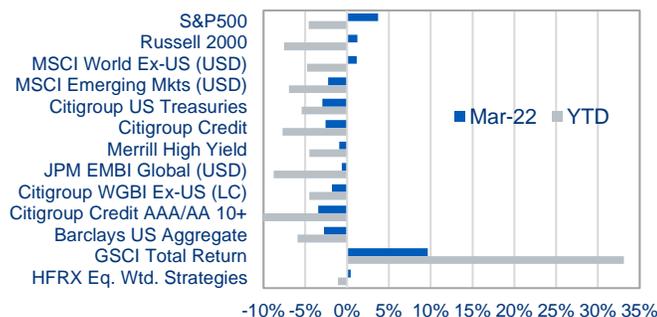


Global Market Review

Russia's invasion of Ukraine continued to roil markets in March (see appendix for a full report). The uncertainty of war combined with poor liquidity across equity, bond, and commodity markets contributed to wide price swings. Despite a large bounce in March, U.S. equities ended the quarter down. Most other advanced and emerging equity markets also fell during the quarter. Accelerating inflation driven by supply bottlenecks and soaring commodity prices led major central banks to adopt an increasingly hawkish stance. The Fed raised rates for the first time since 2018 and signaled a faster-than-expected pace of tightening. The U.S. yield curve flattened as 2-year Treasury yields saw the largest quarterly increase in 40 years. Commodities rose by over 33%, with large jumps in the prices of oil, grains, and strategic metals. The dollar benefited from safe haven flows to appreciate sharply against most major currencies.

Performance of Major Market Indices

Sources: S&P, MSCI, FTSE Russell, Barclays, Citigroup, Bank of America Merrill Lynch, J.P. Morgan, HFR, Bloomberg.



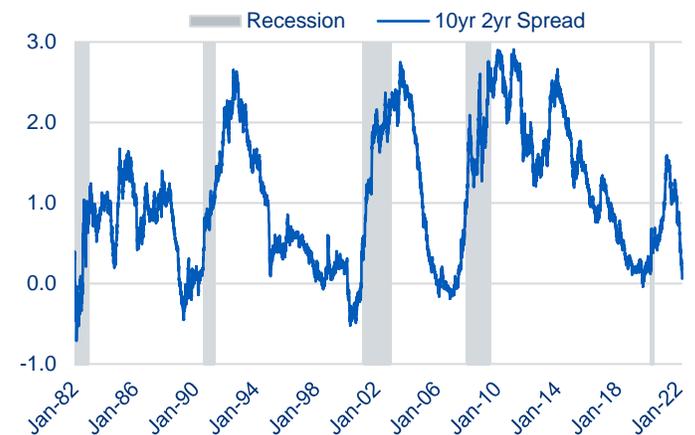
Soaring commodity prices fuel accelerating inflation.

Inflation, Invasion, Inversion...Recession?

Prior to the invasion of Ukraine, the sudden release of pent-up demand, pandemic-related supply bottlenecks, and a labor market in flux combined to entrench a powerful inflation dynamic. The invasion added an accelerant to this dynamic by disrupting exports of energy, grains, and strategic metals from Russia and Ukraine. Inflation concerns and the increasingly hawkish stance of the Fed have contributed to a flattening of the U.S. yield curve (Exhibit 1). Given that an inversion of the yield curve has been a frequent harbinger of past recessions, concerns have mounted that the U.S. economy may face a painful combination of stagnant growth and high inflation.

Exhibit 1. U.S. Yield Curve as Recession Harbinger

Source: FRED. Yield spread between 10- and 2-year Treasuries.



Despite concerns over the risk of stagflation, the S&P 500 index rebounded 3.7% in March. For the quarter, however, the S&P 500 index closed down 4.6%, but is nevertheless performing better than most other advanced and emerging equity markets. Within the U.S. market, small cap stocks (-7.5%) lost more than large (-5.1%). Growth stocks (-9.3%) underperformed value (-0.8%) by a wide margin. Across sectors, only energy and utilities enjoyed gains, while technology and telecom shares suffered sharp declines.

