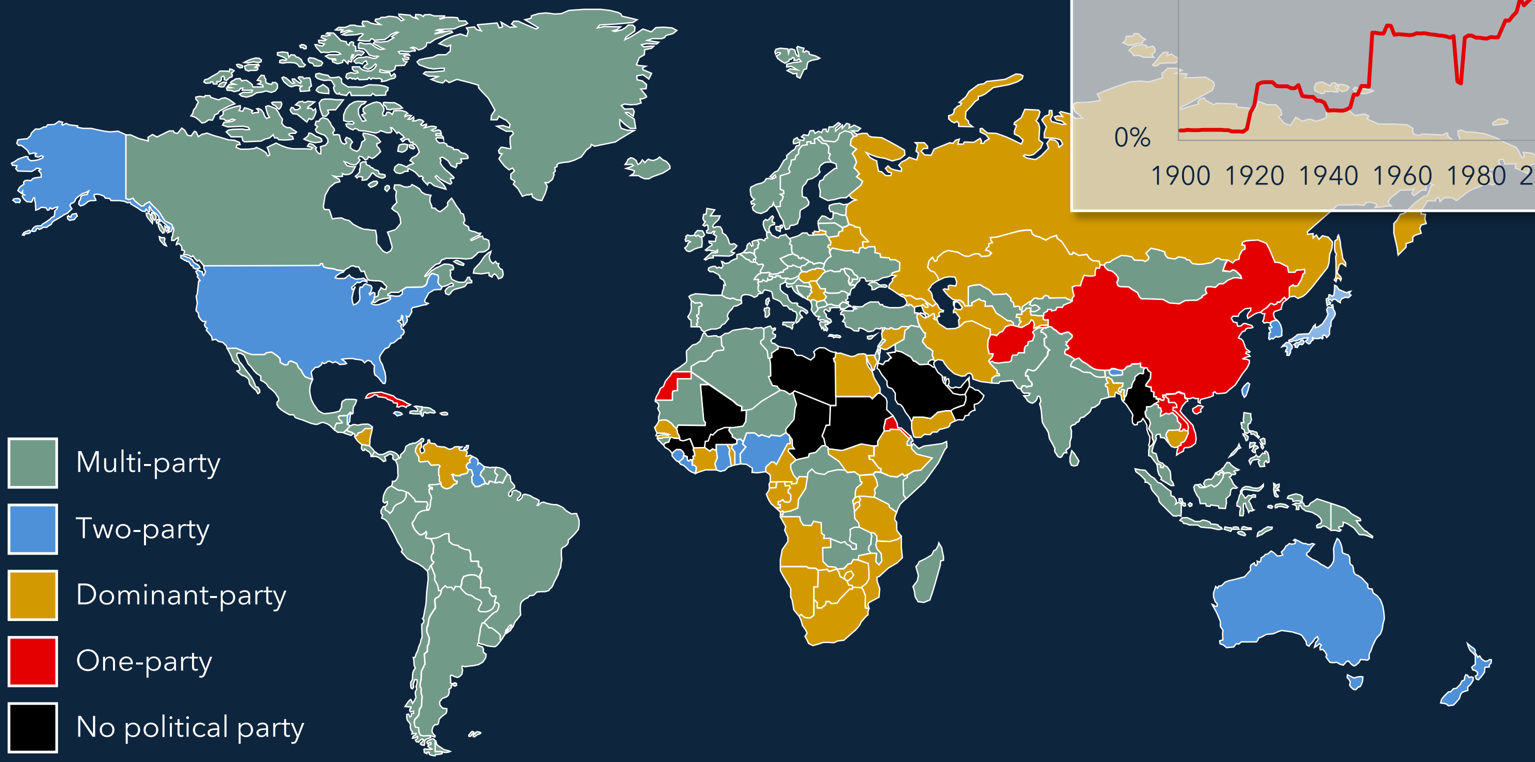


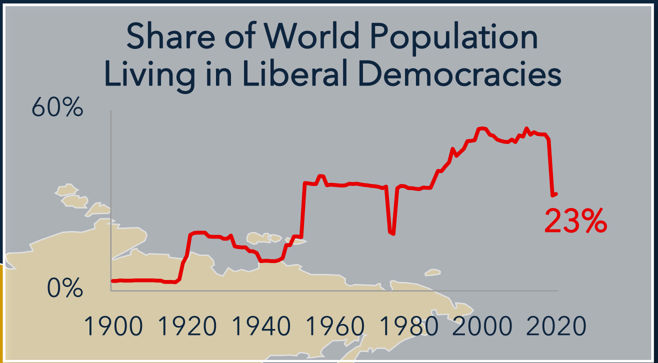
Source: (1) World Bank. Data as of February 28, 2022. 2021 is Oxford Economics data.

Rising Conflict Between Autocracies & Democracies

A recent 2021 report by Washington-DC based "Freedom House" (founded in 1941), downgraded the freedom and democracy scores of 73 countries, representing 75% of the global population. The downgrade represents a 15 year decline that began in 2006. At a systemic level, conflict has been steadily rising between "one" and "dominant" party systems like China and Russia and "multi-" and "two" party democracies in East Asia, Australia and the West.

The world's political systems





Source: (1) Nicholas Thompson, CEO of The Atlantic. (2) Our World in Data, % includes Electoral and Liberal democracies. MUFG Capital Markets Strategy.

President Putin's Objectives in Ukraine

The starting point of analysis for understanding how we arrived at the current situation, and where we may be going, is an understanding that President Putin's objectives are centered very squarely on "Ukraine," and less on "security guarantees" or a deal with the West to pushback NATO expansion.

1. Restore Russia's historical ties to Ukraine ("undoing the country's artificial separation from Russia").

2. Rebuild former boundaries of the collapsed Soviet Union (in his words, "the greatest geopolitical catastrophe of the 20th Century").

3. Strengthen regional security around Russia's "warm water port access" via prior annexation of Crimea in 2014.

4. Revive Russia's global geopolitical prestige, in concert with China to the extent possible, by challenging the Western dominated post WW2 institutional framework.

5. Draw a line on NATO expansion, and secure "guarantees" across the former Soviet bloc and Eastern European region:
   - Ban on Ukraine membership to NATO in perpetuity
   - Withdrawal of NATO military forces to 1997 positions

Source: Francis Kelly (Fulcrum Macro Advisors); Kevin Nealer (The Scowcroft Group). Ian Bremmer (Eurasia Group). Taras Kuzio (Henry Jackson Society of London). The Atlantic Council. Bloomberg. WSJ. Financial Times. Washington Post.

NATO's Eastward Expansion

Since the early1990's, NATO has expanded its membership from 16 to 30 nations, and has acknowledged 3 new aspirational members: Ukraine, Georgia and Bosnia & Herzegovina. With Presidential elections in both the US and Russia in 2024, and Putin's own political clock advancing, drawing a line on Western expansion of NATO became a more important political priority for Putin.

Source: NATO
Note: Map excludes NATO members, the US & Canada

Russia-Ukraine: Why Now?

The peak-winter season, perceived Western leadership weakness and tacit Chinese support have all contributed to the current timing of President Putin's long-held wish to restore Russia's 20th century borders and pushback on potential NATO expansion. However, while seeking to take advantage of a seemingly weakened West and fragmented NATO alliance, Putin's actions have become a catalyst for much stronger NATO unity and policy coordination than anticipated.

Peak winter timing maximizes leverage on West

- European gas dependencies ~40%
- German dependency ~50%
- "Muddy terrain" for military exercises in early Spring ("lesson of history")

Perceived weakness of NATO & Western leadership

- US NATO & European trade policy under Trump
- Recent US withdrawal from Afghanistan
- Low Biden (US) & Johnson (UK) approval ratings
- Upcoming Macron election in France
- Ukraine politically & economically weak

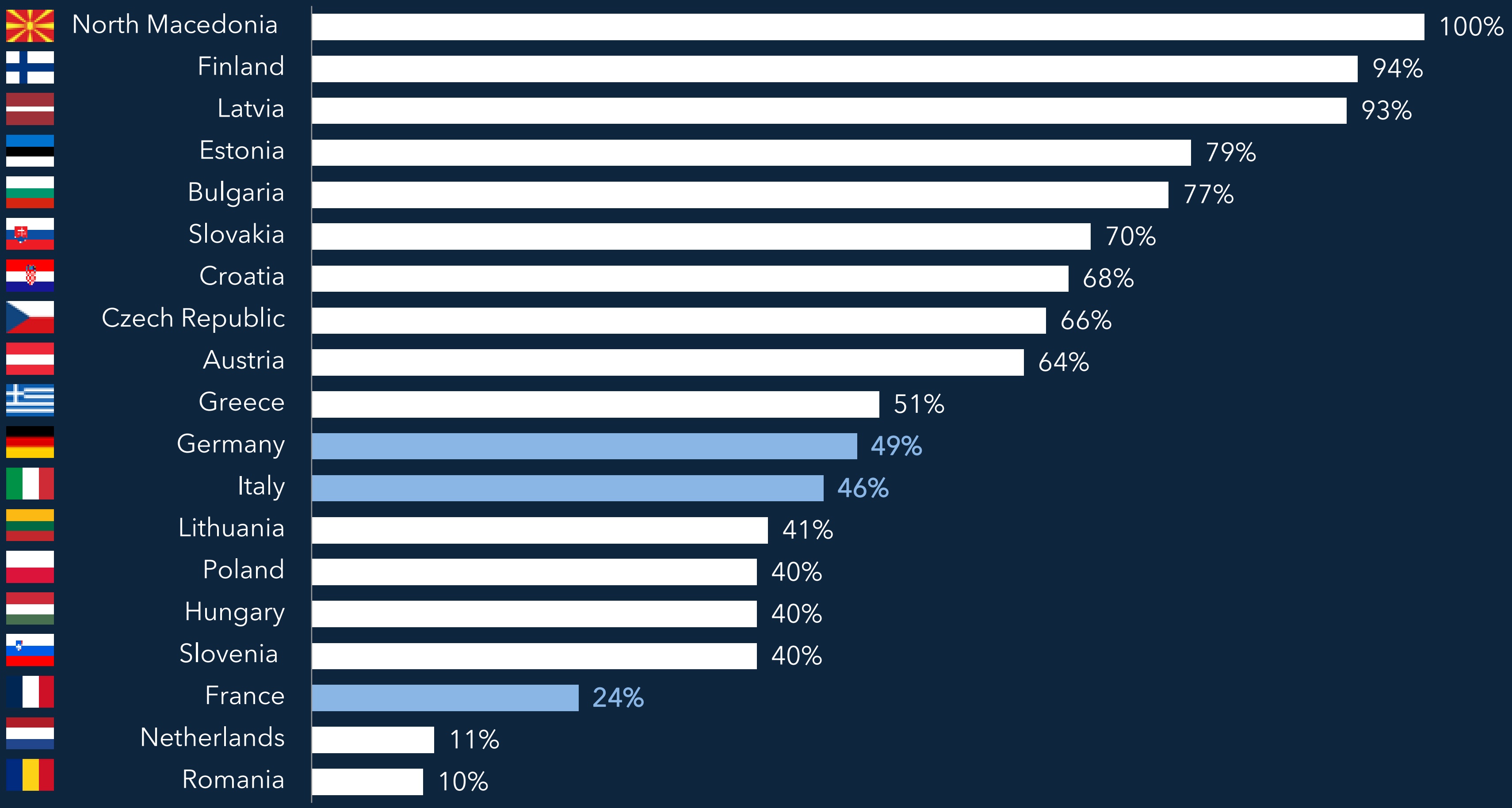
Deepening Sino-Russian strategic ties

- Putin and Xi have held over 30 in-person meetings
- Challenge and disruption to Western-dominated global architecture
- Mirror Xi Jinping's assertiveness in restoring old boundaries (HK, Taiwan & S.China Sea)

Europe’s Russian Gas Dependency

Russia is the world’s 11th largest economy, Europe’s 5th largest trading partner, provides 50% of Europe’s gas, 27% of its oil, with 30% of that transported through Ukraine

Share of gas supply from Russia

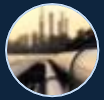


Source: (1) Statista “Which European Countries Depend on Russia Gas?” European Union Agency for the Cooperation of Energy Regulators. 2020 or latest available data.

The Implications of President Putin’s Actions Thus Far

By invading Ukraine, President Putin perhaps sought to take advantage of a weakened West, fragmented NATO and a relatively inexperienced Ukrainian President, Zelenskyy. However, it appears the opposite has happened. The forward trajectory of the crisis remains highly uncertain, but the response of the West to date has been stronger and more unified than expected.

Impact of President Putin’s Escalation Thus Far

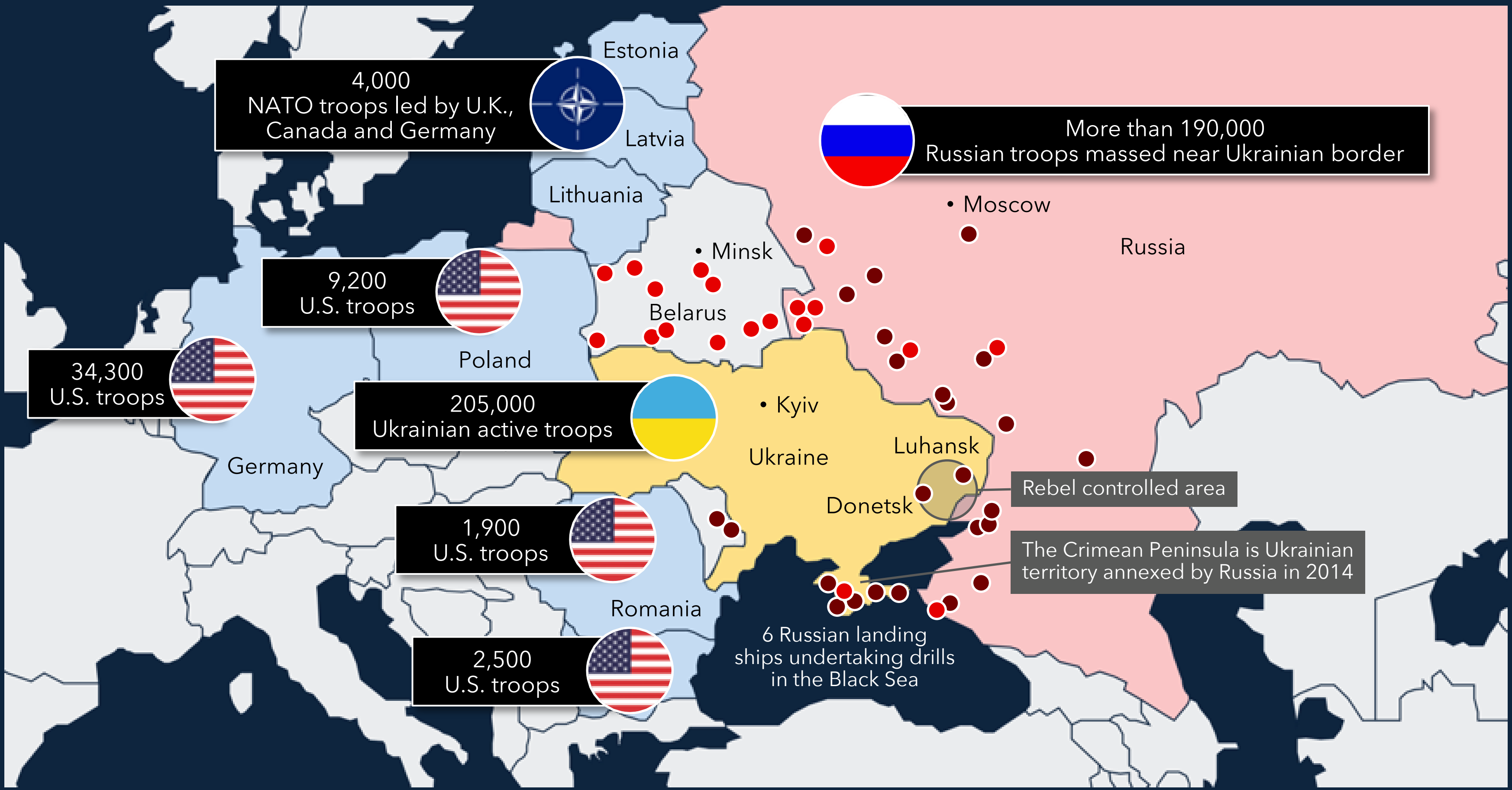
- *Strengthened* global anti-Russian sentiment; triggered long-term damage to Russian economy; deeply subordinated Russia in China relationship
- *Strengthened* NATO
-  *Strengthened* European unity vis-à-vis Russian foreign policy aggression
-  *Strengthened* calls within Europe to diversify energy sources away from Russia
-  *Strengthened* President Zelenskyy’s credibility within Ukraine
- *Strengthened* Ukrainian resolve vis-à-vis independence from Russia
-  *Strengthened* US President Biden’s leadership standing on global stage

2 Military Backdrop

Military Forces Near Ukraine

Russian & NATO military presence just before the invasion

Russian military positions · Temporary Russian military sites · Location of US & NATO troops



Source: Bloomberg; Janes; Russian Defense Ministry; Belarus Defense Ministry; Rochan Consulting; NATO; U.S. Department of Defense; U.K. Ministry of Defense; Ukraine National Institute for Strategic Studies
Note: Locations of closest urban areas to deployments shown on map. Locations in Belarus include drills scheduled Feb 10-20.

