Topics: A revised map of the United States; investing in equities before a recession; Russia's natural gas squeeze on Europe leads to another rescue program for Italy; the high cost of pariah status for the oil refining industry

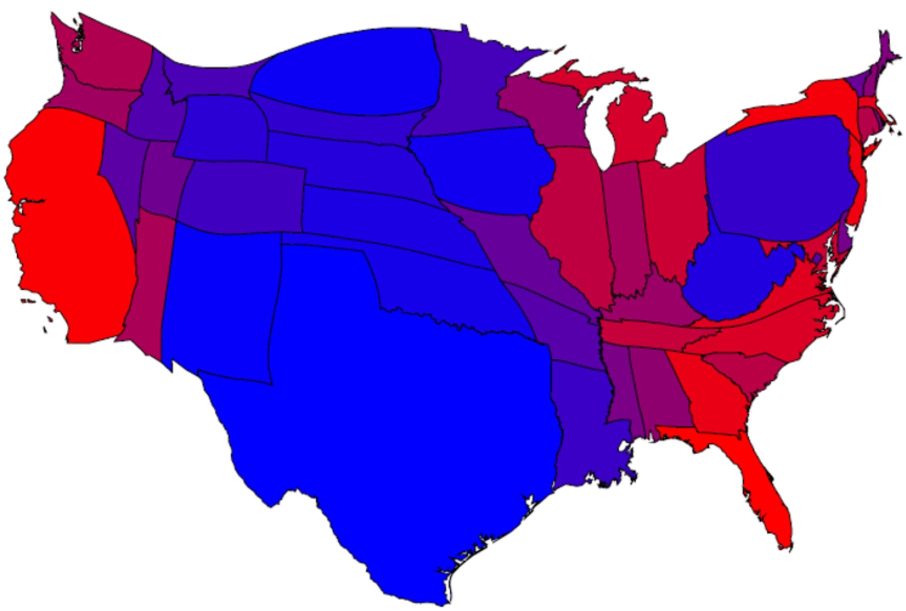
Independence Days. Europe's energy crisis, China's commodity trade war with Australia and other examples of resource nationalism (India and Indonesia restrictions on exports of wheat, sugar and palm oil) all reinforce the following: reliance on food and energy imports creates supply, price, currency stability and national security risks. In the US, food and energy imports as a percentage of consumption are the lowest out of all manufactured goods categories, resulting in a degree of **food and energy independence** uncommon to other countries.

This prompted me to create a map of the United States in which **each state is sized based on its production of food, energy and minerals**. I used 2021 production values; had I used 2022 data, the results would be more amplified. The results: states in the Northeast, Southeast and Pacific Northwest shrink relative to mid-Western and mid-Atlantic states, and Texas. As the Biden administration evaluates options to reduce the highest US food and energy inflation in decades (overtures to Saudi Arabia and Venezuela for more oil; a ban on export of US refined products[1]; gas tax holiday; increase from 10% to 15% in summertime ethanol blends to boost gasoline supply but which has driven corn prices to all-time highs - see Appendix I and II), I think about this map a lot[2].

An energy, mineral and food weighted map of the United States

States sized based on their 2021 production value of energy, food and non-fuel mining

Colors based on state production value relative to population (blue = largest output surplus, red = largest output deficit)



- **Energy includes crude oil, natural gas and coal, plus electricity generated by nuclear, solar, wind, hydro, geo-thermal and biomass**
- **Non-fuel mining includes metallic metals (cobalt, copper, iron ore, REE, nickel, platinum, palladium, zinc), construction aggregates (gravel, crushed stone, construction sand) and other industrial minerals (gypsum, lithium, peat, potash etc)**
- **Food includes gross receipts of farms (meat, dairy, poultry, fruits, vegetables, food/feed crops)**

Sources: EIA, USDA, USGS, Bloomberg, JPMAM, 2021.
Cartogram methodology adapted from Gastner, Seguy and More (Yale-NUS, PNAS, 2018).