War and Inflation Rattle European Markets

The MSCI World ex-U.S. index of advanced non-U.S. equity markets fell 4.8% in the first quarter. European equity markets lost 7.4% as inflation in Europe hit 30-40-year highs. Europe's

heavy dependence on Russia as a key supplier of natural gas, coal, and oil, has proven to be a major vulnerability. With concerns over the security of supply mounting, natural gas prices are six times higher than a year ago and Germany and Austria are initiating plans to ration supplies. The Japanese equity market also declined sharply in the first quarter, falling 7.5% in dollar terms, largely as a result of the weakness of the yen. Widening interest rate differentials between the U.S. and Japan, the Bank of Japan's maintenance of monetary accommodation, and rising oil import prices have contributed to a 6% fall of the yen against the dollar so far this year.

Exhibit 2. Eastern European Equities Shaken by War

Source: Bloomberg. Index January 1, 2022 = 100.



Emerging equity markets lost about 7% in the first quarter, lagging their advanced economy counterparts (Exhibit 2). Eastern European bourses registered the largest declines as the invasion of Ukraine weighed on the region's economic prospects and security. Emerging economies heavily dependent on energy and food imports also endured a jump in inflation. Inflation in Turkey, for example, hit 61%, a 20-year high, reflecting the combined impact of surging import prices and an eccentric monetary policy stance that sees high interest rates as an accelerator rather than a damper of inflationary pressure. A 14.7% fall in Chinese equities was the main driver of the decline of Asian emerging equity markets. Chinese tech stocks were particularly hard hit by the pandemic-related lockdown of Shenzhen, a tech hub, as well as investor concerns over the uncertainties raised by the close alliance of China and Russia. Stocks in Latin America were the major outlier, gaining 26.3%, reflecting the positive impact of soaring commodity prices on the prospects of Brazil and other major commodity exporters.

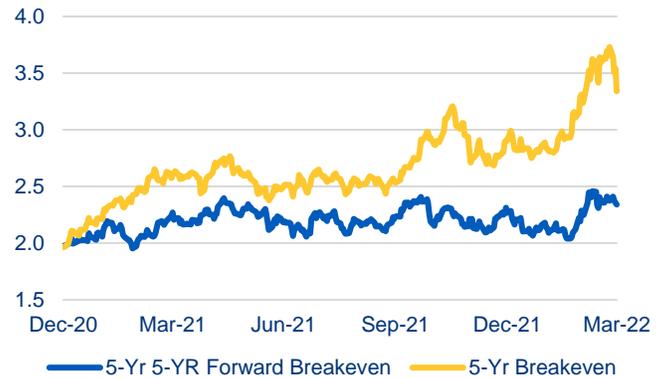
Inflation Concerns Remain Focused on Short-Term

Inflation across many advanced economies is at 30-40-year highs. Major central banks are becoming increasingly hawkish. Faced with high and rising inflation and the prospect of an increasingly aggressive monetary policy response, sovereign bond yields rose, and yield curves flattened, with the U.S. yield curve flirting with inversion (see Exhibit 1). Notwithstanding accelerating inflation, markets continue to signal that price pressures are likely to be a relatively short-term phenomenon. The current structure of bond prices suggests that inflation will

average 3.3% over the next five years, before moderating to 2.3% in the subsequent five-year period (Exhibit 3).

Exhibit 3. Expectations Point to Short-Lived Inflation

Source: FRED. Inflation expectations over near and medium horizons.



Despite this relatively benign outlook for inflation over the medium term, global bond markets plunged in the first quarter. U.S. Treasuries as a group fell 5.4%, and Treasuries with a maturity of 10+ years lost 10.4%. U.S. credit markets also saw declines, with investment grade bonds falling 6% versus a 4.4% fall for the high yield sector. The sovereign bonds of other advanced economies have also experienced steep declines, with the WGBI ex-U.S. index falling 7.1%. Emerging market bonds had the steepest losses, with the JP Morgan EMBI Global index falling 8.8% in the first three months of 2022.

War Accelerates Pace of Commodity Price Rises

Commodity prices had been rising before the invasion of Ukraine. The disruption of supplies caused by the war has accelerated this trend, contributing to a 33% rise of the GSCI index in the first quarter. Russia and the Ukraine together account for a significant proportion of the global production of oil and gas, agricultural commodities, and industrial and precious metals.

Performance of Major Market Indices through 03-31-2022

Sources: MSCI, FTSE, Barclays, Citigroup, Bank of America Merrill Lynch, J.P. Morgan, S&P GSCI, HFR, Bloomberg.

