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Myth and Reality in the Great Inflation Debate: Supply Shocks and Wealth Effects in a Multipolar World Economy

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ABSTRACT

This paper critically evaluates debates over the causes of U.S. inflation. We first show that claims that the Biden stimulus was the major cause of inflation are mistaken: the key data series – stimulus spending and inflation – move dramatically out of phase. While the first ebbs quickly, the second persistently surges.

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We then look at alternative explanations of the price rises. We assess four supply side factors: imports, energy prices, rises in corporate profit margins, and COVID. We argue that discussions of COVID's impact have thus far only tangentially acknowledged the pandemic's far-reaching effects on labor markets.

We conclude that while all four factors played roles in bringing on and sustaining inflation, they cannot explain all of it. There really is an aggregate demand problem. But the surprise surge in demand did not arise from government spending. It came from the unprecedented gains in household wealth, particularly for the richest 10% of households, which we show powered the recovery of aggregate US consumption expenditure especially from July 2021.

The final cause of the inflationary surge in the U.S., therefore, was in large measure the unequal (wealth) effects of ultra-loose monetary policy during 2020-2021. This conclusion is important because inflationary pressures are unlikely to subside soon. Going forward, COVID, war, climate change, and the drift to a belligerently multipolar world system are all likely to strain global supply chains.

Our conclusion outlines how policy has to change to deal with the reality of steady, but irregular supply shocks. This type of inflation responds only at enormous cost to monetary policies, because it arises mostly from supply-side difficulties that require targeted solutions. But when supply plummets or becomes more variable, fiscal policy also has to adapt: existing explorations of ways to steady demand over the business cycle have to embrace much bolder macroeconomic measures to control over-spending when supply is temporarily constrained.

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Introduction

Economic history is full of episodes in which inflation triggered both intense social conflicts and heated debates among economists and policymakers over its causes. The present worldwide upsurge in prices is no exception: from the moment governments and central banks first pondered how to protect their citizens from COVID, inflation hawks and doves divided over whether the measures would touch off an inflationary price spiral.

The arguments intensified as government relief packages swelled and central banks not only supported those but embarked on gigantic programs of quantitative easing to buttress swooning financial markets.

Discord reached a fever pitch as the incoming Biden administration brought in what became its $1.9 trillion relief package in early 2021. Not only analysts allied with Republican administrations, but prominent Democratic economists such as Lawrence Summers predicted disaster. Summers argued that the Biden relief package, taken together with an earlier December 2020 relief package, was far too large for the likely demand shortfall that the administration intended to offset: "the gap between actual and potential output will decline from about $50 billion a month at the beginning of the year [2021] to $20 billion a month at its end. The proposed stimulus will total in the neighborhood of $150 billion a month, even before consideration of any follow-on measures. That is at least three times the size of the output shortfall… the proposed Biden stimulus is three times as large as the projected shortfall" (Summers, 2021).

To justify this judgement, the former Treasury Secretary appealed to recently issued Congressional Budget Office estimates. But he also offered selective comparisons with the Great Financial Crisis. In 2021, he claimed "unemployment is falling, rather than skyrocketing as it was in 2009, and the economy is likely before too long to receive a major boost as COVID-19 comes under control." He also warned about a large savings overhang stemming from earlier lockdowns. Together with other recovery measures already in train or likely to be passed into law, he thought that the overhang would swell total spending even more. He was apprehensive about a "further strengthening of demand as consumers spend down the approximately $1.5 trillion they accumulated last year as the pandemic curtailed their ability to spend and as promised further fiscal measures are undertaken."

While insisting that he supported relief in principle, Summers concluded that the program Biden championed was simply too rich for families of even modest incomes: "In normal times, a family of four with a pre-tax income of $1,000 a week would take home about $22,000 over the next six months. Under the Biden proposal, if the breadwinner were laid off, the family's income over the next six months would likely exceed $30,000 as a result of regular unemployment insurance, the $400-a-week special unemployment insurance benefit and tax credits." Convinced, as he forthrightly stated, that American fiscal space was constrained by the dollar and other demands for funding, he thus recommended scaling back the relief package and substituting more limited and

targeted investment programs. Over the next few weeks, Olivier Blanchard, Jason Furman, and many other economists weighed in with similar strictures and recommendations.[1]

Because inflation indeed eventually accelerated, Summers and his dissenting colleagues are now widely celebrated for their acuity. Champions of other economic approaches who opposed the stimulus are also taking victory laps, including monetarists celebrating what they see as a vindication of the predictive powers of money aggregates and sponsors of newer doctrines such as the fiscal theory of the price level.

We underestimated the extent to which inflation would become a problem. So, we undertook a review to figure out why we missed the turn and get a sense of what policy should have been. As we scrutinized the data it quickly became plain that the conventional wisdom that roots the inflationary upsurge in the Biden stimulus is seriously deficient. What is now trumpeted as a triumph of insightful economic analysis is really something else. It looks more like the fabled case of the broken clock that eventually tells the correct time: That, in other words, after being so wrong in the financial crisis of 2008 and the ensuing Euro crisis, inflation hawks finally got lucky for reasons they have not correctly identified to this day.

The result is a practical and intellectual disaster at many levels, though a full inventory of the damage is beyond the scope of this paper. The triumphal din has cast a pall over serious economic assessments of the Biden administration's early relief programs, even as statistical evidence of their success piles up.[2] Worse, the toxic combination of media hype, political pressures, and farfetched economic judgment has combined to turn that bold effort to help ordinary citizens into an international scarecrow, with some analysts holding it responsible for the rise of inflation not just in the U.S., but the whole world.[3]

Parts of the skeptics' case stretched credulity virtually from the beginning. To his great credit, in the early months of the pandemic, Summers repeatedly drew attention to COVID's possible macroeconomic consequences. But his case for overspending rested explicitly on confidence that with Biden in office, COVID would soon "come under control." This widely shared hope was soon revealed to be fatally misplaced, alas in a literal sense. By any measure—deaths officially attributed to the pandemic or the likely more accurate estimates of "excess deaths"— the deeply depressing fact is that more Americans died on Biden's watch than Donald Trump's.[4] Of course, it is ridiculous to pin all the blame on the administration, given the deadly partisan antics that Trump and many Republican officeholders indulged in and that Republican donors promoted. Still, the White House, the Center for Disease Control, and the Department of Health and Human Services must share responsibility for regulatory neglect and major policy missteps.[5]

The most consequential of these is the failure to ensure distribution of the new vaccines to the bulk of the world's population that cannot afford the manufacturers' prices, thus guaranteeing safe spaces for the virus to mutate into deadlier and more contagious variants for the indefinite future

(Sachs, 2021) (Stiglitz & Wallach, 2021). The administration has also failed to mandate improved ventilation in workplaces, schools, and public buildings, build out a nationwide testing network capable of tracking new COVID variants in real time; and rolled back far too fast most of the pandemic assistance programs for free treatment, free testing, and paid leave for workers who succumb to COVID.[6] As we will see later in this paper, the consequences of these policy failures are not all in the past, despite the President's repeated assurances before the 2022 election that "the pandemic is over" (Sullivan, Gumbrecht, Malloy, & Liptak, 2022).

Another tell-tale sign of something amiss was the yawning gulf that opened between how Summers envisioned inflation taking root and what actually happened. The Biden stimulus, he argued, could well trigger a wage-price spiral akin to the one that many economists believe caused the inflation of the 1970s.[7] His most widely read critique of the Biden plan alluded cryptically to the possibility of overheating on the scale of World War II. His subsequent statements were much blunter. "We are unlikely to achieve inflation stability without a recession of a magnitude that would take unemployment towards the 6% range," Summers told the Financial Times; later he suggested that the U.S. economy will need "five years of unemployment above 5% to contain inflation—in other words, we need two years of 7.5% unemployment or five years of 6% unemployment or one year of 10% unemployment".[8]

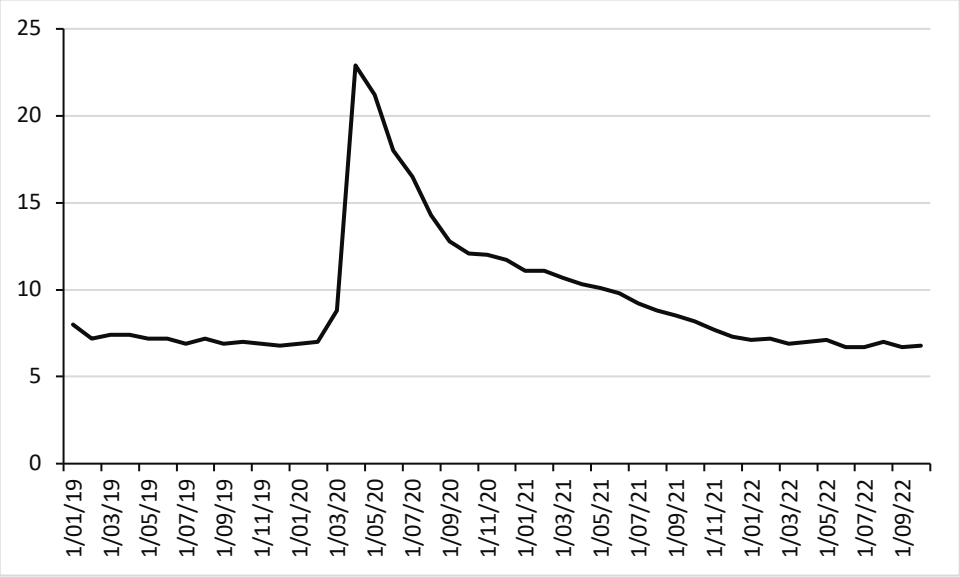
Summers and other critics of the stimulus often added an important twist to the wage/price spiral theme: the prospect of inflation triggering a flight from the dollar that would put further pressure on wages and thus intensify demands for compensatory wage increases.[9]

Neither link in the postulated doom loop ever closed. Summers' preoccupation with possible excess spending by families "of four with a pre-tax income of $1,000" was a red herring, sending analysts down a blind alley. As will shortly become clear, data show that U.S. wages have lagged behind prices throughout, usually far behind. Discussions of what a Federal Reserve staff paper (Ratner & Sim, 2022) actually styled a "Kaleckian" moment in which wages reversed their long-term trend downward and rose sharply for workers in 2021 and 2022 unhelpfully combined with the kind of fears Summers expressed to cloud analysis, as did allusions to a "Great Resignation" within the labor force and breathless media coverage of strikes. The sovereign fact about American inflation is that wages as a whole trailed behind prices and that a short, much misunderstood rise in the very lowest wages ceased after a few months. The same is true of the brief, vastly over-hyped tiny rise in the percentage of workers organized into unions in 2020 – with the Democrats back in power in 2021, the percentage of unionized workers fell back to 2019 levels (Bureau of Labor Statistics, 2022).

Nor, of course, did the dollar fall. Instead, it's rocket-like ascent as the Fed raised rates now threatens the stability of the entire world economy and is itself a major contributor to inflation elsewhere.

Those slips in Summers' argument should have raised misgivings. But another development points to another weak point in the stimulus argument: Summers' overconfidence about the downward trajectory of unemployment, which, after all was what the stimulus was supposed to fix. Jobless rates could hardly have done anything but decline from where they hovered as Biden assumed office. But they fell only slowly and remained at high levels for a long time. In January 2021, the measured rate of official unemployment that we think is least misleading – U6, the figure that includes marginally attached workers and workers employed for less time than they would like – stood at 11.1 %. In December 2021, despite all the allegedly excessive stimulus, U-6 still hung at an elevated 7.3%. It sank back to the level of December 2019 (6.8%) only in the summer of 2022 – a rate that for reasons we will explore later, we and other critics continue to view as too high.

Figure 1
The 'broad' unemployment rate (U-6)
(January 2019-October 2022)



Source: FRED database (series PCEPI). Total Unemployed, Plus All Persons Marginally Attached to the Labor Force, Plus Total Employed Part Time for Economic Reasons, as a Percent of the Civilian Labor Force Plus All Persons Marginally Attached to the Labor Force (U-6), Percent, Monthly, Seasonally Adjusted.

For all these reasons, a critical reappraisal of the case in favor of monetary tightening pressed by inflation hawks is overdue. But with a few exceptions, it has not happened. The steep fall in stock markets in recent months has tempered the enthusiasm for higher interest rates of more than a few bankers, as have fears of a developing crisis in emerging markets (Storm, 2022). But central banks around the world have thus far continued raising rates, while Summers and like-minded colleagues in economics and financial markets trumpet the need for more.

This paper undertakes a fresh analysis of the U.S. inflation experience since COVID in hopes of setting the record straight and identifying less destructive pathways forward than round after round of interest rate increases.

Our discussion is organized as follows. The first section of our paper begins by retracing inflation's time path in the United States. This lays out benchmarks and GDP data that sets the stage for our discussion in section 2 of whether the observed pattern of price rises is consistent with claims about the role of the Biden stimulus in generating excess demand. Scrutiny of inflation's course also prepares the way for the analysis in later parts of our paper of how the twin crises of 2022 – the outbreak of war in Ukraine and the off-the-charts weather extremes that so much of the world experienced – have recast the problem of inflation going forward.

Section 2 details our critical analysis of the claims about the Biden stimulus. Our demonstration of their spuriousness proceeds in three steps. First, we build on section 1's discussion of inflation's course to show how outlandish are notions that rounds of federal (and state-level) pandemic relief spending somehow fueled mighty bursts of consumer demand. The two key data series – stimulus spending and inflation – move dramatically out of phase. While the first ebbs quickly, the second only surges.

We then look at alternative explanations of the price rises. We do this both to rule out any possibility that one or the other could somehow rescue hypotheses about the importance of the stimulus, but, more importantly, we want to assess their own intrinsic limits. We consider in turn four supply side sources of inflation: imports, energy prices, rises in corporate profit margins, and COVID. We believe discussions of COVID's impact have thus far only tangentially acknowledged its importance. In particular, the analysis of its impact on low-wage labor markets in the U.S. has missed important implications of COVID's continuing importance for wage patterns. The pandemic continues to wreak havoc in labor markets in complex ways that analysts and governments have yet to grapple with, not just directly but now also in the form of long COVID and COVID induced complications to other illnesses.

Our conclusion is that these commonly cited factors played critical roles in bringing on and sustaining inflation, but they cannot explain all of it. There really is an aggregate demand problem when supply is constrained. But the source of this surprise surge in demand was not federal government spending. It came from the unprecedented gains in household wealth, particularly for the richest 10% of households, which we show powered the recovery of aggregate U.S. consumption expenditure especially from July 2021. Analysts who have fastened on excess bank reserves generated by quantitative easing as the cause of this spending miss the key point: Reserves (and for that matter the money supply figured any number of ways) have long towered far over legal requirements. But with the waning of the vast Omicron wave of COVID, affluent Americans came out in force and started spending. They had not done this earlier, at virtually the same level of bank reserves.[10]

Section 3 considers how the war in Ukraine and the climate shocks of the summer of 2022 have now added entirely new dimensions to the problem of inflation going forward. The outbreak of war in February had dramatic effects on prices for food, energy, and other important commodities, including fertilizers. More fundamentally, the western democratic countries' sanctions on Russia, especially the restrictions on the use of the U.S. dollar, abruptly reshuffled existing military alliances and defense arrangements, not simply in NATO, but also in the Pacific. With friction increasing between the U.S. and China, the shifts in the military balance and alliances vastly accelerated evolving patterns in the global economy and the international relations system that until then were maturing at a glacial pace. This newly minted "New World Order" has profound implications for the reliability of global supply chains and patterns of demand, not least in energy. In our view, it implies a long period of intensified and irregularly variable pressures on supply chains that will keep interacting with COVID and climate extremes. Depending on how peripheral wars flare up and down, further changes in alliances and safe areas for commerce will disrupt trading patterns as parts of the world economy partially decouple from each other.

Our conclusion outlines how we believe policies for dealing with inflation have to change, if the majority of the world's population is not to be stressed to an inhuman degree. Our argument is basically that current inflation combines the worst of war time price rises and the price cycles that wracked earlier agricultural societies. It responds only at enormous cost to monetary policies, because it arises mostly from supply-side difficulties.

Many of these pressures, unfortunately, will vary directly with the extent to which cooperation, rather than destructive competition prevails in the new, rapidly evolving system of international relations. Without serious efforts to restrain super-power interventions, arms spending, and resort to war, no inflation containment strategy is likely to work very well. If, somehow, the current drift toward a multipolar system with a bias toward intensifying conflict can be arrested, then inflation control will be much easier. But supply-side inflation can only be dealt with efficiently through initiatives that work on the supply issues, such as vigorous antitrust, tight limits on commodities markets, and other targeted (microeconomic) regulatory measures, together with major investments in public health and renewable energy.

Fiscal policy also has to adapt: to control supply shock inflation of the type the world is now fated to experience, existing explorations of ways to steady demand over the business cycle have to embrace much bolder macroeconomic measures to control over-spending when supply plummets or becomes more volatile. Some of these include measures in the spirit of (Keynes, 1940); another could be progressive consumption taxes.

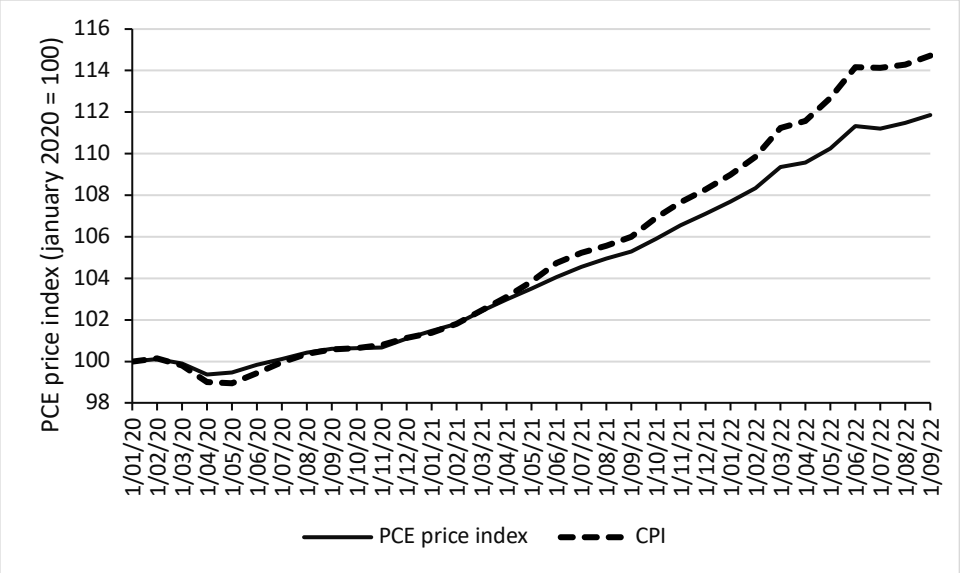
The Time Path of Inflation: A Closer Look

The heart of the case pressed by Summers and other critics of the Biden stimulus is that the increase in US inflation has been caused by rising personal consumption expenditure, funded by the various rounds of federal (and state-level) pandemic relief spending.

To see whether these claims make any sense, we begin with a look at the course of inflation. The personal consumption expenditure price index (PCE index) and other statistical series that trace inflation's progress since January 2020 are all very short time series in econometric terms. As a consequence, it makes little sense to press arguments that rest on fine grained statistical tests. Still, a review of the data is indispensable to orient our discussion and guard against common misinterpretations. The Federal Reserve's Federal Open Market Committee (FOMC) focuses on the personal consumption expenditures price index (PCE) from the Bureau of Economic Analysis in its quarterly economic projections and also states its longer-run inflation goal in terms of headline PCE (Bullard, 2013). The alternative measure of consumer price inflation is the consumer price index (CPI) from the Bureau of Labor Statistics. The PCE price index includes a more comprehensive coverage of goods and services than the CPI; the 'narrower' CPI tends to show more inflation than the PCE price index.

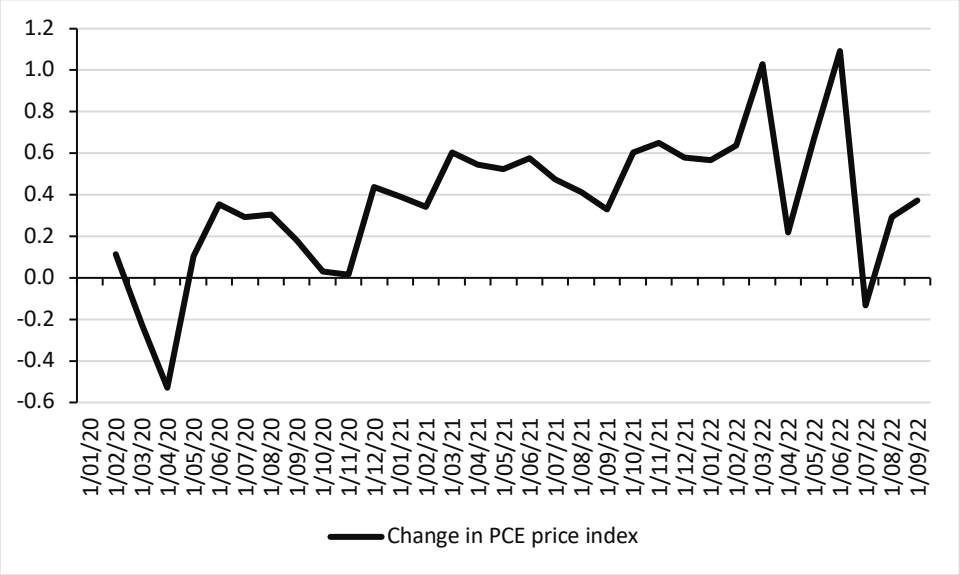
Let us consider the evolution of the PCE price index (January 2020 = 100) during January 2020 and September 2022 (**Figure 2**). For reference, we also include the CPI (January 2020 = 100) in the graph. The PCE price index increased by 11.5 percentage points during this period (while the CPI rose by 14.7%). During the first one-and-half years (i.e., from January 2020 to June 2021, the increase in the PCE price index was rather limited: the rise in the index amounted to 4 percentage points. In June 2021, the annualized rate of PCE inflation was 4%.