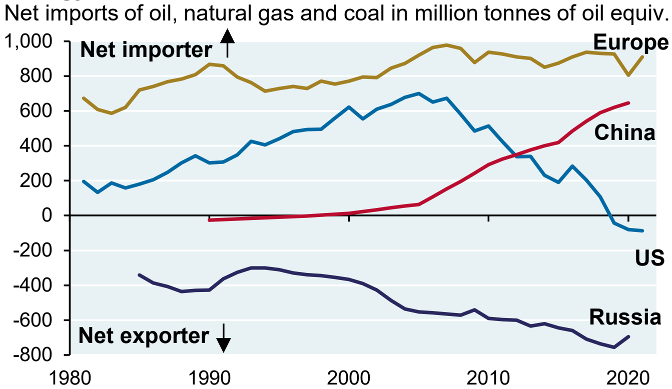
[1] **Export bans on refined products could lead, counterintuitively, to higher gasoline prices**. A refined products export ban could divert gasoline supplies to domestic markets rather than foreign ones. But given low diesel demand in the Northeast, refiners could also be stuck with excess diesel that they would have to store (i.e., an expense rather than revenues). If so, refiners might actually *cut* runs until overall refining profitability per barrel is restored. A temporary Jones Act suspension might be needed as well in order to avoid domestic shipping costs offsetting the benefits of increased gasoline supply. A better solution: an export ban on gasoline only, allowing diesel to still be exported. See JP Morgan Commodity Research, June 22, item #7.

[2] **In a future world of much greater renewable energy, US energy independence would decline**: China is by far the largest producer of PV modules, wind turbines, lithium ion batteries, electric vehicle mineral processing and related cathode and anodes.

The US is a "Republic" which ascribes electoral and legislative power to some states in this revised map that is in excess of their population shares. Their critical contributions to food and energy independence are often underappreciated by an increasingly urbanized society (see below on the energy disaster now facing Germany), so I generally believe that a Republic ends up in the "right" place. But I also know that it's a difficult time to have that discussion. There are different kinds of independence; while US energy independence has finally been attained, other kinds of US independence are suddenly disappearing. They are outside the scope of this report; I will refer you instead to press articles on JP Morgan's policies with respect to its employees and their reproductive rights and health[3].

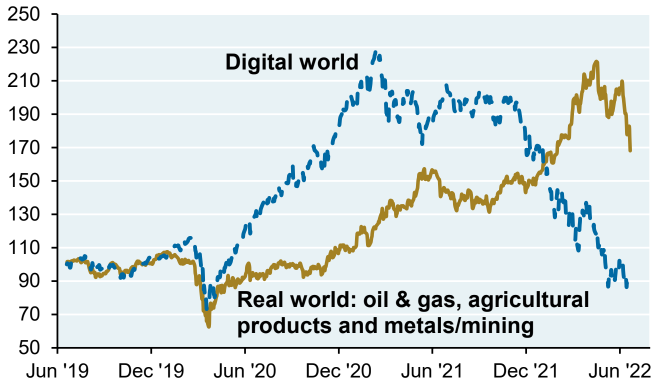
In any case, food and energy inflation and independence also bring to mind another chart below. The unwinding of the largest stimulus program in history has resulted in a **repricing of "real world" vs "digital world" assets**, with the former comprised of equities linked to the food, energy and mining products used to build the US state map. The repricing of "digital world" stocks has resulted in more reasonable growth stock valuations for the first time in a while, and is part of the "investing before a recession" topic we discuss next.

Energy dependence and independence
Net imports of oil, natural gas and coal in million tonnes of oil equiv.



Source: BP Statistical Review, NBS China, JPMAM. 2021.

The Real World vs the Digital World
Equity performance (100 = June 2019)



Source: Bloomberg, JPMAM. June 23, 2022.

Digital world: ride sharing, digital payments, cybersecurity, cloud computing, big data, social media, fintech, metaverse, food delivery, online shopping, wearable tech, peer-to-peer video, gaming, commission-free trading, video streaming and crypto

Lessons learned on energy independence: Germany

Germany, aiming for 100% renewable power by 2035, is now pushing the G7 to rescind a commitment to halt financing of overseas fossil fuel projects. Instead, Germany wants the G7 to "**acknowledge that publicly supported investment in the gas sector is necessary as a temporary response to the current energy crisis**". Why? For the first time since the war began, Russia is cutting gas supplies to Europe via the Nord Stream pipeline (see p.5), leaving Germany with only 10 weeks of supply. The risks: damage to Germany's industrial furnaces requiring 75% gas inputs, gas rationing to homes and businesses, an exodus of manufacturing jobs and a steeper recession. One vital choke point: the world's largest integrated chemical complex run by BASF which sits at the beginning of many industrial supply chains, including ammonia for fertilizer. BASF Chief Executive Martin Brudermüller: "There is no short term solution to replace natural gas from Russia".

A postscript: Eastern Europe, long wary of relying on Russian gas and ridiculed as paranoid by Germany, is moving forward with plans to source nuclear technology from the US. These countries might have sourced it from Germany had the country not sold its nuclear technology assets to Russia's Rosatom during the Merkel administration.

Sources: Bloomberg, Wall Street Journal, Foreign Policy Magazine, JPMAM.