	1-Month	QTD	YTD	1-Year	3-Year	5-Year
S&P500	3.7%	-4.6%	-4.6%	15.6%	18.9%	16.0%
Russell 2000	1.2%	-7.5%	-7.5%	-5.8%	11.7%	9.7%
MSCI World Ex-US (USD)	1.2%	-4.8%	-4.8%	3.0%	8.6%	7.1%
MSCI Emerging Mkts (USD)	-2.3%	-7.0%	-7.0%	-11.4%	4.9%	6.0%
Citigroup US Treasuries	-3.0%	-5.4%	-5.4%	-3.4%	1.4%	1.8%
Citigroup Credit	-2.6%	-7.7%	-7.7%	-4.4%	2.9%	3.2%
Merrill High Yield	-0.9%	-4.5%	-4.5%	-0.3%	4.4%	4.6%
JPM EMBI Global (USD)	-0.6%	-8.8%	-8.8%	-5.7%	0.7%	1.8%
Citigroup WGBI Ex-US (LC)	-1.8%	-4.5%	-4.5%	-4.8%	-0.3%	0.8%
Citigroup Credit AAA/AA 10+	-3.5%	-10.8%	-10.8%	-2.9%	4.3%	5.1%
Barclays US Aggregate	-2.8%	-5.9%	-5.9%	-4.2%	1.7%	2.1%
GSCI Total Return	9.6%	33.1%	33.1%	64.6%	13.4%	10.0%
HFRX Eq. Wtd. Strategies	0.3%	-1.2%	-1.2%	0.0%	3.9%	2.0%

Appendix

Even before the Russian invasion of Ukraine, all of the ingredients for an uncertain and volatile market environment were in place. The world seemed to be escaping from the clutches of the pandemic, but progress was in fits and starts and the risk of reversal remained real. Consumers and businesses were uncertain about whether the social habits, consumption preferences, work practices, and trading patterns adopted during the pandemic would persist. Global debt levels were at record highs and the balance sheets of major central banks were bloated after years of quantitative easing. Inflation in the U.S. and EU was running at 40-year highs, complicating the task of central banks trying to contain inflationary pressure while also managing high debt levels, their own balance sheets, and the vulnerabilities of economies and markets accustomed to extraordinarily easy financial conditions. The invasion and the concerted and sweeping sanctions imposed in response heightened uncertainty, added to inflationary pressures, and further disrupted supply chains. Mounting revelations of war atrocities and the increased possibility that sanctions would be tightened to include a ban on energy imports from Russia to the EU increased the odds that energy shortages would push the EU (the third largest global economy) into recession. This appendix reviews the impact of the invasion on global financial markets.

Volatility

Despite the added layer of uncertainty injected by the invasion, the VIX, also known as the fear index, a measure of expected volatility implied by options on the U.S. equity market, has moderated from a post-invasion spike. Most advanced equity markets have recovered some of the losses incurred in the immediate aftermath of the invasion, but all remain down so far in 2022. The Move index, the U.S. Treasury market counterpart of the VIX, remains elevated. The war has intensified inflationary pressure, triggering an increasingly hawkish response from the Fed and other major central banks. With investor concerns vacillating between the risk of accelerating inflation and that of recession, expected bond market volatility remains high. The tighter market liquidity conditions prevailing in the U.S. Treasury and other markets is further contributing to price swings.

Exhibit 1. Implied U.S. Equity Market Volatility Moderates

Source: Bloomberg. Data from 12/31/20-3/31/22.

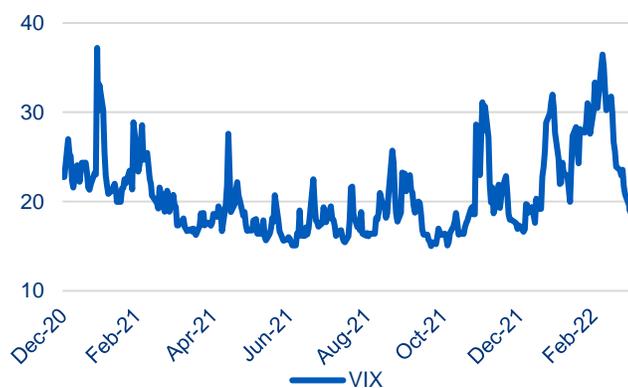


Exhibit 2. Implied Bond Market Volatility Remains Elevated

Source: Bloomberg. Data from 12/31/20-3/31/22.