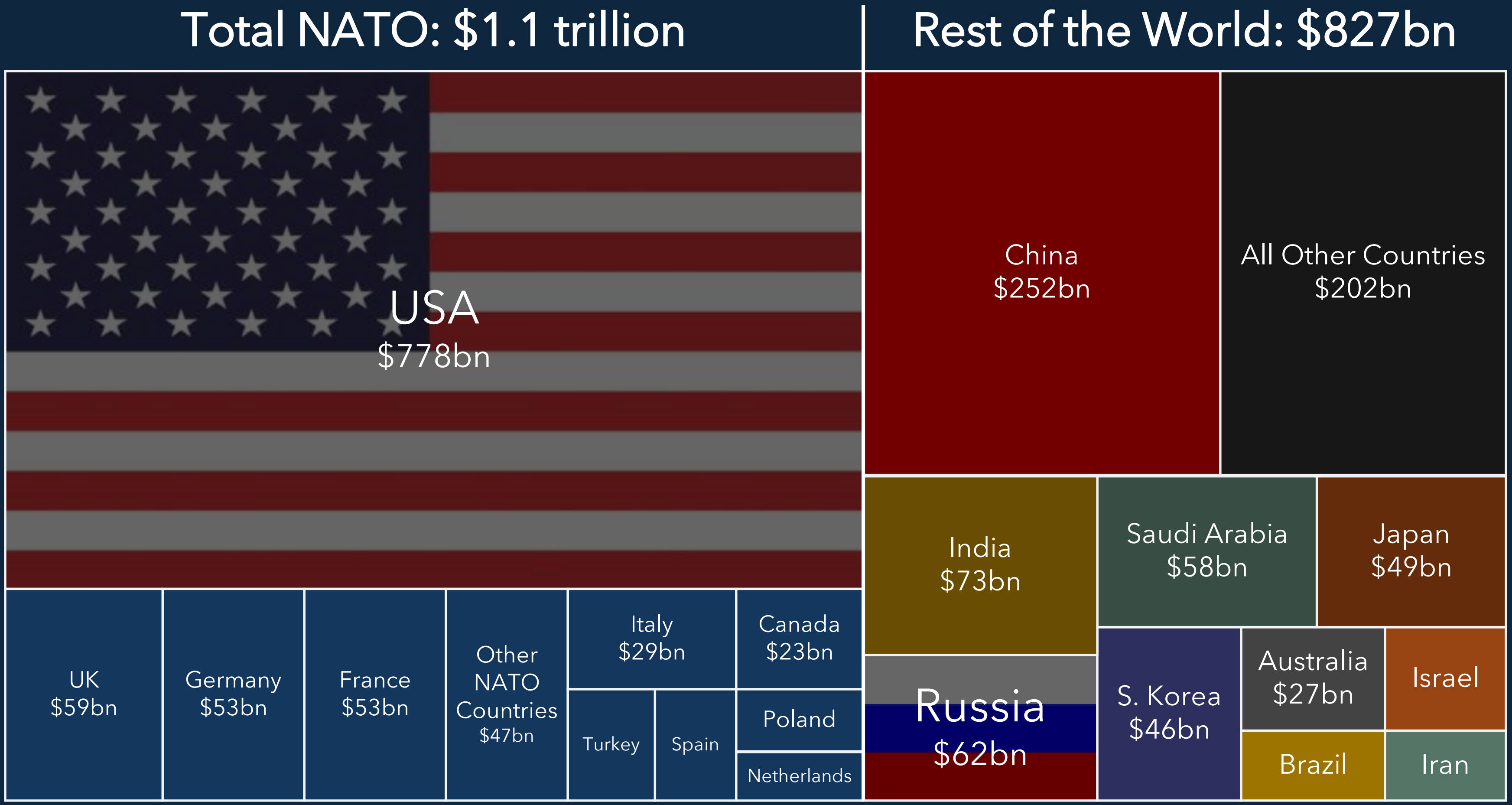
Assessment of Russia's Military Campaign

Assessment as of Feb 28, 2022

Source: BBC Research. Ministry of Defense. Institute for the Study of War. As of February 28, 2022.

Global Defense Spending

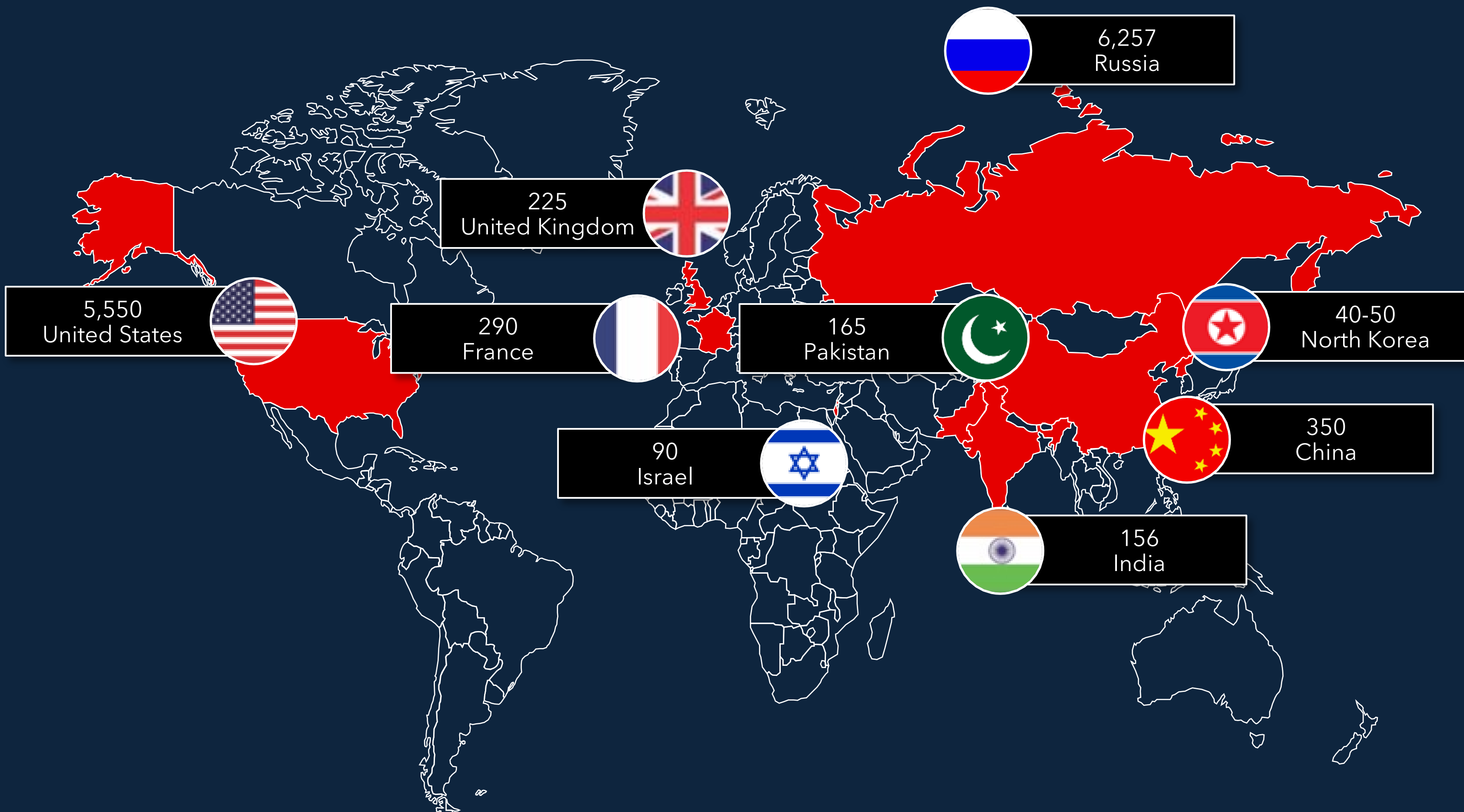
While a US military response to the Ukraine crisis is not "on the table" for both strategic and security reasons, it is worth noting that annual US military spending is more than 12x that of Russia – an observation perhaps secondary to the more important point that both countries are leading nuclear powers



Source: (1) Stockholm International. Peace Research Institute. N.B Data is from 2020, with data available for 151 countries.

The World's Nuclear Arsenal

Global nuclear warhead inventory, by country



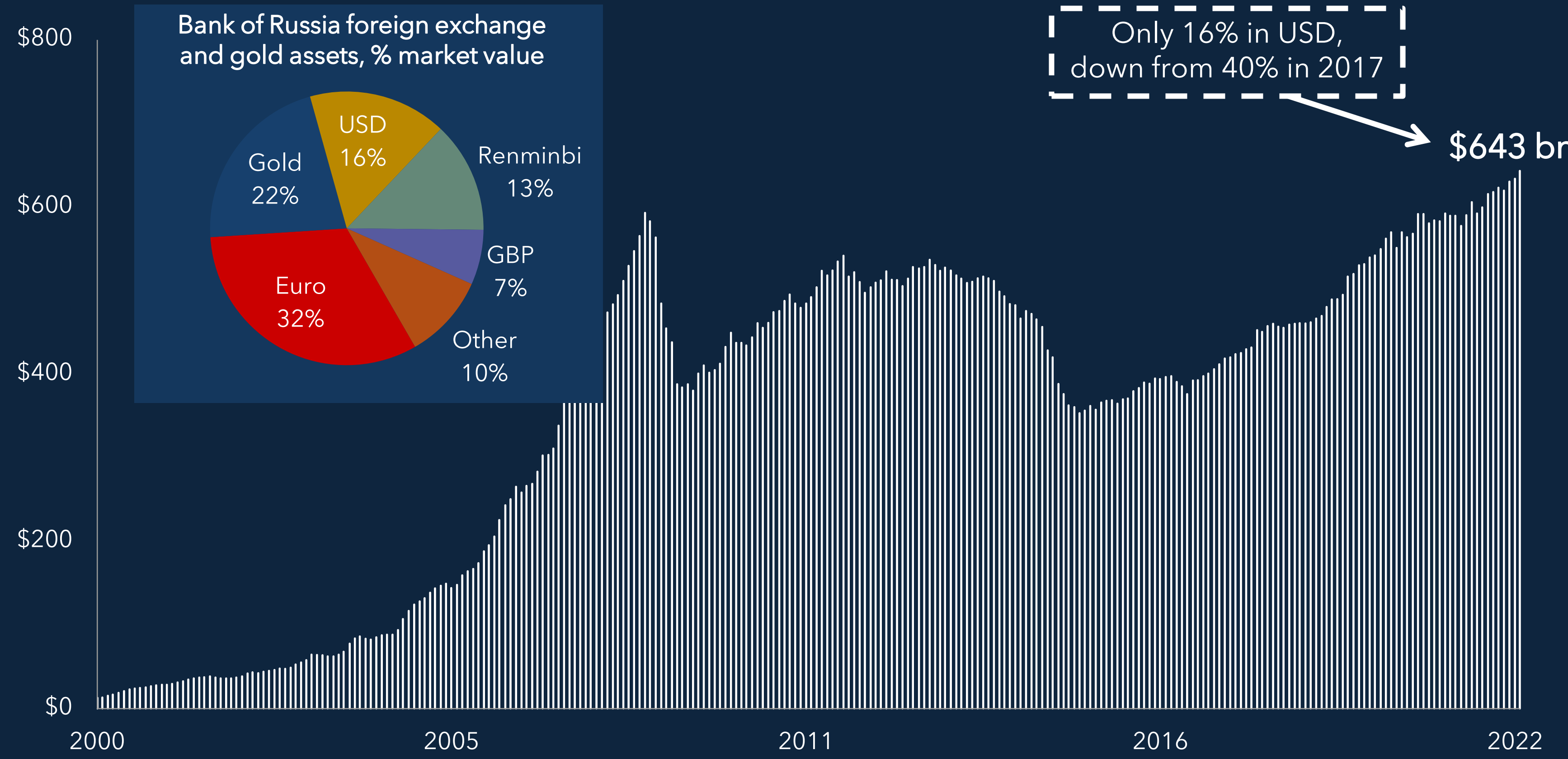
Source: Arms Control Association. Estimated 2021 warhead inventories.

3 Global Sanctions Response

Russia More Prepared This Time

At over $600 bn, Russia's FX Reserves are among the largest in the world, after China, Japan and Switzerland. Combined with sharply lower USD-denominated debt and rising oil prices, Russia's economy today is better positioned to absorb Western financial sanctions than previously.

Russia FX reserves, USD bn



Source: (1) Bloomberg. Data as of February 28, 2022. (2) Central Bank of Russia "FT, A Global Financial Pariah - How Could Central Bank Sanctions Hobble Russia" (February 27, 2021).

Russia's Dollar Decoupling Limits Sanction Impact

USD Exposure	Russia's Mitigating Steps
FX reserves	• Reduced USD exposure of total FX reserves from 40% (in 2017) to 16% today
UST holdings	• Reduced by 98% from peak in 2010
External debt	• Total external debt has been steadily reduced since 2014 sanctions were imposed • In addition, Russia reduced its dollar denominated debt by over 50% in the same time period
Sovereign wealth fund	• Russia's sovereign-wealth fund's assets reached over $170 billion, but has held no US dollar assets since June 2021
Trade settlement	• As of 2020, Euro overtook USD as primary currency for Russian exports to China • USD declined to 56% of Russian trade receipts in 2021, down from 69% in 2016

"Russia has taken considerable steps to diversify away from the dollar. That has led to a degree of resilience, though full-blown economic sanctions is triggering meaningful market volatility and a recession should not be overlooked."

Ehsan Khoman, MUFG's Head of Emerging Markets Research

Source: Bloomberg "Russia's Yearslong Quest to Quit Dollar is Blunting Sanctions".

Russia's Sharply Reduced UST Holdings

As of 2021, just 16% of Russia's central bank reserves are in US dollars, down from 40% four years earlier. In order to reduce US dollar exposure, Russia has reduced its holdings of US Treasuries by 98% from peak in 2010.

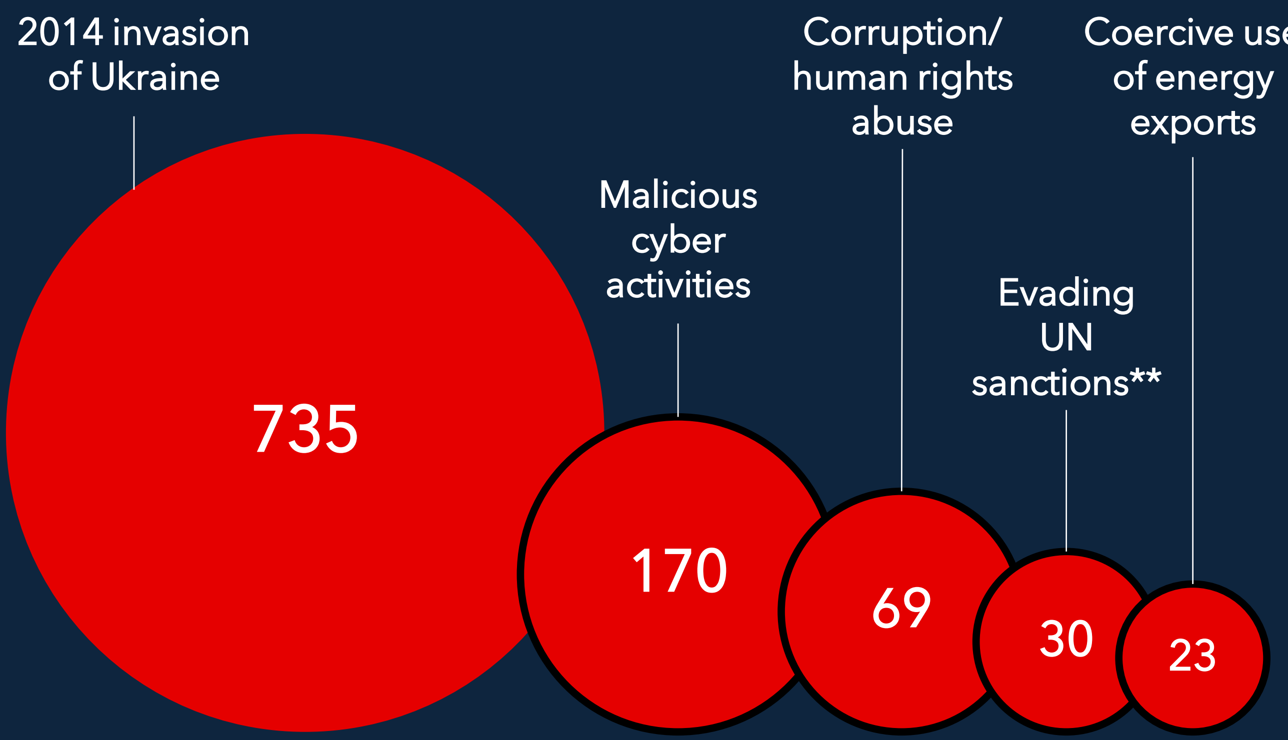
Russia's ownership of USTs (USD bn)

Source: (1) Bloomberg, "Russia's Yearslong Quest to Quit Dollar is Blunting Sanctions". Data as of February 28, 2022.

Recent Historical Drivers of US-Russia Sanctions

With approximately 735 Russian entities targeted, the 2014 invasion and occupation of Crimea, and related activities in Donetsk and Luhansk, have been the primary source of US sanctions policy toward Russia prior to the more recent 2022 escalation in Ukraine.

Approximate number of Russian entities subject to U.S. sanctions for the following reasons (as of Sept. 1, 2021)*



**Can be individuals, organizations or transporting vessels.*
***Against North Korea, Syria, Venezuela*
Source: Congressional Research Service and Statista.

US Sanctions

Sanctions as of Monday, February 28

1. Central Bank: Imposed restrictive measures to prevent the Russian Central Bank for accessing reserves in foreign currencies (done in conjunction with EU, UK and Canada)

2. Financial Sector: Announced removal of selected Russian banks from SWIFT system

3. Visas: Restricted sale of "golden passports" to exclude wealthy Russians

4. Financial Sector: Sanctions on seven significant Russian financial institutions (including two largest, VTB and Sberbank)
   - Range from correspondent banking sanctions to full blocking sanctions
   - Full blocking sanctions freezes assets in US, prohibits transactions with US individuals and businesses, restricts access to the global financial system and US Dollar

5. Funding: Restrictions on US individuals and firms from purchasing debt issued by Russia's MoF, central bank (CBR), National Wealth Fund, Russian SOEs, banks, and private corporations

US Sanctions

Sanctions as of Monday, February 28

6 President Putin: Direct sanctions on President Putin

7 Russian Elites: Full blocking sanctions for selected Russian elites and family members

8 Export Restrictions: Export controls on critical technologies (semiconductors, lasers, sensors, etc.), as well as the addition of 49 Russian military companies to the "Entity List"

9 Regional Sanctions: Broad jurisdiction-based sanctions in the Donetsk and Luhansk regions

- Prohibitions on new investments, imports, exports and financing transactions (similar to sanctions put on the Crimea region after annexation in 2014)

10 Nat Gas: Sanctions on Nord Stream 2 and the company's leadership

Sanctioning the Central Bank of Russia (CBR)

Combined with the decision to deny selected Russian banks access to SWIFT, the move on Feb 26 to sanction the Central Bank of Russia (CBR) has effectively disconnected Russia from the global financial system (ex-energy), precipitated a sharp devaluation of the Ruble and put potentially unsustainable pressure on the Russian banking system.