[3] "*JPMorgan tells employees the bank will pay for travel to states that allow abortion*", CNBC, June 24, 2022. **Maybe one day** the firm will allow me to write a piece on the history of the 14th amendment, substantive due process, the 70 years of Supreme Court cases which led to *Roe* and *Casey* in the first place and the economic consequences of repeal. **Seismic shifts from the Supreme Court may not be over**: watch for a ruling on "major questions" and nondelegation doctrines. The Court might end up curtailing the ability of the Executive Branch (EPA, OSHA, USDA, DOL, etc) to promulgate rules, requiring Congress to pass legislation instead.

Investing in equities before a recession

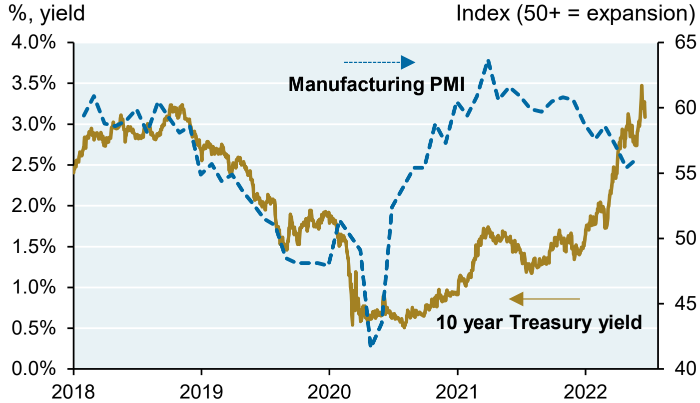
I don't know if there will be a recession in the US, but chances are rising so let's assume there will be. In the last **Eye on the Market**, we discussed how equity markets usually bottom before recessions and how equity markets were already rising by the time the recession was underway (see table below which summarizes the results). If that's the case, investors need to be on the lookout for signals that are not as stale as employment and GDP. Historically, PMI surveys have been the best leading indicators. We expect these surveys to continue falling, but will be watching closely for turning points.

Another equity market signal: in past cycles, equity markets did not bottom until long term Treasury yields were declining, or at least until they stopped rising. The first chart below shows 10 year Treasury yields; the vertical bars represent equity market bottoms. In the last three cycles, bond yields started falling well before the equity bottom. From 1950 to 1982 when rates were rising on a secular basis, Treasury rates hit their peak right at the equity bottom. So, while I'm not a technician, a sign that the PMI index has bottomed out and that Treasury yields have peaked would be a good sign for investors, even as economic data are still deteriorating.

Bond yields peak prior to equity market bottoms
Percent, 10 year Treasury yield

Source: Bloomberg, Shiller, FRED, JPMAM. June 23, 2022. Shaded bars indicate S&P 500 Index bottoms.

Looking for turning points in leading indicators and yields
%, yield
Index (50+ = expansion)



Source: Bloomberg, JPMAM. June 23, 2022.

Waiting for Godot: the opportunity cost of waiting for economic recovery before investing

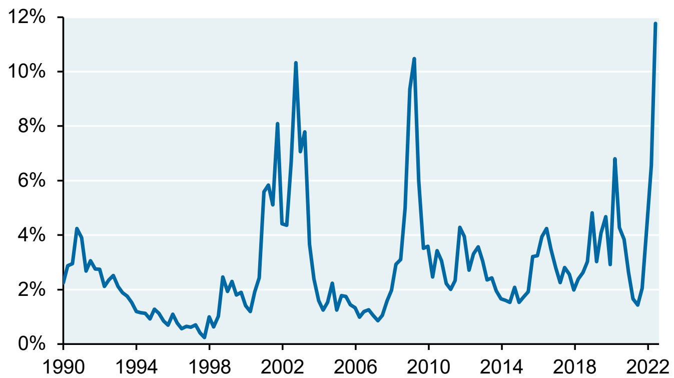
Equity market bottom	GDP bottom	Days in between	Equity market return by the time that GDP bottomed	Equity market return by the time that GDP started rising again
3/31/2020	6/30/2020	91	20%	30%
2/28/2009	6/30/2009	122	25%	44%
10/31/1990	3/31/1991	151	23%	22%
7/31/1982	9/30/1982	61	12%	31%
9/30/1974	3/31/1975	182	31%	50%
12/31/1957	3/31/1958	90	5%	13%

Source: Bloomberg, JPMAM. 2022.