Equities

A combination of strong corporate earnings, increased employment and wage growth, negative real interest rates, and a continued economic rebound from pandemic lows has helped U.S. equities recover some of the losses incurred in the wake of the invasion. European and emerging equity markets have also rebounded since their steep declines immediately following the invasion. The rebound in Europe occurred despite its heavy dependence on Russian energy imports. In the case of emerging markets, the rebound is partly attributable to the improving fortunes of commodity exporters following the spike in commodity prices.

Exhibit 3. S&P 500 Recoups Invasion Losses

Source: Bloomberg. Data from 12/31/20-3/31/22.



Exhibit 4. Commodity Exporters Boost Emerging Equities

Source: Bloomberg. Data from 12/31/20-3/31/22.



Exhibit 5. European Equities Rebound Despite Vulnerabilities

Source: Bloomberg. Data from 12/31/20-3/31/22.



Bonds

Advanced economy sovereign bond yields have continued to rise and yield curves have flattened this year. Fears of inflation and expectations for a faster than expected pace of monetary tightening have dominated safe haven flows to push yields higher. The increase in the yield of 2-year U.S. Treasury Notes in the first quarter was the largest quarterly increase in close to 40 years. The quarterly decline in advanced sovereign bond prices was also at a multi-decade high.

Exhibit 6. Inflation Pushes 10-Year U.S. Treasury Yields Up

Source: FRED. Data from 12/31/20-3/31/22. Yields in percent.

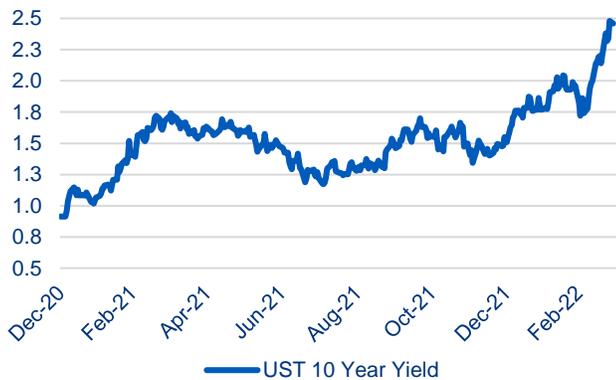


Exhibit 7. 2-Year Treasury Yields Rise at Fast Clip

Source: FRED. Data from 12/31/20-3/31/22. Yields in percent.



Exhibit 8. 10-Year Bund Yields Rise with Inflation Fears

Source: Bloomberg. Data from 12/31/20-3/31/22. Yields in percent.

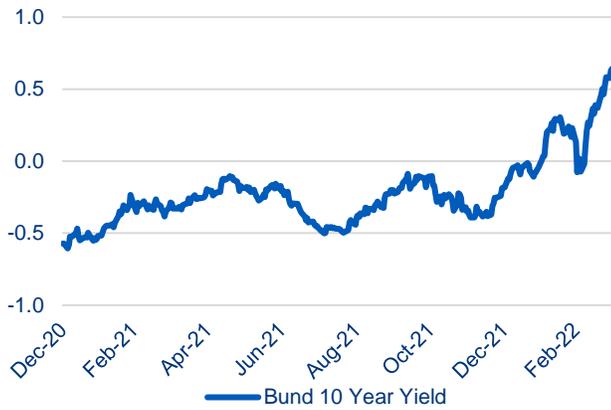
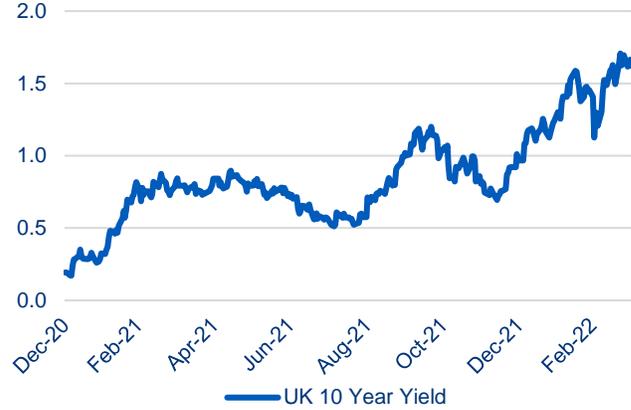


Exhibit 9. 10-Year U.K. Gilt Yields Resume Upward Trend

Source: Bloomberg. Data from 12/31/20-3/31/22. Yields in percent.



