Thanksgiving Eye on the Market: the three things I'm thankful for this year

In the October Eye on the Market I wrote about how in 6 of 7 post-war recessions, equity markets preceded the decline in profits, employment and GDP by several months at least. I also mentioned that the best indicator to follow was the ISM survey, which tends to coincide with the equity market bottom +/- 2 months. So, in the interest of thinking about when equities could bottom, the first chart below projects the ISM survey by looking at new orders and inventories. Using this crude approach, the ISM would bottom in the mid-40's in December. If so, 3570 on the S&P 500 Index reached in mid-October could actually mark the low for the cycle; such a scenario should not be discounted entirely, and would be consistent with market history.

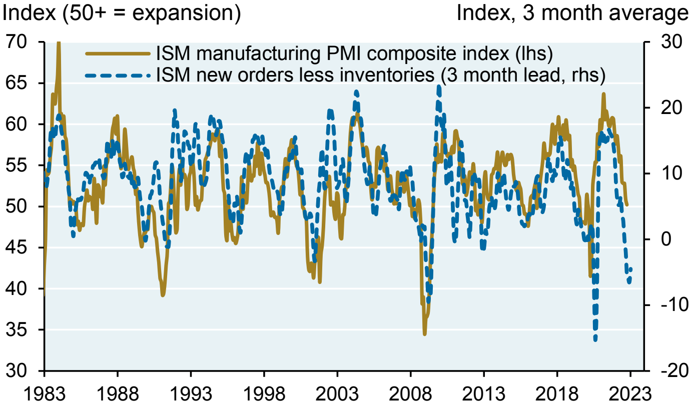
Even so, I still think that there will be more corrections ahead, and that 3200-3300 would offer very good value for long term investors if we got there. The big question now is not how high inflation is going; it's how long it will remain there. As shown in the second chart, the markets are pricing in a rapid descent in inflation, possibly due to expectations on China reopening or an end to the Russia-Ukraine war. But in the history of inflation spikes in developed countries, once inflation rises, it tends to stick around for a while. This would limit the opportunity for the Fed to rapidly reverse course and cut rates. More on all of this in our 2023 Outlook.

Sometimes I write a November Eye on the Market on things I am thankful for. My list this year: CH_4, HR4346 and mRNA-1273. This particular intersection of preferences is unlikely to be popular at dinner parties, which is why I don't go to them. In any case, Happy Thanksgiving.

Michael Cembalest, JP Morgan Asset Management

New orders less inventories predicting ISM downturn

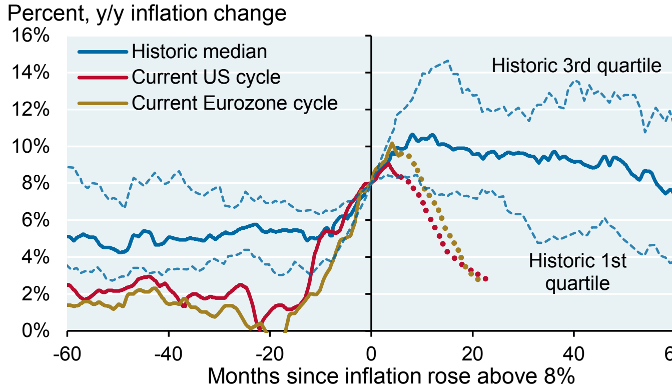
Index (50+ = expansion) Index, 3 month average



Source: Bloomberg, JPMAM. October 2022.

Developed market inflation episodes since 1970

Percent, y/y inflation change



Source: Jim Reid, Deutsche Bank. October 2022. Dotted lines indicate Bloomberg consensus.