Meanwhile, market signals on investor capitulation are mixed. As shown on the left, there has been a spike in the number of **companies trading below the value of cash on their balance sheets**. To be clear, companies that are destined for insolvency can trade below cash value for good reason (i.e., when the value of their non-cash assets are insufficient to repay liabilities). But as a measure of capitulation, this is a sign that investors have thrown in the towel on many of their ill-fated growth investments. In contrast, the chart on the right shows a survey of retail investor asset allocation preferences (which are still elevated) vs consumer sentiment (which has crashed). The growing gap between the two suggests that retail investors are still too optimistic.

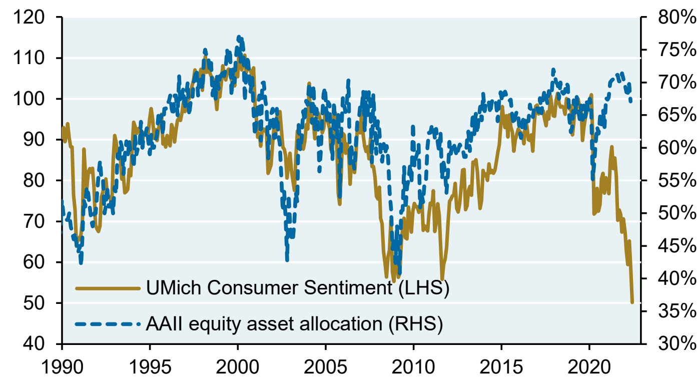
I put more stock in the first chart (i.e., more capitulation) when combined with (a) data we discussed last time on how the average stock in the Russell 1000 Growth Index, the NASDAQ and the Russell 2000 Small Cap Index is down 40%-50% from peak levels, and (b) a sharp decline in hedge fund and risk parity fund leverage[4].

Signs of capitulation: stocks trading underwater
Percent of companies trading below cash and short term investments



Source: Factset, JPMAM. June 23, 2022. Universe: CRSP all cap.

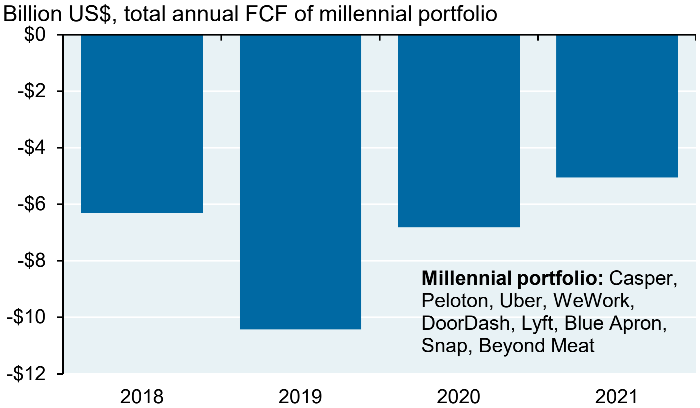
Consumer sentiment vs investor positioning
Index %



Source: University of Michigan, AAII, Bloomberg, JPMAM. June 2022.

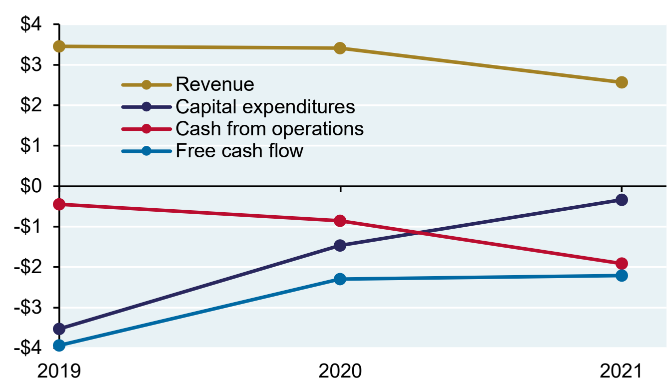
On a related note, I read an article in the *Atlantic* on the "end of the Millennial lifestyle subsidy". The article notes that millennials have effectively been subsidized by overly optimistic investors and that this subsidy is now ending. Let's assume that a prototypical millennial wakes up in a Casper bed, exercises on a Peloton, takes an Uber to their WeWork office, spends time on Snap while waiting for DoorDash to bring an Impossible Meat burger for lunch and takes Lyft home for a Blue Apron dinner. In aggregate, these companies were supported by equity investors despite having aggregate $6 to $10 billion in annual free cash flow deficits since 2018[5]. Many of these companies will now have to be profitable to survive, which may involve higher prices to customers.

Millennial portfolio: free cash flow
Billion US$, total annual FCF of millennial portfolio



Source: Bloomberg, JPMAM. June 2022.

WeWork free cash flow detail
US$, billions



Source: Bloomberg, JPMAM. June 2022.