Notable observations:

- A G20 central bank has never been sanctioned before (only Iran, Venezuela & Afghanistan)
- CBR sanctions from the US, UK, EU and Canada (40% of CBR's FX reserves)
- Prevents CBR from liquidating foreign assets to support the ruble
- Prevents CBR from helping Russian corporates service their FX-denominated liabilities
- Disconnects Russia from global financial system (ex-energy)

Key Question:

Will the US Treasury add the CBR to the Specially Designated Nationals (SDN) list and/or impose "secondary sanctions" on foreign entities that deal with the CBR?

Alternatives for the Central Bank of Russia

Alternatives available to the CBR to defend the currency and stabilize Russia's economy are extremely limited. According to the BIS, Western exposures to Russia have been reduced significantly since the invasion of Crimea in 2014, estimated at $30 bn exposure to Russian banks, and approximately $90 bn to all Russian entities.

Policy alternatives for the CBR without access to its overseas reserves:

- Raise interest rates (Raised from 9.5% to 20% on Feb 28)
- Capital controls (initiated on Feb 28)
- Sell gold (5th largest stockpile in the world) - likely difficult
- Assistance from China (14% of Reserves held in RMB)

Why assistance from China may be limited?

- Fear of secondary sanctions on Chinese banks, denying access to USD and EUR
- Desire to preserve economic relationship with the West (trade, tech, FDI)
- Significant Chinese BRI investments across Eurasia region
- Xi concern of being viewed as a "responsible global leader"
- China's preference for global order, over disorder

The Nuclear Option: Denying Access to SWIFT

The US and Europe had been hesitant to deny Russia access to the global SWIFT payments system given the extensive negative feedback loops to the global economy. However, on February 26th, the US, European Commission, France, Germany, Italy, UK and Canada, announced in a joint statement that they would exclude some Russian banks from the SWIFT system.

Society for Worldwide Interbank Financial Telecommunication (SWIFT)

Background on SWIFT:

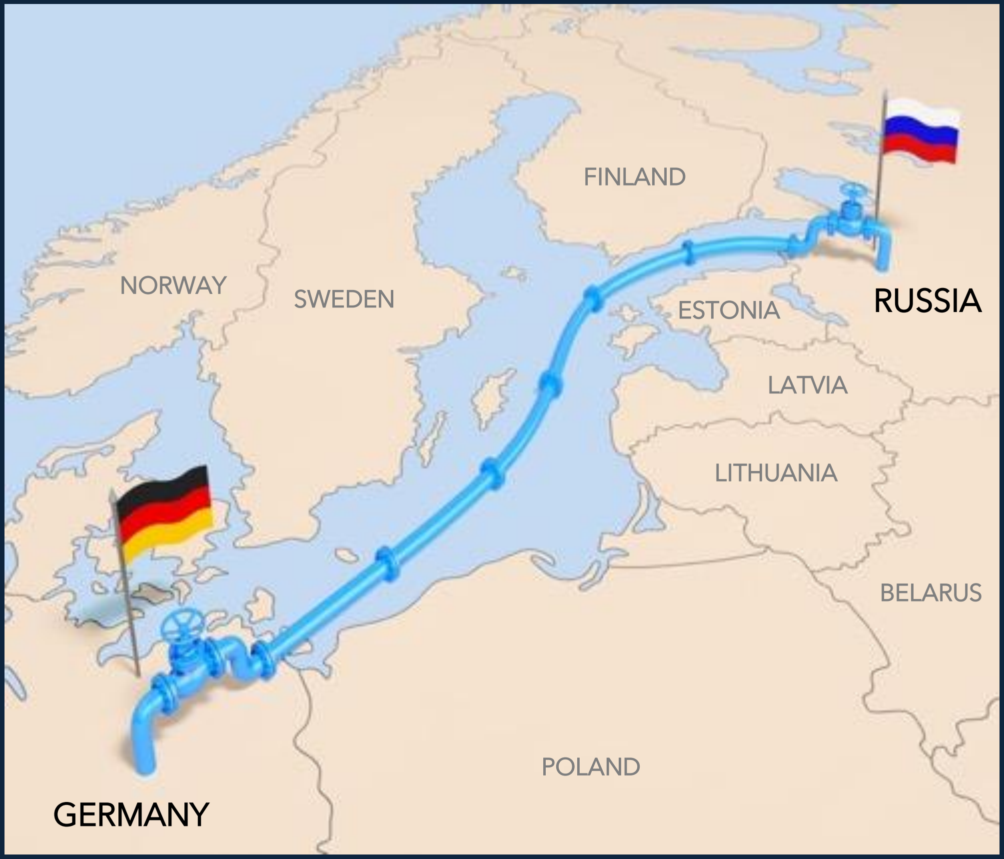
- Founded in 1973
- Belgian-based cooperative society under Belgian law
- International payments system used by 11,000 financial institutions in 200 countries (exchanging an average of about 32 million messages per day)
- Accounts for approximately 50% of all high-value global cross border payments
- Communicates payments and securities transfers
- Majority of transactions settled in USD

Reasons SWIFT Had Been "Off the Table":

- Resistance from selected member states (i.e., Germany, Austria, Hungary)
- Negative feedback loops to global economy likely significant given Russia's size and global inter connectivity (EU's 5th largest trading partner, 40% of natural gas supplies)
- Targeted sanctions on Russian banks nearly as consequential without undermining global financial architecture
- Russian banks have access to less efficient but usable systems (i.e., SPFS, CIPS)
- Would adversely impact non-sanctioned sectors (agriculture, NGOs, humanitarian aid)
- Politicizing SWIFT risks negative longer term impact to USD as a reserve currency
  - May encourage China/Russia/EM to utilize block-chain alternatives
  - Creates incentives to reduce dependency on USD based monetary system
- May trigger significant Russian retaliatory response (i.e., cyber, energy access)

Halting Certification & Sanctioning Nord Stream 2

Following a visit to Washington the prior week, German Chancellor Olaf Scholz unexpectedly announced on Feb 22 that Germany was halting certification indefinitely of the Nord Stream 2 gas pipeline following Russia's actions in eastern Ukraine. On Feb 23, President Biden announced plans to sanction Nord Stream 2 and its corporate officers. The US Congress passed legislation in 2020 requiring sanctions on the pipeline, but President Biden temporarily waived the toughest sanctions on national security grounds. That waiver has now been lifted.



Key Facts on Nord Stream 2:

- 750 mile offshore gas pipeline
- 55 billion cubic meters of gas per year (> 50% of Germany's annual consumption)
- Announced in 2015
- $11 bn cost of construction
- Completed in Sept 2021
- Wholly owned subsidiary of Russian state-owned company Gazprom
- Not yet certified by German regulators
- Opposed by US, UK & several EU countries

EU Announced Sanctions

Sanctions as of Monday, February 28

1 Central Bank: Imposed restrictive measures to prevent the Russian Central Bank for accessing reserves in foreign currencies (done in conjunction with US, UK and Canada)

2 Financial Sector: Announced removal of selected Russian banks from SWIFT system

3 Nat Gas: Halted certification of the Nord Stream 2 Pipeline

4 Individuals: Financial sanctions on 27 high profile Russians and entities involved in the violations of international law by the Kremlin

- Freezes assets, ban on providing funds, ban on travel to and within the EU

5 Banks: Sanctions on banks that finance the Russian military and contribute to the destabilization of Ukraine

6 Regional Sanctions: Ban on trade between the EU and the Donetsk and Luhansk regions (similar to sanctions implemented after the annexation of Crimea in 2014)

7 Financial Markets: Measures to limit access on EU's financial markets for the Russian state and government

8 Banks: Limits on bank deposits and restrictions on Russians investing in EU securities

9 Exports: Export controls on dual-use and high-tech goods (electronics, computers, telecom, IT, sensors, lasers, marine appliances)

10 Exports: Ban on export of aircrafts and related parts / equipment as well as tech needed to update Russian oil refineries

UK Announced Sanctions

Sanctions as of Monday, February 28

1. Central Bank: Imposed restrictive measures to prevent the Russian Central Bank for accessing reserves in foreign currencies (done in conjunction with US, EU and Canada)
2. Financial Sector: Announced removal of selected Russian banks from SWIFT system
3. Russian Banks: Sanctions on all major Russian banks: freezes assets in UK, prohibits transactions with UK individuals and businesses, ban on travel to the UK, blocking banks from sterling markets
4. Financial Markets: Legislation to block all major Russian companies from raising finance on UK markets
5. Sovereign Debt: Legislation to prohibit Russian sovereign debt in the UK market
6. Russian Elites: Sanctions on selected Russian elites
7. Russian Airlines: Ban on Aeroflot planes landing in the UK

UK Announced Sanctions

Sanctions as of Monday, February 28

8 Exports: Ban on exports of any good that could have military use (electrical components, truck parts)

9 Exports: Pending legislation to prohibit certain technology exports

10 Individuals: Limits on deposits by Russian nationals in UK bank accounts

11 Financial Sector: Accelerated passage of economic crime bill to target illicit Russian money in the UK

12 Individuals: Sanctions on members of the Russian Duma and Federation Council (who voted to recognize the independence of Donetsk and Luhansk)

13 Regional Sanctions: Extend existing territorial sanctions imposed on Crimea
- Banning UK individuals and business from dealing with the territory

14 Belarus: All sanctions extended to Belarus

Canada Sanctions

Sanctions as of Monday, February 28

Canada

1. **Central Bank:** Imposed restrictive measures to prevent the Russian Central Bank for accessing reserves in foreign currencies (done in conjunction with US, EU and UK)
2. **Financial Sector:** Announced removal of selected Russian banks from SWIFT system
3. **Sovereign Debt:** Prohibition on Canadians buying Russian sovereign debt
4. **Regional Sanctions:** Prohibition on conducting business in Donetsk and Luhansk
5. **Individuals:** Sanctioning members of Russian parliament who voted to recognize Donetsk and Luhansk as independent
6. **Banks:** Additional sanctions to be applied to two state-backed Russian banks
7. **Armed Forces** Deploying additional Canadian Armed Forces to Operation Reassurance

Source: Prime Minister of Australia. Reuters. CNN. Japan News.

Japan Sanctions

Sanctions as of Monday, February 28

Japan

1. Visas: Suspending the issuance of visas and restricting travel for certain Russian individuals
2. Regional Sanctions: Freezing assets of parties in Donetsk and Luhansk regions
3. Individuals: Freezing assets of certain Russian individuals
4. Trade: Ban on imports and exports to / from Donetsk and Luhansk
5. Sovereign Debt: Ban on issuance and circulation of new sovereign bonds by the Russian government in Japan

Source: Prime Minister of Australia. Reuters. CNN. Japan News.

Australia Sanctions

Sanctions as of Monday, February 28

Australia

1 **Individuals:** Travel bans and targeted financial sanctions on eight members of Russia's Security Council

2 **Banks:** Financial sanctions prohibiting Australian individuals and entities from doing business with five Russian banks (Rossiya Bank, Promsvyazbank, IS Bank, Genbank, and the Black Sea Bank for Development and Reconstruction). Restrictions also placed on Australians investing in the state development bank VEB.

3 **Regional Sanctions:** Extending existing sanctions on Crimea and Sevastopol to include Donetsk and Luhansk

- Prohibits trade in the transport, energy, telecommunications, and oil, gas and minerals sectors

4 **Individuals:** Will broaden scope of individuals and entities that Australia can list for sanctions

5 **Visas:** Extending visas for Ukrainian nationals in Australia & fast tracking pending visa applications from Ukrainian nationals

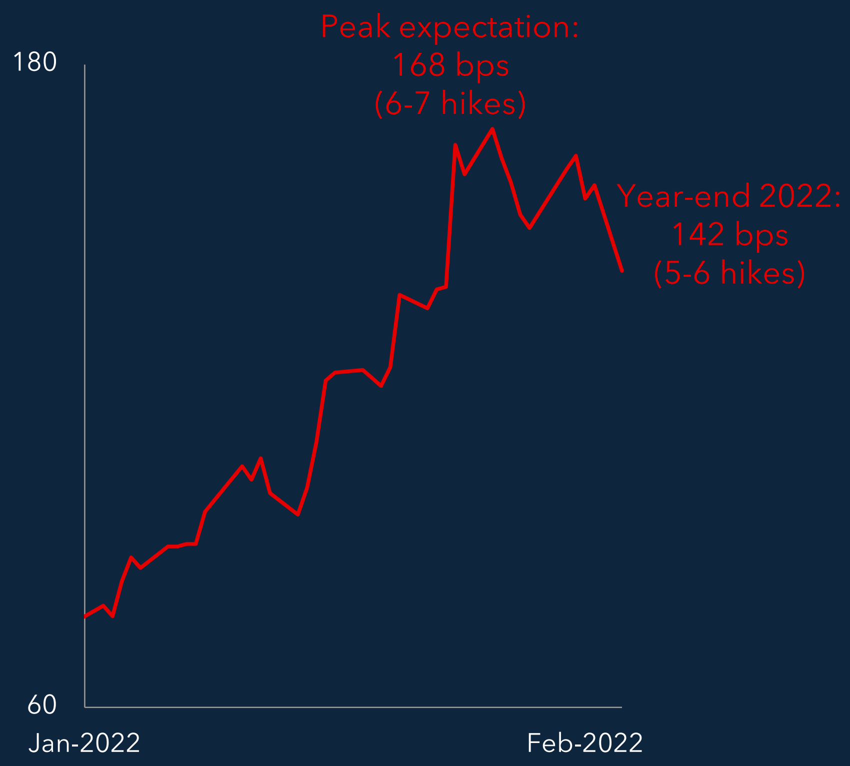
Source: Prime Minister of Australia. Reuters. CNN. Japan News.

4 Policy Implications

Fed Tightening May Marginally Slow

The most immediate impact of the Ukraine crisis on Fed policy has been the market's repricing of March rate hike expectations from 50 bps to 25 bps. While the market is still pricing significant tightening by year end, it is worth noting that the Fed has never in its history been in this position: policy rates at 0%, inflation above 7%, and the uncertainty of a potentially systemic geopolitical risk event.

Market implied rate hikes, bps



Market implied probability of 50 bps hike in March 2022

Source: (1-2) Bloomberg. Data as of February 28, 2022.

Engineering a "Soft Landing" Will be Difficult

While the 2s-10s curve has been flattening rapidly, a 2018 Fed study found that the 3m - 10 yr UST curve has been the most accurate market metric in predicting nearly every US recession since 1970, with a median lead time from inversion to recession of approximately 9 months. While US recession is not the baseline scenario for 2022 or 2023, the market has clearly become concerned about decelerating growth on the back of rising inflation, elevated geopolitical risk and the potential for Fed policy error.

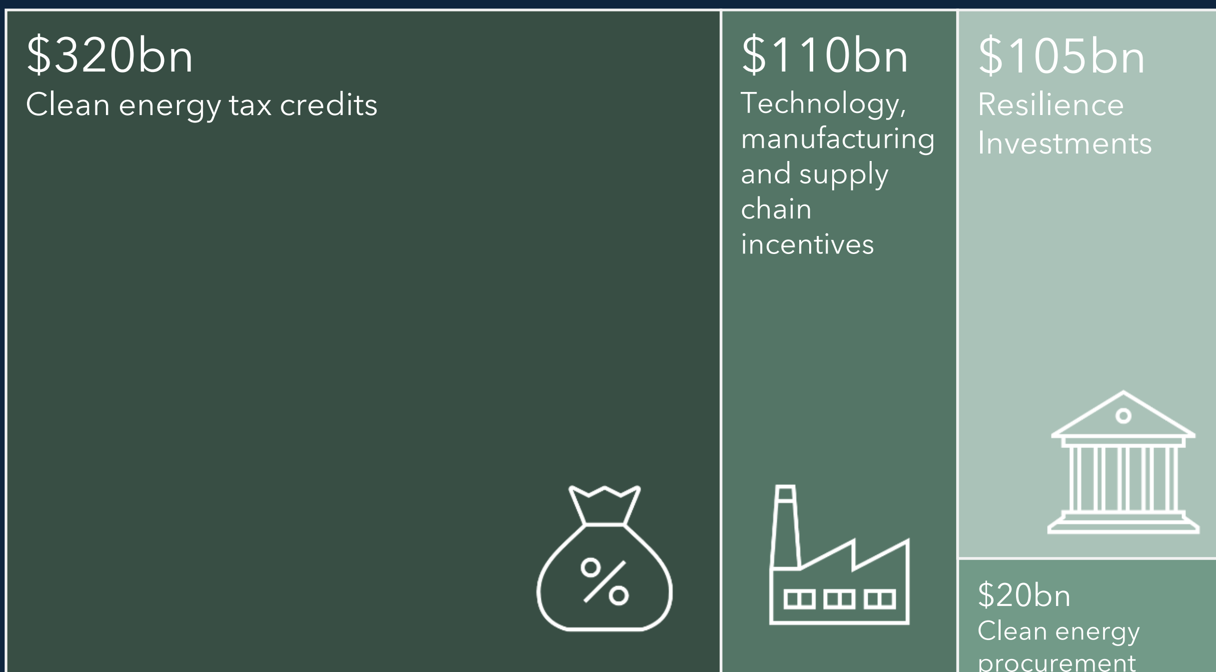
US 3m-10yr Curve

Source: (1) Bloomberg. Data as of February 28, 2022.

“Green” Fiscal Stimulus Marginally More Likely

One of President Biden’s policy priorities has been passing additional climate focused fiscal stimulus, a priority that was put in jeopardy when Senator Manchin announced his opposition to the Build Back Better bill at the end of 2021. However, the escalating Russia-Ukraine crisis has likely given President Biden marginally more leverage to negotiate a scaled down “green energy” focused fiscal stimulus bill with Democrats in the spring.