Thanksgiving Eye on the Market: the three things I'm thankful for this year

#1: The national security and economic benefits of US natural gas (CH_4[1]) supplies

As of September 2022, this is what was happening in Europe due to soaring energy costs and reliance on Russia:

- 70% of fertilizer capacity shuttered (BASF shuttered or slowed production at 180 of its plants worldwide)
- 30% decline in aluminum smelting capacity
- ArcelorMittal to close two German electric arc furnace steel plants and others in Spain, Poland and France; Acerinox (Spain) furloughed 85% of its steel production workforce; other steel closures in Italy
- Largest German cement company (Heidelberg) warned of plant closures if energy prices remain high
- Since September 2021, 30 UK energy suppliers filed for bankruptcy; nationalization of French EDF
- Lowest level of business expectations for energy intensive German industry since reunification in 1990
- Germany sees highest inflation rate in 32 years (and in Italy, in 40 years)

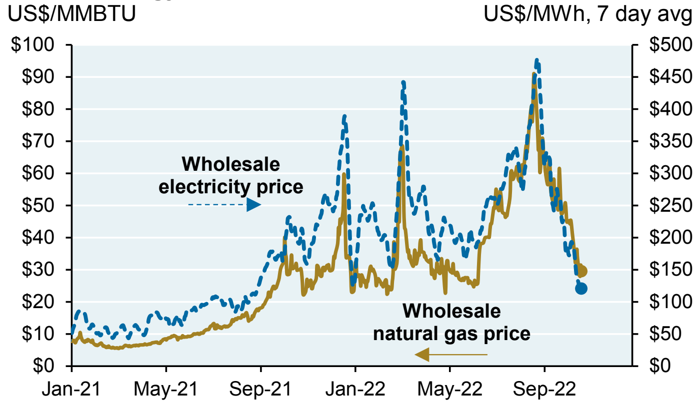
European gas and electricity prices have declined sharply since the summer peak, and there are also a wide range of initiatives underway to cap energy prices, reduce energy taxes and provide support to businesses. As a result, some of this industrial production may come back online. However, European gas and electricity prices are still 2x-3x times higher than at the beginning of 2021, European gas prices are still 6x US levels, and few European countries will be able to immunize industry from the entire shock. While Europe is set for this winter with gas storage at 90%+ of capacity, one factor offsetting the loss of Russian pipeline gas (in addition to increased LNG imports) is lower European consumption due to higher energy prices. In other words, self-imposed austerity with all of its negative economic repercussions.

If I've learned anything from the 12 years working on our annual energy paper with Vaclav, it's that the renewable transition will take time for all the technological, political, judicial, behavioral and economic reasons we discuss each year. In the meantime, I'm thankful the US has ample supplies of its own natural gas. In the latest World Energy Outlook from the International Energy Agency, global natural gas demand *rises* by 2030 and 2050 in the Stated Policies scenario, and only declines by ~15% by 2050 assuming much more aggressive decarbonization policies.

Business Climate Survey: German gas-intensive industry expectations, Index (100 = 2015)

Source: GS, IFO Institute. October 2022.

Europe energy prices

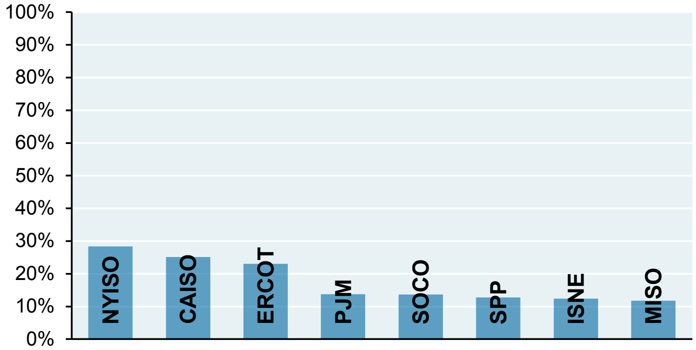


Source: Bloomberg. October 26, 2022. Dots represent latest daily price.

[1] Natural gas composition: 70%-90% CH_4, with smaller amounts of ethane, propane and butane mixed in as well. US natural gas consumption is split between electricity generation (37%), industrial production (33%) and winter heating by homes and businesses (26%).