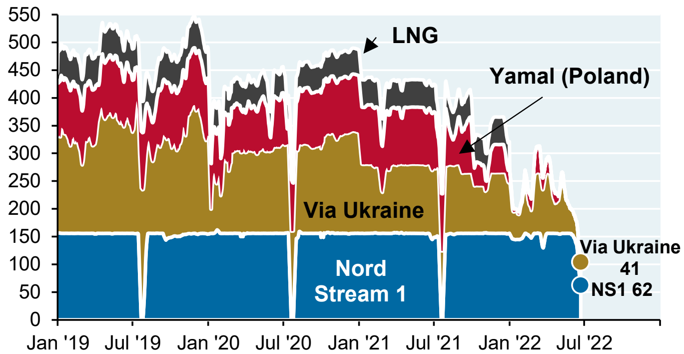
[4] JP Morgan Global Markets Strategy *Flows & Liquidity Report*, June 23, 2022, see exhibits 2 and 4

[5] One reason for the recent improvement: WeWork lost less money by reining in its footprint rather than by growing revenue or growing cash flow from operations. I thought it was notable that according to Bloomberg, the only two firms with research analysts covering WeWork are Mizuho Securities and Piper Sandler.

Russia's natural gas squeeze on Europe indirectly leads to another rescue program for Italy

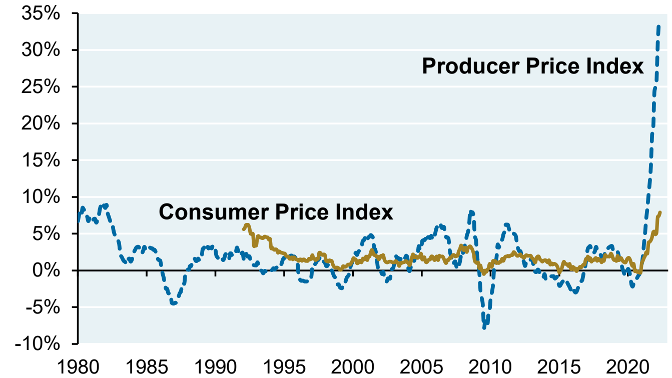
Inflation pressures are rising in Europe, in part since Russian supplies of natural gas to Europe are being cut again. For the first time since the war began, Russia cut gas flows to Europe through the Nord Stream pipeline: NS1 flows are down by 60% as Russia claims the need for turbine maintenance. Producer and consumer prices are rising in Germany at the fastest rate since 1980, and markets expect European headline inflation to hit 9% later this year which is ~2% higher than current ECB forecasts. As a reminder, natural gas shortages affect both energy and food prices since natural gas accounts for 70%-90% of nitrogenous fertilizer costs. As the ECB raises policy rates and credit spreads widen, this creates problems for one the world's most indebted countries: Italy.

Russian natural gas exports to Europe plummeting
Million cubic meters per day, 7 day average



Source: Bloomberg, EIA, JPMAM. June 22, 2022. Excludes pipelines to and through Turkey. Annual LNG data amortized daily; no LNG data for 2022.

German inflation since 1980
%, y/y change

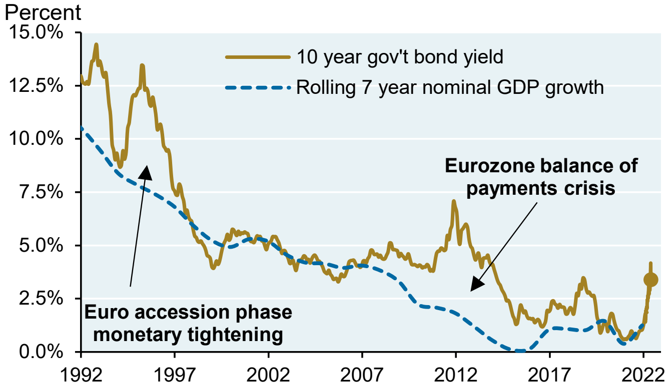


Source: Bloomberg, JPMAM. May 31, 2022.

I haven't written about Italy for a while. Its default risk declined in 2012 when the ECB partially socialized Italy's debt problem among other members of the Eurozone. Given Italy's high sovereign debt, it needs low rates: as Gavekal Research has highlighted, every time Italy's government bond yields drift above its economic growth rate (left chart), its debt ratio has gone up (right chart). Now yields are rising and growth is falling in Italy, threatening another surge in government debt.