Figure 2
The monthly PCE price index and the CPI, January 2020-September 2022
(January 2020 = 100)



Source: FRED database (*series* PCEPI and CPIAUCSL).

Figure 3
Change in the monthly PCE price index, February 2020-September 2022
(January 2020 = 100)



Source: FRED database (series PCEPI).

During the next 14 months (July 2021 – September 2022), we observe steadily larger increases in the PCE price index (see **Figure 3**). During this period, the PCE price index rose by 7.8 percentage points. The annualized PCE inflation rate in September 2022 is 6.6%.

In cumulative terms, the PCE price index rose by 4.7 percentage points during the first eight months of 2022—more than the cumulative increase during the 18 months period January 2020-June 2021. It is clear that PCE inflation has accelerated during the second half of 2021 and (especially) the first half of 2022. The largest jumps, it is worth noting, coincide with the war in Ukraine, not any stimulus.

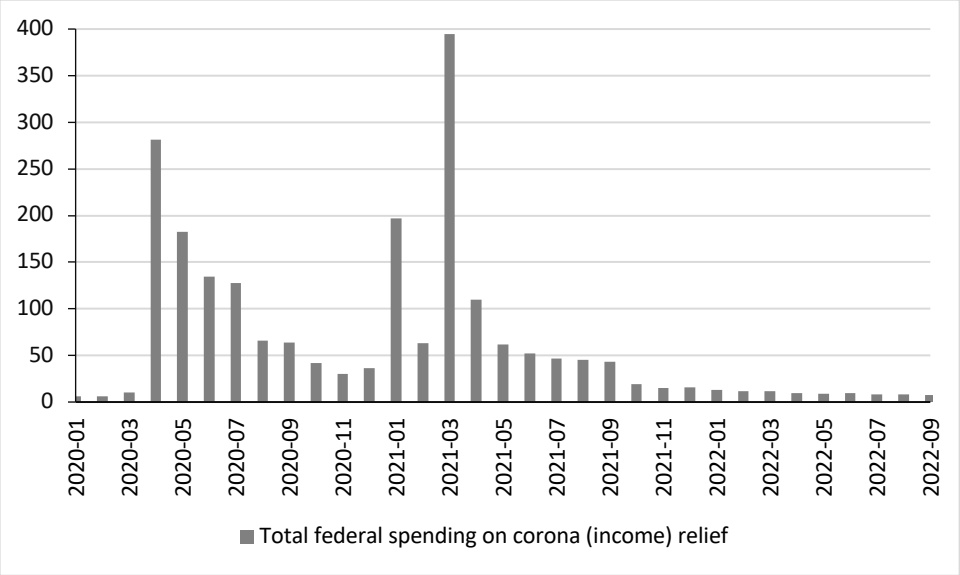
Our first question is whether the pattern of price rises observed in **Figures 2** and **3** is consistent with claims about the role of the Biden stimulus in generating excess demand.

Monthly total federal pandemic relief spending appears in **Figure 4**.[11] Cumulative pandemic relief spending by the federal government during March 2020-July 2022 amounted to $2,110 billion. As can be seen in **Figure 4**, total federal emergency income relief peaked in April 2020 (amounting to $281 billion), in January 2021 ($197 billion) and in March 2021 ($395 billion). Pandemic relief spending levels off almost completely after June 2021.

Figure 4

Total federal corona relief spending during January 2020-September 2022

(Billions of US dollars, current prices, monthly)



Source: Bureau of Economic Analysis (BEA), 'Effects of Selected Federal Pandemic Response Programs on Personal Income' (https://www.bea.gov/recovery/). The pandemic relief spending comes under two (broad) headings: (*a*) unemployment insurance; and (*b*) government social benefits to persons (see Appendix).

In fact, and this is important, almost 90% of cumulative pandemic relief expenditure to individuals and businesses (worth $2.1 trillion) during March 2020-July 2022 occurred during the first 15 months of the COVID19 crisis, *i.e.*, during March 2020-June 2021. This presents us with a puzzle: almost all of the corona income support was paid and received before the second half of 2021, *i.e.*, well before the PCE inflation rate began to rise (**Figure 3**). What has been driving rising consumer price inflation in the US, if it cannot be straightforwardly linked to (federal) pandemic relief spending?

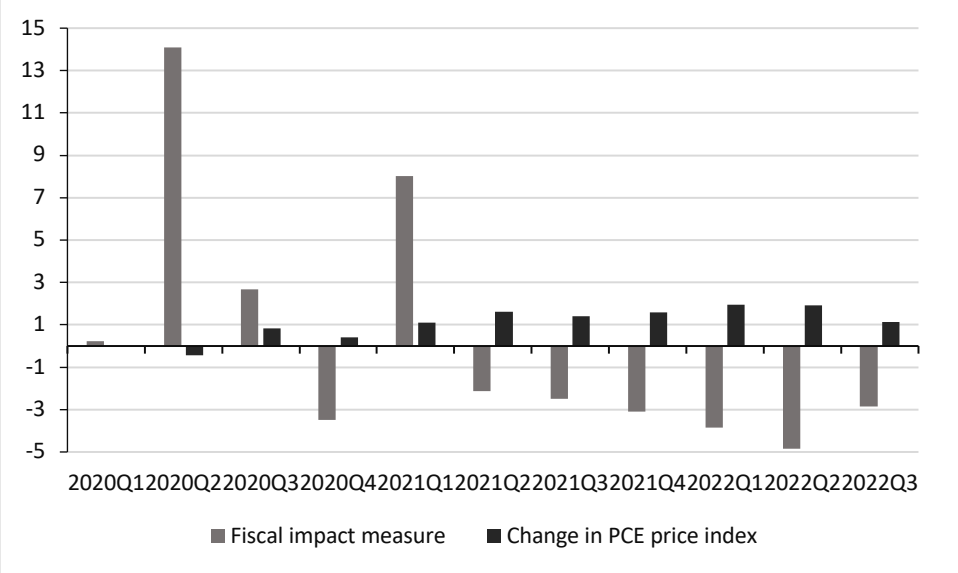
The mystery is underscored by **Figure 5**, which tabulates the Brookings Institute Hutchins Center Fiscal Impact Measure against the quarterly change in the PCE price index (2020Q1-2022Q3). The Hutchins Center measure shows how much local, state, and federal tax and spending policy adds to or subtracts from overall U.S. economic growth (Asdourian, Salwati, & Sheiner, 2022). It can be seen that the positive growth impacts of the various rounds of fiscal support occurred in the second and third quarters of 2020 and the first quarter of 2021. But from the second quarter of 2021 onwards, fiscal policy has been a drag on economic growth, driven by the waning effects of the pandemic relief spending (**Figure 4**), a rise in federal and state tax collections and declines in real federal, state and local purchases. It is obvious that the fiscal drag on U.S. economic growth

coincides in time with rising PCE inflation, directly contradicting the claims of Summers and other critics.

This conclusion is confirmed by (Parker, Schild, Erhard, & Johnson, 2022), who used data from the Consumer Expenditure (CE) Interview Survey to estimate the impact on (non-durable) consumer spending of the three waves of Economic Impact Payments (EIPs) to American households. These authors find that households spent only a small fraction of their 2020 and January 2021 EIPs within a couple of months of arrival and for the third round of EIPs in March 2021, their estimates imply almost no spending response, not in the short and not in the longer run. Taken together, these findings should put to bed claims that the surge in inflation has been caused by Biden's pandemic relief spending.

Figure 5

Hutchins Center Fiscal Impact Measure (FIM) and quarterly change in the PCE price index (2020Q1-2022Q3)



Source: Hutchins Center Fiscal Impact Measure; see text.

Below we will show that there has been another *demand-side* factor – unprecedented gains in household wealth, particularly for the richest 10% of households—which has helped the recovery of aggregate US consumption expenditure during July 2021 and August 2022.

Four Less Famous Supply-Side Causes of Higher Inflation

However, before we proceed, we have to consider four *supply-side* causes of rising PCE inflation, which have undoubtedly and significantly affected US consumer price inflation, in addition to excessive (consumer) demand, namely: (*1*) higher import prices; (*2*) higher energy prices; (*3*) higher corporate profit margins; and (*4*) the impact of COVID19 on wages in (mostly) low-wage occupations that had previously been considered safe. It must be noted that since Biden assumed office interest in the impact of these supply side factors has waned; Summers, Blanchard, and Furman instead focus on demand-pull inflation (through higher wages), arguing that 'supply is what it is' and (unlike demand) beyond the control of macroeconomic policy.[12]

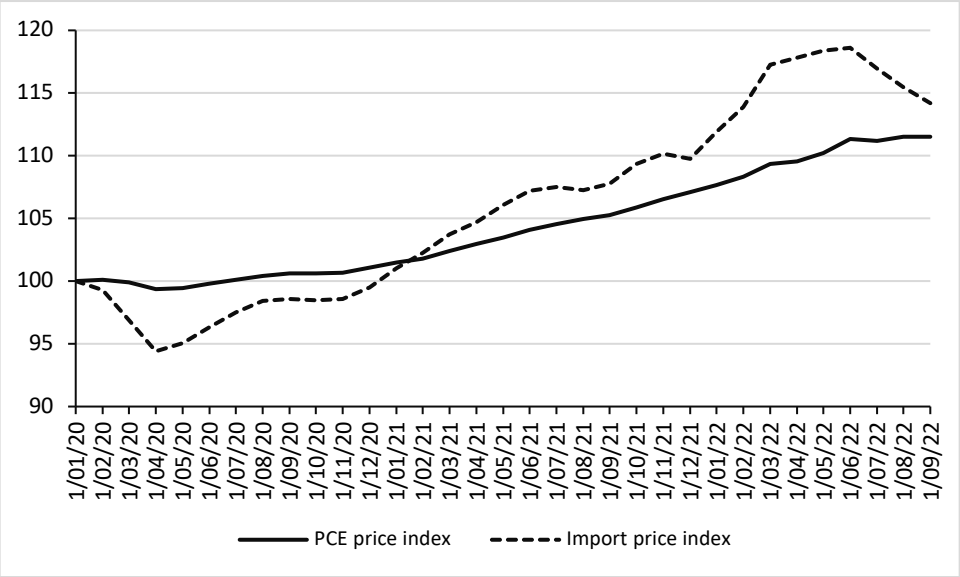
First Supply-Side Factor: Higher Import Prices

Let us look at the rise in import prices first. Summers & Co. pin blame for inflation primarily on domestic macroeconomic policy mistakes in Washington, making little out of the fact that prices are also rising rapidly in other advanced and emerging economies, which responded to the pandemic with much less expansionary macroeconomic policies. Inflation is rising as well in the rest of the world, because of a surge in global import prices, which is unrelated to the pandemic relief spending in the US, but must be attributed to repeated lockdowns in China, COVID clogged global supply chains, and speculation in financial (commodities and energy) markets that were deregulated partly on Summers's watch in the late 1990s, as well as, recently, shortages caused by the war and climate disasters.[13]

Higher import prices have been a key driver of higher PCE inflation. (The correlation coefficient between the PCE price index and the (general) import price index for the U.S. is 0.99). The general index of U.S. import prices, normalized to 100 in January 2020, had increased by almost 17 percent in July 2022 (**Figure 6**). Import prices affect U.S. inflation both because imports are used as inputs in domestic production and because foreign firms directly compete with U.S. firms in final goods markets. Import prices have risen by 50 percent for industrial supplies and materials since early 2020. These products are used as inputs in a broad range of industries. Import prices of food, feeds & beverages have risen by 15 percent during January 2020 and August 2022, while prices of final consumer goods and capital goods have also grown throughout 2021, but are currently only about 3 percent higher than at the beginning of the COVID pandemic.

Figure 6

The monthly PCE price index and import price index,
January 2020 – September 2022 (January 2020 = 100)

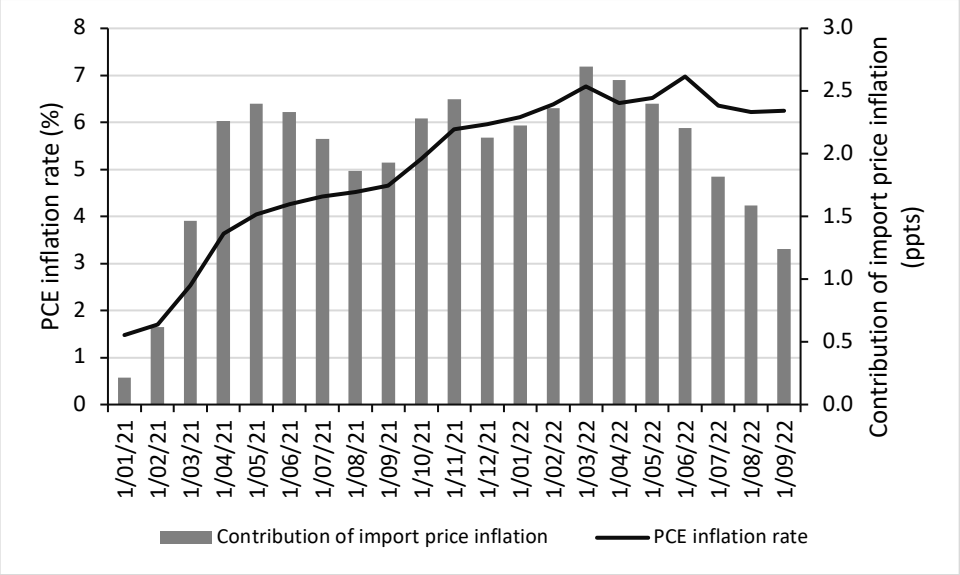


Source: FRED database (*series* PCEPI and IR).

Estimates of the pass through of import prices to consumer prices vary, but not importantly. We use the study by (Taylor & Barbosa-Filho, 2021), according to which a one percentage-point increase in import prices pushes up U.S. consumer prices by approximately 0.207 percentage points. Using this figure, we have calculated the contribution of (monthly) import price inflation to the (monthly) PCE inflation rate for the period January 2021-September 2022 (**Figure 7**).

It can be seen that higher import prices contributed considerably to higher PCE inflation during March-July 2021, when the Biden stimulus was enacted. But import price inflation continued to fuel consumer price inflation in the U.S. even more strongly in October-November 2021 and February-May 2022, long after the Biden stimulus had petered out. Going back to **Figure 7**, on average, import price inflation has been responsible for around 40% of US PCE inflation during January 2021-August 2022. Today's inflation is a global phenomenon. It is not primarily coming from U.S. stimulus.

Figure 7
The contribution of import price inflation to the PCE inflation rate,
January 2021 – September 2022



Source: FRED database (series PCEPI and IR).

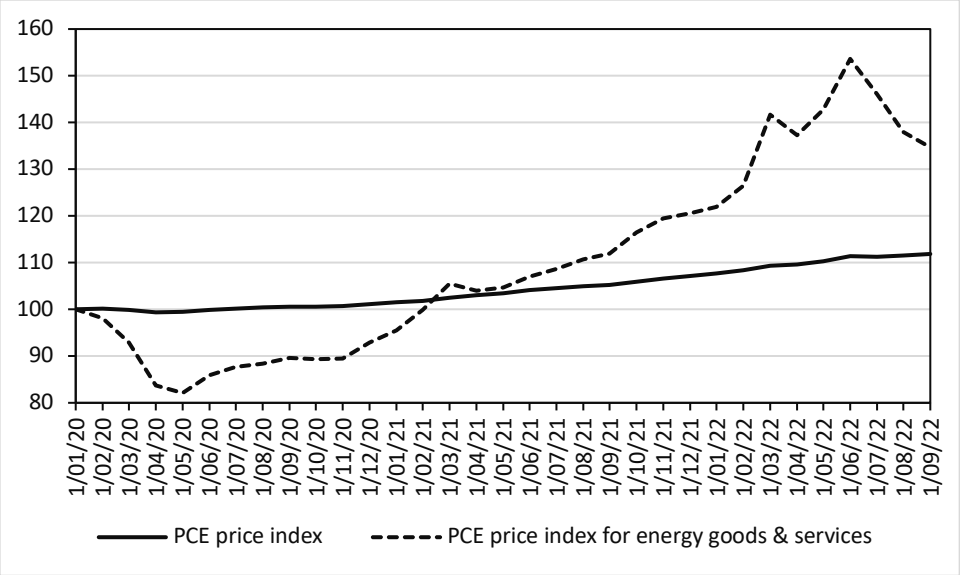
Second Supply-Side Factor: Higher Energy Prices

Universally rising (global) energy prices are a second factor contributing to rising consumer prices in the US. The PCE price index for energy goods & services, normalized to 100 in January 2020, rose by 38% during January 2020-August 2022 compared to an increase in the aggregate PCE price index of 11.5% over the same period. This is shown in **Figure 8**. Energy prices declined (by around 18%) in Spring 2020, following the COVID19 shock—and then gradually recovered; however, until March 2021, the energy price index was still lower than the aggregate PCE price index.

The energy price then increased by 20% during March 2021-February 2022 and then jumped by another 20% during February-June 2022, following the outbreak of the war in Ukraine. The energy price index has come down in July and August 2022 and may decline further as prospects of a world recession rise.

Figure 8

The PCE price index (general) versus the PCE price index for energy goods & services, January 2020 – September 2022 (January 2020 = 100)

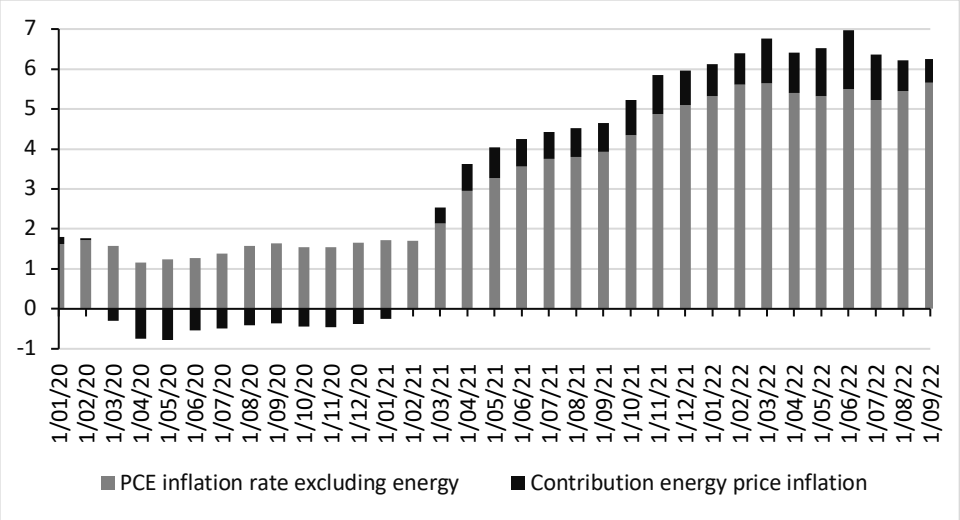


Source: BEA, Table 2.4.4U. Price Indexes for Personal Consumption Expenditures by Type of Product.

We have estimated the contribution of energy price inflation to aggregate PCE inflation in **Figure 9**. During most of 2020, the contribution of energy price inflation to aggregate consumer price inflation was negative (i.e., declining energy prices lowered aggregate inflation for households). But higher energy prices have been contributing to higher PCE inflation ever since March 2021. On average, higher prices for energy goods and services 'explain' around 15% of rising PCE inflation during March 2021-August 2022. The sharp increase in energy prices during March-June 2022 (by 20%) accounts for 18% of the (sharply rising) PCE inflation rate during the same period and certainly derives in large part from the outbreak of war in Ukraine and the ensuing sanctions regime. Global increases in energy prices thus were a major cause of accelerating consumer price inflation in the U.S. *anno Domini* 2022.