Clean energy provisions in the Build Back Better bill:



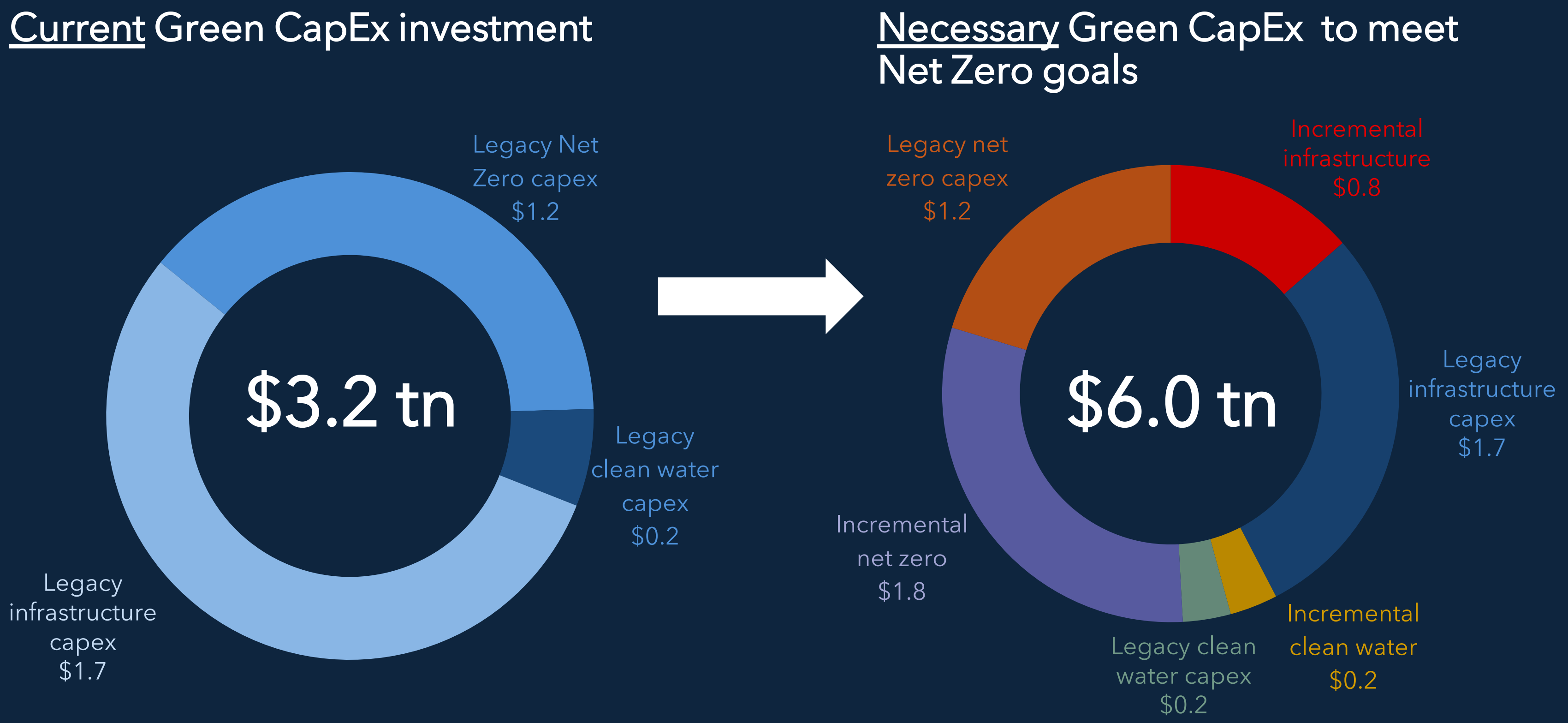
Key challenges to progress

- Mid-term election year
- Impact of Senator Ben Lujan’s (D-NM) illness on Democratic majority
- Spending resistance given rising inflation
- Aligning moderate (i.e., Manchin) and more left-leaning wings of the Democratic Party (i.e., Sanders, Warren)

Source: Build Back Better bill.

Investment in Renewables Likely to Surge

Historically, "Green CapEx" (investments in net zero, green and clean water infrastructure) has averaged roughly $3.2 trillion per year. In order to meet the Net Zero and UN Sustainable Development Goals, CapEx will need to rise to roughly $6 trillion per year for the rest of the decade. The Russia-Ukraine crisis will likely accelerate the pace of transition globally toward renewable energy, especially in Europe.

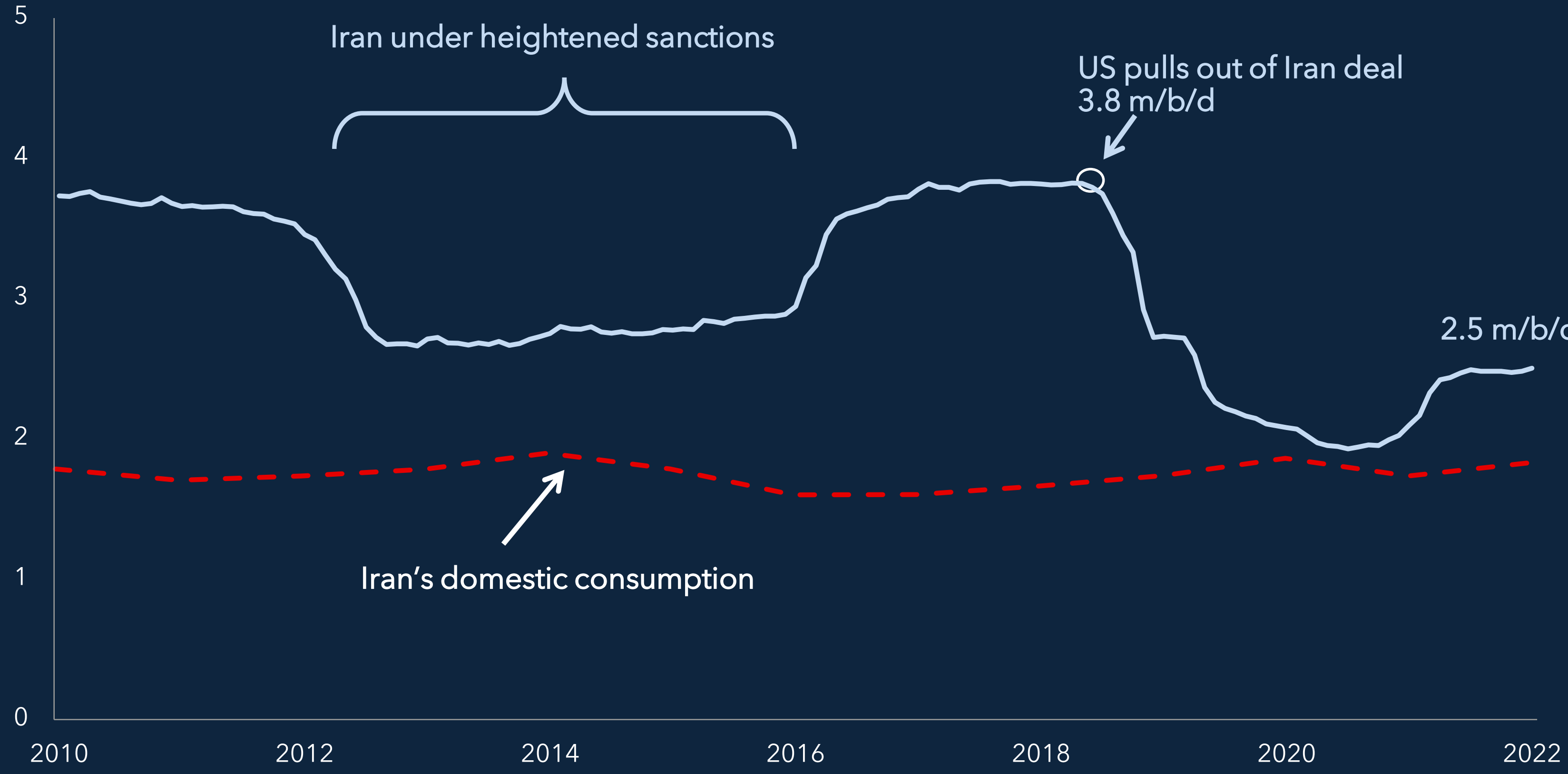


Source: (1-2) Goldman Sachs, "Green Capex Making Infrastructure Happen" (October 2021). World Bank. IEA. McKinsey. OECD.

Iran Nuclear Deal Revived

MUFG's Head of Emerging Markets Research, Ehsan Khoman, expects an "interim Iran deal" could be reached in Q3 2022 that would permit oil exports of up to 0.5 m/b/d, but that a full return to the Joint Comprehensive Plan of Action (or to a new JCPOA) will not occur until Q4 2022 or Q1 2023. Russia's Ukraine invasion may increase the probability, and accelerate the timing, of a deal.

Iran oil production, m/b/d



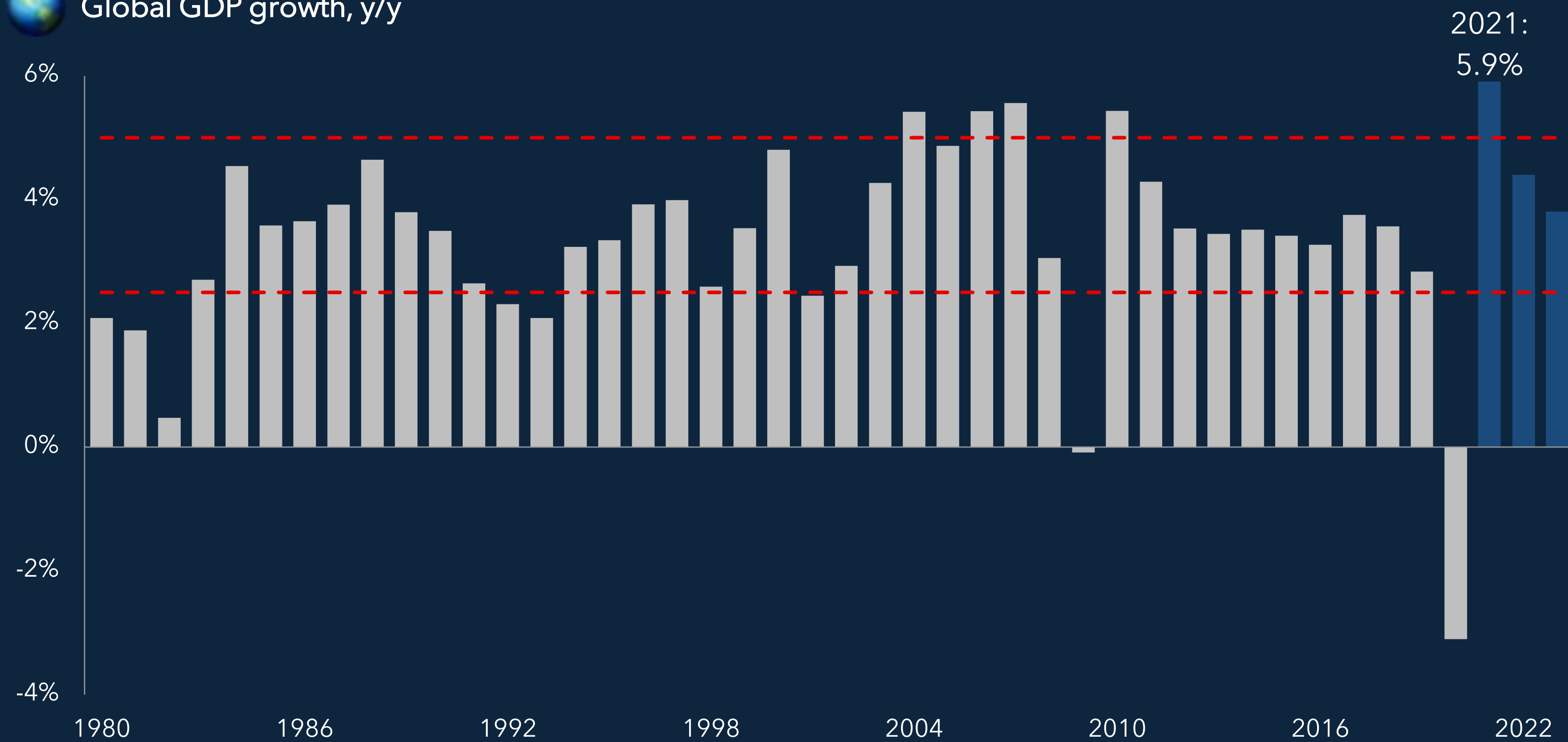
Source: OPEC, BP, Capital Economics "China won't hurt itself to help Russia" (Mark Williams). MUFG EMEA Research (Ehsan Khoman).

5 Economic Implications

Triple Hit for Global Economy

Inflation, policy tightening and geopolitical risk (Russia-Ukraine) have been a "triple-hit" for the global economy in 2022, especially as compared to expectations less than a year ago. The IMF estimates that supply chain dislocations cost the global economy a full one percentage point of growth in 2021 (i.e., 5.9% global growth would have been approx. 6.9%).

Global GDP growth, y/y

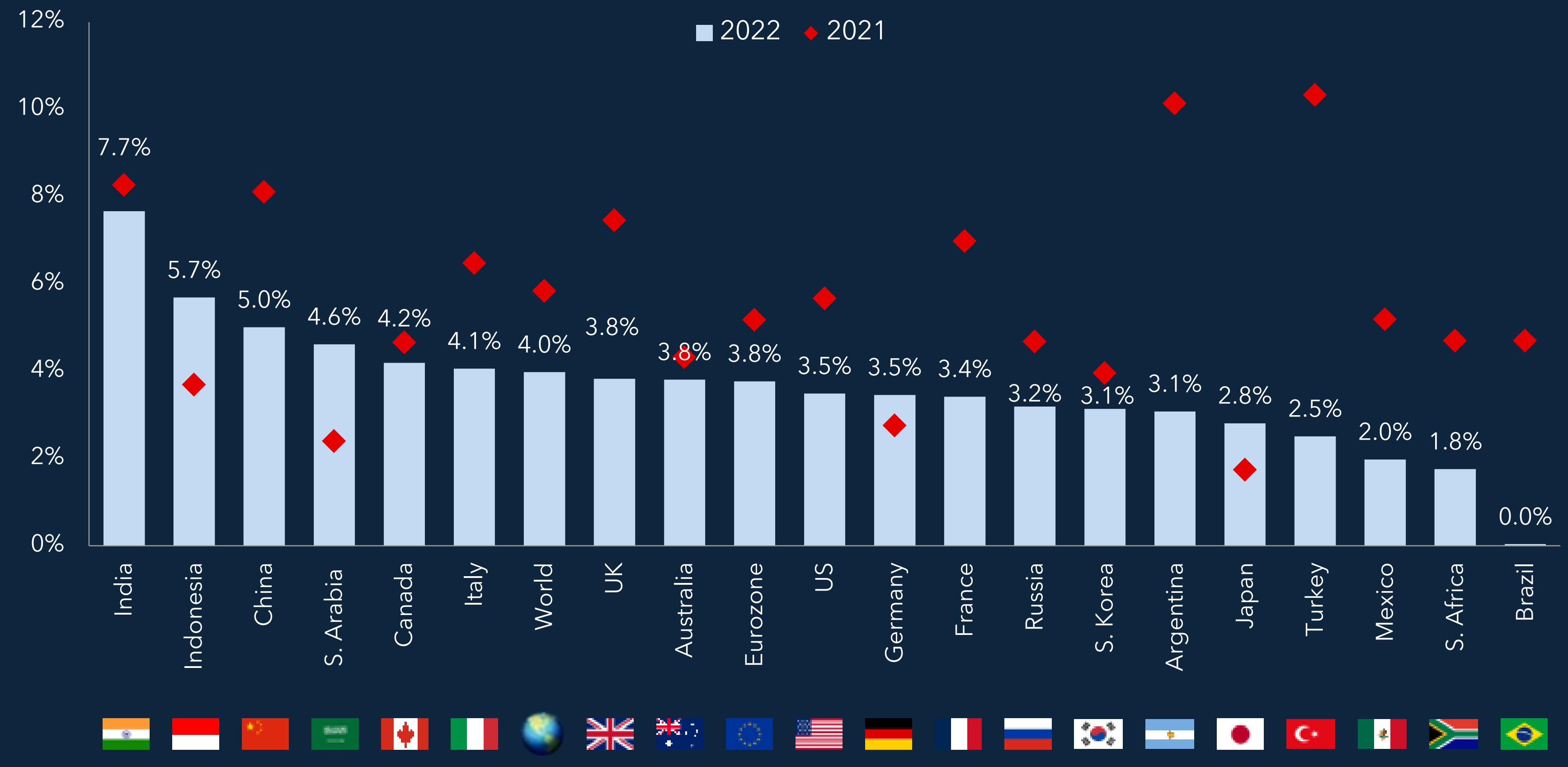


Source: (1) Bloomberg. Data as of February 28, 2022. IMF forecasts.

Decelerating Global Growth

Growth will likely decelerate in almost every major global economy in 2022, but still remain “above long term trend” in most advanced economies

2021 & 2022 GDP growth forecasts, y/y

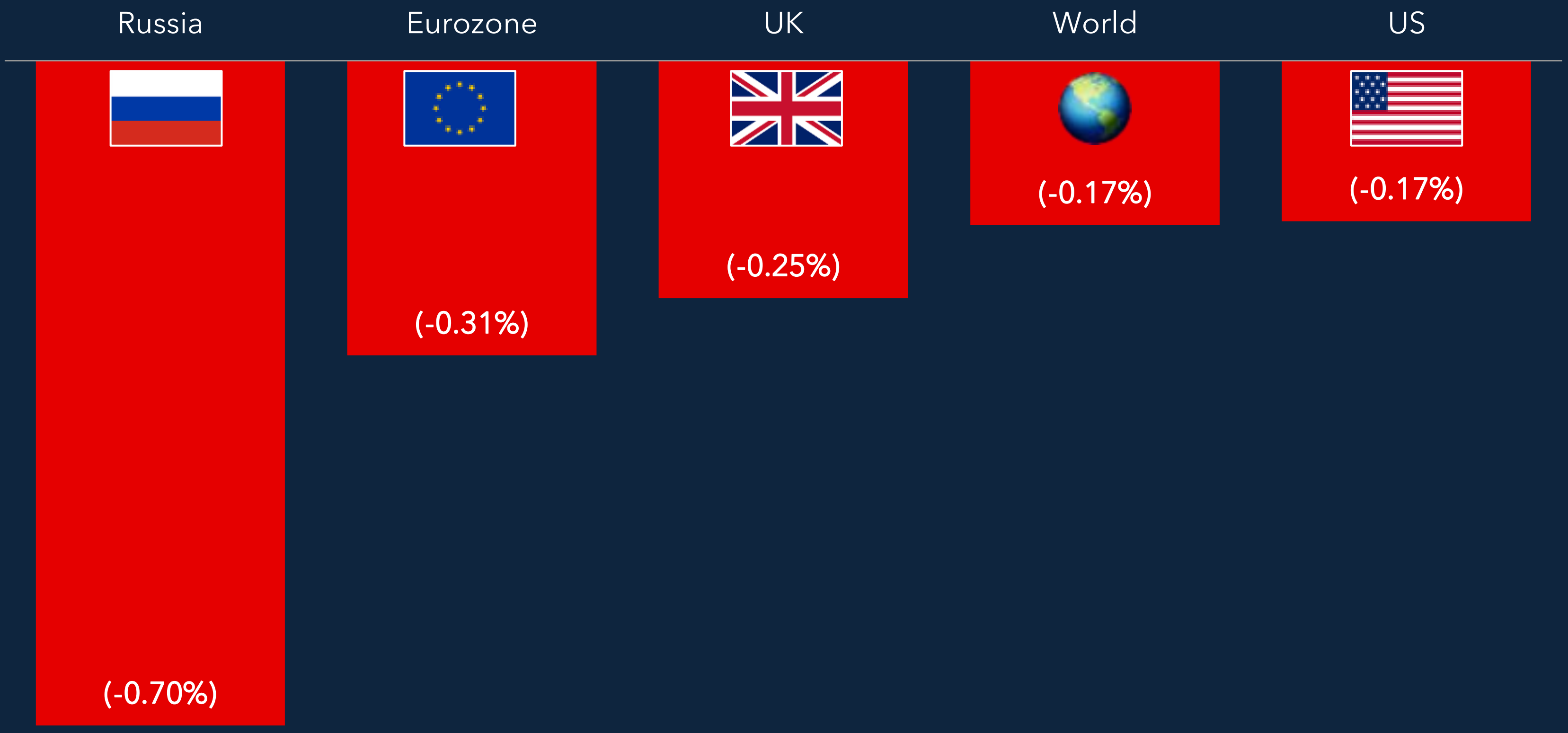


Source: (1) Oxford Economics. Data as of February 28, 2022.