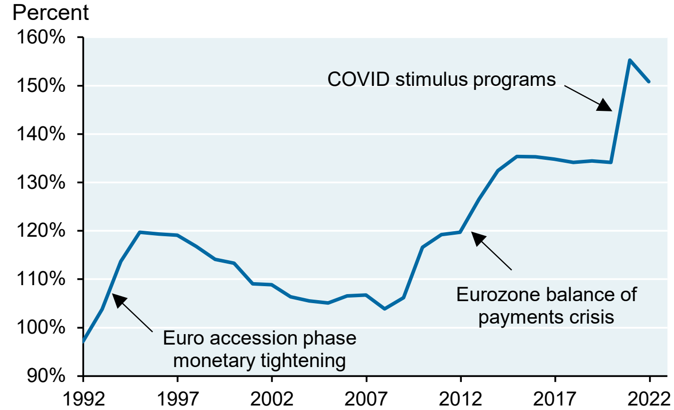
However, it looks like yet another ECB rescue program is on the way. We expect an announcement in July; the ECB organized an emergency meeting when Italian 10 year yields hit 4% (~2.5% over Germany), which appears to be some kind of tolerance threshold. We expect the ECB to "sterilize" its purchases of Italian debt by soaking up money supply via European bank deposits, similar to the Fed's repo program. As usual, the ECB hopes that the threat of intervention will be enough to drive Italian yields down without actually having to buy them. It should be obvious at this point that **Italy is a permanent financial ward of the Eurozone**, and that German savers who pay for this have effectively lost their economic independence.

Italy 10 year government bond yields vs GDP
Percent



Source: Bank of Italy, ISTAT, Bloomberg, JPMAM. June 23, 2022. Dot represents latest data point.

Italy debt to GDP ratio
Percent

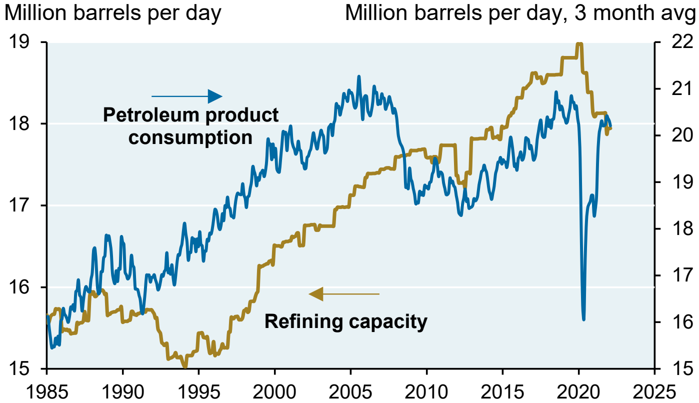


Source: Bank of Italy, ISTAT, JPMAM. 2021.

Appendix I: US refining capacity, gasoline prices and the high cost of pariah status

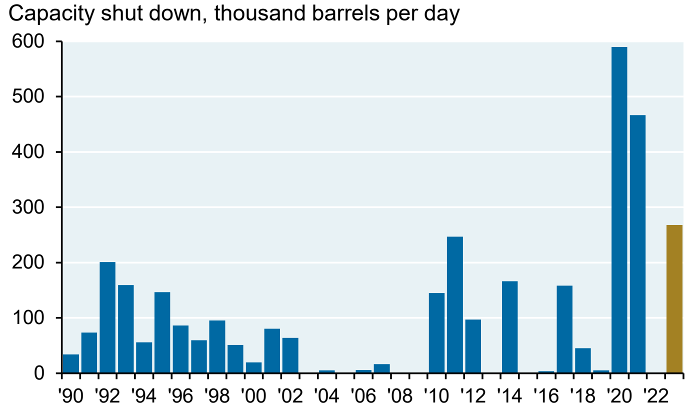
- US refining capacity has been falling since COVID while US refined product consumption is back to pre-COVID levels
- US gasoline refinery shutdowns have increased due to (a) high maintenance/repair costs, (b) declining institutional investor interest in oil & gas, (c) declining bank lending to oil & gas, (d) widespread opposition to refinery expansion and (e) conversion of refineries to biofuels instead [Marathon, Phillips 66 and HollyFrontier]. Refinery shutdowns are very costly and practically impossible to reverse
- US refineries are operating at the upper end of historical capacity utilization
- Russia is the 2nd largest refined products exporter after the US, so sanctions affect global prices for refined products
- If US refining capacity continues to decline, options for eventually importing refined products are unfavorable

US refining capacity vs petroleum product consumption
Million barrels per day	Million barrels per day, 3 month avg