Russian Financial Markets

Sanctions have severely disrupted Russian financial markets and its ability to make international payments. The immediate impact of sanctions on Russian financial instruments was dramatic. The ruble lost half its value, Russian sovereign bonds traded at pennies on the dollar, and Russian equities plummeted, prompting the closure of the Moscow stock exchange for one month. Trading on the Moscow exchange has resumed. However, the trading of Russian equities on foreign bourses remains suspended and foreigners are not permitted to sell securities on the Moscow exchange.

Although Russian sovereign bonds and equity prices have rebounded from their post-invasion lows, they remain at depressed levels. The ruble, in contrast, has close to fully recovered its pre-invasion value. This turnaround in the face of sustained sanctions is attributable to two main factors. First, the Russian authorities have acted forcefully to prop up the ruble. Actions include the imposition of stringent controls on bank withdrawals and the transfer of money abroad as well as a doubling of interest rates by the Russian central bank. Second, Russia's external trade and current account balances have strengthened, and are set to continue to do so. Although export volumes are down, prices, notably of energy exports, are up. At the same time, Russia's domestic economy and its demand for imports are slowing. While the combination of capital controls and an expanding external current account surplus have helped the ruble to recover its value, this dynamic is not sustainable. Higher interest rates and a strong ruble will tighten financial conditions in Russia and slow economic growth. Longer term productive capacity is being further undermined by restrictions on the importation of key inputs from the west. Economic weakness and a strong currency are ultimately incompatible. Exchange rates dependent on capital controls for their stability have proven brittle in the past.

Exhibit 10. Credit Default Swap Prices Jump with Risks

Source: Bloomberg. Data from 12/31/20-3/31/22.

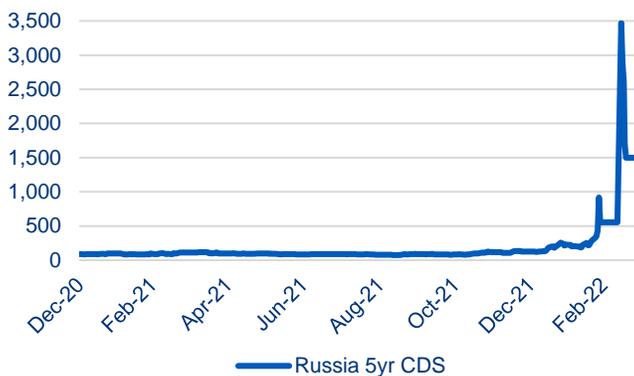


Exhibit 11. Pennies on the Dollar for Russian 25-Year Sovereign

Source: Bloomberg. Data from 12/31/20-3/31/22.

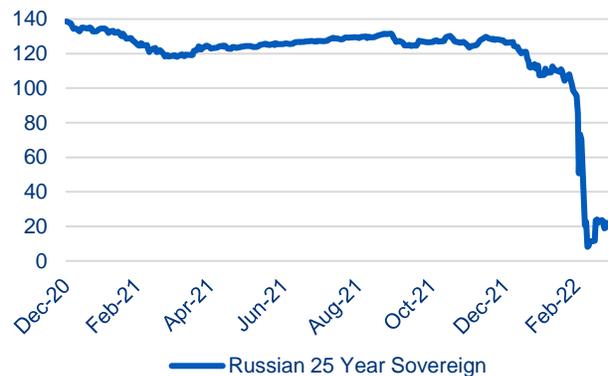


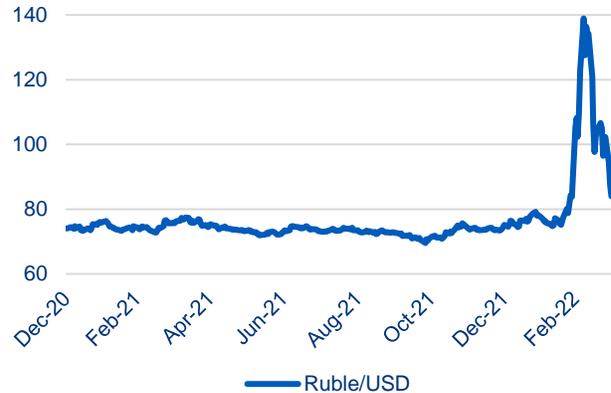
Exhibit 12. Russian Equities Rebound with Market Opening

Source: Bloomberg. Data from 12/31/20-3/31/22.



Exhibit 13. Ruble Recovery Appears Unsustainable

Source: Bloomberg. Data from 12/31/20-3/31/22.