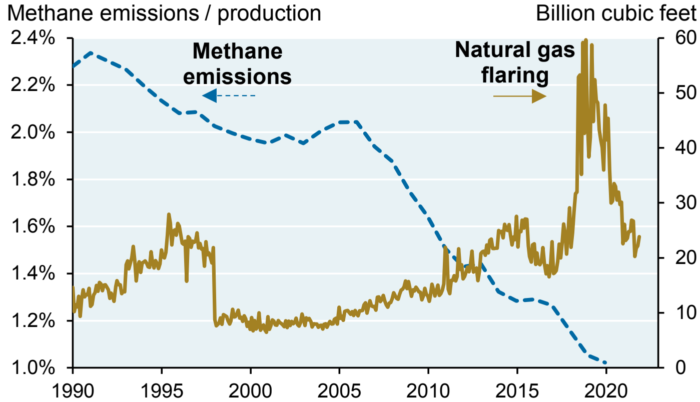
The US will need plenty of natural gas capacity even as more wind and solar power is built in response to energy bill incentives. Wind and solar intermittency creates periods during the year when there's not enough renewable generation to meet electricity demand. As a result, you typically cannot disconnect 1 MW of natural gas every time you add 1 MW of wind and solar power. The amount of natural gas that can be disconnected is referred to as a "capacity credit"; these credits are a function of specific hourly generation patterns in each region, and range from just 10% to 30% of added wind and solar power. More details in next year's energy paper in a section on the irrelevance of "levelized costs", which do not include backup power requirements.

The capacity credit: how much natural gas capacity can be reduced per MW of new wind and solar power?
%, computed for 2021, assuming new wind and solar = 10% of demand



Source: EIA data, JPMAM computations. 2022.

Methane emissions and natural gas flaring
Methane emissions / production
Billion cubic feet



Source: EPA, EIA, JPMAM. December 2021.

What about methane emissions and natural gas flaring? If you accept EPA data at face value, methane "leakage" rates from natural gas have fallen to ~1%, down from 2.3% in 1990. These rates include leakage from exploration, production, gathering, processing, transmission, storage and distribution. However, EPA emissions data is usually provided by the oil & gas industry and may not reflect variations in utilization or operating performance. As a result, climate scientists conduct their own measurements. Based on aerial, satellite and other surveillance methods, some believe that the EPA data underestimates methane leakage rates by 60%.

In a December 2021 Dallas Fed survey, while 68% and 58% of large firms had plans to reduce methane emissions and flaring, only 24% and 26% of smaller firms had similar plans. The IEA believes that emission reductions of another 75% are feasible with proven technology. I asked my colleague Ben Ratner in J.P. Morgan's Sustainability group for his thoughts on this issue, since he has done a lot of work on it. Ben's comments:

- Industry leaders have begun the important shift from desktop estimation to more accurate emission measurement (including the use of sensors on planes), committed to eliminate gas flaring by 2025 and engaged constructively with regulators
- The federal government has directly regulated methane as a pollutant under the Clean Air Act for newer facilities, while also legislating a methane fee that is designed to give way to expanded regulations
- States like Colorado, New Mexico, and Pennsylvania have instituted tight requirements for leak detection and repair, flaring minimization and other best practices
- The Oil and Gas Methane Partnership (OGMP) is a collaboration of US and European industry leaders working with civil representatives. Under OGMP's recently defined "2.0" protocols, companies agree to set a methane target, increase methane measurement and report progress annually
- Eliminating natural gas flaring is a common-sense move for companies that want to support energy security and sensibly reduce their carbon footprint. Note: in a 2019 Dallas Fed survey, 70% of respondents cited lack of pipeline capacity as the reason for Permian Basin flaring. Industry leaders do not put wells into production until pipeline capacity is available