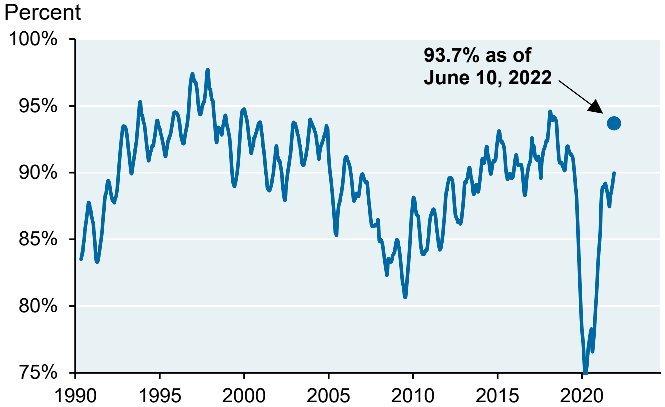
Source: EIA. March 2022.

US refineries permanently shut down by year
Capacity shut down, thousand barrels per day



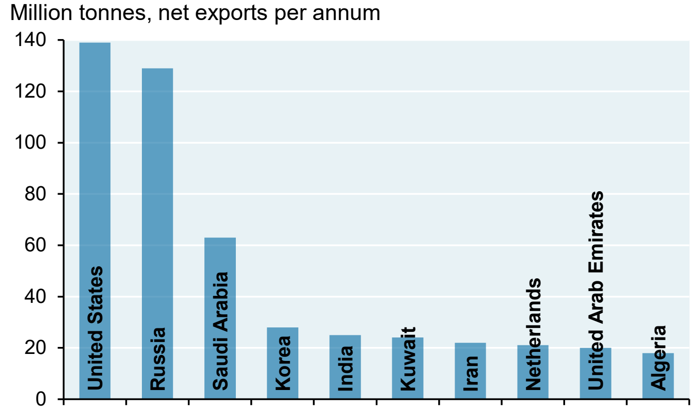
Source: EIA, JPMAM. January 2022. Gold bar represents Lyondell estimate.

Utilization rate of US refineries
Percent



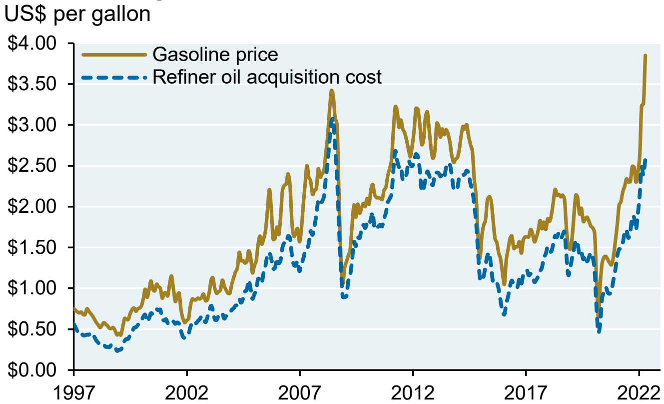
Source: EIA. June 2022. Note: 6 month rolling average.

Top exporters of petroleum products
Million tonnes, net exports per annum



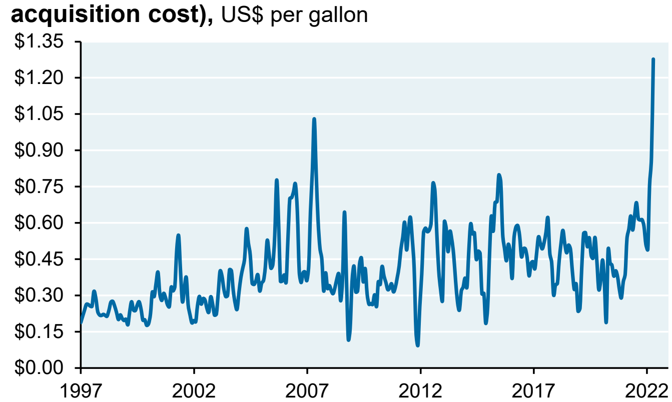
Source: IEA. 2021.

Crude oil vs gasoline prices
US$ per gallon



Source: EIA, JPMAM. May 2022.

US crack spread (refined product prices less refiner oil acquisition cost), US$ per gallon

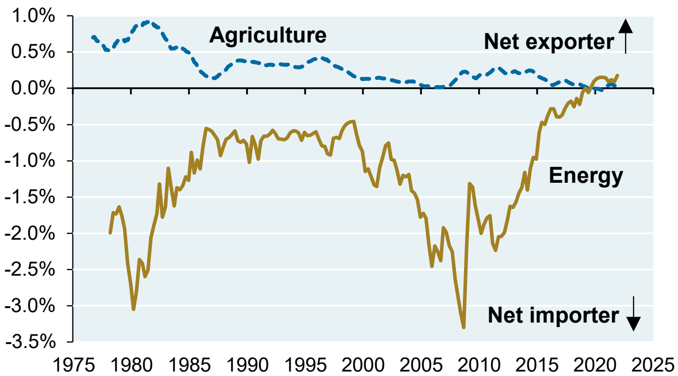


Source: EIA, JPMAM. May 2022.