Figure 9

The contribution of energy price inflation to the PCE inflation rate, February 2020-September 2022



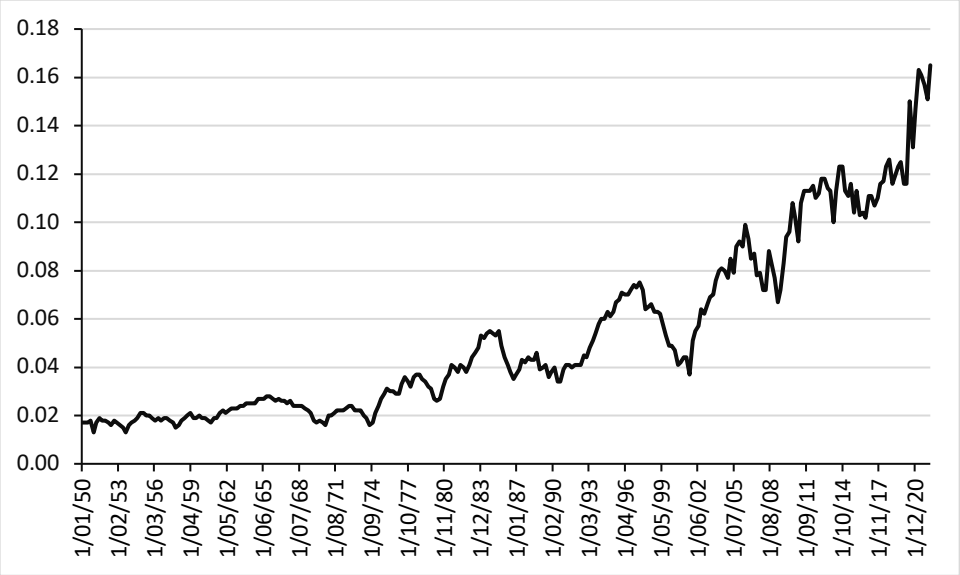
Source: Authors' calculations based on BEA, Table 2.4.4U. Price Indexes for Personal Consumption Expenditures by Type of Product.

Third Supply-Side Factor: Higher Corporate Profit Margins

The third supply-side factor driving up the rate of consumer price inflation derives from the steady increase in the profit margin of non-financial corporations (**Figure 10**). The corporate profit margin increased from 0.116 in 2020Q1 to 0.165 in 2022Q2 a rise of 42%, whereas the GDP deflator rose by 'only' 16% over the same period. As shown by **Figure 10**, corporate profit margins have not been higher since 1950 than they are now. There is, therefore, no evidence that rising worker wages are eating into corporate profits.

Figure 10

Profit per unit of real gross value added of nonfinancial corporate business: Corporate profits after tax with IVA and CCAdj (1950Q1 – 2022Q2)



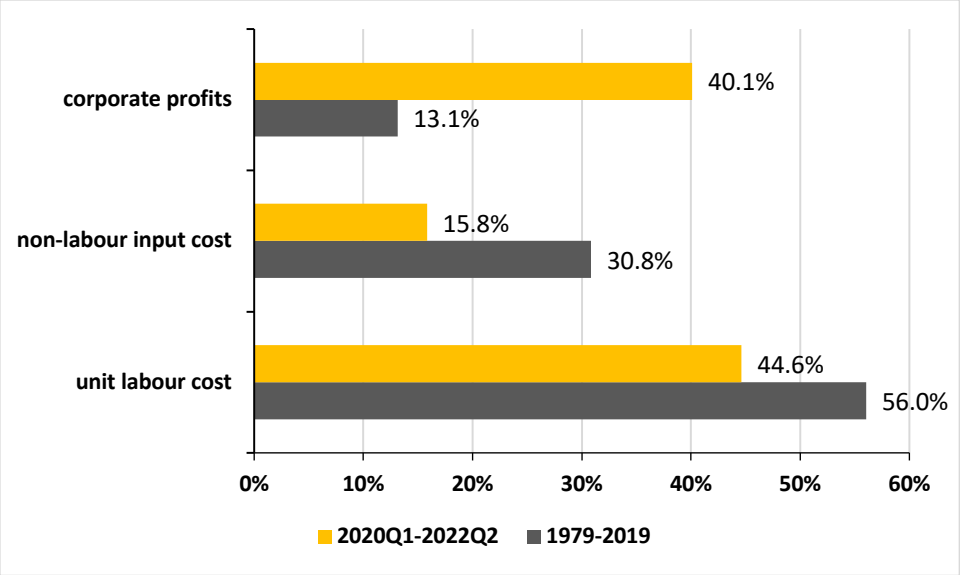
Source: FRED database (A466RD3Q052SBEA).

The higher profit margins 'explain' 40% of the growth in the GDP price deflator in the non-financial corporate sector during 2020Q1-2022Q2, which is considerably more than during 1979-2019, when higher profit margins accounted for only 13% of GDP deflator growth (**Figure 11**). Higher unit labor costs are responsible for *circa* 45% of the growth in the GDP deflator and higher non-labor input costs account for 16% of the increase in the GDP deflator during 2020Q1-2022Q2.

The timing of the profit rate hike is uncanny, as corporations issued more than $300 billion in stock buybacks to institutional shareholders and CEO pay, including stock awards and options, is up 11.1% since 2020, which is around three times more than nominal wages (**Figure 11**).[14] This increase was not matched by increased pay for typical workers: The ratio of CEO-to-typical-worker pay soared to 399-to-1 under EPI's realized measure of CEO pay (and excluding Elon Musk's salary in 2021), the highest ratio on record, up from 366-to-1 in 2020 (**Figure 12**).[15]

Figure 11

Contributions to growth in unit prices in the nonfinancial corporate sector (1979-2019 *versus* 2020Q1-2022Q2)



Source: Based on (Bivens, 2022). Calculated using data from Table 1.15 from the National Income and Product Accounts (NIPA) of BEA.

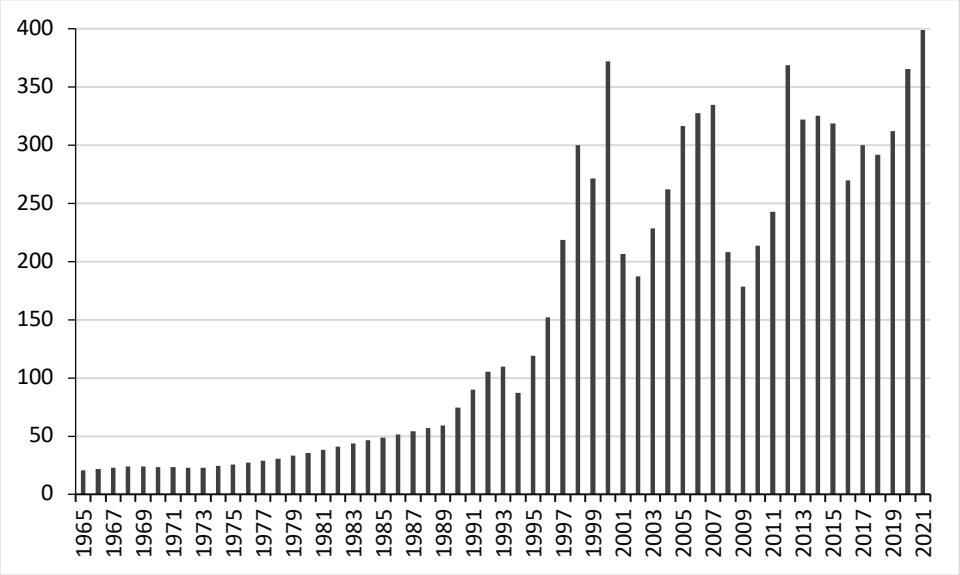
Some CEOs have admitted on shareholder calls and in surveys that they have been taking advantage of inflation to raise profit margins by increasing prices beyond what is needed to offset any increase in their input costs.[16] Whether increased use of the internet and algorithmic pricing by businesses makes this easier than previously is an important topic for future research.[17] In any case, in *The Wealth of Nations* (1776), Adam Smith already recognized the importance of profit-price dynamics, writing:

> "High profits tend much more to raise the price of work than high wages. Our merchants and master-manufacturers complain much of the bad effects of high wages in raising the price. … They say nothing concerning the bad effects of high profits. They are silent with regard to the pernicious effects of their own gains. They complain only of those of other people (Smith, 1776)."

We do not disagree.

Figure 12

CEO-to-worker compensation ratio, 1965–2021



Source:(Bivens & Kandra, 2022).

Fourth Supply-Side Factor: The Impact of COVID19 on Wages and Work

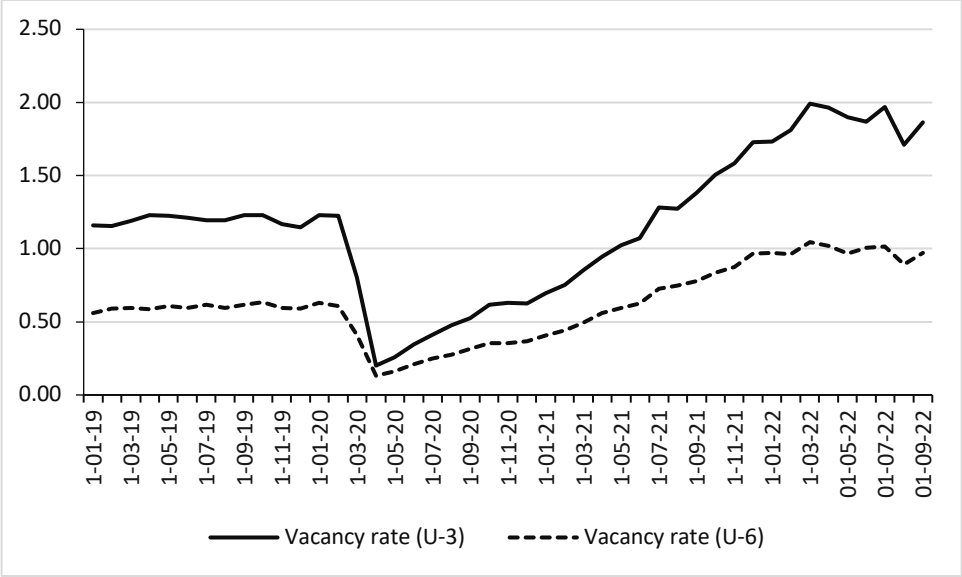
Summers warned that massive fiscal and monetary stimulus in response to the impact of the corona crisis would result in the labor market overheating and higher wages. Some labor market data appear to vindicate his warning: one common indicator of the 'tightness' of the U.S. labor market is the vacancy rate (defined as the ratio of job vacancies to the official (narrow) unemployment measure U-3). This rose to almost 2 during March-July 2022 (**Figure 13)**, meaning that there were two job openings per unemployed worker. This is far above its long-run average during 1960-2020, which was approximately 0.60 (Barnichon, Oliveira, & Shapiro, 2021).

But the standard 'vacancy rate' is a rather poor indicator for labor market tightness (for an elaboration, see (Mui, 2022). One immediate problem is the use of U-3, the narrow measure of unemployment, to calculate the vacancy rate. Using a broader, more encompassing, measure of unemployment (U-6), the vacancy rate is halved—hovering around a value of 1 (or 1 job opening per unemployed worker). The U.S. labor market appears to be considerably less tight than is suggested by the vacancy rate based on U-3.

Nevertheless, it is true that many American employers have been facing an unexpected problem: they can't hire the workers they profess to need. The 'labor shortage' is illustrated by the fact that some 10.7 million job vacancies remain in September 2022. Intriguingly, (broad) unemployment in September 2022 is measuring more than 11 million workers (see **Figure 1**). This problem is concentrated among America's low-wage workforce, hitting restaurants, warehouses,

manufacturers and many services, though as will become obvious below, certain well remunerated industries are also affected.

Figure 13
The vacancy rate, defined for U-3 versus U-6
(January 2019-September 2022)



Source: Calculated based on FRED Database.

Many Republicans and a considerable number of economists see these numbers and blame the labor shortage on basic support for workers, arguing that the problem is unemployment payments that are, in their estimation, disincentivizing (already lazy and unwilling) people to actively look for work. In reality, researchers have found that the (temporary) unemployment benefit's impact on the labor shortage was fairly small. As (Petrosky-Nadeau & Valletta, 2021) of the Federal Reserve Bank of San Francisco conclude their empirical analysis:

> "(in) each month in early 2021, about seven out of 28 unemployed individuals receive job offers that they would normally accept, but one of the seven decides to decline the offer due to the availability of the extra $300 per week in UI payments."

However, this and other evidence have not stopped conservative groups from claiming that the benefits were so high that employees became more incentivized to stay home and collect unemployment than to go back to work.

The true reasons for the worker shortage are easy to understand, if one starts not with the labor market itself, but from how the pandemic and chronic regulatory failure have combined to

structurally transform low wage work in America. Long before COVID, the American health care system stood out among developed countries for its uniquely disastrous combination of high costs and miserable results. As two physicians summarized the situation as COVID hit:

> "Four decades of neoliberal health policies have left the United States with a health care system that prioritizes the profits of large corporate actors, denies needed care to tens of millions, is extraordinarily fragmented and inefficient, and was ill prepared to address the COVID-19 pandemic. The payment system has long rewarded hospitals for providing elective surgical procedures to well-insured patients while penalizing those providing the most essential and urgent services….Before the recession caused by the pandemic, tens of millions of Americans were unable to afford care, compromising their physical and financial health; deep-pocketed corporate interests were increasingly dominating the hospital industry and taking over physicians' practices; and insurers' profits hit record levels. Meanwhile, yawning class-based and racial inequities in care and health outcomes remain and have even widened."[18]

Despite many warnings and, after 9/11, several official national security alarms, almost nothing was done to improve either the system as a whole or public health in particular. No national system for gathering statistics in real time existed and the bureaucratic inertia and political infighting that dominated the Center for Disease Control and other key agencies was an open secret well before the Trump administration came to power (Lewis, 2021).

COVID's onslaught challenged every country's health care system, but in the United States it produced a catastrophe of historic proportions. Indeed, though we lack the space to examine the evidence in detail here, we suspect that later analysts will conclude that the pandemic broke the U.S. health care system. Perhaps the most compelling summary evidence on this score emerges from comparative studies of excess deaths. In a paper comparing major developed countries, (Bor et al., 2022) show how age-adjusted death rates in the United States ran well below those of virtually all other developed countries from the nineteen thirties to approximately the early nineteen seventies. They then began a dramatic rise, until on the eve of the pandemic, the U.S. ranked highest among all developed countries in the study's sample.

Comparative studies of the pandemic's effects on excess death rates show that this terrible "American exceptionalism" dramatically deepened under COVID. In 2020, excess death rates increased virtually everywhere. But nearly all high- income countries rebounded in 2021, except the United States. As one analysis summarized the "diverging pandemic trajectories in 2021": "While most countries in Western Europe experienced bounce-backs from previous life expectancy losses, life expectancy for most of Eastern Europe, the USA and Chile dropped even further below their pre-pandemic value (Schöley *et al*., 2022).

Regulatory neglect—to put it politely—vastly exacerbated the situation. The Trump administration was famously uninterested in government regulation of any sort. But the depths of its hostility to actions to protect Americans at work defies easy summary. It had quite deliberately downgraded the Occupational Health and Safety Administration (OHSA), the principle governmental agency. As long as Trump remained in power, that agency acted only slowly and reluctantly to curb even grotesque examples of employer neglect in meat packing, hospitals, nursing homes, and other industries in which rates of death and sickness soared (Ferguson *et al*., 2021).

The Biden administration was widely expected to break with this pattern. It did, but much less decisively than almost everyone expected. A full discussion of its record on health policy and safety would take us too far afield. We have space only to mention some of its most problematic steps that were especially important in reshaping the labor market.

A first surprise came with the circulation of a draft transition memo listing members of a team charged with advising the incoming administration on COVID. Its roster contained no one with strong ties or experience with OSHA. Under-the-radar protests led to a reshuffle that fixed that, but the White House, the Center for Disease Control (CDC), and OHSA moved only very slowly and deliberately on key reforms.[19] Rather more infuriatingly puzzling has been the CDC's continuing reluctance to fully embrace the now overwhelming evidence that COVID is principally transmitted via the air. Not only has the agency continued to shortchange the point in many public notices, but despite many challenges from highly credentialed researchers, neither the CDC nor OSHA has mandated ventilation standards for workplaces, schools, and other obviously problematic gathering places.[20] The Biden administration also failed to establish a national system of testing capable of identifying dangerous new variants of COVID in real time, making authorities dependent on reports from hospitals. These, though, typically arrive with a lag, new variants are already spreading exponentially. The situation also leaves American agencies responsible for evaluating proposed new pharmaceutical remedies and treatments heavily dependent on data from foreign countries.

All these failing had dramatic effects on U.S. labor markets. The American economy has generated vast numbers of low paying jobs for decades. Even with OSHA's less than stellar record, many were generally considered safe. No one thought positions in daycare, education, or most restaurant, hospitality, or clerk jobs were dangerous. But with the advent of COVID, that is precisely what legions of these and similar jobs suddenly became: low paid and potentially fatal.

Especially in the first waves of COVID, the health care industry's own safety record was equivocal. Many hospitals and nursing homes "provided especially shocking examples of how regulatory neglect and the pursuit of profit combined to produce disastrous outcomes... Hispanic and Black workers, along with patients, were disproportionately at risk."

> In hospitals, many doctors and nurses were in touch via social media with physicians, nurses, and analysts in other countries. Some knew virtually from the outset that COVID-19 almost certainly transmitted through the air, though top U.S.

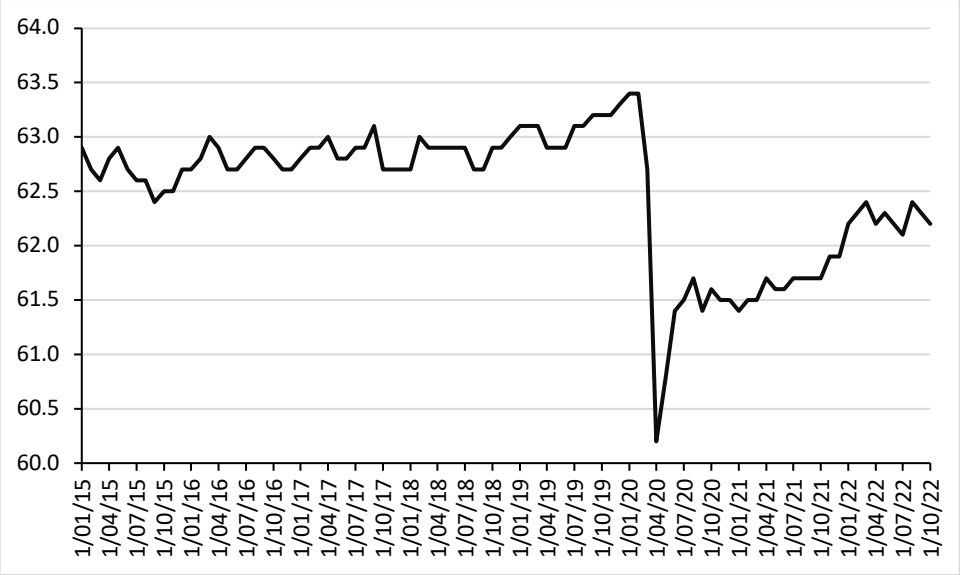
> health experts and the Center for Disease Control for a long time did not highlight that possibility. But when they improvised masks for themselves (good ones were virtually unavailable at any price) or their patients, they often met with stern official disapproval. When they protested the lack of appropriate personal protective equipment or encouraged colleagues and patients to wear masks, they were often threatened. More than a few were dismissed by hospitals and clinics.
>
> Meantime American workers who suspected they were at high risk at work had to find ways to save themselves. With virtually no publicity, many tried. In perhaps the least appreciated chapter of COVID's deadly surge, a wave of wildcat strikes, walk-outs, demonstrations, and campaigns by workers welled up. Many focused on safety; others also sought hazard pay or simply higher wages. A few protested dismissals of other workers (Ferguson et al., 2021).

Many, though far from all (consider education) white collar jobs could be done from home. But for vast numbers of low paid workers that was not a realistic possibility. As workers and their families by the thousands fell ill with COVID, labor force participation plunged as **Figure 14** shows—from 63.4% in January and February 2020 to 60.2% in April 2020. More than 8.2 million American workers withdrew from the labor force.

Figure 14

Labor force participation rate, monthly

(January 2015-October 2022; per cent)

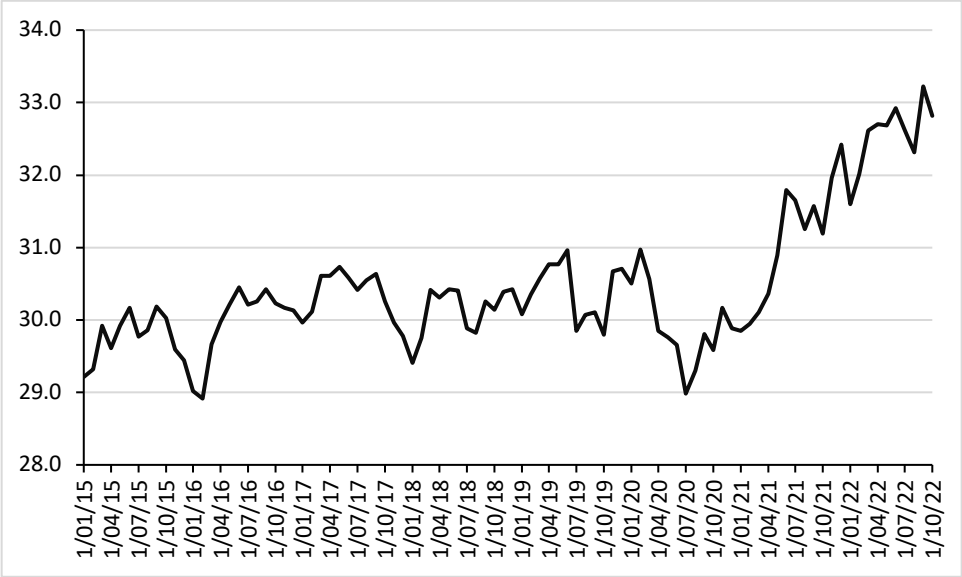


Source: FRED Database (*series* CIVPART).