#2: The bipartisan realism of the semiconductor "CHIPs" bill, H.R. 4346

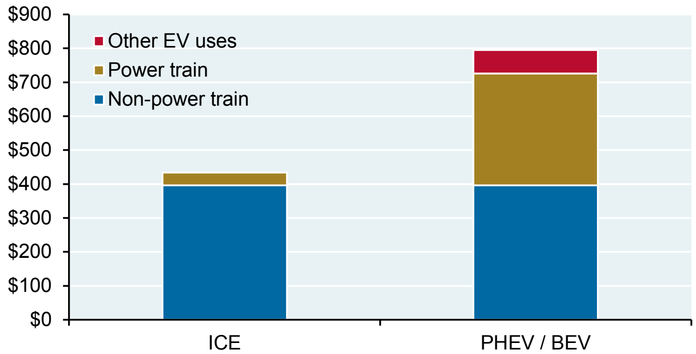
Let's continue the energy thread from the prior section. For the renewable transition to accelerate, EV adoption will have to move into overdrive. Transportation accounted for one third of US fossil fuel consumption in 2021, around half of which was passenger cars and light trucks. There are critical mineral issues to be resolved regarding EVs; we will discuss those another time and talk about semiconductors today.

As shown below, EVs have more semiconductors than internal combustion engine cars. The US will need a reliable supply of semiconductors if EVs come anywhere close to the forecasts released by the Senate in the aftermath of the energy bill. One of the sources the Senate cited estimates that 100% of US passenger car and light truck sales in 2030 will be EVs, and that 92% of Class 8 semi truck sales will be EVs as well in 2030.

Where would all the semiconductors come from? Starting in 1990, semiconductor capacity started migrating out of the US. While the US still has 47% market share of global semiconductor *revenues*, only ~40% of US semiconductor *capacity* is located in the US; the rest is in Singapore, Taiwan, China, Japan and Europe. Taiwan has the largest share of global semiconductor capacity (20%), a 50% share of higher value added logic chip capacity and 60% of the semiconductor foundry market, which refers to outsourced semiconductor production for companies like AMD, Apple, Qualcomm and Nvidia. Do I need to spell out why this might be a geopolitical and economic risk for the US? Probably not.

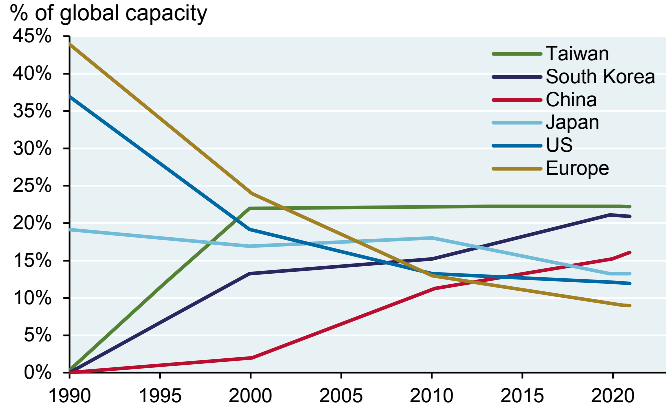
So, that's why I'm thankful for H.R. 4346, otherwise known as the semiconductor "CHIPs" bill. It creates meaningful support for US semiconductor production at a time when many US semiconductor companies are negatively affected by White House policies limiting high-end US semiconductor exports to China (Nvidia, which sell 95% of high end AI chips in China, is one example). Some critics view the CHIPs bill as "corporate welfare"; perhaps, but if your goal is improved US semiconductor supply chains, some government support will be needed to offset the impact of US national security priorities limiting their profitable exports to China.

Semiconductor content by power train
US$ per vehicle



Source: SIA, Infineon. 2021. Note: power train includes voltage regulators and integrated circuits; "other" includes sensors, motor control units, and memory.