Appendix II: energy/food independence and food price inflation

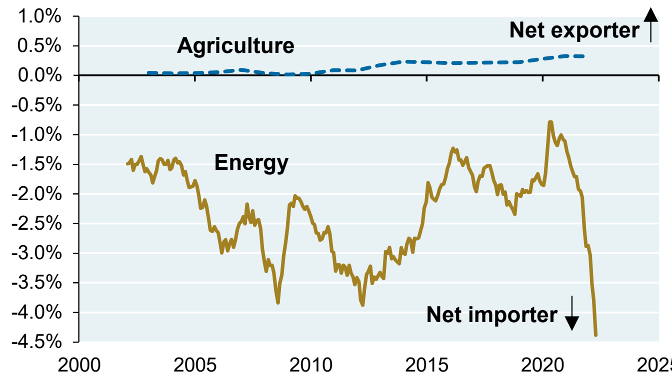
- The US has finally reached independence in both food and energy. Europe is also a net food exporter, but is still a substantial energy importer
- US farmers seeking to boost the food supply requested that the USDA relax rules related to the Conservation Reserve Program that pays them to keep land idle. So far, the USDA has only made minor adjustments, allowing farmers with CRP contracts expiring in 2022 to start planting now
- US corn prices are rising due to (a) an increase in US ethanol blends over the 2022 summer driving season, (b) the impact of rising natural gas prices on nitrogenous fertilizer costs and (c) a 25% decline in Russian fertilizer exports (Russia usually accounts for 15%-20% of global fertilizer exports, see bar chart). US tariffs on imported fertilizer have not been reduced; instead the Administration announced a grant program designed to boost fertilizer production

US food and energy independence
% of GDP



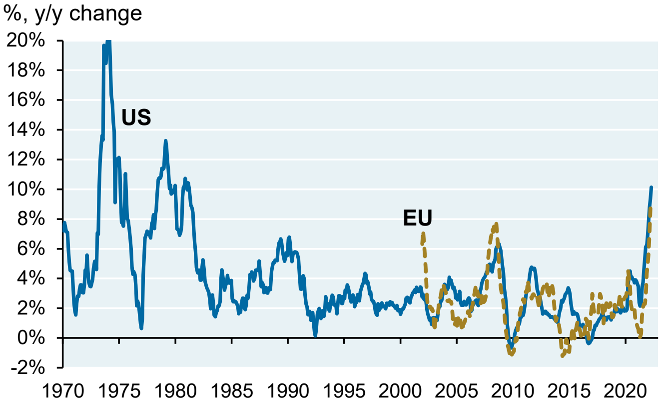
Source: USDA, BEA. April 2022.

European Union food and energy independence
% of GDP



Source: Eurostat. April 2022.

Consumer price index: food prices
%, y/y change



Source: BLS, European Statistical Office, JPMAM. May 2022.

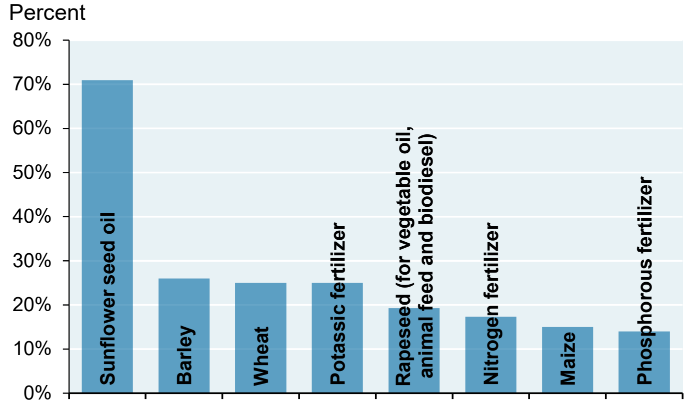
US corn prices
US$ per bushel

Source: Bloomberg, JPMAM. June 23, 2022.

North America fertilizer price index
Index (100 = January 2002)

Source: Bloomberg. June 17, 2022.

Russia and Ukraine share of global exports in 2021
Percent



Source: FAO, JPMAM. June 2022.

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