Many workers whose circumstances and age made retirement a possibility immediately took that option (Fry, 2021). That affected not only the labor force participation rate, but productivity, since many of these were among the most skilled and experienced in their lines of work. Though the data are fragmentary, there is little doubt that many firms responded by trying to push workers still on the job too far, at least sometimes with disastrous results.

Not surprisingly, with so many workers succumbing to debilitating illness, disability rates shot up, as **Figure 15** shows. Specifically, we note that the average number of Americans (of 16 years and older) with a disability increased by 2.5 million persons from 30.1 during January 2015-December 2019 to 32.6 million during January-October 2022.

Figure 15
Persons with a disability – 16 years and over
(January 2015-October 2022; millions)

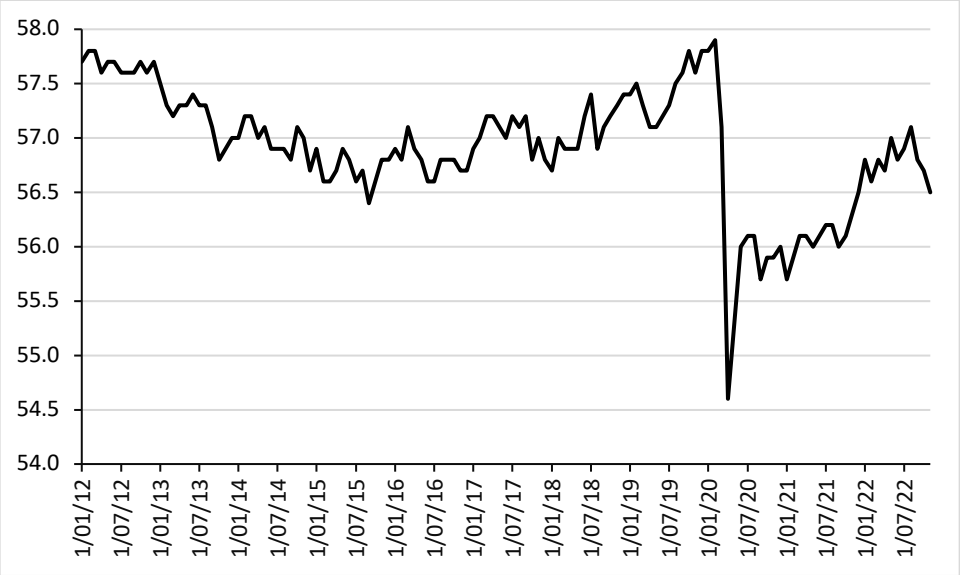


Source: FRED Database (*series* LNU00074597).

As the workforce in the childcare industry melted away, day-care became all but impossible to find at a price anyone but the superrich could afford. Legal strictures on procedures for competitive bidding blocked many public schools from making use of newer, much cheaper tests for COVID. Their reliance on expensive legacy tests meant that many blew through their test budgets in weeks or months, leaving them unable to track COVID's rampages in their classrooms.[21] With schools

frequently under lockdown or otherwise dysfunctional even when they were not locked down, vast numbers of workers, especially women, had to stay home to care for their children (S. Ferguson, 2022). The labor force participation rate for women dropped from 57.9% in February 2020 to 54.6% in April 2020 and has, so far, not recovered (see **Figure 16**). As of November, 2022, the labor force participation rate for women stands at 56.5%.

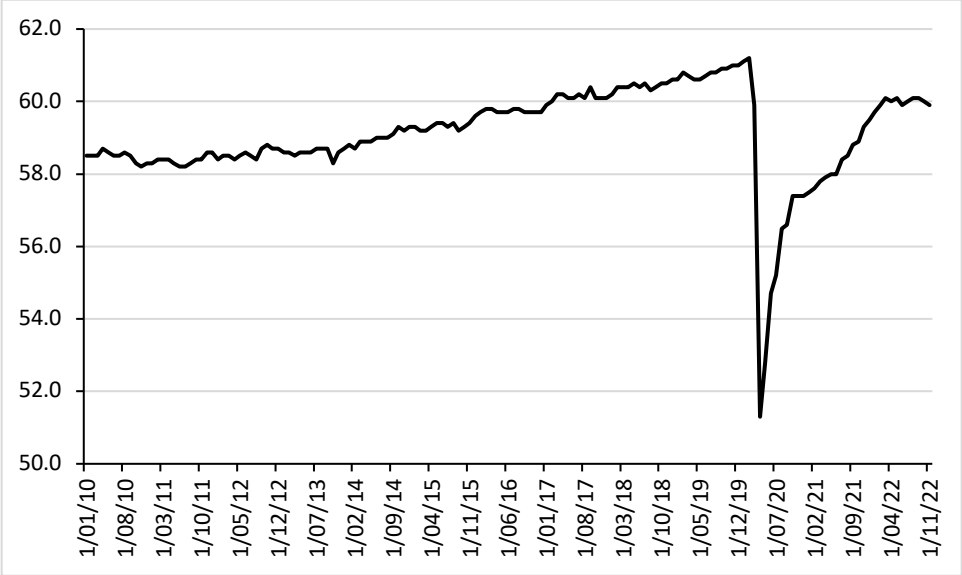
Figure 16
Labor Force Participation Rate: Women, Monthly,
January 2012 – November 2022 (Percent)



Source: FRED database (LNS11300002).

We believe the towering significance of these changes in the workforce has been missed by many analysts. Take the simple point about job safety first. When millions of jobs previously considered very safe abruptly become perilous, wage levels should be expected to adjust according to virtually any theory of wages. Never mind arguments about whether the federal government should have assisted with some system of hazard pay; all but the most desperate wage earners are likely to demand higher wages for doing exactly the same work they did before. This reaction, which empirically was most common in the very lowest wage jobs, should not be confused with a system-wide rise in the power of labor or a "Kaleckian moment" (Ratner and Sim 2022).[22] These frames of reference blind analysts to the real nature of what was transpiring: jobs that are suddenly dangerous have trouble finding anyone willing to do them. Discussions of "monopsony" in labor markets are beside the point, especially in industries such as restaurants or leisure, where unions are rare and many employers usually cluster.[23]

Figure 17
The employment-to-population ratio, Monthly,
January 2010 – November 2022 (Percent)



Source: FRED database (*series* EMRATIO).

Moreover, as long as COVID persists, this condition will not be transitory: every time a new wave strikes, some wage reshuffling in the most exposed industries and occupations is likely to occur, while some jobs go begging. That is why for example, the members of the Massachusetts National Guard became emergency bus drivers in some cities in that state during some stages of COVID. And why so many analysts noticed that many of the lowest paid jobs saw sharp rises in wage levels as COVID normalized – for a while.

Hence, the true reason for the worker shortage is a combination of too little pay and increased risk of illness, particularly for lower-paid wage workers operating on the front line of potential COVID (and other) infections. As a matter of fact, around 16.3 million working-age Americans (those aged 18 to 65) suffer from long COVID (see the Census Bureau's June to July 2022 Household Pulse Survey), and of those, 2 to 4 million (full-time equivalent) persons are out of work due to long COVID.[24] These findings have been corroborated by recent analyses by the Federal Reserve Bank of Minneapolis (Ham, 2022), the Federal Reserve Bank of New York (Deitz, 2022), and the Brookings Institution (Bach, 2022).

A pandemic that killed more than one million Americans and hit more than 16 million workers with long COVID was bound to make (frontline, services-sector) workers reconsider their jobs: after a year of being deemed "essential workers", many of them are no doubt wondering why they are not treated as such: why they are not paid enough to afford food and rent and why they should face all the (health) risks. After all, 40% of U.S. workers, and 66% of service-sector workers, earn

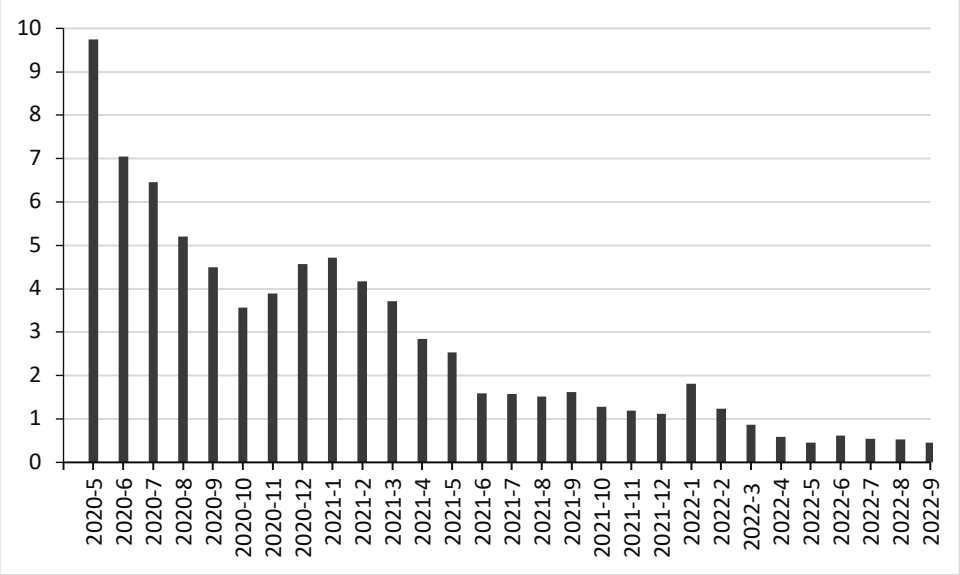
less than $15/hour; 24% do not have paid sick leave; 45% have no or inadequate health insurance; and few have paid family leave to care for the sick and dying (Tomaskovic-Devey, Dominguez-Villegas, & Hoyt, 2020).

Understandably, many workers 'left' the labor force because of COVID19: during May-December 2020, 5.6 million workers left the labor force because of the pandemic; during 2021, more than 2.3 million persons were not looking for work because of corona; and during January-March 2022, the number of workers discouraged by corona was more than 1.3 million (**Figure 18**). Every time a new COVID wave occurred, workers withdrew from the labor force (as in December 2020-January 2021, and in January 2021).

As the economy re-opened and vaccines became available, millions of lower-wage workers decided to return to the job market—but many of them re-evaluated their priorities out of (quite justified) fears of reinfection, long COVID concerns, and an inability to find affordable day care for children and continued problems with schools.[25] They quit their earlier jobs in food services and retail and searched for new opportunities with better pay and safer working conditions. Increases in job turnover have been concentrated in hospitality and other low-wage sectors, where intense competition for employees has given workers the leverage to seek better pay. Data from the Federal Reserve Bank of Atlanta indeed show that job-switchers are winning significantly higher pay increases than people who stay in their jobs (Atlanta, 2022).[26]

Figure 18

Millions of persons not in the labor force who did not look for work in the last 4 weeks because of the coronavirus pandemic (May 2020-September 2022)



Source: BLS data. See: (BLS, 2022)

Some employers have reacted to these shifts by subtly downgrading the services offered to customers, as for example, the many hotels that have simply stopped making up rooms every day. We also expect to see a wave of automation in the future. But these responses have limits, at least in the short run. As a result, many employers in these sectors have tried to lure workers back with raises, COVID19 hazard payments, and bonuses. As a result, nominal wages have increased—even if the wage gains have been distributed unevenly throughout the workforce, with workers in some industries seeing far smaller gains than those in others. Year-on-year nominal and real growth rates of average U.S. wages during January 2021-November 2022 are shown in **Figure 19**.

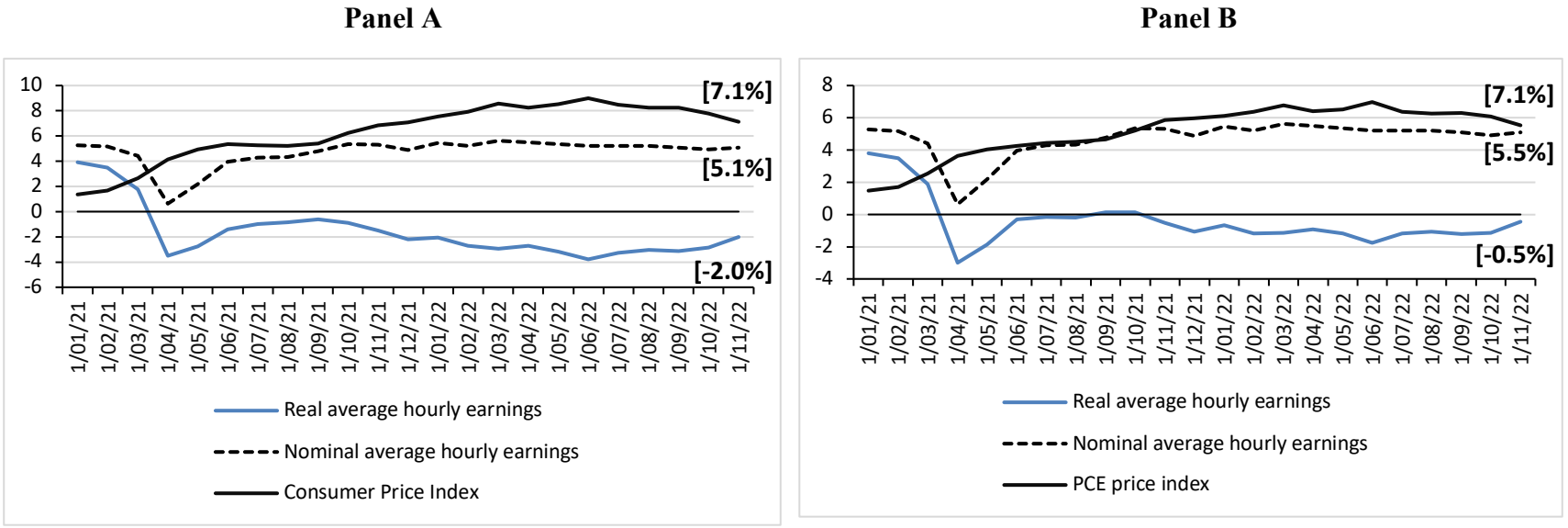
Hourly real wage growth, calculated based on the CPI, has been negative since April 2021; the year-on-year growth rate of real wages was -3.8% in June 2022 and stands at -2% in November 2022. Using the PCE price index (instead of the CPI) to deflate nominal wage growth gives a similar picture: average real wage growth turned negative in April 2021 and remained negative until November 2022 (except during September and October 2021, when year-on-year average real wage growth was a pithy +0.1%). Nominal wages for all U.S. workers increased by 9.4% on average during April 2020-November 2022 (a period of 31 months). The U.S. CPI rose by 16.5% over the same period, and as a result, U.S. workers suffered an average cumulative real wage *decline* of 7.1% since April 2020. (Note that the PCE price index increased by 13.2% during this period, which implies a real wage decline by 3.8% on average over a period of 31 months.)

The nominal employment cost index (ECI) for all U.S. workers increased by 9.5% during 2020Q2-2022Q3 (see **Figure 20**). The nominal ECI in goods-producing industries (including manufacturing) rose by 8.6%, whereas the ECI in services increased by 9.6% during these ten quarters. However, increases in the ECI have not kept up with increases in the PCE price index, which rose by 12.1% during 2020Q2-2022Q3, and hence, workers' real purchasing power has been eroded. On average, American workers experienced a cumulative decline in real wages by 2.6% over the past two-and-a-half years.

Only (the mostly poorly paid) workers in 'accommodation and food services' and 'retail trade' managed to obtain nominal wage growth in excess of PCE inflation (**Figure 20**). The real wage of the circa 15.4 million workers in retail services increased by a modest 1.7% during 2020Q2-2022Q3, while the real wage of the 14.1 million workers in the leisure & hospitality industry increased by 3.7%; taken together, these workers make up less than 19 percent of the U.S. labor force and they belong to the least organized and most exploited workers in the U.S. Wages in these industries have increased mostly because the (health) hazard associated with jobs in these industries has significantly increased as a result of COVID19. But modest real wage increases in the lowest-paid, most risky frontline jobs are an unlikely driver of wage-push inflationary pressure. Overall, reports of rising 'worker power' impress us as greatly exaggerated.

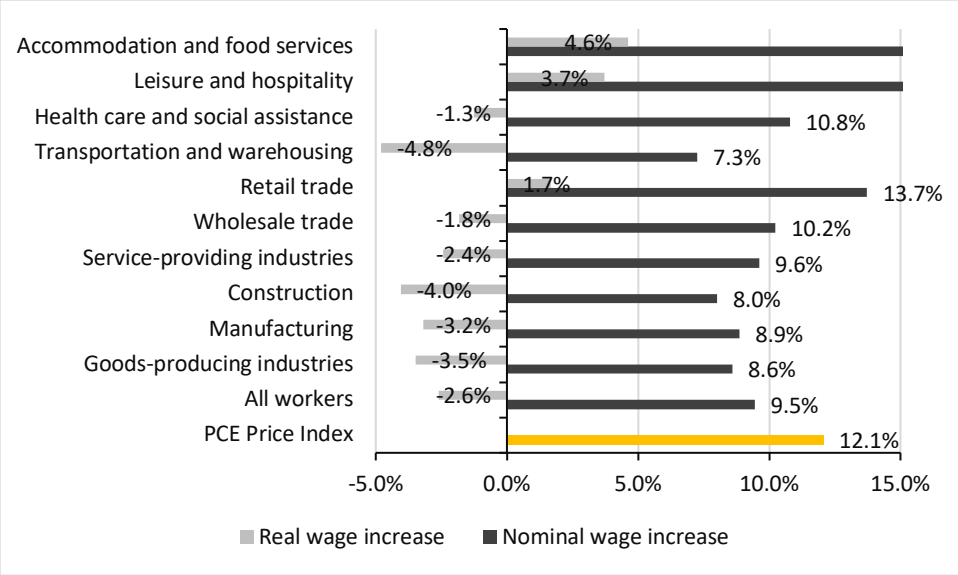
Figure 19

Year-on-year percentage change in average nominal and real hourly earnings, January 2021-November 2022



Source: U.S. Bureau of Labor Statistics. *Note*: Earnings for all employees on private non-farm payrolls; seasonally adjusted. Real average earnings are calculated using the CPI (Panel A) and, alternatively, the PCE price index (Panel B).

Figure 20
Nominal and real wage growth in selected industries
(2020Q2-2022Q3; percent; deflated using the PCE price index)



Source: BLS *Employment Cost Index* data (Table 1). *Note*: 'Accommodation and food services' is part of the larger industry 'Leisure and hospitality'.

This is confirmed by **Figure 21** which presents monthly *median* real wage growth numbers per wage quartile (using Federal Reserve data), instead of average real wage growth. We have deflated nominal median wage growth by the CPI inflation rate (in Panel A of Figure 21) and by the PCE inflation rate (in Panel B).

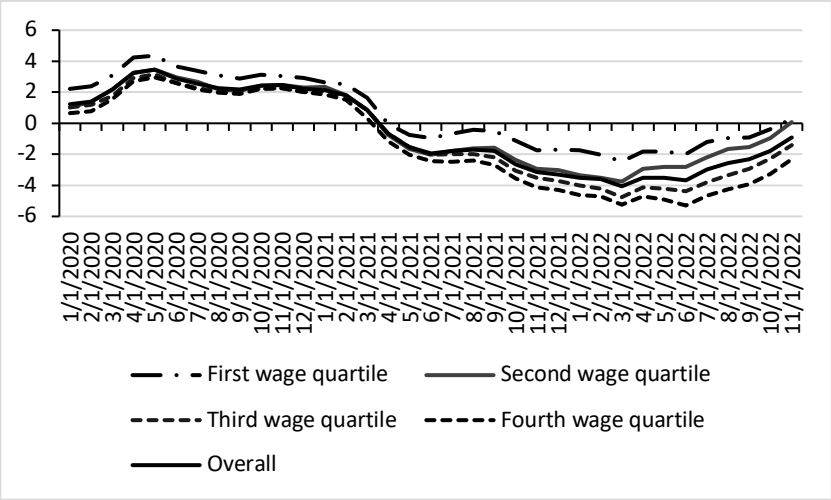
Using the CPI inflation rate, median real wage growth for all wage quartiles turned negative in April 2021 and remains negative until October 2022. Overall median real wage growth declines from 0.8% in March 2021 to -4.1% in March 2022 and is equal to -0.9% in November 2022. Overall median real wage growth was -2.6% (on average) during March 2021-November 2022. It can be seen that real wage declines were larger (in absolute terms) for employees in the 3rd and 4th wage quartiles than for wage earners in the bottom two wage quartiles (**Figure 21**, Panel A). Median real wage growth for the 3rd and the 4th quartiles remains negative until November 2022. However, median real wage growth for the 1st and the 2nd wage quartiles turned positive in November 2022. Overall, real wage growth for the bottom two wages quartile was negative (on average) during April 2021-November 2022. Clearly, nominal wage growth has not kept up with higher CPI inflation, and workers' real purchasing power has been eroded (**Figure 21**).