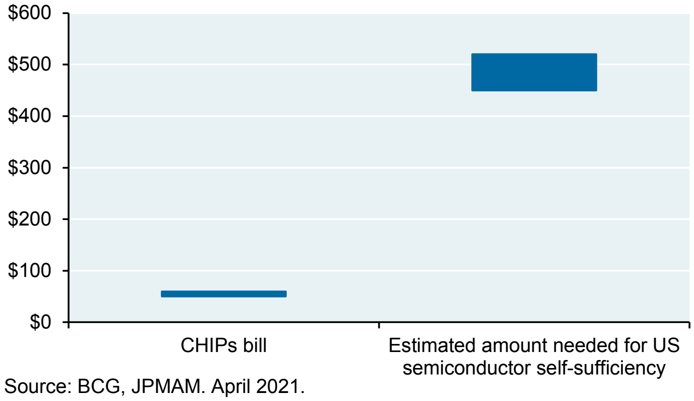
Semiconductor manufacturing capacity
% of global capacity



Source: SIA, Bloomberg. February 2021. Dotted lines represent estimates

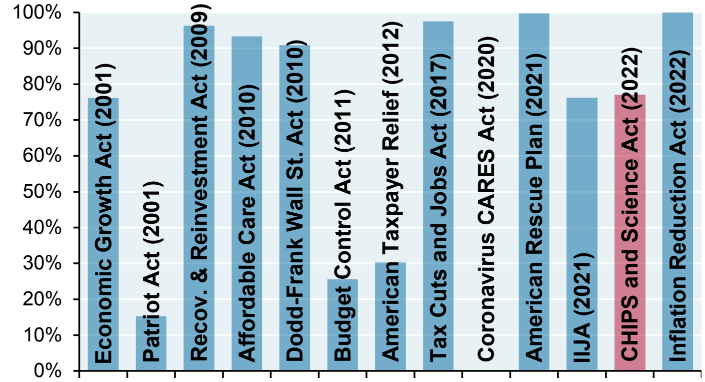
To be clear, the semiconductor bill is just a start. See the next chart below; BCG estimates that the $52 billion in the CHIPs bill dedicated to semiconductor production capacity is only 10% of what would be needed for complete US semiconductor self-sufficiency. But something is better than nothing, and at least it will begin to move the needle in the other direction and reverse some of the outsourcing trends.

Semiconductor bill spending and estimated amounts required for US self-sufficiency, US$, billions



Source: BCG, JPMAM. April 2021.

Partisanship gap for major US legislation
Average difference in "yea" votes between parties in House & Senate



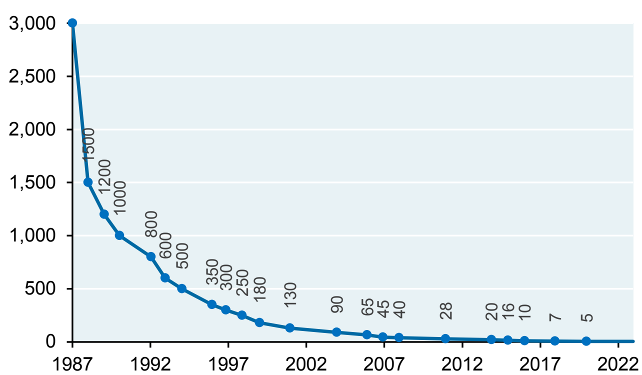
Source: US Senate, US House of Representatives, JPMAM. 2022.

Is the CHIPs bill really bipartisan? Yes. We track the partisanship of major bills since 1913 when legislation was passed creating the Federal Reserve and the first Federal income tax. The partisanship of major bills began to soar in the late 1990's, and since the year 2000 many bills have essentially been single-party legislation passed by the party controlling the White House and both chambers. The Trump Tax Cut Act was the most partisan bill in US history, surpassing the prior partisanship peak (2009 Recovery and Reinvestment Act) until it was surpassed by the partisanship of the 2021 American Rescue Plan and the 2022 Inflation Reduction Act, both of which were passed without a single GOP "yes" vote in the House or Senate. **So with that context, the CHIPs bill's support from 17 GOP Senators, 24 GOP House members and Trump's former Secretary of State Mike Pompeo can be seen as an outpouring of giddy bipartisanship**.