Commodities

Commodity prices, particularly oil prices, had been rising rapidly prior to the invasion. This dynamic has accelerated since, most notably in the case of commodities produced and exported in significant quantities by Russia and Ukraine. Russia is the world's third largest oil producer and the world's largest exporter of petroleum products. About 60% of Russian petroleum product exports go to Europe and 20% to China. Russia and Ukraine account for about 28% of global wheat exports and the Ukraine is a major exporter of corn. The disruption to global agricultural commodities is compounded by the rising cost of fertilizer, whose supply has also been curtailed following the invasion. Finally, Russia is a significant producer of industrial and precious metals, accounting for 40% of global palladium output and 10% of global gold production, as well as being a significant supplier of aluminum, cobalt, copper, nickel, and titanium.

European economies are especially exposed to the disruption of energy exports from Russia, which supplies about 34% of Europe's imports of petroleum products and 40% of its natural gas. High energy costs and the prospect of severe shortages risks pushing European economies into recession. Germany and Austria are contemplating rationing natural gas. Emerging economies are also vulnerable to increasing import prices. The combination of rising food and energy import costs have hit lower income emerging markets particularly hard. Commodity exporters, notably Brazil, in contrast, have enjoyed a windfall gain.

Exhibit 14. Oil Prices Remain Elevated and Volatile

Source: Bloomberg. Data from 12/31/20-3/31/22.



Exhibit 15. Sixfold Increase in EU Natural Gas Prices in 1 Year

Source: Bloomberg. Data from 12/31/20-3/31/22.

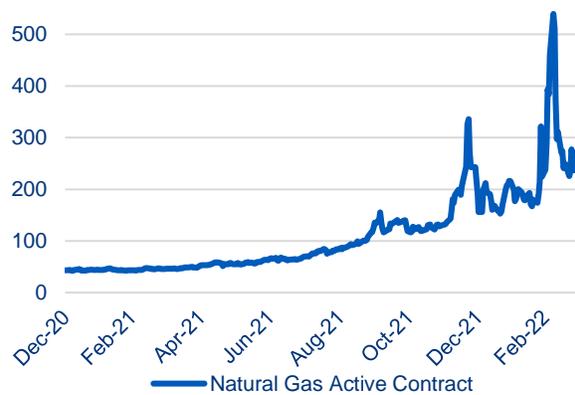


Exhibit 16. U.S. Gas Price Increases Squeeze Consumers

Source: Bloomberg. Data from 12/31/20-3/31/22.

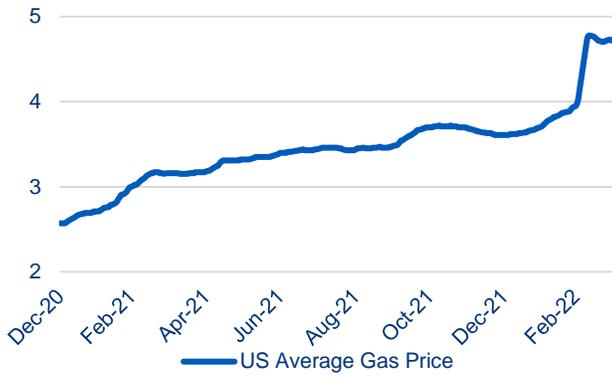


Exhibit 17. EU Diesel Fuel Prices Remain Elevated

Source: Bloomberg. Data from 12/31/20-3/31/22.

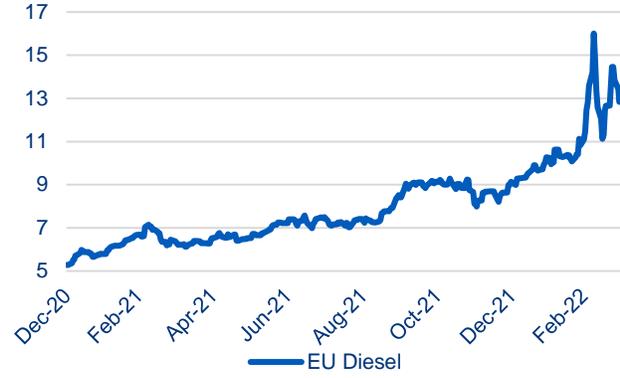


Exhibit 18. Wheat Price Increase Hits EM Economies

Source: Bloomberg. Data from 12/31/20-3/31/22.



Exhibit 19. Corn Prices Contribute to Rising Global Food Prices

Source: Bloomberg. Data from 12/31/20-3/31/22.