The evolution of real wages per wage quartile, when using the PCE inflation rate and pictured in Panel B of **Figure 21**, is relatively similar to the changes in real wages based on the CPI inflation rate. Median real wage growth for all wage quartiles, except the first one, turned negative in April 2021. Median real wage growth of the (richest) 4th wage quartiles has remained negative until November 2022, while median real wage growth of the 3rd wage quartile was negative until October 2022. Wage earners in the bottom two wage quartiles did slightly better. The median real wage of employees in the 2nd wage quartile increased during September-November 2022, whereas the median real wage of employees in the bottom wage quartile rose during May-November 2022. It must be noted, however, that (i) overall median real wage growth has been negative (-1.2%) during April 2021-November 2022; (ii) median real wage growth of the 2nd, 3rd and 4th wage quartiles has been negative during this period; and (iii) only the lowest-paid workers in the bottom wage quartile experienced positive, but still limited real wage growth (of 0.25%) on average during April 2021-November 2022.

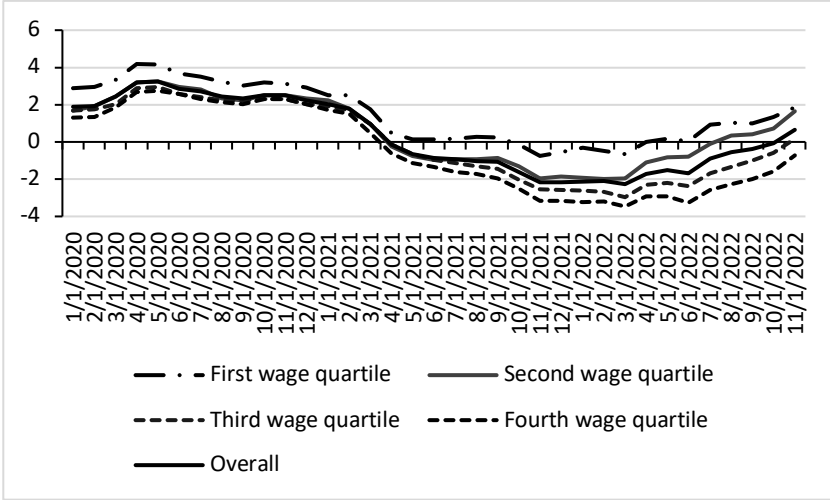
Figure 21

Year-on-year percentage change in average nominal and real hourly earnings, January 2021-November 2022

Panel A



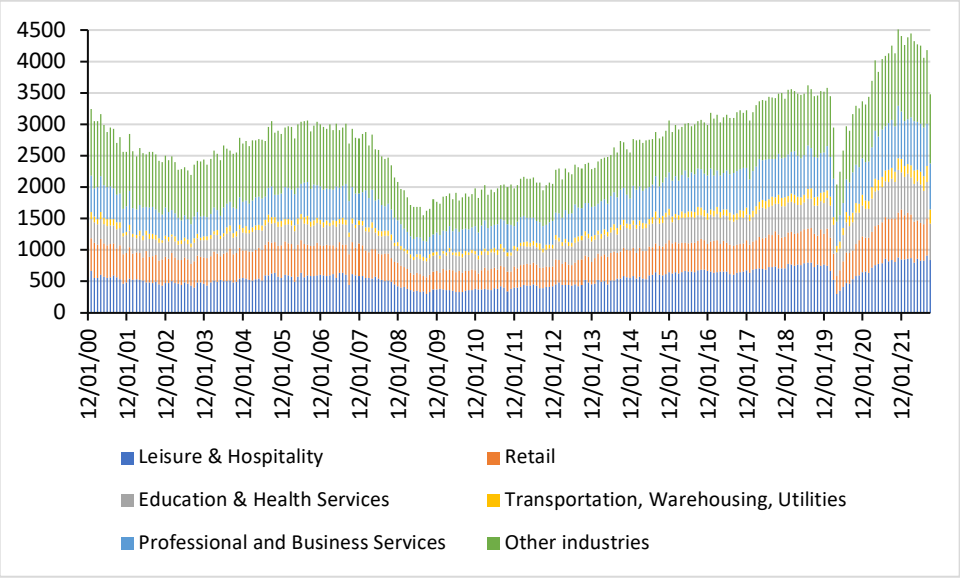
Panel B



Source: *Federal Reserve Bank of Atlanta* Wage Growth Tracker. Monthly (year-on-year) nominal median wage growth has been deflated using the monthly (year-on-year) the CPI (Panel A) and, alternatively, the PCE price index (Panel B).

The impact of COVID19 on the (lower-wage) labor market has not just led to higher nominal wages, but also to much higher labor turnover than before (**Figure 22**). The number of workers quitting their jobs increased from around 3.4 million per month during 2018-19 to more than 4.4 million during November 2021-May 2022, meaning that around 6 million *more* Americans left their jobs during these six months than during 2018-2019. The number of workers quitting their jobs were particularly high in leisure & hospitality, retail, education and health services, and professional and business services (**Figure 22**).

Figure 22
Level of Quits: Total Nonfarm, Monthly, Seasonally Adjusted
(December 2000-September 2022; in thousands)



Source: FRED database.

The sharply elevated rate of labor turnover in the U.S. is having a negative impact on (average) labor productivity for several reasons. First, employees starting a new job need time and resources to build up the necessary firm-specific skills and expertise. Second, firms incur search and recruitment costs, often at much higher wages than the departed employee earned. Thirdly, in a COVID-19 caused, one-shot wave of early retirement, the most experienced, often with irreplaceable firm-specific knowledge, left. By itself this hurts average labor productivity of their firms, but there is also some evidence that firms sometimes tried to cope by over-relying on the experienced personnel who remained, leading both to employee burnout and damages to equipment.[27] U.S. labor productivity growth has been rather erratic during 2020Q1-2022Q3 (**Figure 23**), but during the first three quarters of 2022, it has been negative. The *level* of average U.S. (non-farm) labor productivity has declined by 3.8 percentage points during 2022 (in

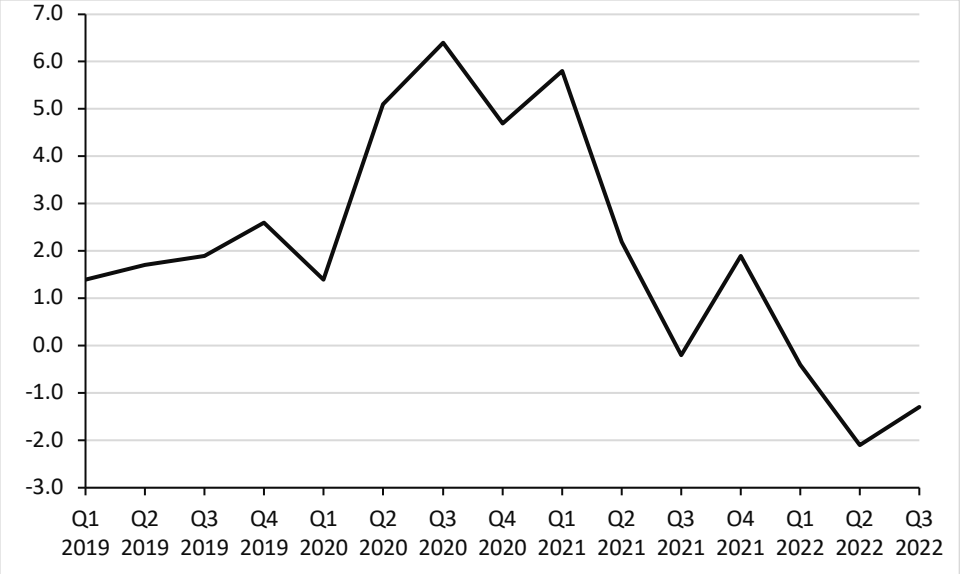
cumulative terms)—and we think this is undoubtedly related to the COVID-19 disruptions and resulting elevated labor turnover.

Summers does not talk much about the impacts of the pandemic on the low-wage labor market and productivity. Nor do he and other inflation hawks ever consider an obvious reason for employee reservations, namely that their real wages have been falling. Instead, he attributes the fall in productivity levels on "quiet quitters", *i.e*., workers who have grown disillusioned with their workplaces and given up putting in additional effort (Daniel, 2022). The evidence for such claims is thin indeed – little more than media phrasing.

Figure 23

Average U.S. non-farm labor productivity growth

(2019Q1 – 2022Q3; percentage change same quarter 1 year ago)



Source: BLS data.

The argument is important to Summers, however, because it allows him to double down on his claim that nominal wage growth has to be weeded out, root and all: "Given dismal productivity growth, *likely caused by quiet resignations*, wage inflation will need to fall significantly if sustained months close to 2% inflation are to be achieved" (*Italics added*) (Daniel, 2022). Given that his diagnosis is so wrong, it is hard to believe that the treatment proposed by Summers (*i.e.,* brutal monetary tightening) will be appropriate.

The Argument Thus Far

Our intermediate conclusion is that evidence is weak for claims that federal pandemic relief expenditure, especially the stimulus in Spring 2021 by the Biden administration, constitutes a major

cause of the sudden acceleration in the US PCE inflation rate which started in late 2021. The timing of expenditures is just wrong: almost 90% of cumulative pandemic relief expenditure to individuals and businesses during March 2020-July 2022 occurred during March 2020-June 2021, *i.e.*, well before PCE inflation began to accelerate. Second, crucial supply-side factors including import prices, global energy prices and non-financial corporate profit margins, made significant contributions to rising consumer price inflation in the US. Furthermore, COVID19 disruptions of the (low-wage) labor market led to labor shortages, higher labor turnover, a fall in labor productivity, and a re-pricing of (some) essential, low-wage frontline jobs. All these factors have contributed to higher inflation, but are not related to the Biden pandemic relief spending—and they are left unmentioned by Summers and other critics who stubbornly continue to attribute the surge in inflation to the corona income relief.

This brings us, finally, to the aspect of the inflation explosion that we think is least well explored by the armies of central bank and other researchers purporting to "explain" the acceleration of inflation in 2021-22: The complete neglect of wealth effects.

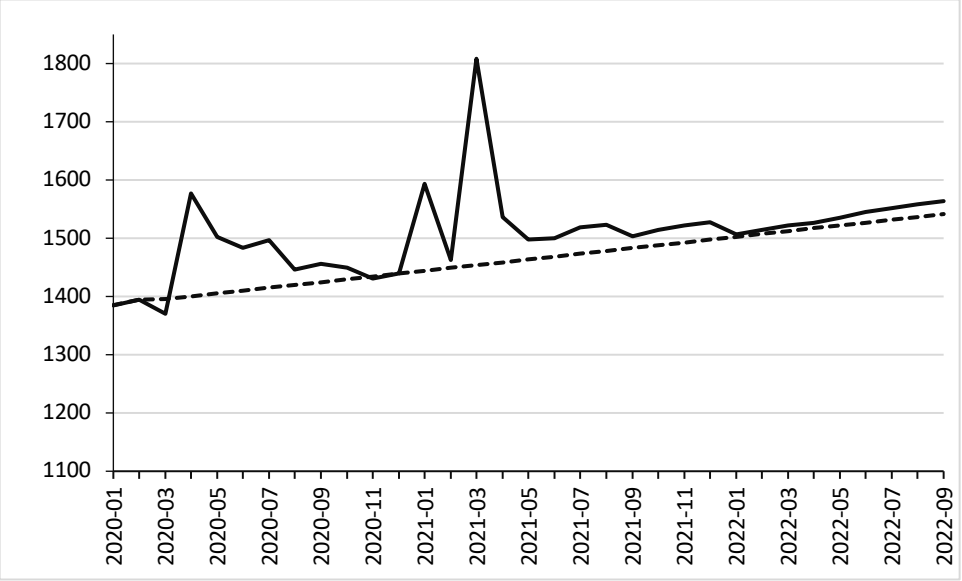
Class Will Tell: The Biden Stimulus, Incomes, and Spending

There is no reason to doubt that the various rounds of pandemic relief spending helped to support disposable personal incomes; according to our estimates, aggregate disposable personal income in the U.S. was higher by $1.43 trillion in cumulative terms relative to the counterfactual trend during March 2020-August 2022. Almost 90% of this income support was received by US households and businesses during March 2020 – June 2021, *i.e.*, before the PCE inflation rate accelerated. U.S. households, especially the richest 10%-20%, saved most of these income receipts—as the level of personal consumption spending remained below pre-corona trend. Cumulative 'excess' personal savings during March 2020-March 2022 amounted to $2.4-2.7 trillion, which implies that most of the income support was not spent—and could not, therefore, have contributed to rising inflation. However, nominal consumer spending did rise late in the game, *i.e.*, from around December 2021 onwards. But the evidence is very strong that this surge in demand flowed predominantly from a source that has so far been virtually ignored in the long debate over inflation: the richest 10% of U.S. households whose spending was funded out of the incredible wealth gains these households experienced—rather than from a broad-based increase in consumption demand, triggered by the fiscal relief measures (which did not happen).

Disposable personal income and consumption

We first consider what happened to aggregate disposable personal income in the US during the corona-crisis (**Figure 24**). Disposable personal income increased noticeably (relative to the trend) in March 2020, January 2021 and March 2021. (These are the months in which most of the corona income support was disbursed).

Figure 24
Disposable personal income, January 2020-September 2022
(Billions of US dollars, current prices)



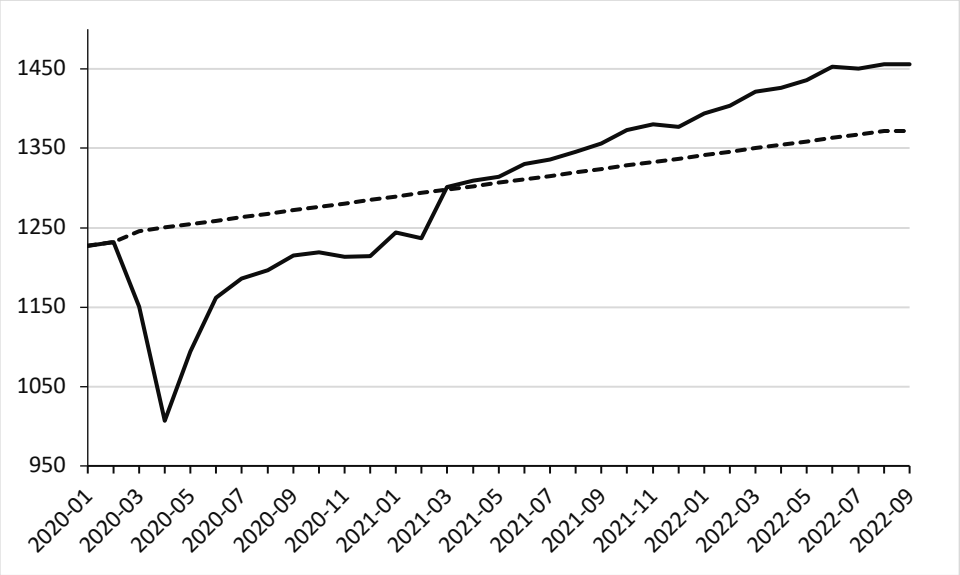
Source: Authors' calculations based on BEA, Table 2.6. Personal Income and Its Disposition, Monthly.

During March 2020-September 2022, current disposable personal income increased, in cumulative terms, by $1.46 trillion relative to the counterfactual trend. (Note that total federal corona income support was $2.1 trillion during March 2020-September 2022; see **Figure 4**). In terms of timing, almost 90% of this income support was received by US households and businesses during March 2020 – June 2021, which coincides with the pandemic relief provided. Crucially, the disposable personal income increases occurred well before PCE inflation took off (*i.e.*, at the end of the year 2021). Cumulative higher-than-trend disposable income gains during the year 2022 amounted to just $126 billion.

However, aggregate personal consumption expenditure did not follow the evolution of disposable personal income during 2020-2022. Nominal personal consumption expenditure took a hard hit in March and April 2020, declining by a cumulative $225 billion. Personal consumption expenditure remained subdued, *i.e.*, below its long-run trend, until March 2021. Personal consumption expenditure remained somewhat (but not much) higher than the trend during April-December 2021, but increased rather significantly (relative to the trend) in the first six months of 2022 (**Figure 25**). This is months after the Biden stimulus happened and exactly when disposable personal income converged back to its trend. It also coincides with the acceleration of PCE inflation due to the war in Ukraine.

Figure 25

Personal consumption expenditure (Billions of US dollars, current prices)
(January 2020 – September 2022)

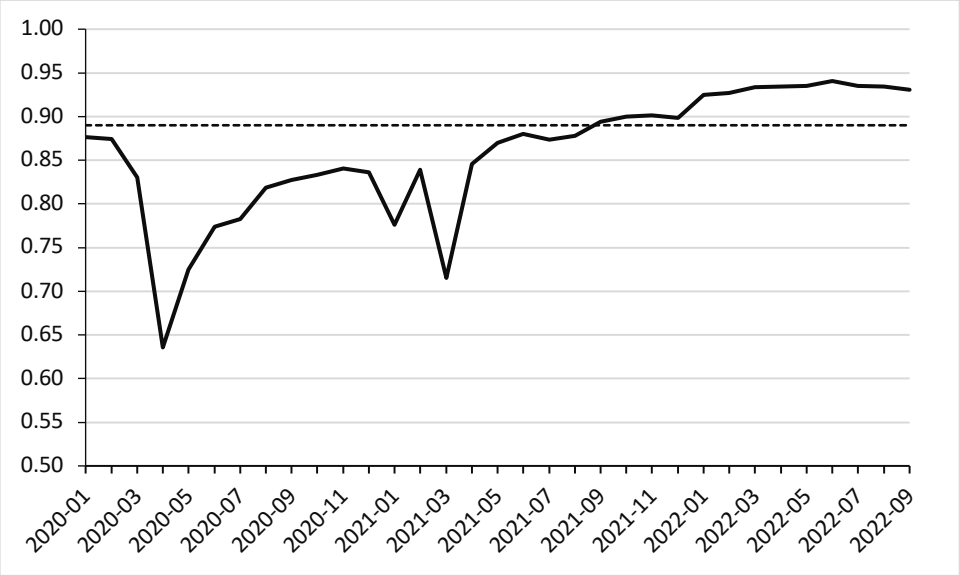


Source: Authors' calculations based on BEA, Table 2.6. Personal Income and Its Disposition, Monthly.

This can also be seen in **Figure 26** which plots the average propensity to consume out of disposable personal income during January 2020 – September 2022. During March 2020 – September 2021, the average propensity to consume is consistently lower than the long-run average consumption propensity out of disposable personal income (of 0.89). During October-December 2021, the consumption propensity is very close to its longer-run average, and only in January 2022, we observe a significant increase in the consumption propensity, which remains elevated throughout the year 2022. **Figures 25** and **26** indicate that the recovery of consumption demand happened relatively late in the game—almost three quarters of year after the Biden stimulus.

Figure 26

Personal consumption expenditure as a proportion of
disposable personal income (in current prices) (January 2020 – September 2022)



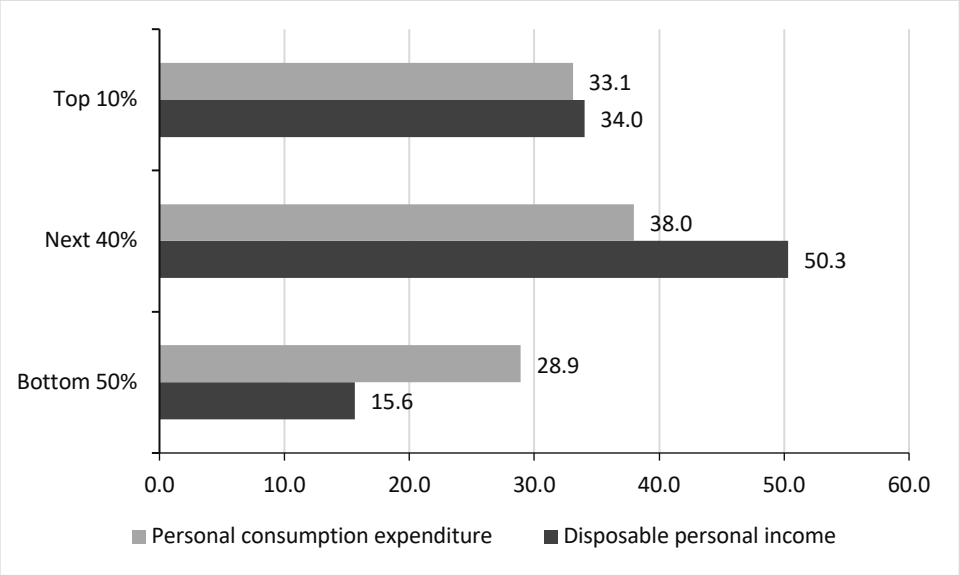
Source: Authors' calculations based on BEA, Table 2.6. Personal Income and Its Disposition, Monthly. The dashed line gives the longer-run average propensity to consume out of disposable personal income (which is equal to 0.89).

We now proceed to a key point: how was the cumulative gain in personal disposable income distributed across income classes? BLS data allow us to examine this question and yield a straightforward answer: Inequality in consumption increased drastically as personal disposable income rose. According to BLS data, *aggregate* disposable personal income rose by 6.95% in nominal terms during 2020-2021. The disposable incomes of the bottom 50% of income earners rose by 5.25%, the incomes of the next 40% increased by 7% and the disposable incomes of the top 10% rose by 8% (all in nominal terms).