What about Chinese reliance on Taiwan? China accounts for 60% of global semiconductor demand, but only 10% of that demand is met via Chinese production. The other 90% is met through imports and foreign firms producing chips in China. As of 2021, Taiwan accounted for a 70% share of Chinese chip consumption: TSMC produces 10% of China's chips in its factories in Nanjing and Shanghai, and exports the remaining 60% from Taiwan. **There may be no example anywhere in the world of one country so reliant on another for a specific high-value import**. That 70% reliance figure dwarfs Europe's prewar reliance on Russian energy (around 25% of total European energy consumption in 2021). Most Chinese foundries are working on 14-28 nanometer chips while the global leaders like TSMC are already producing at 5-7 nanometers.

More background[2]: the most advanced and most profitable chips of 10, 7, 5, and 3 nm are difficult and costly to fabricate and can only be made by machines designed and built by ASML (Netherlands) using a process called extreme ultraviolet photolithography (EUV). Because of their complexity, ASML only produces 45-55 such machines per year. Advanced chip foundries require a clean room that is 10,000x cleaner than a hospital surgical room. The chip etching process, parts of which are done in a pure nitrogen environment, can take weeks operating 24 hours a day and involve 700 separate steps, many of them repeated. Completing all necessary steps in the value chain may involve multiple air flights back and forth over thousands of miles to sites with specialized capabilities. These foundries require exotic chemicals, gasses, rare metals, materials and components from thousands of companies and dozens of countries.

TSMC semiconductor capabilities
Nanometers



Source: TSMC. 2022.

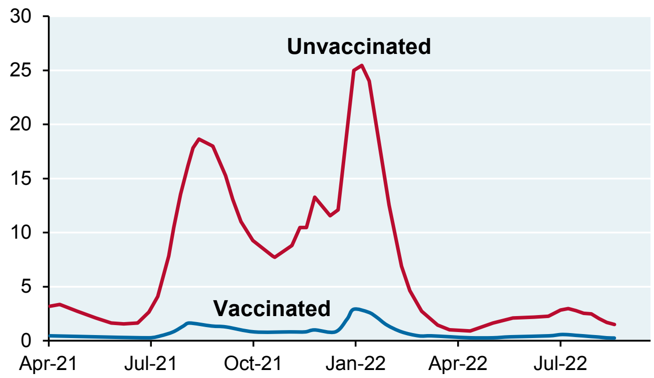
[2] "*Semiconductors and Taiwan's Silicon Shield*", Stimson Center, August 2022

#3: The remarkable success of mRNA vaccines in reducing mortality risk for people interested in taking them

The latest COVID variants are showing signs of increased resistance to existing treatments[3], the bivalent booster derived from the original variant and BA.5 only has 12%-15% uptake (the US ranks 73rd in the world on boosters per 100 residents), and vaccine-induced and infection-induced immunity is waning. And as we all know by now, current mRNA vaccines are not highly effective at preventing infection and transmission, only at preventing hospitalization and mortality. What the world needs: nasal vaccine delivery which might do a better job preventing transmission and infection, and pan-coronavirus vaccines that are not variant-specific.