Global Growth Revised Lower

Russia's invasion into Ukraine is expected to cause higher European gas, oil and food prices over the medium term. In addition, increased EU and US sanctions on Russia will cause an economic drag and financial market disruptions. As a result, Oxford Economics lowered their forecast for global growth by 0.2% in 2022 and 0.1% in 2023.

Global GDP Forecasts, % difference from no conflict baseline

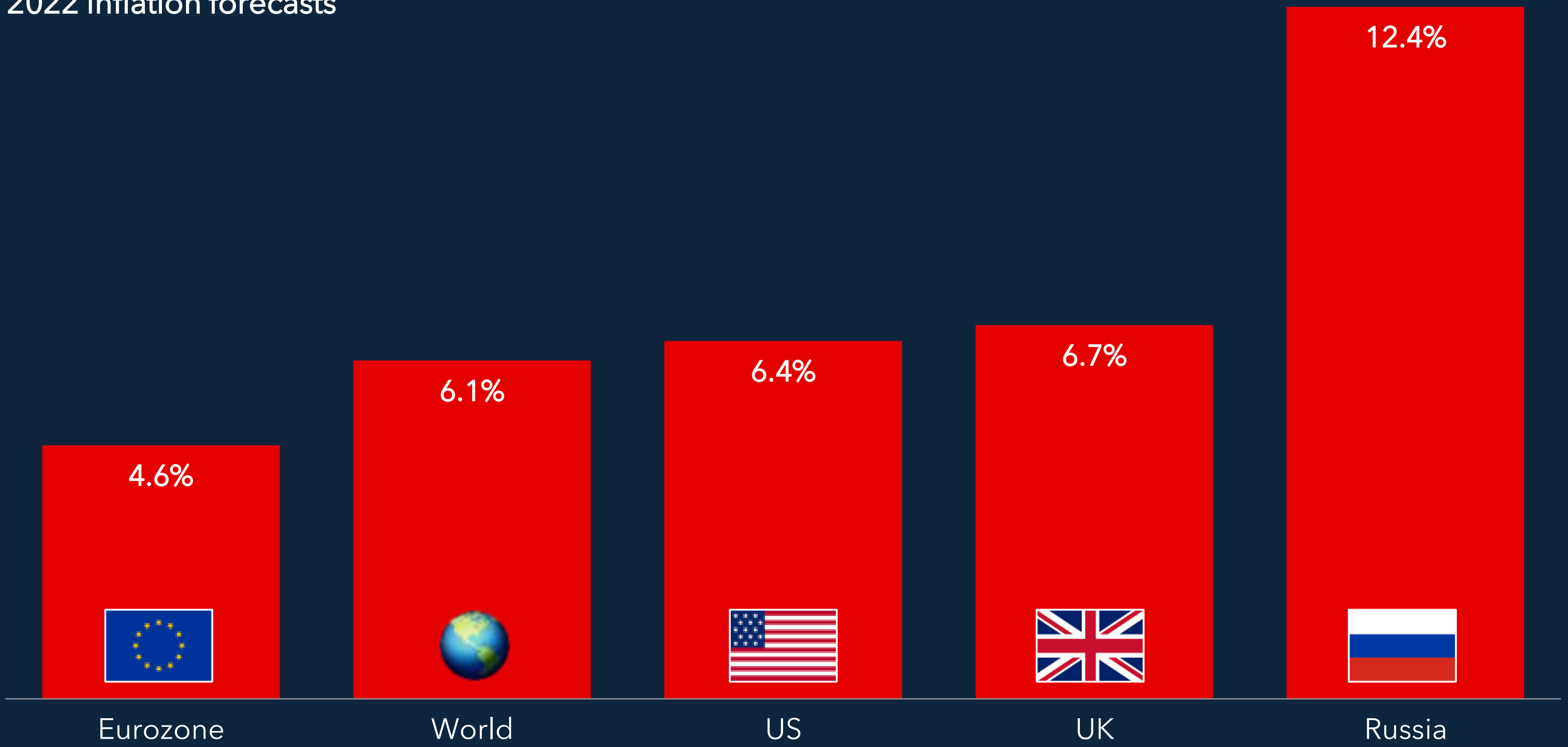


Source: (1) Oxford Economics, "Russia Invades Ukraine, damaging the global economy".

Inflation Expectations Revised Higher

Additional and prolonged supply side disruptions will cause higher peaks and a slower return to "normal" inflation than had initially been expected. Europe will be hit hardest by these developments. Average Eurozone CPI is now expected to reach 4.6% in 2022, 0.7 pp higher than prior forecasts.

2022 inflation forecasts

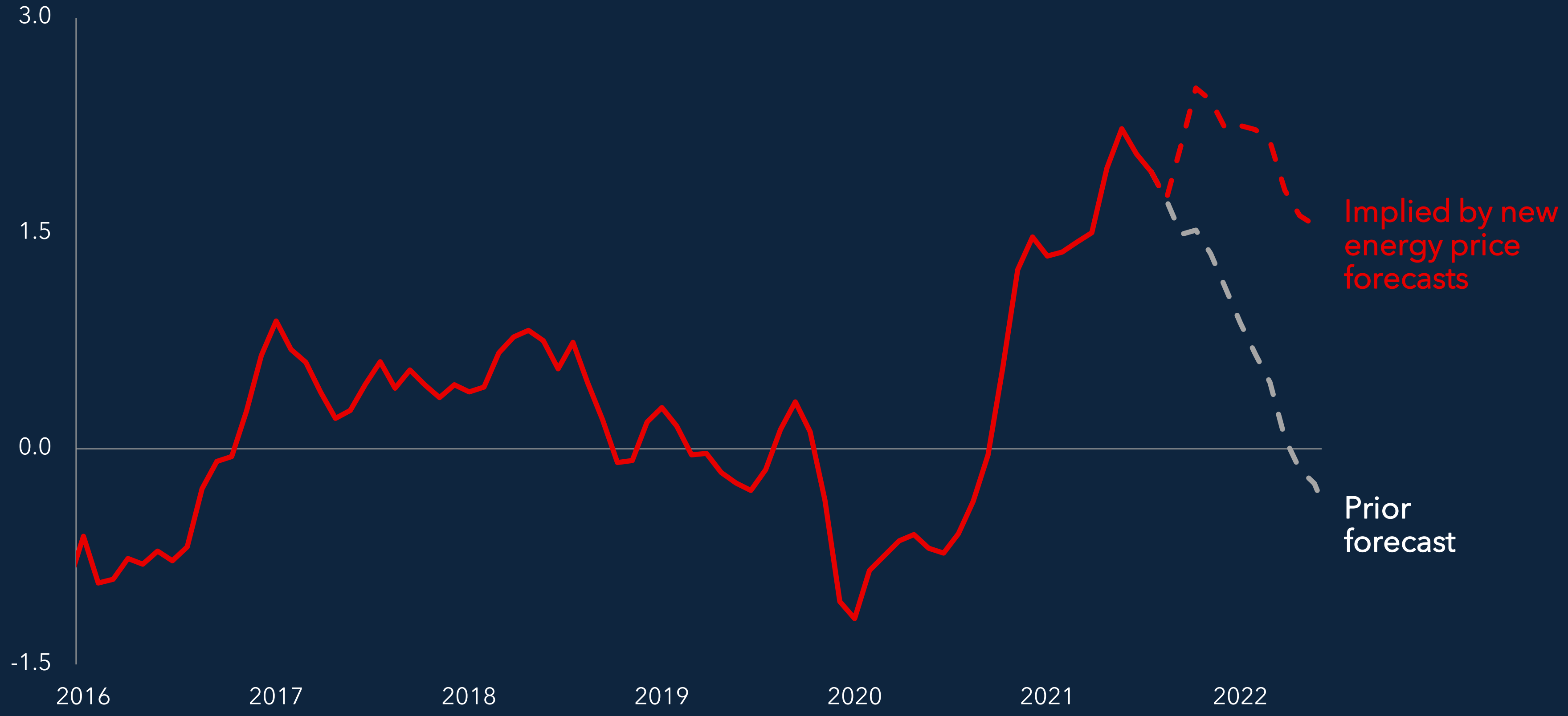


Source: (1) Oxford Economics, "Russia Invades Ukraine, damaging the global economy". CPI inflation.

Ukraine Crisis Impact on Energy Inflation

Prior to Russia's Ukraine invasion, energy prices were increasingly approaching late cycle and expected to exert less pressure on US and global inflation over the next 12-18 months. While it is thus far helpful that Western sanctions have avoided the energy sector, rising prices will nonetheless increase inflation and prolong the projected return to normal.

Percentage point contribution of energy CPI inflation to Headline rate in major DMs



Source: (1) Capital Economics, "8 questions about the Russia-Ukraine crisis". Average of US, UK & Germany.

Supply Side Shock for Economies

Russian military action and Western sanctions would largely constitute a supply side shock, rather than demand, for the European and global economy. While higher energy prices would be the most immediate transmission channel, the negative knock-on effect to consumer demand would follow.

Channels of contagion for supply

- Russia restraining exports as a diplomatic tool
- Western embargoes and sanctions
- Damage to infrastructure (i.e., pipelines)

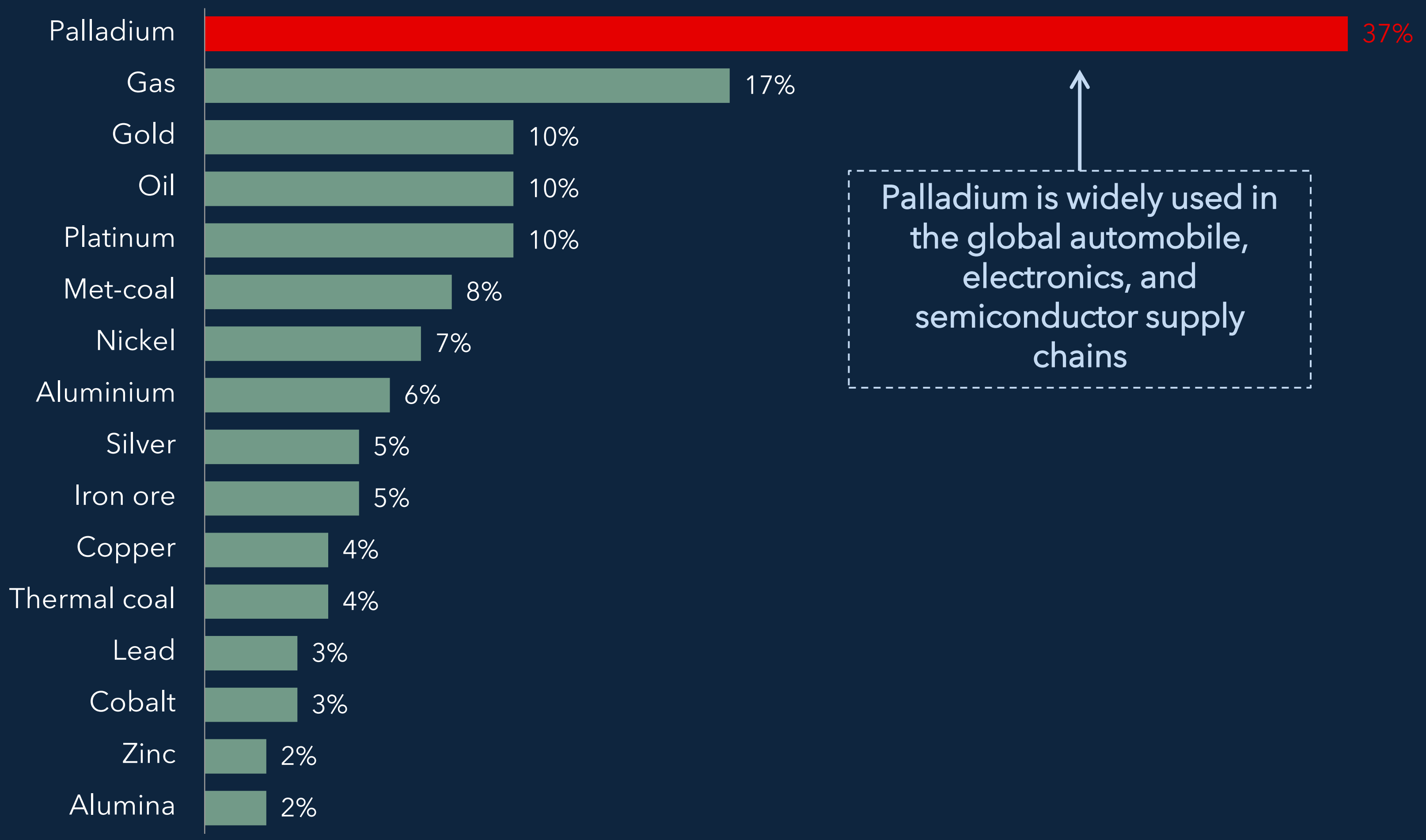
Commodities most vulnerable to supply shocks

- Russia accounts for approximately 40% of European **natural gas**
- Russia is the world's 3rd largest oil **producer**, accounting for > 10% of global production
- Russia and Ukraine account for 25% of global **wheat** exports
- Russia is the world's largest exporter of **fertilizers**
- Russia is the world's largest exporter of **palladium**, critical for the global auto sector
- Russia is highly dependent on the West for **technology**, **semiconductors** and **oil equipment**

Source: Capital Economics: Russia-Ukraine: Near-term inflation; long-term decoupling. EIA.

Russia's Share of Global Commodity Production

Russia's share of global production by commodity (% of world total)

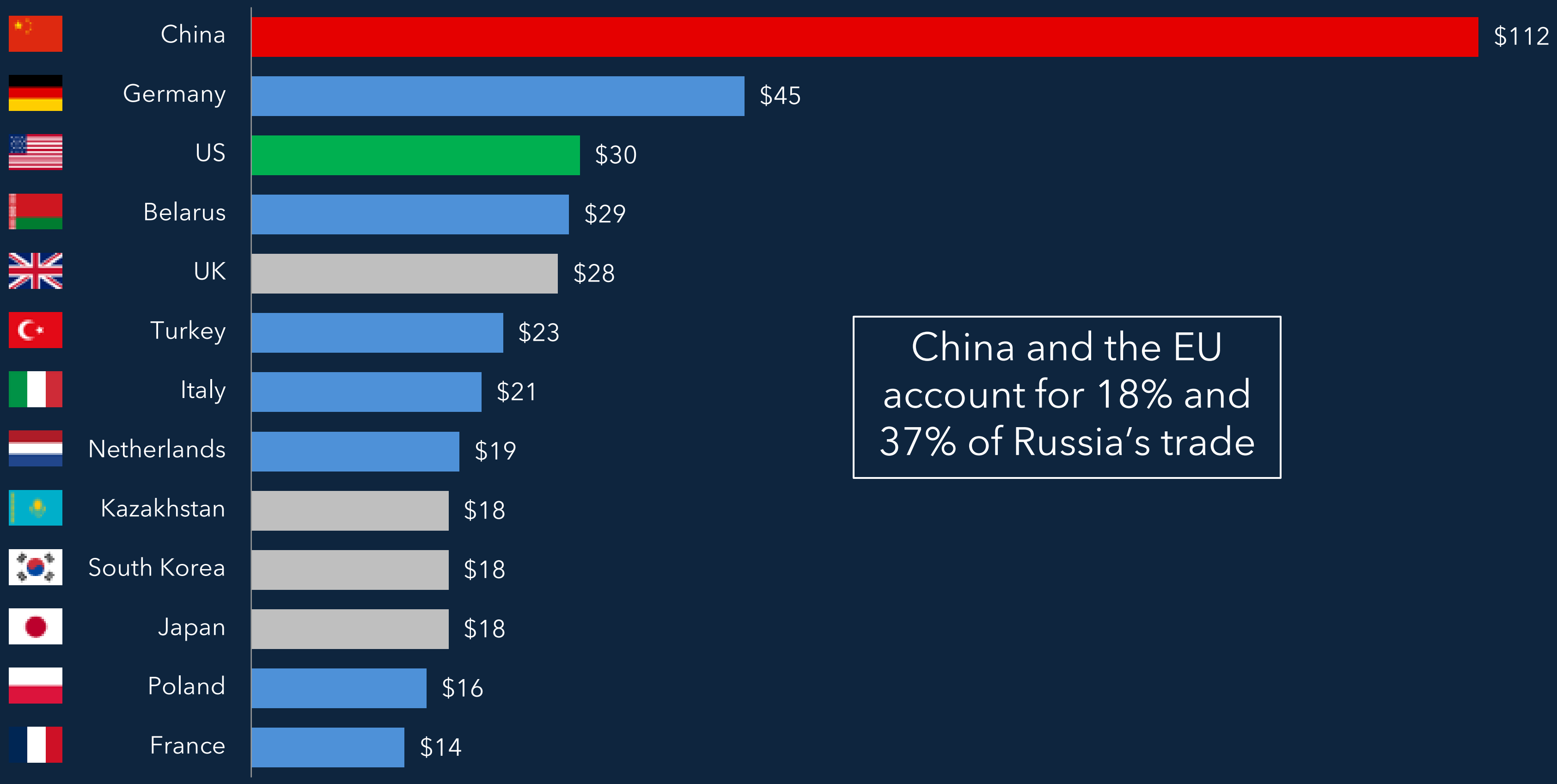


Source: (1) MUFG. Ehsan Khoman, Head of Emerging Markets Research – EMEA. Bloomberg.