These imply vastly different shares of the growth of disposable income by income class. In distributional terms, the richest 10% of US households claimed 34% of the disposable personal income growth in 2021 (as compared to 2020), while the next 40% of households received more than 50% of the aggregate personal income increase (**Figure 27**). The bottom 50% of US households garnered only 15.6% of the aggregate personal income increase in 2020-21. Clearly, disposable personal income inequality greatly increased during the COVID19 crisis—notwithstanding the federal pandemic income relief.

Figure 27

Shares in the increase in disposable personal income and
in personal consumption expenditure during 2020-2021 (Percentages)



Source: Authors' calculations based on Bureau of Labor Statistics, Table 1110. Deciles of income before taxes: Shares of annual aggregate expenditures and sources of income, *Consumer Expenditure Surveys*, 2021.

Aggregate personal consumption spending (in current prices) rose by more than 11% in 2021 relative to 2020. The bottom 50% of US households increased consumption expenditure by 10.6%, the next 40% of households raised spending by 8.9% and the top 10% richest households increased consumption by 16.5% (*i.e.*, almost twice as much in percentage terms than middle-class households).

Again, these statistics imply that in distributional terms, the richest 10% of US households were responsible for 33% of consumption growth in 2021 (as compared to 2020), while the next 40% of households accounted for 38% of the increase in personal consumption expenditure (**Figure 27**). The bottom 50% of US households accounted for just under 29% of the aggregate consumption increase in 2020-21 (**Figure 27**).

These expenditures can be translated into average consumption propensities for each income quintile for each year. **Table 1** shows that the *aggregate* average share of consumption in disposable income rose by 3 percentage points during 2020-2021. But this is the key point: this average figure disguises radically different consumption rates across income quintiles. For the bottom 50 percent of income earners, average consumption propensity rose by 6 percentage points; for the middle classes, the propensity rose by just 1 percentage point. By contrast, for the top 10% consumption increased by 5 percentage points. Given the absolute levels of income flowing to each

group, this result reinforces the conclusion that the increase in consumer spending was heavily concentrated in the top 10% richest income earners.

Table 1 carries another important implication: as inflation began to rise at the end of 2021, the bottom 50% were spending more than they were earning as disposable income. This means that they were borrowing in order to spend.

Table 1

Personal consumption as a share of personal disposable income

In current prices	Aggregate	Bottom 50%	Next 40%	Top 10%
2020	0.82	1.19	0.78	0.62
2021	0.85	1.26	0.79	0.66
Absolute increase	*0.03*	*0.06*	*0.01*	*0.04*

Source: Authors' calculations based on *Bureau of Labor Statistics*, Table 1110. Deciles of income before taxes: Shares of annual aggregate expenditures and sources of income, *Consumer Expenditure Surveys*, 2021.

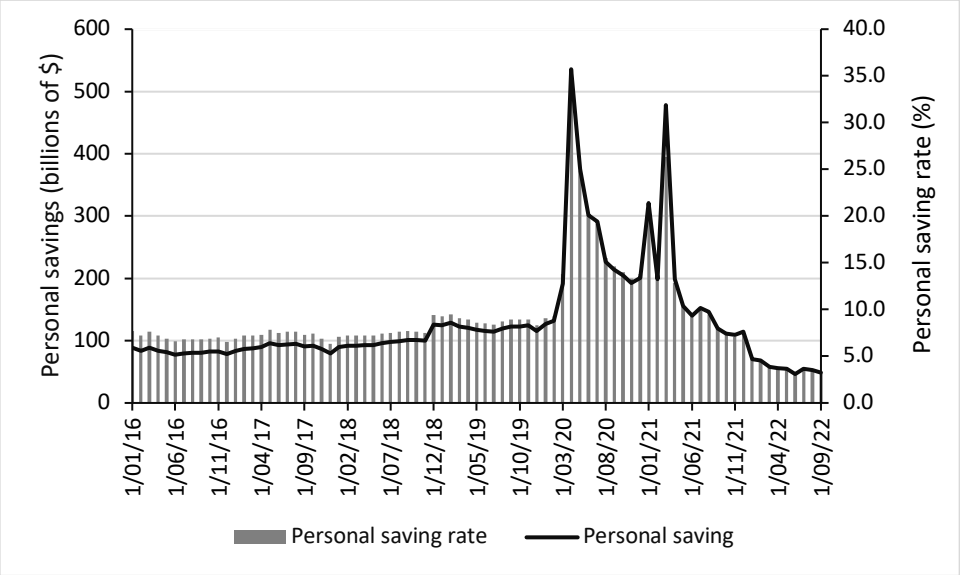
Three rounds of income support payments (in April 2020, January 2021 and March 2021) boosted the disposable incomes of US households. Initially, in April 2020, personal consumption spending declined by more than 18% and gradually recovered thereafter. Obviously, spending on close-contact services (such as eating out, tourism and entertainment) remained low, but consumers instead increased spending on (durable) goods, including electronic equipment (needed to work from home), (second-hand) cars (for socially distanced transportation), and goods for home improvement. But there are limits to durable consumption outside of home improvements: even the rich can at most buy only one or two Nordic Tracks. Hence, US households were more or less forced to save a greater proportion of their incomes.

This can be seen in **Figure 28**: the (monthly) personal saving rate was 7.4% on average during January 2016 and February 2020, but then rose to 33.8% in April 2020 and 24.8% in May 2020, and averaging 15.7% during June 2020-February 2021. The personal saving rate rose to 26.6% in March 2021, again in response to the corona income support payments. Following this peak in March 2021, the personal saving rate has declined and averaged 'only' 5.1% during April-July 2022 (which is lower than the average rate of personal saving before the COVID19 crisis).

According to estimates of Moody's Analytics, during 2020Q1-2022Q1, U.S. households built up $2.7 trillion in extra (excess) saving (**Figure 29**). This is somewhat higher than our own estimates (based on monthly BEA data), according to which cumulative excess personal saving by U.S. households amounted to $2.4 trillion during the same period. Moody's Analytics estimated excess savings by income level, as is shown in **Figure 29**.

Figure 28

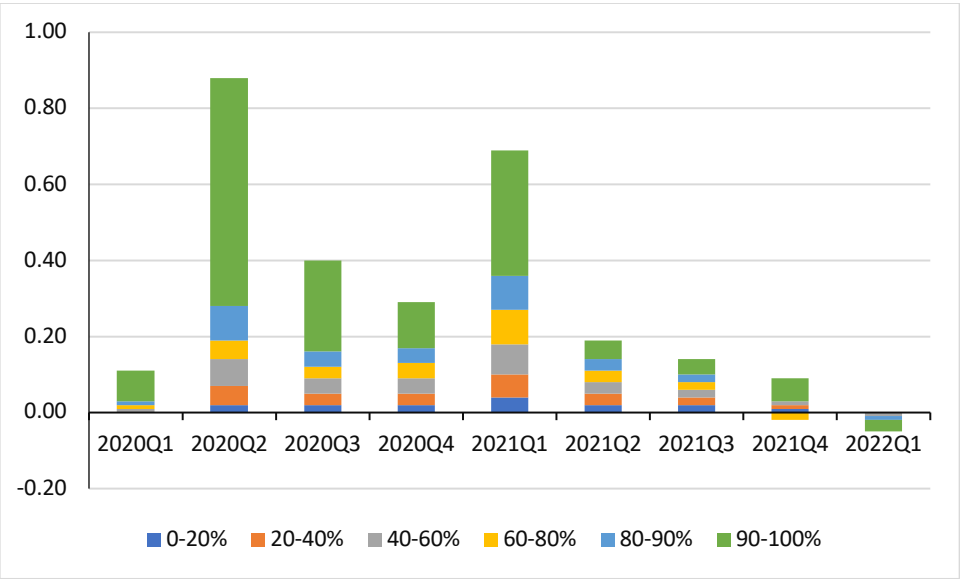
Personal saving (billions of US dollars) and personal saving rate (%), January 2016-September 2022



Source: FRED database.

Figure 29

Estimated excess saving by income level (Trillions of U.S. dollars)



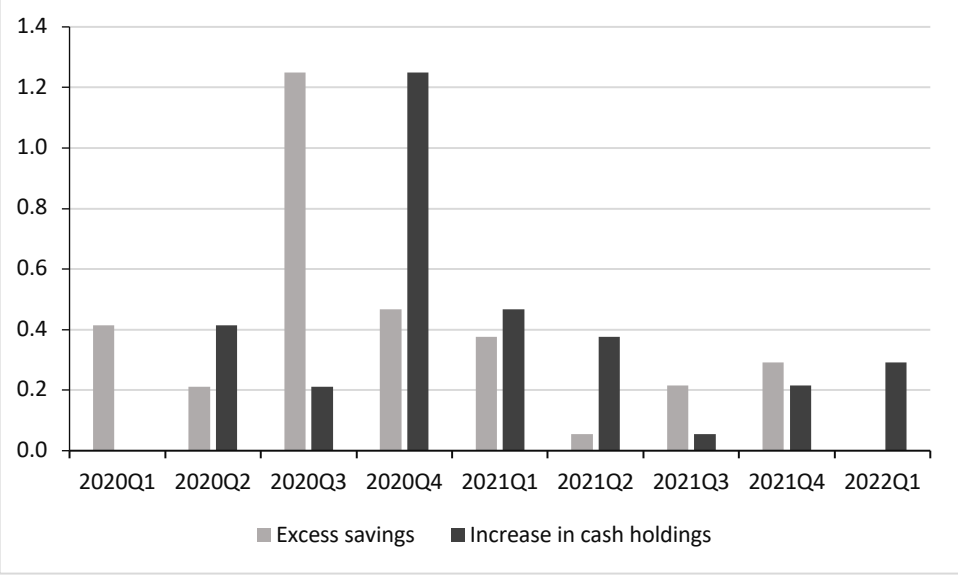
Source: Moody's Analytics in (Ensign & McCaffrey, 2022)

Two things can be observed:

1. Most of the extra saving was done by the richest households. The richest 10% had $1.49 trillion extra savings, which accounts for almost 55% of total excess savings. The next 10% had $0.31 trillion extra savings, which is equal to 11.4% of total excess savings in the US. The bottom 40% (or 60%) of the income distribution had extra savings of only $0.38 trillion (or $0.67 trillion), which is equal to just 14% (or 24.6%) of total excess savings.
2. Excess savings have declined over time – and became negative in the first quarter of 2022. That is, with PCE inflation beginning to rise, Americans are drawing down their savings to cover the higher cost of living.

The 'excess' savings were initially kept liquid, stored in checkable deposits and cash balances. **Figure 30** plots quarterly excess savings during 2020Q1-2022Q1 (from **Figure 29**) and the increase in checkable deposits and currency held by households (based on Federal Reserve data). Cash holdings of households rose by $1.25 trillion during 2020Q4, following a similar increase in excess savings during 2020Q3. The increases in cash holdings became smaller over time. In cumulative terms, cash holdings increased by more than $3 trillion during 2020Q1-2022Q2.

Figure 30
Excess saving and increases in checkable deposits and currency held by US households



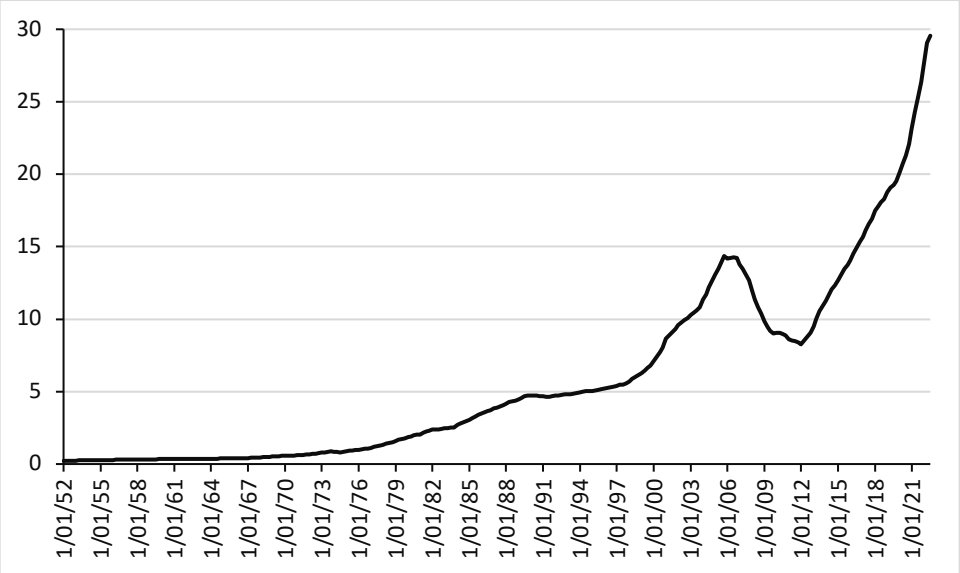
Sources: Moody's Analytics in (Ensign & McCaffrey, 2022) and FRED database (CDCABSHNO).

Most of these cash or near-cash balances were held by the richest 20% of US households, which were also responsible for around two-thirds of the extra savings (**Figure 29**). This brings us to the aspect of the inflation explosion that we think is least well explored: the wealth effect on personal consumption expenditure.

Lopsided Wealth and Income Growth Led to Lopsided Spending

It is no secret that the skyrocketing rises of pandemic housing and stock markets created additional household wealth at an extraordinary pace. Let us consider the case of housing wealth first, which some journalist accounts (Badger & Bui, 2022) claim to be without precedent. **Figure 31** shows what happened to owners' home equity during the period 2020Q1-2022Q3. Owners' equity in real estate rose by $9.5 trillion (an increase of 47%) during the first quarter of 2020 and the third quarter of 2022. The highest-income households, who own the most expensive homes, have of course seen the largest gains in absolute terms.

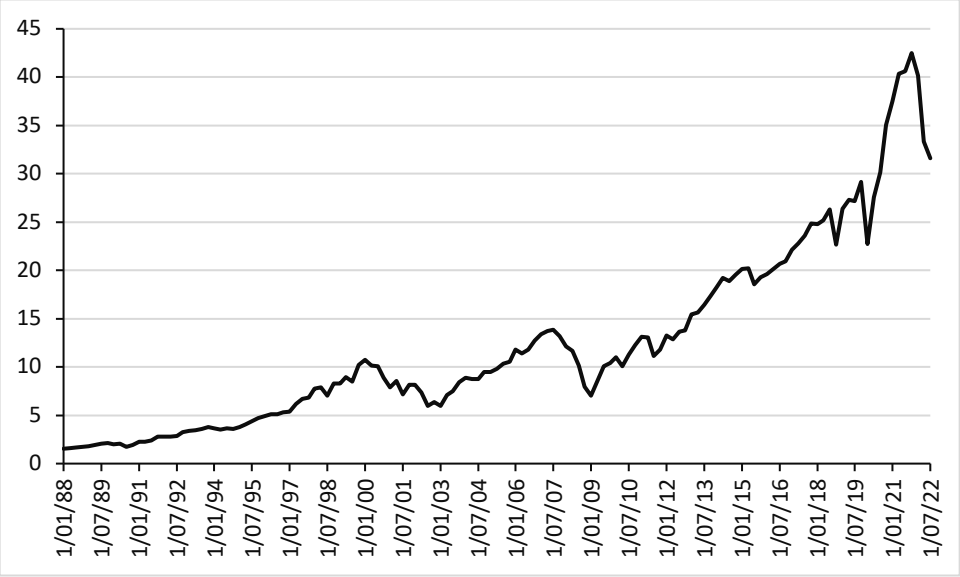
Figure 31
Owners' equity in real estate, 1952Q1 – 2022Q3
(Trillions of dollars)



Source: FRED database (OEHRENWBSHNO)

The gains that households reaped from the spectacular boom in the Wall Street stock market were equally spectacular. The market value of households' holdings of corporate equity and mutual fund shares rose by 75% or $17 trillion during 2020Q1 – 2022Q1 (and by 39% or $8.9 trillion during 2020Q1 – 2022Q3, if we take into account the recent stock market decline) (see **Figure 32**).

Figure 32
U.S. households: corporate equity and mutual fund shares, 1988Q1 – 2022Q3
(Trillions of dollars)



Source: FRED database (BOGZ1LM193064005Q).

The Federal Reserve's *Distributional Financial Accounts* (DFA) provide more insight in the distributional dimensions of this phenomenal increase in personal wealth. We define wealth as real estate and corporate equites and mutual fund shares. Using the latest (2022Q2) DFA data by income percentile, we find that aggregate personal wealth increased by an amazing $26.1 trillion during 2020Q1-2022Q1 (**Table 2**). More than 40 percent (or $10.6 trillion) of this wealth increase accrued to the top 1% of U.S. income earners, while the richest next 9% claimed 33.4% of the nominal wealth gain. This means that the richest 10% of U.S. income earners saw their wealth rise by a stupendous $19.3 trillion during the pandemic. U.S. billionaires and millionaires had a terrific pandemic, in other words. The middle classes (the next 40% of income earners) saw their wealth increase by $5.1 trillion and the bottom 50% of income earners enjoyed an increase in wealth of $1.7 trillion (or 6.6% of the aggregate wealth gain).[28]

Table 2

Increase in personal wealth by income percentile during 2020Q1-2022Q2

(Trillions of US dollars, current prices)

Real estate		
Top 1%	1.00	
Next 9%	2.98	
Next 40%	3.53	
Bottom 50%	1.60	
Corporate equity		
Top 1%	9.58	
Next 9%	5.73	
Next 40%	1.55	
Bottom 50%	0.12	
Total increase in wealth		**Estimated wealth effect on consumption**
Top 1%	10.59 (40.6%)	0.424
Next 9%	8.71 (33.4%)	0.348
Next 40%	5.08 (19.5%)	0.203
Bottom 50%	1.72 (6.6%)	0.069
Total	26.10 (100.0%)	1.044

Source: Federal Reserve, *Distributional Financial Accounts* (Governors, 2022) and authors calculations.

There exists a large (theoretical and empirical) literature on the effect of wealth on consumption; (Cooper & Dynan, 2016) provide a useful survey, but see also (Paiella & Pistaferri, 2017) for Italy; and (Chodorow-Reich, Nenov, & Simsek, 2021) and (Caceres, 2019) for the U.S. What surprises us, is that no one has so far considered the impact of the rise in wealth during 2020-2022 on consumption demand in the U.S., especially because the increase in wealth during these pandemic years, particularly for the richest 1% and 10% of Americans, was so astonishing. This silence on the wealth effect on consumption in 2021-22 is all the more remarkable in view of the fact that, not so long ago, Lawrence Summers and Paul Krugman were upholding the argument (in the context of the debate on secular stagnation of growth) that the only way the U.S. economy could be made to grow was by means of abnormal stock market returns. As Summers stated in *The Financial Times* of May 6, 2018:

> "If [tax-cuts-fueled] budget deficits had …. not grown relative to the economy … [and if] an extra $10 trillion in wealth had not been created by ***abnormal stock market returns***, it is hard to believe that the U.S. economy would be growing at all (Summers, 2018)."

If this was true in 2018, then it must have been true in 2021-22 as well, since household wealth rose by $26.1 trillion in the latter period (see **Table 2**).

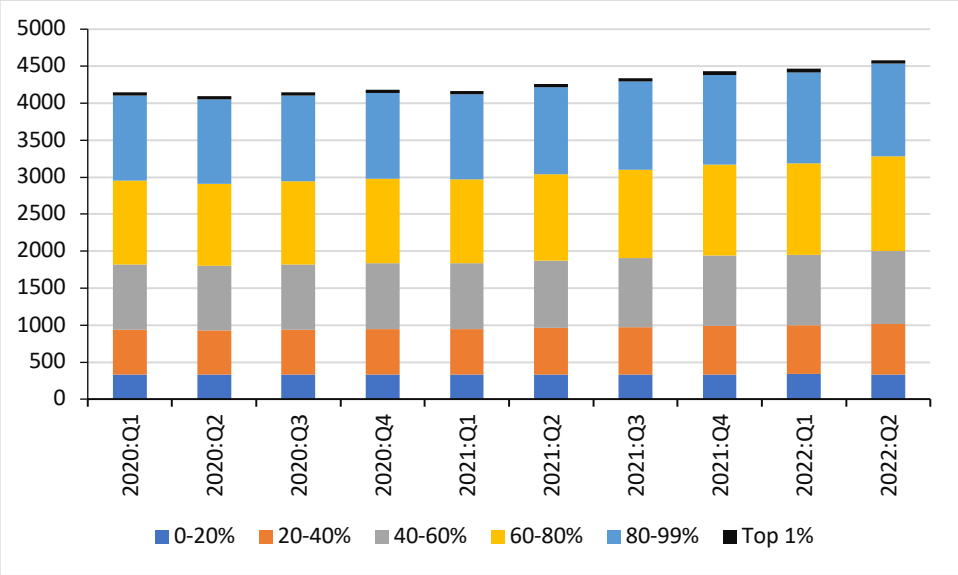
We make the conservative assumption, in line with the econometric evidence for the U.S., that the marginal propensity to consume out of wealth is 0.04 (Cooper and Dynan 2014; Chodorow-Reich *et al*. 2019; Caceres 2019). We note here, based on evidence provided by Caceres (2019), that the marginal propensity to consume out of wealth is above average for lower income groups as well as for the highest income earners.