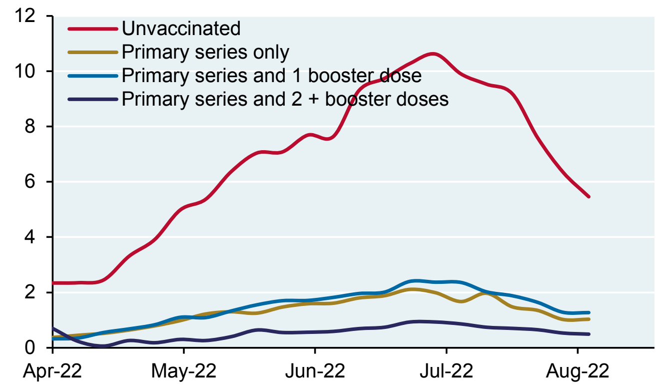
That said, I'm still very thankful for US mRNA vaccines, including the mRNA-1273 versions I have been receiving. They have saved a lot of lives in the US and elsewhere, and according to the Brown School of Public Health, they could have saved more lives if vaccination uptake were higher[4]. That is all. Happy Thanksgiving.

US COVID deaths by vaccination status: 6+ months old
Deaths per 100,000 people



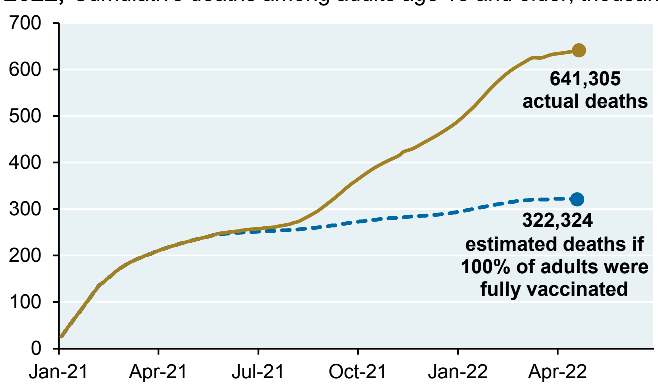
Source: CDC, JPMAM. August 28, 2022.

US COVID deaths by vaccination status: 50+ years old
Deaths per 100,000 people



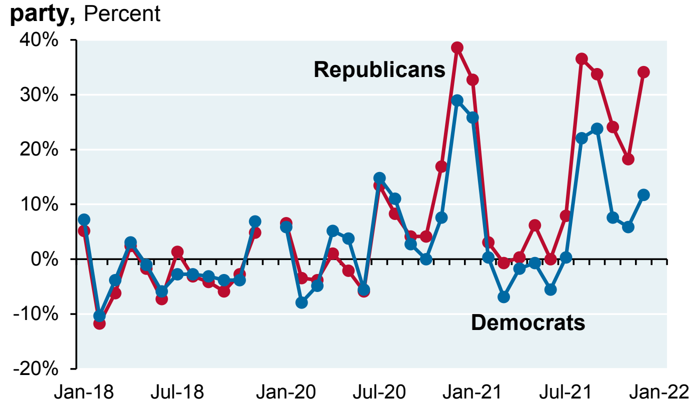
Source: CDC, JPMAM. August 28, 2022.

Preventable US COVID-19 deaths from Jan 2021 to April 2022, Cumulative deaths among adults age 18 and older, thousands



Source: Brown School of Public Health, Microsoft AI for Health. May 2022.

Age-adjusted all-cause excess death rates by registered party, Percent



Source: Yale School of Public Health. September 2022.

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[3] The **latest COVID variants** (BQ.1.1 and XBB) are more resistant to Bebtelovimab (the only monoclonal antibody let that worked against Omicron), and to Evusheld, the antibody mix used for immune compromised people

[4] Any cross-country analysis of vaccination and COVID mortality is only as good as its reported COVID data. Many developing countries have poor data collection (over 100 countries do not track or publish COVID deaths at all). As a result, **the only sensible approach would be to use "all-cause mortality" statistics instead**. High income country excess death rates are 1.3x higher than reported COVID death rates; in middle income countries, 3x higher; and in lower income countries, 6x higher. See: "*Exploring the Gap between Excess Mortality and COVID Deaths in 67 Countries*", San Marchi (University of Bologna) et al, JAMA Network Global Health Research Letter, July 2021, and "*The pandemic's true death toll: millions more than official counts*", Nature, January 2022

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