Russia's Largest Trading Partners

While Russia's trade with China is more than 2x the volume of their next largest trading partner, the EU in aggregate represents nearly 40% of Russia's trade

Russia's main trading partners, annual USD bn

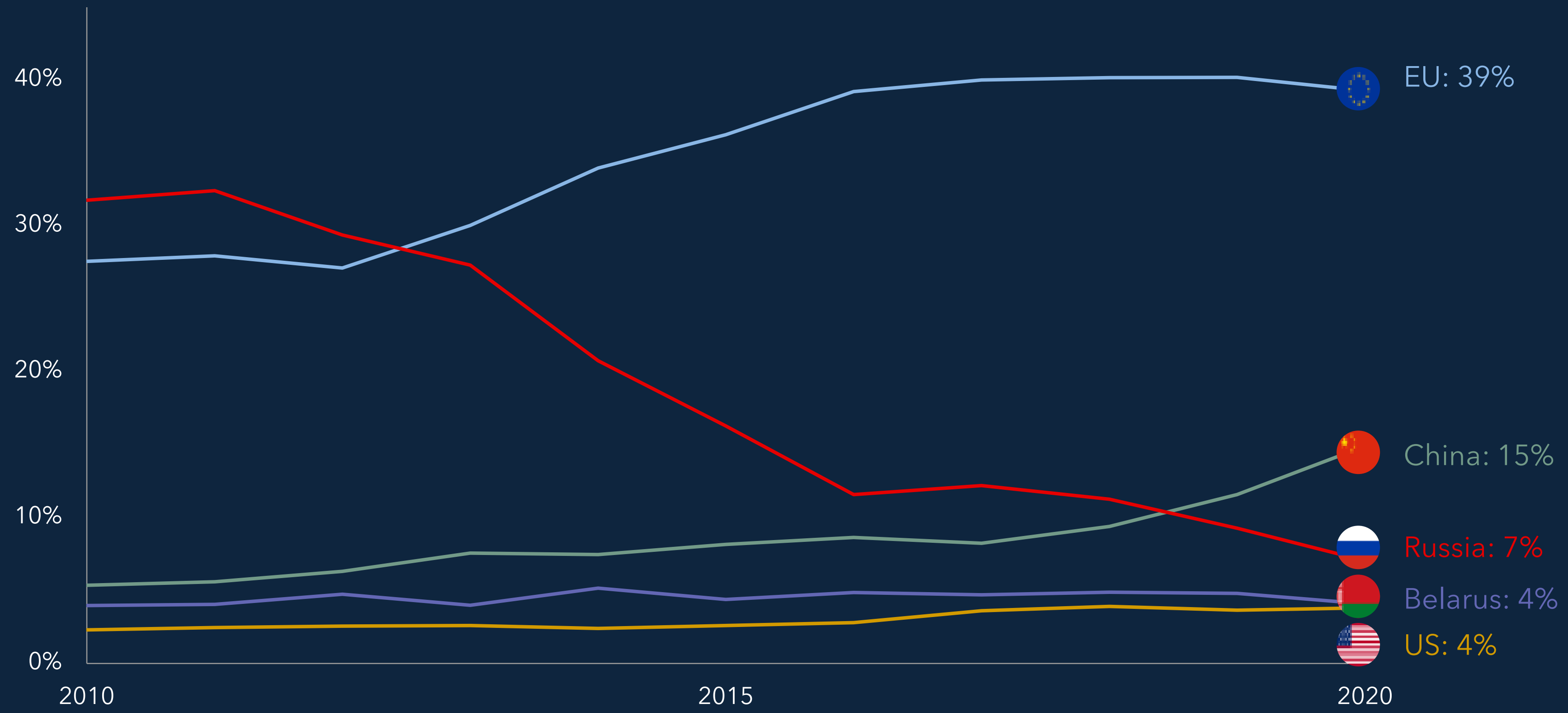


Source: Bloomberg, More Sanctions as Mass Incursion Feared" (February 23, 2022). IMF data for 2020.

Ukraine's Largest Trading Partners

Russia accounts for just 7% of Ukraine's total trade, down from over 30% a decade earlier. Over the same time period, Ukraine has increased trade with the EU from 28% to 39%. Ukraine's deepening economic ties with the West have fueled Putin's concern over NATO's eastward expansion.

Total trade for Ukraine's top trading partners, as a percentage of total

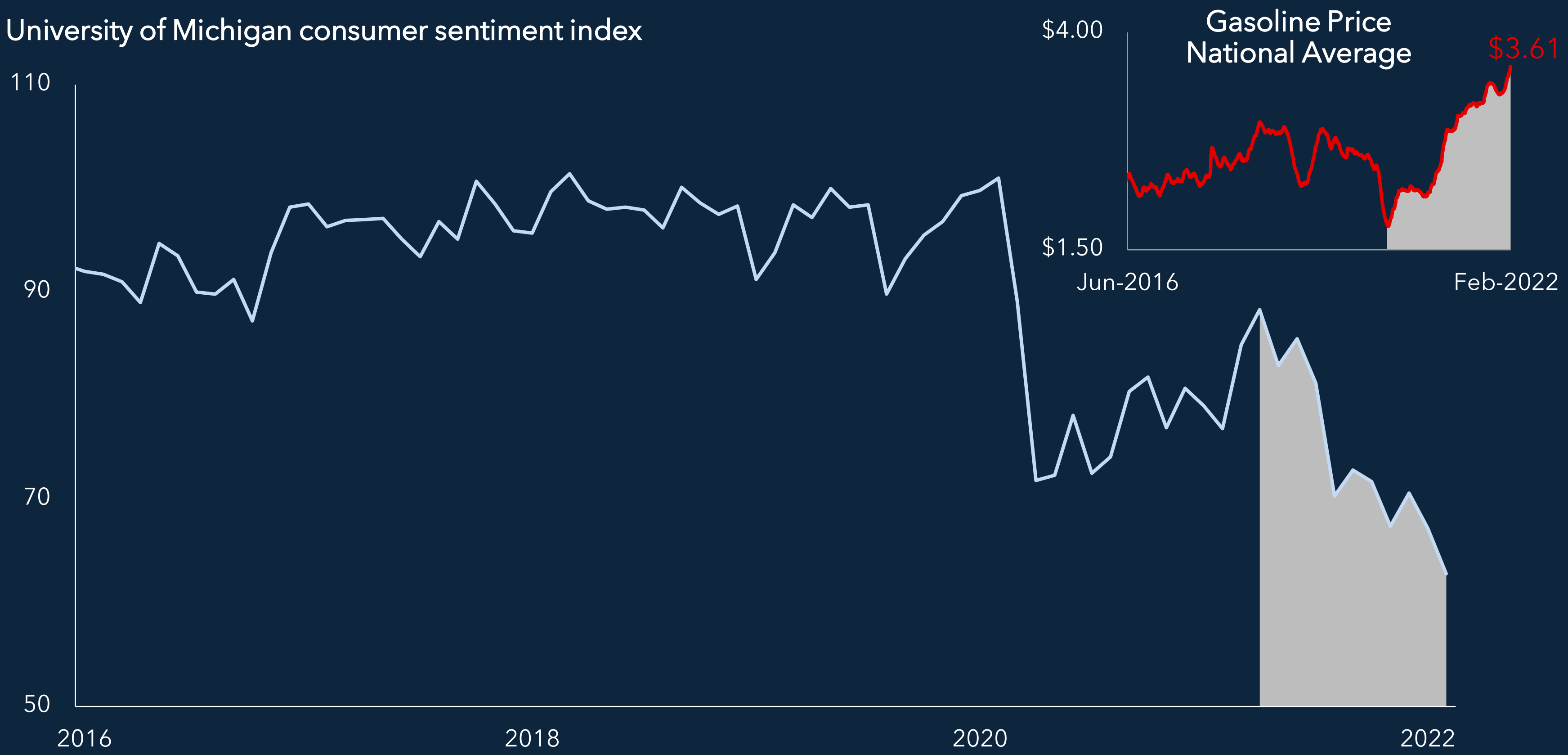


Source: Reuter's Graphics, "On the Edge of War" (January 26, 2022). IMF. Total trade is import + exports.

US Consumer Sentiment Vulnerable

In February, the University of Michigan consumer sentiment index declined significantly to 63, the lowest reading since October 2011. Expectations for inflation in the year ahead, concerns over future real income levels, and expectations of weakening growth all weighed on consumer sentiment. Gasoline prices, which hit the highest level since 2014, have also been a drag on confidence.

University of Michigan consumer sentiment index



Source: (1) Bloomberg. Data as of February 28, 2022.

6 Market Implications

Areas of Optimism & Concern for Markets

In the first week of the Ukraine crisis, markets rallied into the end of the week, taking a page from the COVID playbook in assuming a "finite" timeline for the crisis and policy support where needed. However, the markets may very well be underpricing the scale of economic damage and geopolitical escalation in a seismic shift that will play out over years, not weeks and months.

Areas of Optimism

- Sanctions thus far side-stepping energy sector, the most immediate channel for contagion
- COVID-playbook suggests even deep crises are temporary, and policy support will follow if needed
- Fed may tighten policy at marginally *slower* pace than otherwise
- Direct impact to US economy limited, at least initially (low Russia dependency)

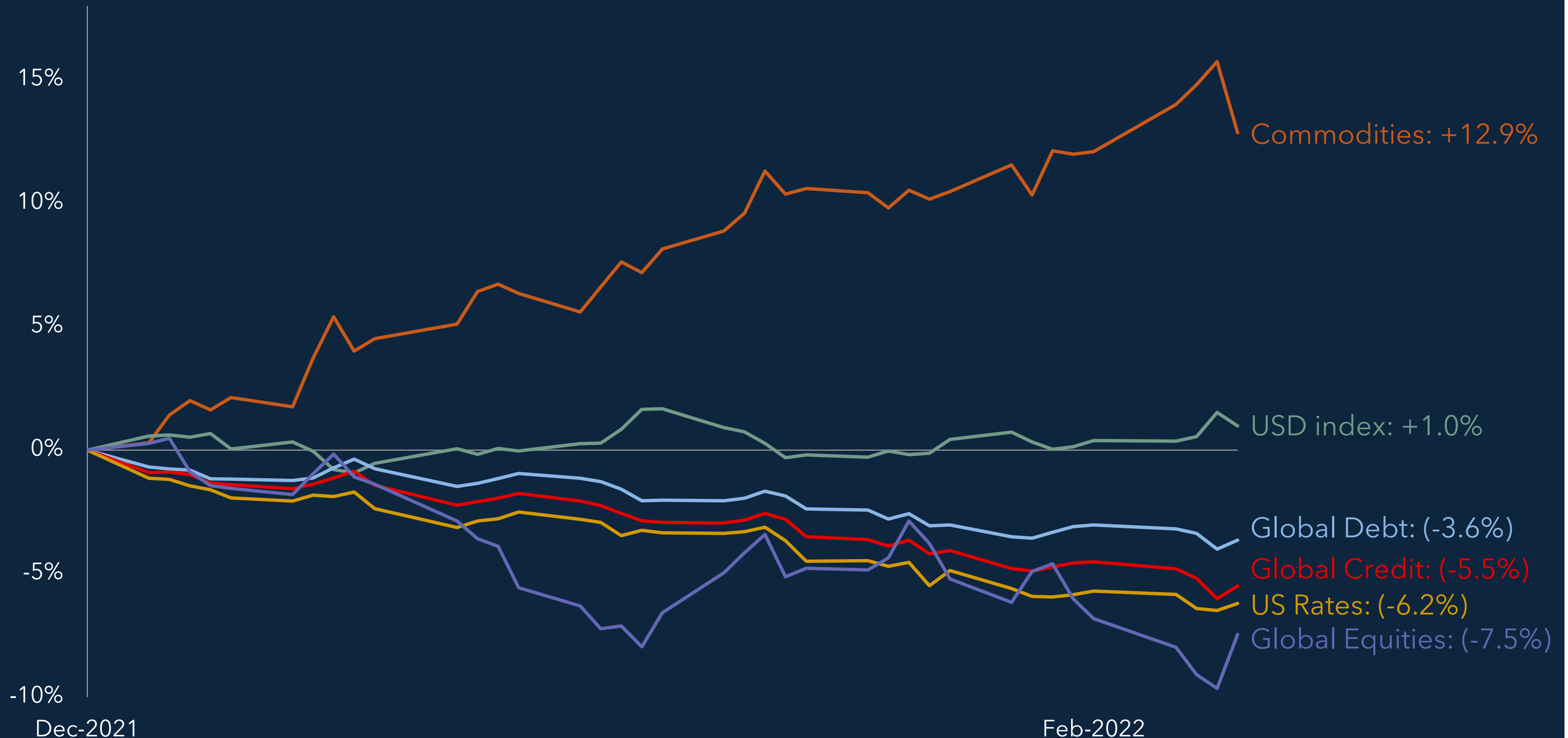
Areas of Concern

- Economic damage over time may be greater than currently anticipated
- Exacerbates COVID-era supply side dislocations and inflation
- Seismic shift in global geopolitical structure poses significant risks
- As humanitarian crisis worsens, and West tightens policy grip and sanctions, unpredictable retaliatory response from Putin may follow (cyber, energy access, military escalation)
- Impact of SWIFT & CBR sanctions on Ruble and banking system

Global Markets in 2022 YTD

Higher structural volatility and commodity prices have been the two dominant market themes of 2022 so far

YTD cross-asset performance

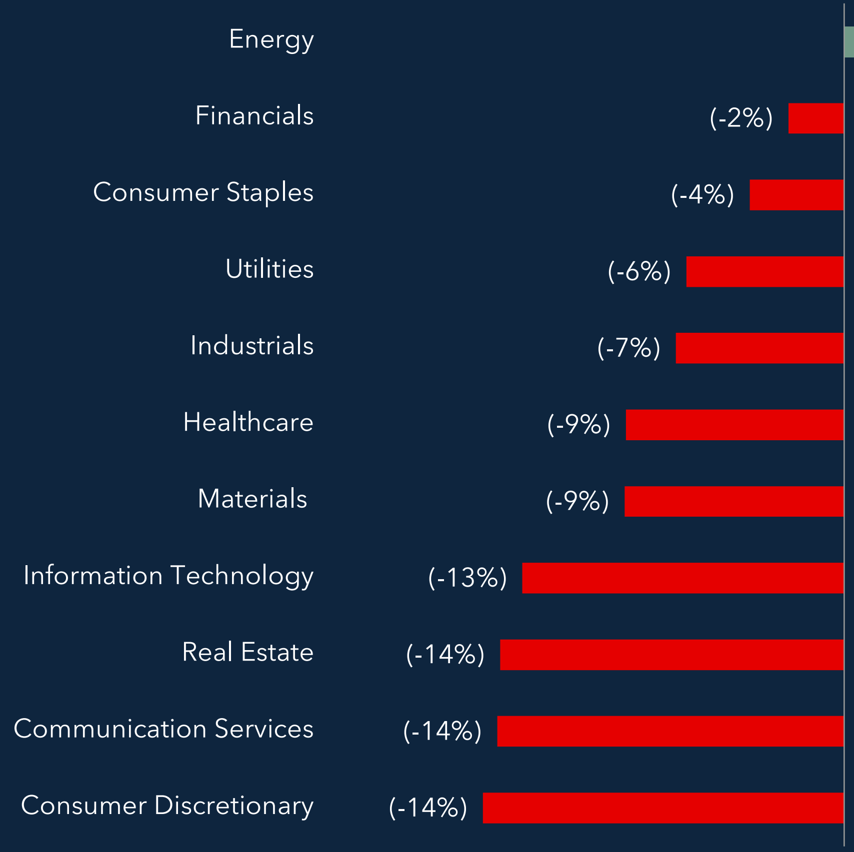


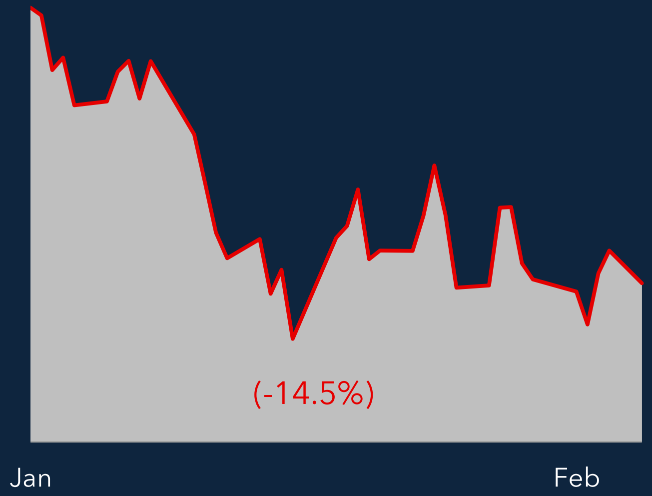
Source: (1) MUFG EMEA Research (Ehsan Khoman). Bloomberg. Data as of February 28, 2022. Global equities is MSCI All World Index. Rates is Bloomberg US Corporate Bond Index. Credit is Bloomberg Global Aggregate Credit Total Return Index. Debt is Bloomberg Global Aggregate Index. USD is DXY index. Commodities is Bloomberg Commodity Spot Index.

Energy Stocks Outperforming

Of the 11 sectors in the S&P 500, energy stocks are the only ones in positive territory year to date. Semiconductors, in particular, continue to struggle under the weight of global supply chain dislocations, geopolitical uncertainty, and sanctions.