If we assume a marginal propensity to consume of 0.04 for the effect of an increase in wealth on personal consumption, we obtain an aggregate wealth impact on consumption of $1 trillion during 2020Q1-2022Q1. This implies that the wealth effect amounted to about half of the size of the $2.1 trillion Biden corona support measures (see **Figure 4**). The wealth effect on consumption demand is not based on a broad-based stimulus, however, but rather on the skewed, highly concentrated, pandemic gains in personal wealth arising mostly from the Federal Reserve's quantitative easing program. Almost three quarters of the wealth effect on consumption is due to higher wealth for just the richest 10%—and the richest 1% alone account for more than 40% of the increase in consumption demand.

The middle- and higher-income households also have more access to credit and financial services—as they have more reported income that can be used as collateral in any loan application or financial transaction—and are thus able to 'extract' higher consumption out of their (housing and financial) assets as they "liquify" part of the wealth gains. The middle-income and higher-income households indeed raised their indebtedness, both consumer loans and mortgages, during the corona crisis.

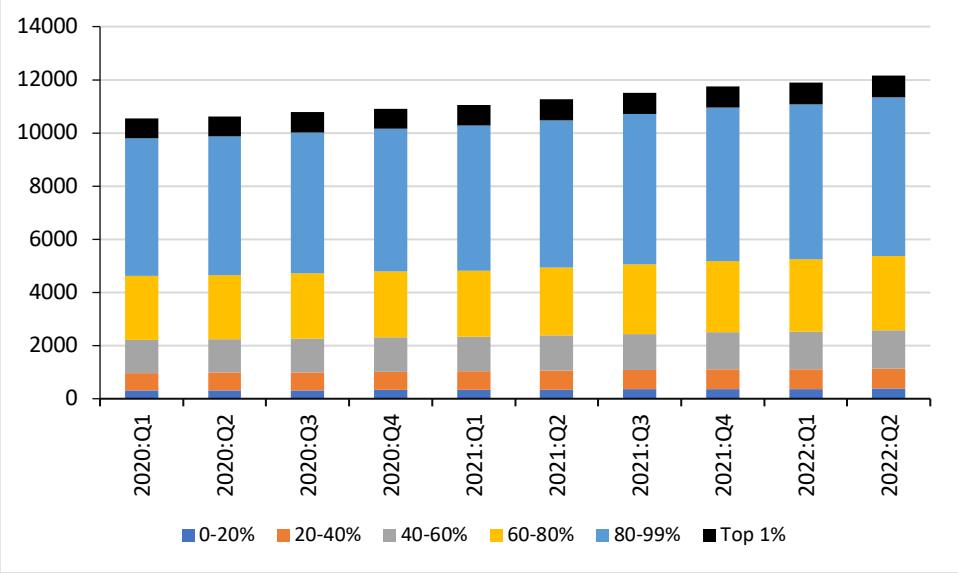
Consumer credit (including credit card debt) increased by $434 billion during 2020Q1- 2020Q2 (according to FDA data), as is shown in **Figure 33**. Almost 60% of the additional consumer borrowing was done by households in the income quintiles 60-99%, while households in the income quintiles 40-60% increased consumer debt by $94.4 billion (or 21.7% of the total increase in consumer credit). Note that the poorest 20% of households and the richest 1% each accounted for only around 1% of the total increase in consumer credit.

Figure 33
Consumer credit by income percentile
(2020Q1-2022Q2)



Source: Federal Reserve, *Distributional Financial Accounts*.

Figure 34
Home mortgages by income percentile
(2020Q1-2022Q2)



Source: Federal Reserve, *Distributional Financial Accounts*.

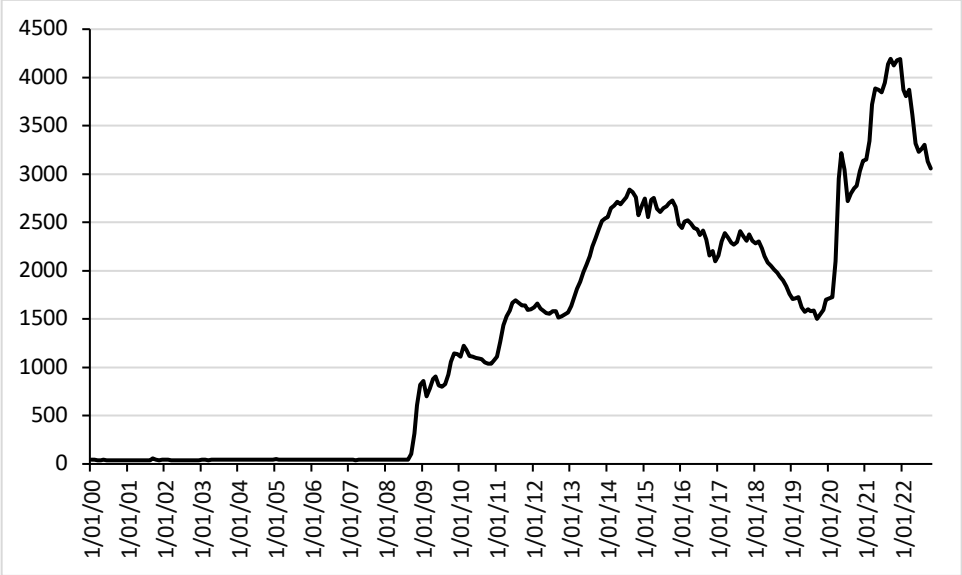
Home mortgage debt held by U.S. households rose by $1625 billion during 2020Q1 and 2022Q2 (**Figure 34)**. Again, the richer households in the income percentiles 60-99% accounted for most (namely 71%) of these debts. Households in the income percentiles 40-60% took on $208 billion in mortgage debt, which is almost 13% of the total mortgage debt increase. The shares in the increase in mortgage loans of the richest 1% and the poorest 20% are 5.5% and 4.4%, respectively.

When we combine consumer credit and home mortgages, total household debt rose by more than $2 trillion during 2020Q1-2022Q2. Households in the income percentiles 60-99% were responsible for almost 70% of the increase in (consumer loans and mortgages) indebtedness. It is clear that those households which experienced considerable increases in their wealth during the corona-crisis years, also borrowed the most—and these loans must have been extensively used to finance spending. This way, lopsided growth of incomes and wealth fueled consumption spending, with almost three quarters of the wealth effect on consumption caused by higher wealth for just the richest 10%. The rich and the super-rich really had a terrific pandemic.

We note that the remarkable and very uneven wealth growth and the strong growth in household borrowing were enabled by the Fed's monetary policy stance during, and well before, the COVID-19 crisis. The Fed's low-interest-rate and QE policies following the financial crisis of 2008-09 did next to nothing to raise business investment and economic growth; the $3 trillion in newly created dollars did not raise inflation during 2009-2021, as it never made it into the economy. Most of the new money created by QE was still sitting on banks' balance sheets as excess reserves (**Figure 35**), because the demand for creditworthy loans was very low.

Reserves have been far higher than legal requirements. During January 2010-February 2020, excess reserves in U.S. depository institutions hovered around $2 trillion, while the (monthly) PCE inflation rate averaged 1.6% during this period. During the first 15 months of the corona crisis, excess reserves *rose* to $3.1 trillion, but this increase in bank reserves was associated with a rise in the PCE inflation rate to 4.3% in June 2021. Excess reserves rose further, peaking at $4.2 trillion in December 2021, while the inflation rate rose to 6%. Excess reserves then modestly declined to $3.9 trillion in March 2022 and further to $3.1 trillion in October 2022, while the PCE inflation rate (measured on a 12-months' basis) rose to 7% in June 2022 and then declined to 6% in October 2022. Based on the evidence, it is impossible to claim that the surge in U.S. inflation has been caused by a running down of bank reserves. As we argued above, in late 2021, affluent Americans came out in force and started spending. They had not done this earlier, at virtually the same level of bank reserves.

Figure 35
Reserves of Depository Institutions (January 2000 – October 2022)
(Billions of dollars)



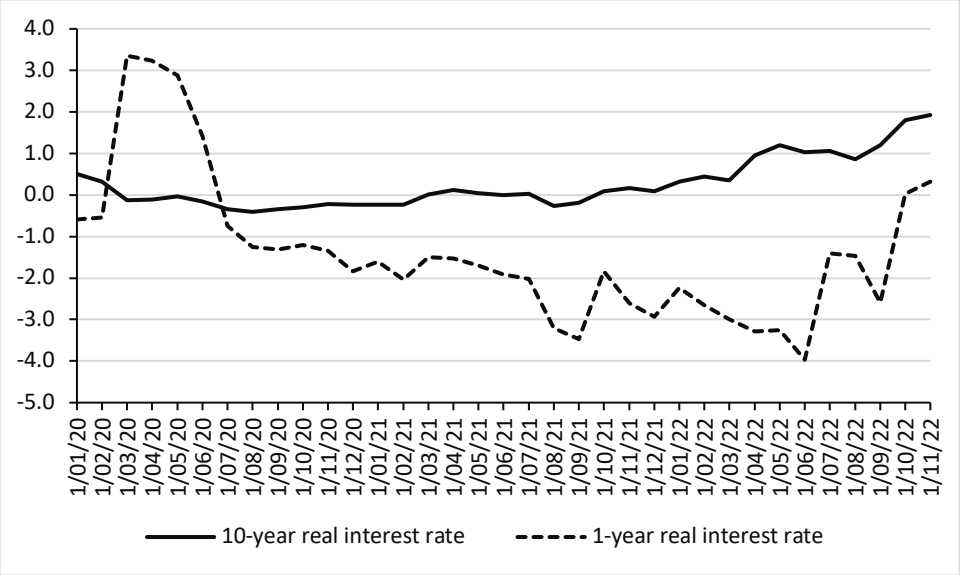
Source: FRED database (*series* TOTRESNS).

But the low interest rates did turbocharge the stock market. The major beneficiaries, again, were the wealthiest 10% of Americans, who owned 89% of stocks and mutual fund shares held by U.S. households as of year-end, according to Fed statistics.[29] More than half of that — 53% — is owned by the top 1%. Home prices have also benefited from the Fed's easy money policies.

As is shown by **Figure 36**, short-term and long-term interest rates were very low (even negative) throughout January 2020-September 2022, which encouraged risk-taking, increased borrowing and raised spending. The ultra-low interest rates, along with the backstop the Fed provided to financial markets, fortified the major asset prices, including the purely speculative cryptocurrencies. This way, monetary policy has contributed not just to higher wealth and higher wealth inequality, but — through the wealth effect on consumption demand — also to higher consumer price inflation. In other words, the Federal Reserve is now forced to 'fight' the surge in inflation that its loose monetary policies during 2009-2021 have helped to cause.

Figure 36

Real interest rates (January 2020-November 2022)



Source: FRED database.

Summers ignores the lopsided distributional changes in income and wealth, and the resulting wealth effect on consumer spending by the rich and the super-rich, and instead targets his ire on "a family of four with a pre-tax income of $1,000 a week." Because Summers is so wrong in terms of his diagnosis of the roots of U.S. inflation, he is also completely—and dangerously—off when arguing in favor of a drastic tightening of monetary policy to bring inflation down. "We need five years of unemployment above 5% to contain inflation," Summers argued in June 2022, adding "in other words, we need two years of 7.5% unemployment or five years of 6% unemployment or one year of 10% unemployment (Aldrick, 2022)." The social cost of Summers' preferred policy, which will fall on ordinary Americans and not hurt the richest, is not just unacceptably high, but also fully avoidable, because there exist alternative and smarter policy interventions to bring down inflation, which target the real source of excessive consumer demand (for specific goods and services), namely the lopsided income and wealth growth in favor of the very rich.

Conclusion: A Future of Ramified Supply Shocks

Acknowledging that the wealth effect, not the Biden stimulus, made aggregate demand important in the early stages of the inflation generation process in the United States is indispensable to clarifying the issues involved in controlling inflation going forward. But it is far from sufficient. Governments, central banks, and the public all need to realize that the brave new world of supply shocks is likely here to stay for an indefinite period for at least three different reasons.

The first is elemental: the pandemic is not over. Though many governments, including the Biden administration, often talk, in public at least, like it is, the plain fact is that the evil genie is not back

in the bottle. The U.S., Germany, and other rich countries decided that when they declined to make good on their resonant declarations early in the crisis about disseminating low-cost vaccines to the whole world (Corporate Europe Observatory, 2022) (Sachs, 2021). The subsequent U.S. failure to sustain high rates of vaccination also creates an analogously dangerous situation within a giant developed country. As we finish this paper, various multinational efforts to provide the rest of the world with vaccines are announcing cutbacks or even weighing shutting down. It is true that vaccine take up has flagged in numerous countries, but that is irrelevant from the standpoint of system safety – the vaccines save lives and need to be both available and used. The main producers of the new mRNA vaccines have vigorously opposed modifying property rights protections for their vaccines even after they have made billions of dollars from them and their governments have aligned with them.

A critical moment has thus been missed. For the indefinite future everyone everywhere has to live with the possibility that some new, deadly variant of COVID might suddenly materialize that is impervious to the vaccines. That that horrific possibility has so far not materialized is cold comfort; already the European Medicine Agency is warning that many newly developed or recently deployed antibody drugs for treating COVID are likely ineffective against the most recent strains of COVID (MedicalxPress.com, 2022).

The U.S. remains particularly vulnerable on this score, as even many interest groups and government agencies concerned with national security now complain. We have already discussed how the Biden administration failed to put in place a reliable national system for monitoring pandemic variants in real time on par with those in many other developed countries, and the hazards this creates for national health and employment policy.

There is worse. In the early stages of the pandemic, the Center for Disease Control was famously slow to recognize that the pandemic spread mostly through the air. A long campaign by dedicated medical professionals and epidemiologists changed that, but the CDC still resists highlighting this dominating fact. No one expected any bold initiatives from the Trump administration that might inconvenience business interests, but even under Biden neither the CDC nor OSHA has mandated ventilation improvements. Instead, they have chosen to emphasize individual responsibility.[30] Meantime, the special pandemic assistance programs that helped sick Americans pay for insurance, meet the costs of drugs, and help them through illnesses are being allowed to run out.

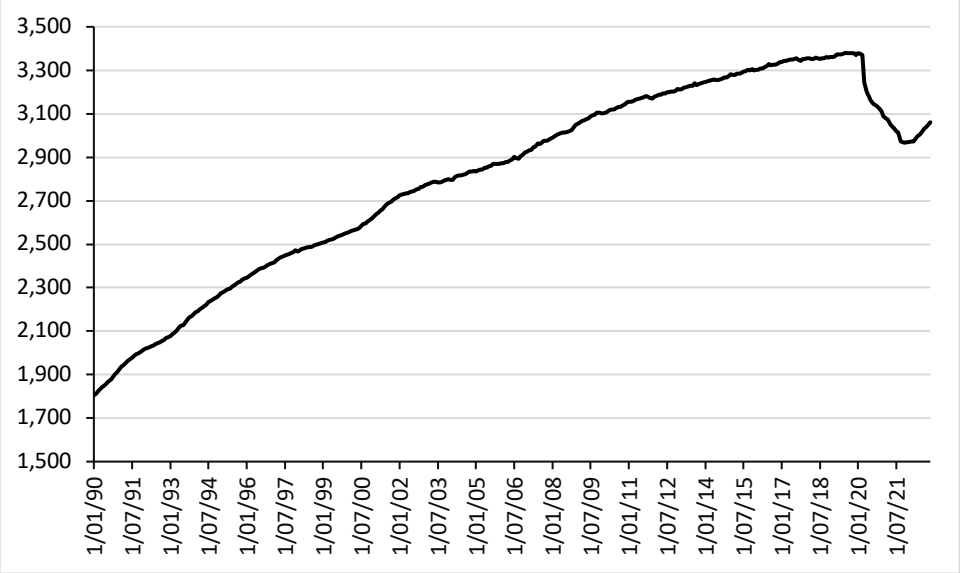
Even from a very narrow economic perspective, these developments are gravely concerning. Though many crucial details remain unclear, it is apparent that Long COVID is a serious problem with major implications for workforce participation and productivity (Deitz, 2022) (Bach, 2022; Ouimet, 2022) (Brown, Tache, & Fremstad, 2022). But national health authorities have been slow to seize the initiative, leaving much of the research to private institutions and central banks. A growing number of analysts are also wondering if down the line complications to immune systems from COVID may intensify effects of other diseases and conditions on many people.[31]

If national health authorities vigorously follow up, we can hope that these questions can be quickly resolved, though the chilling study of the CDC's early response to the pandemic (Lewis, 2021) council's skepticism. It seems safe to conclude that for a long time to come COVID is likely to circulate with little publicity through the most vulnerable parts of the population. Periods when waves of new COVID variants coincide with other seasonal health threats are likely to be especially trying. Each of these reminders of heightened danger is likely to remind many workers of the advantages of retiring as early as possible (Steward, 2022).

These workers, along with white-collar workers in sectors like health care, education, nursing homes, and day care in which fairly intense human contact is the norm, will continue to sicken whether or not authorities or the mass media choose to talk about it. We are thus confident that wage premia for safety will persist in many previously low wage occupations and exposed white-collar positions.

Considering the evidence already discussed about the pandemic's direct effects on labor force participation, this line of analysis leads to testable conclusions that are discomforting: weak American regulatory responses to the pandemic keep exacerbating the crisis in labor force participation that is hammering traditional "care industries." It is striking, for example, that as of November 2022 the total workforce in nursing homes remains far below the levels of 2019, as can be seen in **Figure 37**. During the twelve months of 2019, the average number of workers in nursing homes was 3.4 million; in November 2022, the number of employees in nursing and residential care had declined by 9.3% to 3.1 million.

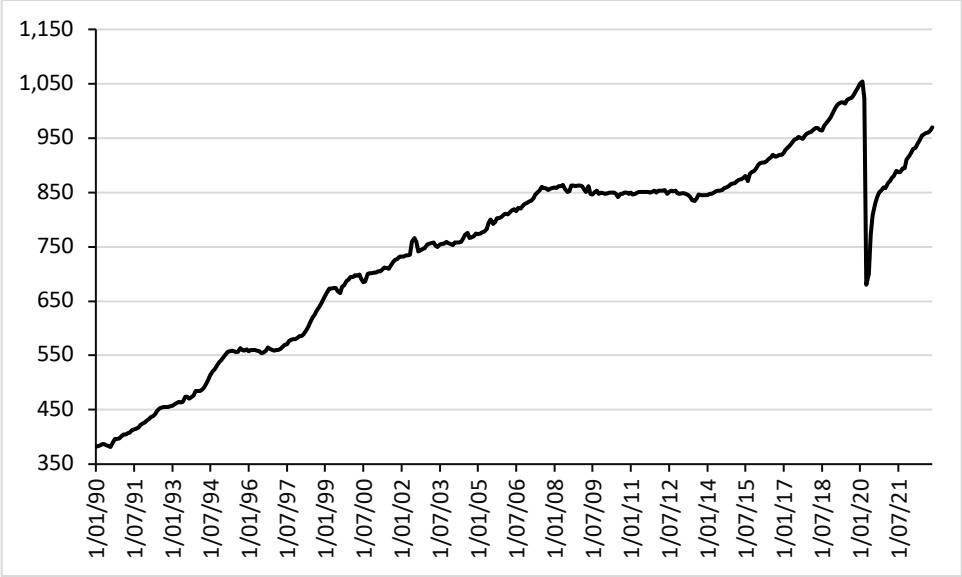
Figure 37
All Employees, Nursing and Residential Care Facilities, Monthly,
Seasonally Adjusted, January 1990 – November 2022 (Thousands of persons)



Source: FRED database (CES6562300001).

The same is true of child day care, where the number of workers in November 2022 has declined by 5% compared to 2019 (**Figure 38**). The day care squeeze has obvious ripple effects on general labor force participation. If U.S. authorities do not intervene, we think the situation in many of the care industries is likely to get worse very quickly. The market cannot fix it: higher safety premia can draw in more workers, but with the existing American distributions of wealth and income, the resulting higher prices for 'care services' are guaranteed to price more and more workers completely out of the market.

Figure 38
All Employees, Child Day Care Facilities, Monthly,
Seasonally Adjusted, January 1990 – November 2022 (Thousands of persons)



Source: FRED database (CES6562440001).

This situation may well turn into a true doom loop: By constraining workforce participation and the labor hours of working Americans, the lack of affordable day care will make the distribution of wealth and income even more lopsided, leading to yet more workforce exclusion and restriction. We fear that this downward spiral could spread to many parts of the American economy, especially its giant low-wage sectors. Strong evidence, for example, suggests that it may be taking hold in many parts of education, especially in those sections run by governments that are structurally inhibited from responding rapidly to changing wage levels.[32]

For now, however, our conclusion is that supply shocks arising from labor force issues and health are likely to be pervasive in the future. They will hit countries like the U.S. with minimal welfare states and weak work regulation especially hard, but waves of (perhaps little reported) illnesses and occasional defensive job actions will afflict weakly regulated industries everywhere and especially

in the care sectors of economies. If the hard-hit sectors include ocean shipping, air transport, and other vital arteries of globalization, the damage will be all the greater. The bitter conflict over recent proposals by American railway unions for sick pay may be a harbinger of things to come.