S&P 500 sectors in 2022





Source: (1) Bloomberg. Data as of February 28, 2022

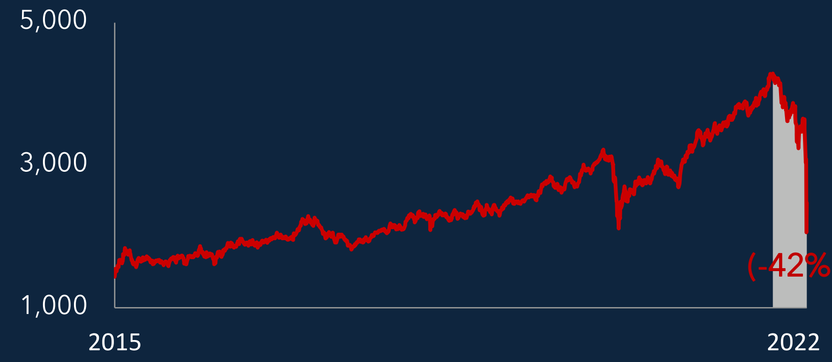
Russia's Markets Under Pressure

5 year CDS widened by over 600 bps between Feb 18 and Feb 24

Russia 5 year CDS

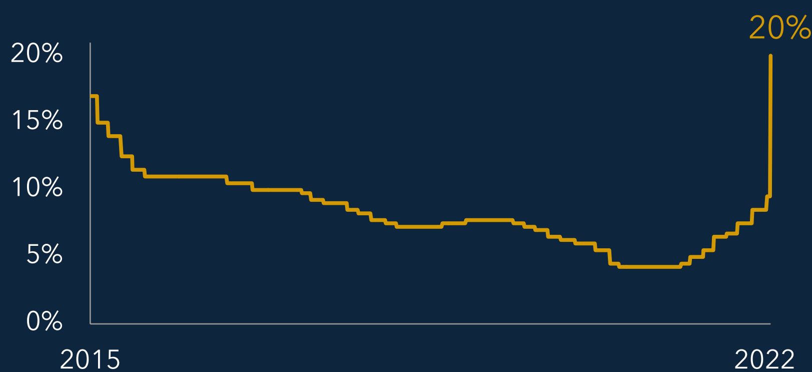
Russian equities have declined over 40% since peak in Oct 2021, and nearly 30% since Feb 18

Russian Equities



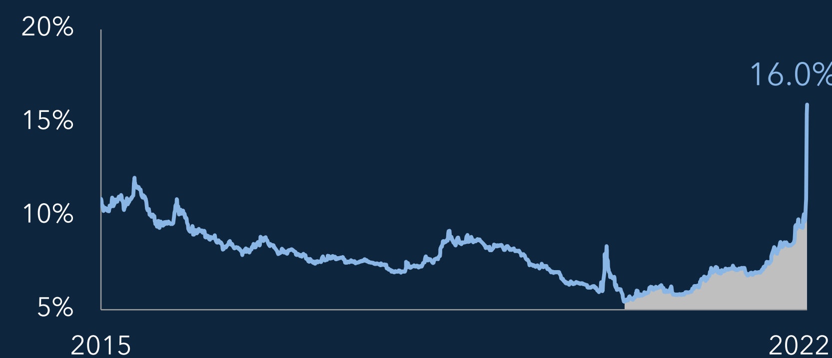
The Russian Central Bank raised its key policy rate from 9.50% to 20% on Feb 28th

Bank of Russia key rate announcement



Russia 10 year bond yield is above 10% for the first time in six years

Russia 10 year domestic government bond yield



Source: (1-4) Bloomberg. Data as of February 28, 2022.

Commodity Prices Surging Higher

According to Bloomberg, more major commodity contracts today are in backwardation (current prices > future prices) than at any time since 1997. Production cuts, underinvestment in fossil fuel projects, bad weather, pent-up demand and supply chain constraints have driven the Bloomberg Commodity index to record highs. In addition, stockpiles of key commodities (including copper, aluminum, natural gas, and some agricultural products) are at seasonally, and in some cases, historically low levels.

Bloomberg commodities index

According to Bloomberg, more than 130 countries globally have at least one commodity or import that is predominantly sourced from Russia, Ukraine or neighboring Belarus.

Source: (1) Bloomberg. Data as of February 28, 2022.

Commodity Prices Surging Higher

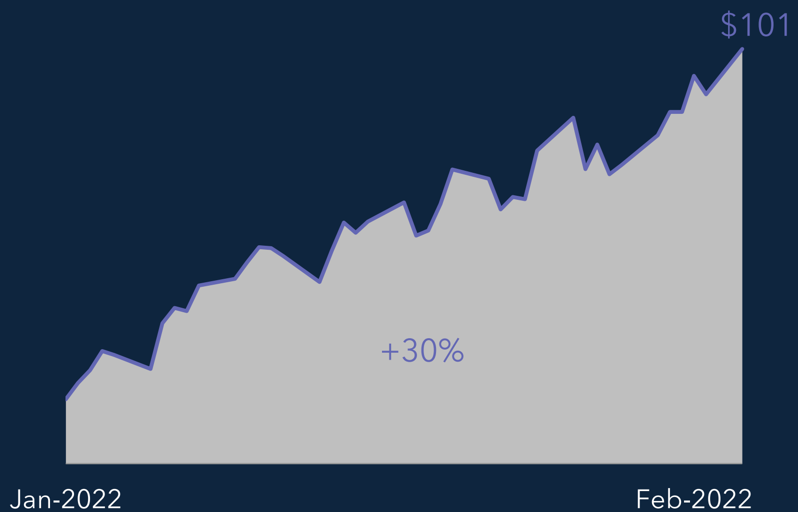
2022 YTD performance

Source: (1-12) Bloomberg. Data as of February 28, 2022. Sunflower oil is Russia export price.

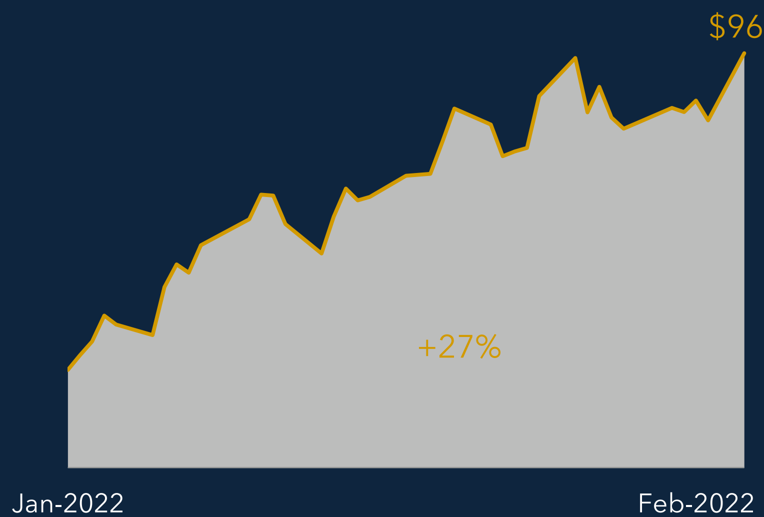
Commodity Prices Surging Higher

Resilient demand, depleting inventory, structural under-investment and rising geopolitical risk (Russia-Ukraine) have all been contributing factors. While demand was the prevailing driver of oil prices early in the COVID crisis, supply considerations have now become the stronger marginal driver of oil both currently and looking ahead in 2022.

Brent Oil 2022 Performance



WTI Oil 2022 Performance



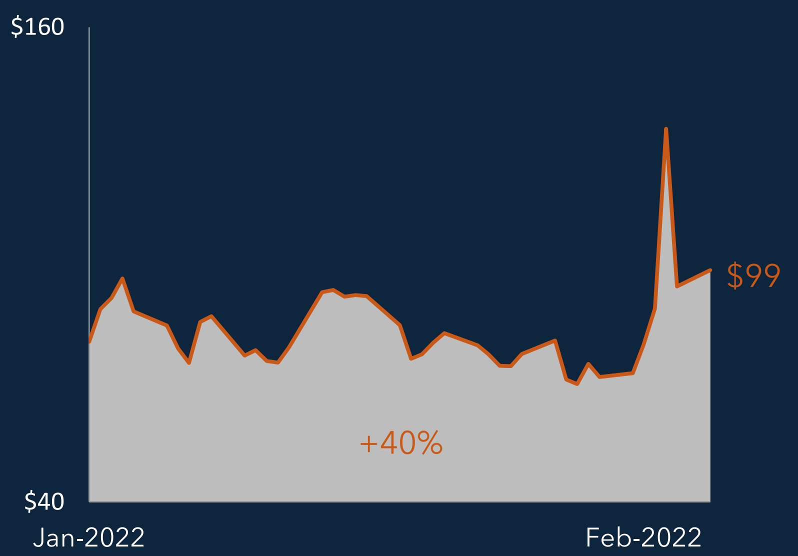
	Spot (Feb 28)	Q1 2022	Q2 2022	Q3 2022	Q4 2022
Brent	$101	$96	$102	$87	$108
WTI	$96	$93	$99	$84	$105

Source: (1-12) Bloomberg. Data as of February 28, 2022.

Commodity Prices Surging Higher

While there is no expectation that Russia will fully halt natural gas exports to Europe, MUFG's Head of Emerging Markets Research, Ehsan Khoman, now expects heightened physical delivery risk to cause higher and more volatile European gas and utility prices through the summer and into next winter

European Natural Gas (TTF)



	Spot (Feb 28)	Q1 2022	Q2 2022	Q3 2022	Q4 2022
Nat Gas	$99	$96	$104	$88	$117

Key Drivers of Natural Gas Prices in 2022

Elevated physical delivery risk

- Sanctions (despite energy carve-outs) will limit access to payments / funding
- Transportation through Ukraine likely disrupted (supply challenge for central and eastern Europe)

Germany halting certification of Nord Stream 2

- Putin has said he will not increase gas exports unless Nord Stream 2 approved

Tight inventories to keep a higher floor on prices

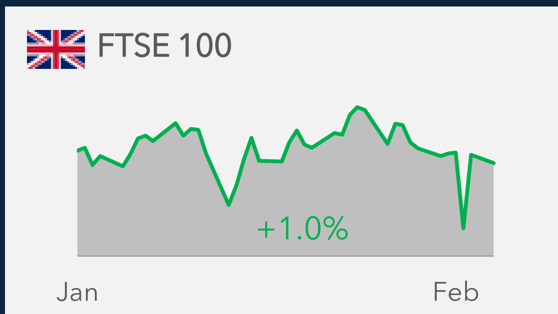
Mitigating factors:

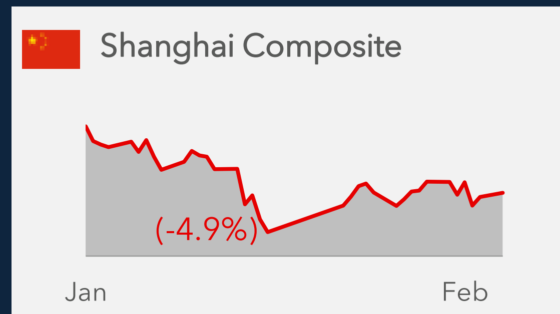
- Increased US LNG shipments
- Milder winter weather
- Strong wind generation
- Current gas storage 31% full (enough for current winter season)

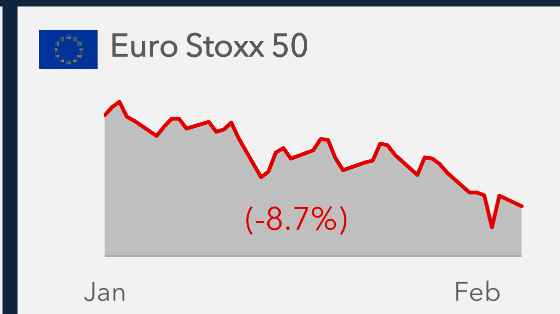
Source: (1) Bloomberg. Data as of February 28, 2022. MUFG Commodities research "How much will European gas markets be impacted from the Russia-Ukraine crisis?" (Ehsan Khoman).

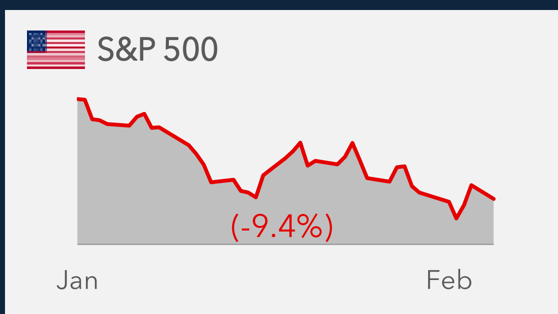
Risk Off for Global Equities

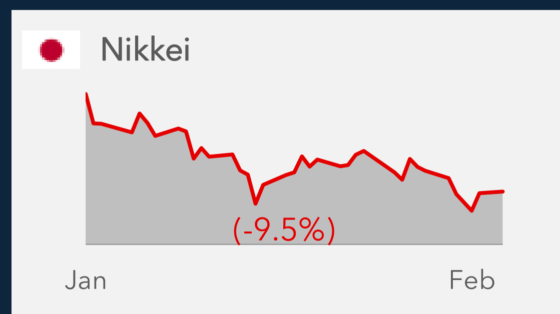
2022 YTD performance

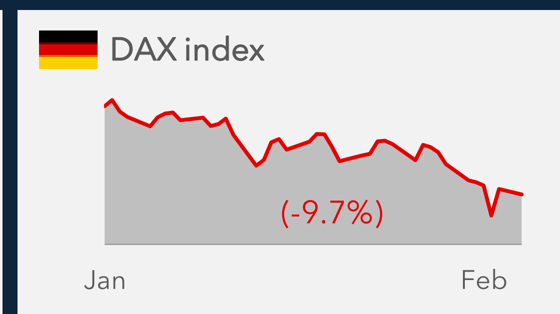


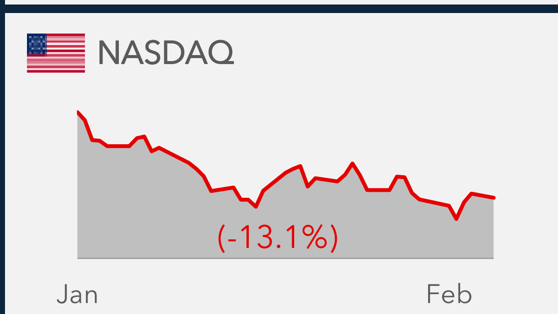


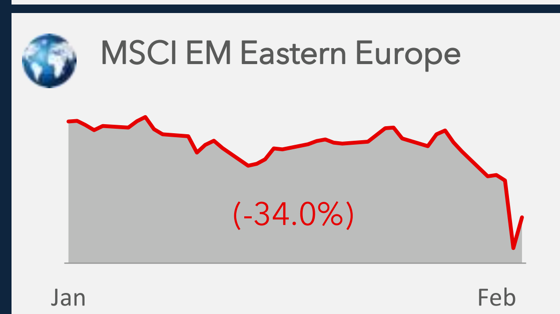












Source: (1-9) Bloomberg. Data as of February 28, 2022.

Equities Typically Trade Higher After Geopolitical Events

While there may not be an exact historic parallel for events that may transpire in Ukraine, the below table nonetheless provides useful perspective on how markets trade in the months following major geopolitical events. Over the last 30 years in particular, equities have shown an ability to "trade through" major geopolitical events, both near and medium term.

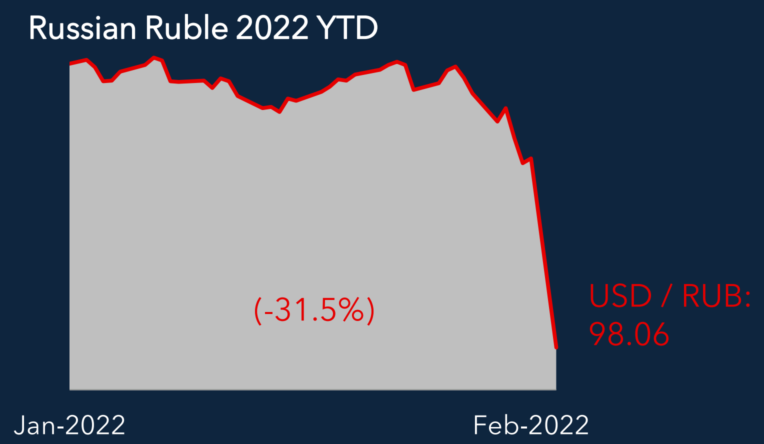
S&P 500 performance around select geopolitical / military events

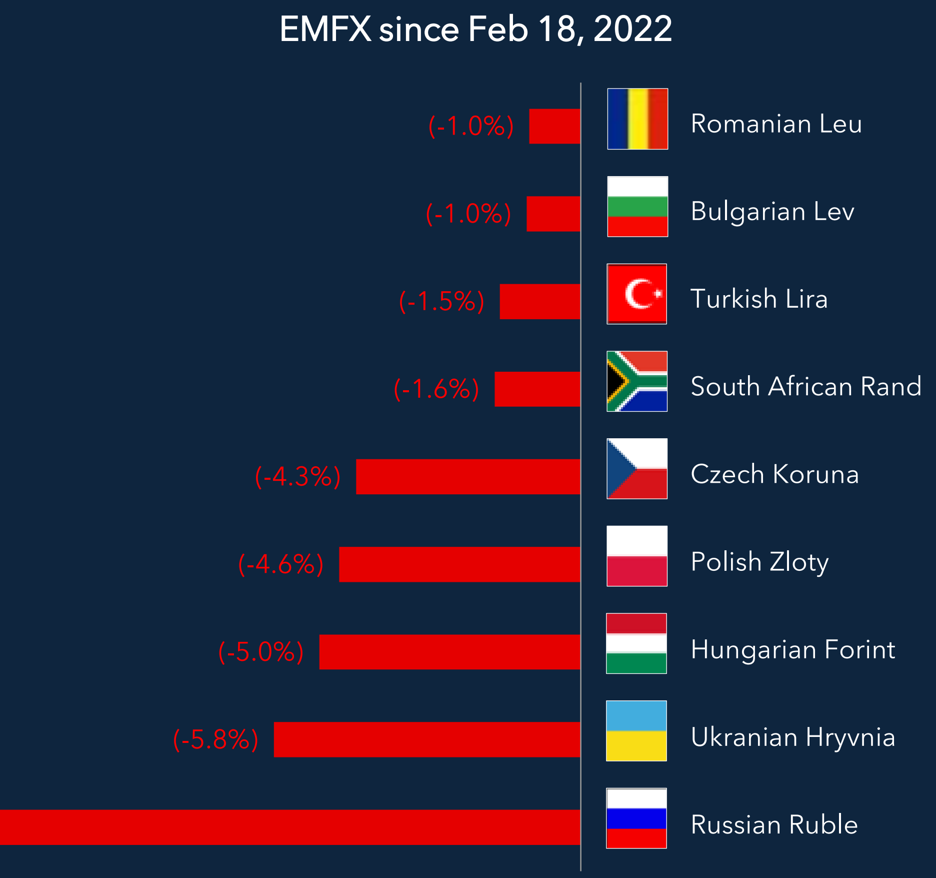
Date	Select geopolitical/ military events	1-month later	3-months later	6-months later	12-months later
12/7/1941	Pearl Harbor	(-3.4%)	(-12.7%)	(-9.1%)	0.4%
10/31/1956	Suez Canal crisis (& recession)	(-2.8%)	(-3.8%)	(-0.1%)	(-11.5%)
10/20/1962	Cuban missile crisis	8.7%	17.7%	25.1%	32.0%
10/17/1973	Arab oil embargo (& recession)	(-7.0%)	(-13.2%)	(-14.4%)	(-36.2%)
11/3/1979	Iranian hostage crisis	4.2%	11.6%	3.8%	24.3%
12/25/1979	U.S.S.R. in Afghanistan	5.6%	(-7.9%)	6.9%	25.7%
8/31/1990	Iraq invades Kuwait	(-8.2%)	(-13.5%)	(-2.1%)	10.1%
1/17/1991	Gulf War	15.2%	23.5%	20.6%	33.1%
8/17/1991	Gorbachev coup	0.0%	3.0%	7.0%	8.9%
2/26/1993	World Trade Center bombing	1.2%	2.5%	4.0%	6.4%
9/11/2001	9/11 (& recession)	(-0.2%)	2.5%	6.7%	(-18.4%)
3/20/2003	Iraq War	2.2%	15.6%	17.4%	28.4%
	Average	**1.3%**	**2.1%**	**5.5%**	**8.6%**
	% Positive	**50%**	**58%**	**67%**	**75%**

Source: John Authers, "Factor in Poor Sentiment to Size up Ukraine Crisis" (February 15, 202022) Bloomberg. Data source: Truist IAG, Factset. Grey shading represents down markets where the economy was in recession at some point during the measurement period.

Implications for Ruble and EMFX

Ruble, the primary channel of contagion in global FX markets, traded to its weakest level on record





Source: (1-3) Bloomberg. Data as of February 28, 2022. Currency axis inverted to show depreciation. Currency performance shown vs. USD

Implications for Global FX

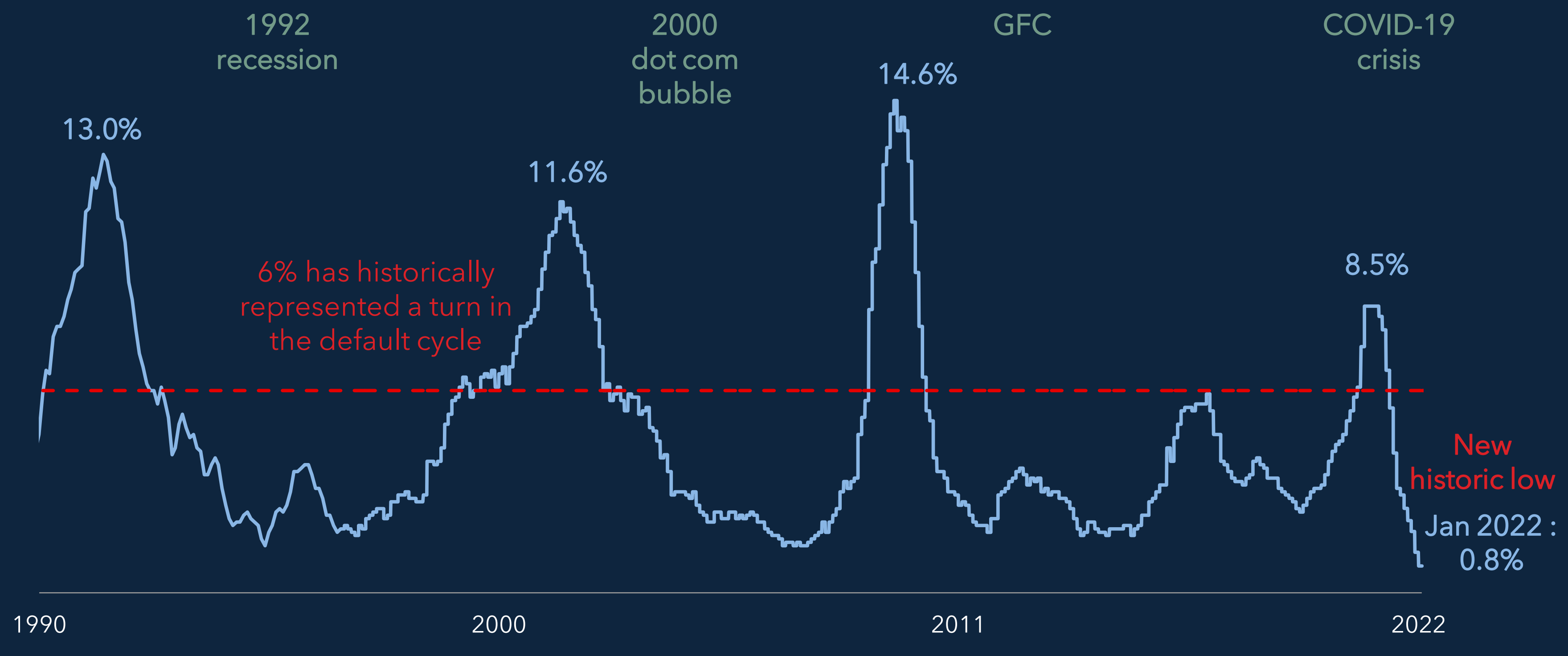
Impact of Russia-Ukraine Crisis
Strength in safe haven currencies (USD, JPY, CHF)
Sharp depreciation in Russian Ruble (despite Central Bank intervention)
Weakness in Central European currencies (Czech, Hungary, Poland)
Divergence between USD and EUR with Europe more exposed to commodity inflation
Near term support for commodity based currencies
Oil, inflation and outflow sensitive EMFX under pressure (INR, KRW, TWD)
Dovish shifts from developed market Central Banks (ECB, BoE)

Source: MUFG FX Research, "Worst case scenario continues to unfold",

USD Credit Market Fundamentals Remain Strong

Despite the high volatility and poor credit market returns in early 2022, the US High Yield market did not have a single default in the month of January, with the 12 month trailing default rate declining to an all-time record low of 0.8%. In fact, according to a recent Fitch report, there have not been any defaults in six of the last 12 months, including a record 103-day zero default period in Q3 and Q4 2021. Volatility and inflation are running high, but the economy and credit quality remain strong.

US corporate speculative grade trailing 12 month default rate



Source: (1) Bloomberg. Median net debt to EBITDA for companies in Bloomberg high yield index for which data was available. Companies that reported negative EBITDA are excluded. Data as of February 25, 2022.

Key Drivers of Strong Credit Fundamentals

Macro backdrop challenging, but still attractive

- Strong US consumer, in aggregate ($3 trillion “excess savings”)
- GDP growth decelerating, but still 2-3x “normal” trend growth
- Inflation rising, but pricing power still high

Corporate liquidity exceptionally strong

- Corporate earnings & margins above historical trend
- Record 2020-21 debt issuance
- Low near term maturity walls

Fortified corporate balance sheets

- $7 trillion of global corporate cash balances
- Declining corporate leverage ratios

Default rates at historic lows

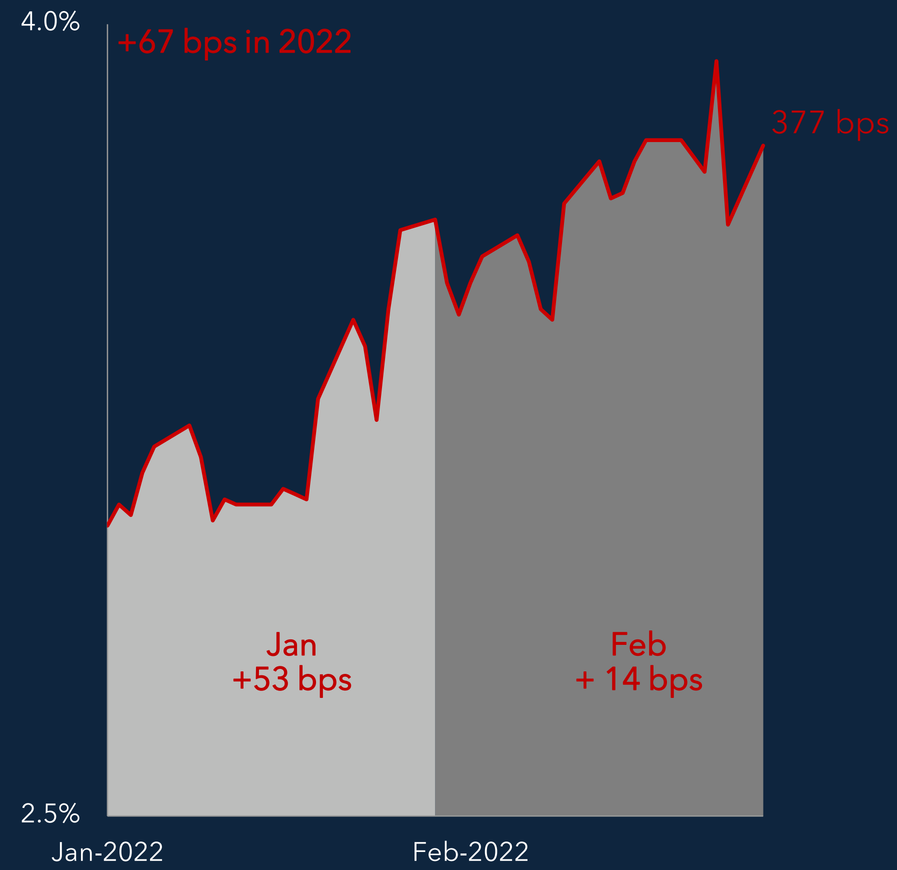
- USD HY default rate hit record low of 0.8% in January
- Recovering “fallen angels”
- Upgrades outpacing downgrades in both 2021 and 2022

Credit Spreads Wider on Volatility

Higher than anticipated volatility in 2022 on a more hawkish Fed and rising geopolitical uncertainty

IG Spreads in 2022

HY Spreads in 2022

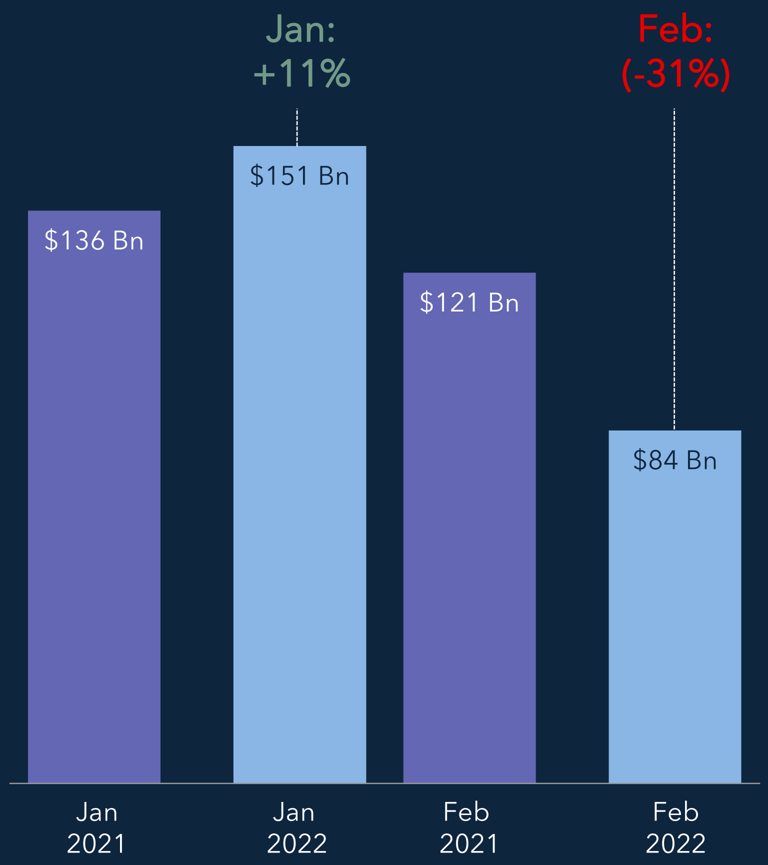


Source: (1-2) Federal Reserve Board. Data as of February 28, 2022.

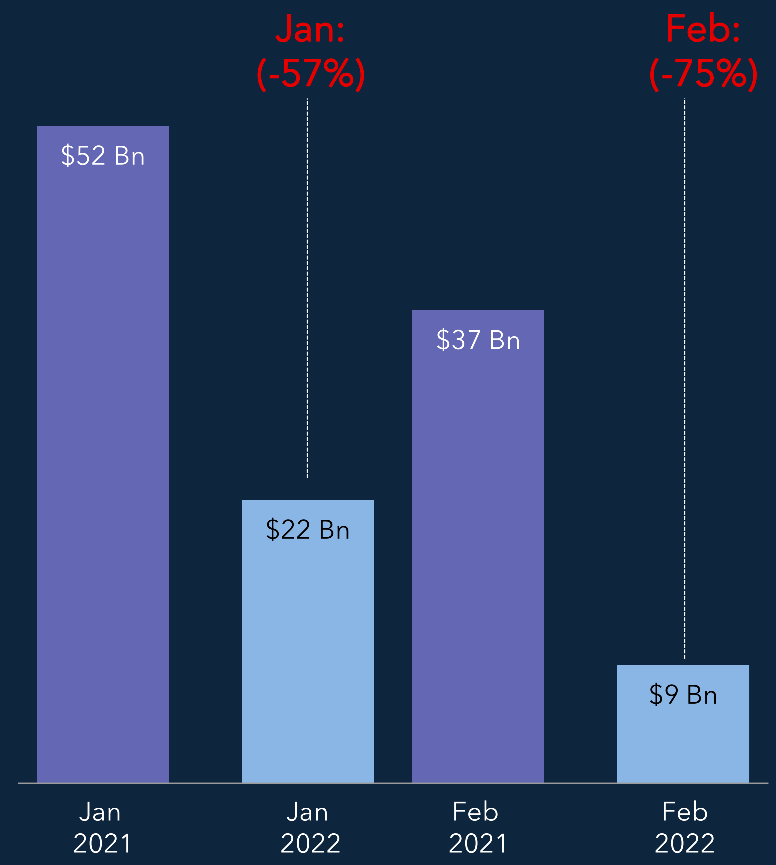
More Muted Issuance Pace in Bond Markets

In the first two months of the year, investment grade issuance is down 9% and high yield is down 63%. In particular, new issue volumes dropped sharply with the Russia-Ukraine geopolitical tension in February.

IG Issuance, USD Bn



HY Issuance, USD Bn



Source: (1-2) Federal Reserve Board. Data as of February 28, 2022. (3) MUFG Capital Markets Syndicate.

About the Authors

Tom Joyce
Managing Director
Capital Markets Strategist
New York, NY

Tom.Joyce@mufgsecurities.com
(212) 405-7472

Tom Joyce is a Managing Director and Capital Markets Strategist within MUFG's global capital markets and investment banking business. Based in New York, Tom heads a team that creates customized analytical content for multi-national S&P 500 companies. His team provides in depth analysis on the impact of economic, political, public policy and regulatory dynamics on the US credit, foreign exchange, rates and commodities markets.

Tom has over 25 years of Investment Banking experience in New York, London, Hong Kong, and San Francisco. Over the last 15 years, Tom created and built the Capital Markets Strategy role, advising corporate C-Suite executives (Boards, CEOs, CFOs, and Treasurers) on the pervasive macro forces driving markets. Tom also presents at dozens of corporate events each year including Board meetings, CEO ExCo sessions, CFO and Treasury off-sites, corporate leadership events and conferences.

Tom's educational background includes a year of study at Oxford University from 1991 - 1992, a Bachelor of Arts in Political Science from Holy Cross College in 1993, and a MBA from Kellogg Business School, Northwestern University in 2000.

Tom resides in New Canaan, CT with his wife and four sons, where he coaches youth basketball and serves on the Board of Trustees of the New Canaan Library, the Board of the New Canaan Football (Soccer) Club and the Holy Cross College President's Council.

About the Authors

Hailey Orr

Director
Capital Markets Strategist
New York, NY

Hailey.Orr@mufgsecurities.com
(212) 405-7429

Hailey Orr is a Director in MUFG's Capital Markets Strategy group within the global capital markets and investment banking business. The team provides market based content for corporate clients to assist in strategic decision making. Focus areas include the impact of economic, political, public policy and regulatory dynamics on the US credit, foreign exchange, rates and commodities markets.

Hailey has a decade of Wall Street experience, including three years as a Consumer Sector Specialist in Equity Sales and seven years as a Capital Markets Strategist. Hailey is also a member of MUFG's Inclusion & Diversity Council and has devoted years to participating in and developing Wall Street recruiting programs.

Hailey graduated with honors from the University of Michigan's Ross School of Business with a BBA and a minor in International Studies.

In March 2020, Crain's New York Business Magazine named Hailey one of the "Rising Stars in Banking and Finance".

Stephanie Kendal

Associate
Capital Markets Strategist
New York, NY

Stephanie.Kendal@mufgsecurities.com
(212) 405-7443

Stephanie Kendal is an associate in MUFG's Capital Markets Strategy group within the global capital markets and investment banking business. The team provides market based content for corporate clients to assist in strategic decision making. Focus areas include the impact of economic, political, public policy and regulatory dynamics on the US credit, foreign exchange, rates and commodities markets.

Stephanie has spent over three years as a Capital Markets Strategist. At her prior firm, Stephanie was a part of the Americas Women's Network Junior Council and was an active member of the University of Michigan recruiting team.

Stephanie graduated with honors from the University of Michigan's Ross School of Business with a BBA .

MUFG's Capital Markets Strategy Team

The MUFG Capital Markets Strategy team provides monthly publications and weekly policy notes, presenting to Boards and C-Suite executives, on a broad range of transformative themes driving the FX, rates and credit markets including: the COVID-19 recovery, ESG's acceleration, tax code policy changes, US-China decoupling, corporate strategy, geopolitical risk and central bank monetary policy.

MUFG's Capital Markets Strategy Team

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