A second source of continuing shocks is likely to come from the many forms of climate change. This subject can be analyzed at almost any level of detail. In this paper, however, we want to press only a minimal case. We begin by acknowledging that international statistics for major climate and natural disasters are less than perfect. Both human and economic losses are imperfectly tabulated. The human toll of COVID and many other disasters, including weather catastrophes, are not well chronicled outside of developed countries. Economic loss estimates are very noisy, since they vary wildly depending on insurance coverage, how many weather catastrophes hit wealthy countries, and relative prices. For these reasons, we are cautious about extrapolating recent studies pointing to exceptionally high rates of losses from natural causes during the pandemic years. But we also think that climate change is real and that the very hot temperatures of 2022 in particular are a warning. The widely applauded (at least outside the United States) studies published by the Swiss Re Institute impress us as reasonable estimates along with its warning that "Climate change poses the biggest long-term threat to the global economy. If no mitigating action is taken, global temperatures could rise by more than 3°C and the world economy could shrink by 18% in the next 30 years."[33] Large scale migration is an obvious consequence of intensifying climate change which is destined to set off more shocks to the system, though some labor issues may be eased depending on how public policy responds.

The risks of shocks from climate change are particularly threatening when viewed in light of the third factor we believe is destined to supply a whole set of steady supply shocks in the future: the dramatic changes in international relations and the international economic order crystallized, if scarcely inaugurated, by Russia's attack on Ukraine. Like climate change itself, this is another topic that is too vast to be treated in more than summary fashion here. We reject out of hand extreme claims about the "death of globalization." Supply chains are principally controlled by firms; they differ in important ways we do not have time to discuss from traditional arm's length international trade. But it is already clear that not only the U.S., but Russia, China, Saudi Arabia, and, slowly and haltingly, Europe are all taking steps to direct their trade and investments. We think these are only destined to snowball and interact.

By themselves, these efforts will trigger ramifying supply shocks that in the medium term add up to much larger magnitudes than those suggested by measures of their initial direct effects. The very special case of energy is a powerful warning on this point, though we cannot discuss it here.

But there is a second, much more dangerous factor that will operate powerfully. Few economic analysts have come to terms with the deep implications of the shift to a multipolar world economy. It does not help that much thinking in economics about the subject is superficial. The most famous discussion of power in contemporary international economics, Charles Kindleberger's analysis of the crucial role hegemony plays in the supply of global public goods, flatly contradicts the balance

of power condition that many international relations theorists have emphasized as indispensable for avoiding wars.[34]

Thinking about many related themes is equally woolly. We are skeptical of views that treat the structure of the international economy as a function of the financial dominance of the dollar with that in turn analyzed as reflecting principally coercive pressures. Dollar dominance, we think, results from the historical dependence of money systems on states that can act effectively in crises, as well as how well their currencies provide low-cost vehicles for trade and safe repositories for elite savings. As a factor determining the relative power of countries within the world economy, we would emphasize also the role played by intellectual property rules and related mechanisms that are critical determinants of technological superiority on a world scale.

These reflections lead us to emphasize what we think will be a decisive influence on the magnitude of future supply shocks: the tenor of relations between the major poles of the emerging multipolar world economy. It goes almost without saying that if relations between China and the U.S. continue to worsen, supply conditions throughout the world will be profoundly affected. But the strategy and aims of other leading powers also count. In the context of climate change, these tensions could become deadly in more senses than the obvious possibilities of additional major wars. Great power rivalries arising from the Ukraine invasion are now leading many countries to back off their efforts to reach net zero emissions and instead make major new investments in fossil fuels (Bryan, 2022). These reverses in course will inevitably increase the world's dependence on fossil fuels just as threats from climate change intensify. Companies and countries specializing in legacy fuels are also rather obviously doubling down on efforts to harvest gains from their obsolescent assets and protect their positions (T. Ferguson, 2022).

Considerations like these suggest that containing supply shocks going forward will depend crucially on precisely the factor that proved decisive after the two world wars: the structure of relations between major powers in the world economy. To the extent that broadly cooperative relationships exist, one can hope to work through tensions, minimize shocks, and negotiate economic and political difficulties and limit spending on armaments, which from the standpoint of the system as a whole constitute a giant social drain. Bipolar systems may also be tensely stable. But our new "new world order" is a multipolar system, and those are notoriously unstable. To the extent that belligerent multipolarity dominates, the potential for major system shocks is likely to increase and multiply – in the nuclear age virtually without limit, though cyber technologies are opening doors to entirely new kinds of potential devastation. Whether or not the worst perils finally materialize, however, there is no question that every country will be learning how to protect itself as best it can from the pandemic's debilitating legacy.

Policy Implications

Going forward we expect that the emerging multipolar global economy will suffer from frequent, but irregular *supply-side shocks*, triggered by geopolitical tensions and war as well as COVID-like

diseases and extreme weather events. Global supply chains will become more fragmented—and their resilience will face increasingly severe tests. The resulting supply-side inflation can only be efficiently combatted through initiatives that operate on the supply issues, such as vigorous antitrust policy, tight limits on commodities (futures) markets, and other targeted (microeconomic) regulatory measures including strategic price controls and limits to speculation in commodity markets, along with major investments in public health and renewable energy.

Fiscal policy also needs adapt to control supply shock inflation of the kind the world is now fated to experience. Recently we have all heard warnings about the possibility of "secular stagnation," in which demand remains chronically weak.[35] But the new "new world order" comes with a symmetrical short-term risk: not merely of undershooting full employment, but also of demand overshooting when supply plummets suddenly for extended periods and labor supply falls. The danger is particularly acute when central banks have been pursuing quantitative easing policies that markedly increase wealth inequality.

When supply is irregularly constrained for long periods, relying on monetary policy as the main policy response is a cure worse than the disease. Monetary tightening cannot remove the structural supply-side causes of the likely inflationary surges, and it carries a very high social cost in terms of higher unemployment and permanent damage to potential growth. Higher interest rates imply a loss of potential investment and lower productivity growth, which will raise, not lower, the inflation barrier, defined in terms of the 'steady-inflation' rate of unemployment. Existing inequalities in income and wealth will increase. Nor will rising interest rates do anything to mitigate the damage from long run climate change, especially agricultural and weather catastrophes, reopen supply pathways, or reduce risks from pandemics and weak national health care systems.

Far less destructive ways of coping with the emerging world system are possible. Explorations of ways to steady demand over the business cycle need not only to envisage policies to prevent deficient demand from spreading, but also to temporarily stabilize demand when supply is under pressure. Some of these may include measures in the spirit of Keynes' (1940) *How to Pay for the War,* including forcing private households to temporarily save a certain part of their income in the form of government bonds. This allows consumption to be shifted over time from a period of excess demand into a phase of (expected) excess supply; it could also change the distribution of financial wealth in favor of the lower- and middle-income classes. Other measures could be progressive consumption taxes and higher taxation of wealth and capital gains (Klein, 2022b). What has to be avoided is precisely what is happening now, as central banks respond to the demands for protection from inflation by kicking interest rates up and up. That is a program that is guaranteed to undermine economic progress and, potentially, democracy itself. It makes about as much sense as raising rates in response to harvest failures in old time agricultural economies.

Appendix:

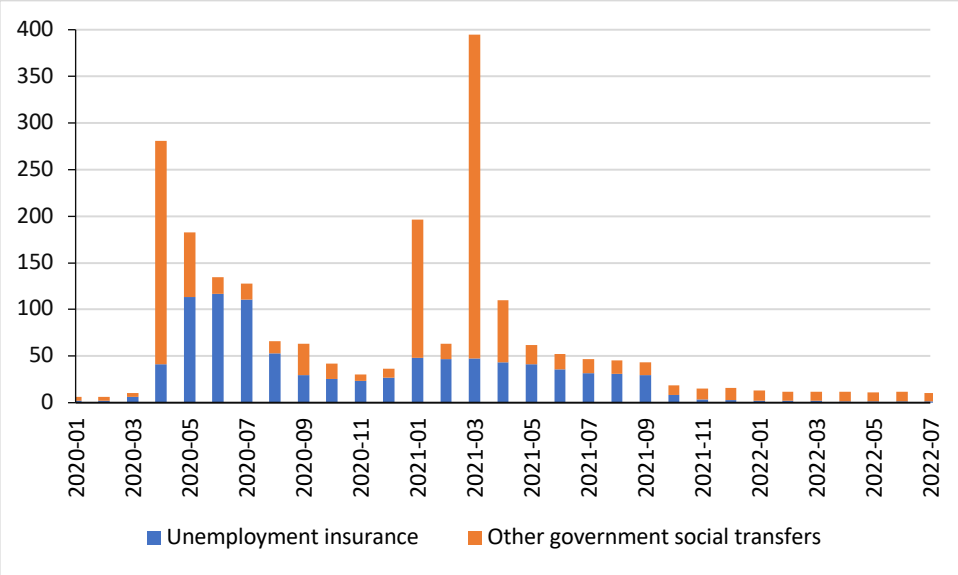
Composition of federal spending on corona relief

Federal spending on corona (income) relief measures has amounted to $2.1 trillion during March 2020-August 2022. The public spending by the federal government on corona relief measures are recorded, on a monthly basis, by the BEA under the heading 'Effects of Selected Federal Pandemic Response Programs on Personal Income'. The pandemic relief spending comes under two (broad) headings: (a) unemployment insurance; and (b) government social benefits to persons (see **Figure A**).

Figure A

Federal corona relief spending during January 2020-July 2022

(Billions of US dollars, current prices)

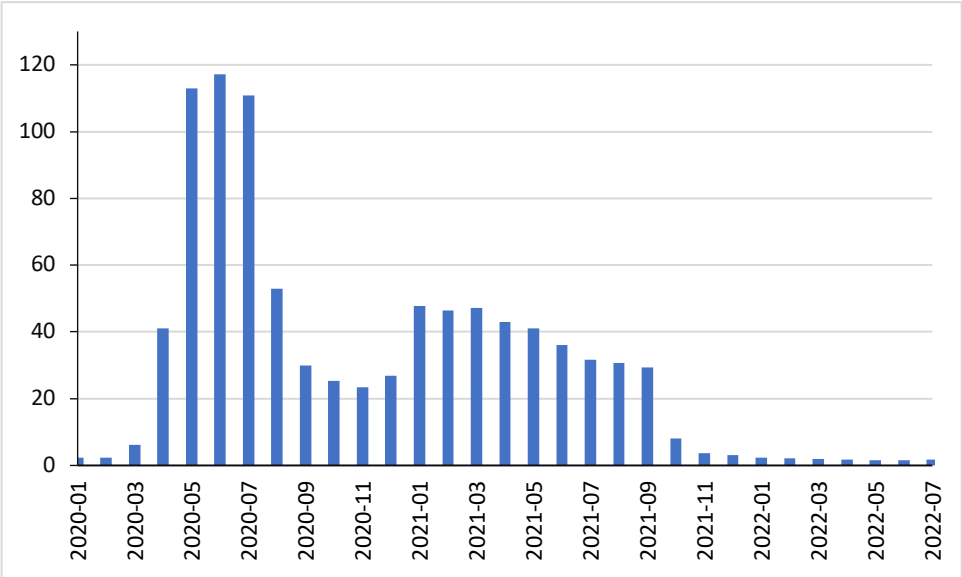


Cumulative pandemic relief spending under the heading of unemployment insurance consists of $14 billion spent on 'Extended unemployment benefits', $98.1 billion spent on 'Pandemic Emergency Unemployment Compensation', $155.6 billion used for 'Pandemic Unemployment Assistance', and $441.4 billion spent on 'Pandemic Unemployment Compensation Payments'. Total cumulative relief spending on unemployment compensation during March 2020-July 2022 was $709 billion (or 37% of cumulative federal outlays on pandemic relief).

As can be seen from **Figure B**, most of the spending on unemployment benefits occurred in the year 2020. Spending on unemployment benefits peaked in Spring 2020; spending on unemployment compensation amounted to around $40 billion during January-September 2021, but levels off almost completely after September 2021. Almost 60% of cumulative spending on unemployment compensation (or $551.4 billion) took place in 2020, and another 28% (or $261.6 billion) of emergency unemployment relief occurred during the first six months of 2021 (see Figure

4B). That means that most of the unemployment benefits were paid and received before the 2nd half of 2021, *i.e.*, well before PCE inflation began to accelerate.

Figure B
Federal emergency spending on unemployment compensation
during January 2020-July 2022
(Billions of US dollars, current prices)



Government social benefits to persons make up the other 63%, or $1191 billion, of cumulative federal pandemic relief spending during March 2020 – July 2022 (**Figure C**). The child tax credit provided US households with $847.7 billion of emergency income support in cumulative terms, making up 71% of government social benefits and 45% of total COVID19 income support (**Figure D**). Other income support measures include 'Economic impact payments', 'Lost wages supplemental payments', 'Paycheck protection program loans to NPISH' and 'Provider relief fund to NPISH'.

It can be seen that the income support measures peaked in April 2020, in January 2021 and in March-April 2021, and then dropped down to almost nothing during May 2021-July 2022. In fact, cumulative emergency income support during May 2021-July 2022 amounted to $184 billion, which is around 15% of total cumulative income support. This means that 85% of the emergency income support provided by the federal government was received during March 2020-April 2021.

Figure C

Federal emergency spending on corona income support
during January 2020-July 2022 (Billions of US dollars, current prices)

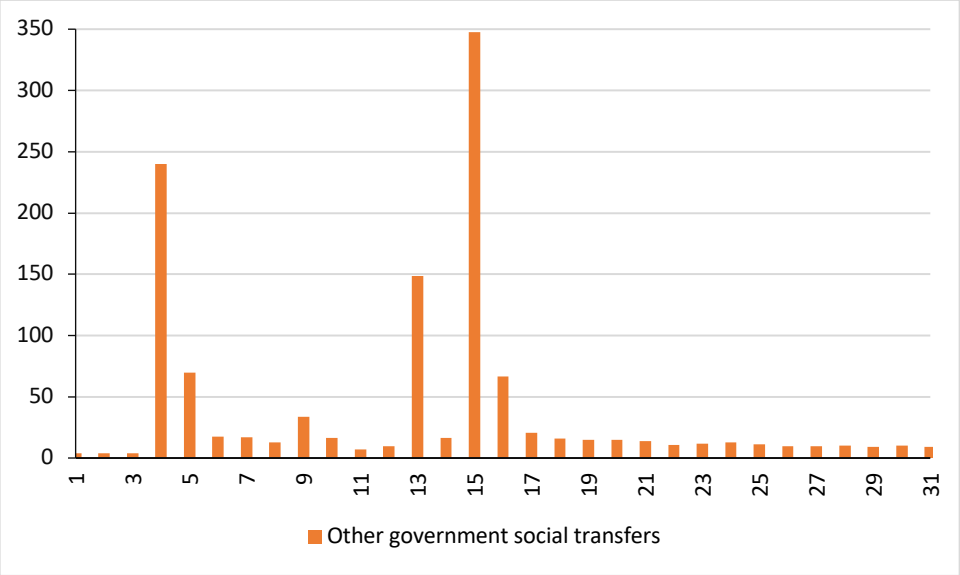
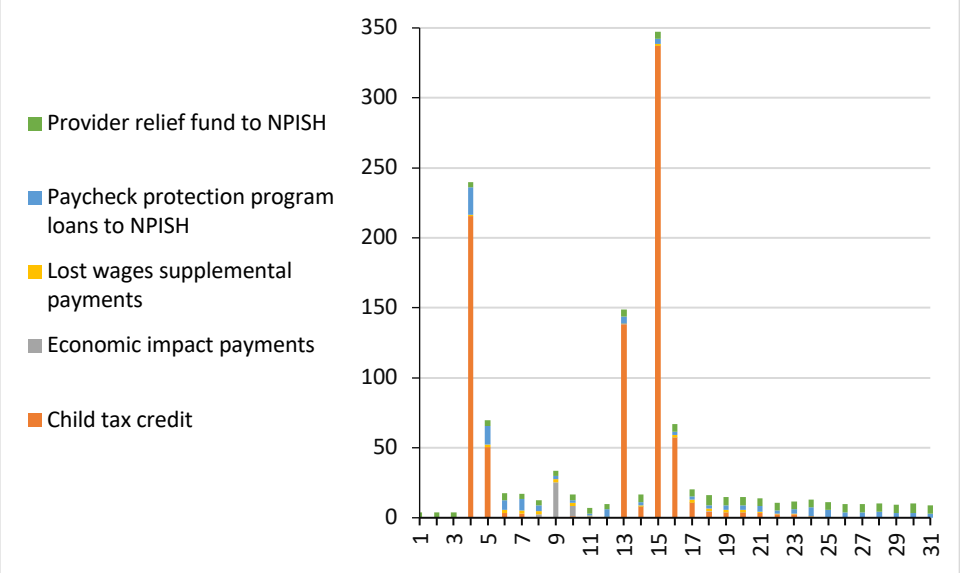


Figure D

Composition of federal emergency spending on corona income support
during January 2020-July 2022
(Billions of US dollars, current prices)



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Notes

[1] See, e.g., (Blanchard, 2021); (Wolf, 2021a) and (Kuttner, 2021) for Furman.
[2] See the discussion below.
[3] See, e.g., (Wolf, 2021b) on spillover effects.
[4] (Fink, 2022) for declared COVID; for excess deaths, see, inter multi alia, (Paglino et al., 2022).
[5] See, for the Republicans under Trump, e.g., (T. Ferguson, Jorgensen, & Chen, 2021); a recent wave of papers offers detailed analyses of death rates by county partisanship. The differences antedated COVID, but generally increased during the pandemic. See for pre-COVID (Denworth, 2022); for COVID, (Wallace, Goldsmith-Pinkham, & Schwartz, 2022) and, among a large and growing literature (Kaashoek et al., 2022). Republican opposition to additional funding for COVID also killed an extension of some administration backed programs. Assessments of responsibility for this lapse vary, since Democrats also refused various compromises. We lack the space for a longer discussion. See, e.g., (Romm, 2022).
[6] See the discussion below but also e.g., (Muoio, 2022), reporting on a major statement in the Journal of American Medical Association by former Biden transition team advisers.
[7] (Summers, 2021) argued that "there is a chance that macroeconomic stimulus on a scale closer to World War II levels than normal recession levels will set off inflationary pressures of a kind we have not seen in a generation, with consequences for the value of the dollar and financial stability. This will be manageable if monetary and fiscal policy can be rapidly adjusted to address the problem. But given the commitments the Fed has made, administration officials' dismissal of even the possibility of inflation, and the difficulties in mobilizing congressional support for tax increases or spending cuts, there is the risk of inflation expectations rising sharply.
[8] See the Financial Times interview in (Wolf, 2022); and (Rainey, 2022) for the later view.
[9] The interview on CNN.com: (Egan, 2021).
[10] As in many previous episodes of inflation, many firms also borrowed since real rates lagged nominal rates.
[11] Federal pandemic income support consists of spending on extended (emergency) unemployment compensation and (direct) government social benefits to persons (which includes the Child Tax Credit); the Appendix presents details on the composition of federal pandemic relief expenditures. See especially, https://www.bea.gov/recovery/
[12] According to Summers (Klein, 2022a), "supply is what it is. Monetary policy, can't change it. Fiscal policy can't change it, except in the long-run. And so given what supply is, it's the task of demand to balance supply. And if demand is greater than supply, then you're going to have excess inflation and you're going to have the problems of financial excess. […..] So, the job of the demand managers, principally the Fed, is to judge what supply is and calibrate appropriately. It's not an excuse for inflation to blame it on supply. It's a reality in the environment that you have to deal with. And so, the job is to look for measures of overheating, and when you see measures of overheating, to apply restraint."
[13] Deregulation was a process, not an event. Position limits in commodities markets, for example, were abolished during the Bush administration.
[14] (Schweitzer & Khattar, 2022); generally on CEO pay and stock options, see (Lazonick & Shin, 2020). A fundamental paper in the field is (Hopkins & Lazonick, 2016).
[15] (Bivens & Kandra, 2022).
[16] For the shareholder calls see (Owens, 2022); for a striking survey, see esp. (Digital.com, 2022). A possibility that needs through checking is that an increased use of the internet and algorithm that take account of competitors prices almost from moment to moment may be significant factors in the inflation.
[17] (Lobe, 2022) raises several interesting points. In the U.S., litigation concerning algorithms used by landlords, possibly to collude, has been started. See also (Parramore & Singer).
[18] (Himmelstein & Woolhandler, 2020).
[19] Details on the early discussions and OSHAcome from investigative reporting; cf. the headnote on sources in (T. Ferguson et al., 2021); for the later developments, see discussion below.
[20] For aerosol transmission, cf. (KHN, 2022). This single morning news summary from the Kaiser Foundation in *March* of *2022* points up the problem better than any amount of commentary, given that so little about the debates behind the scenes is publicly available:
"A blog post Thursday was the first time the White House formally acknowledged that aerosol transmission has been the primary driver of the COVID pandemic, CIDRAP reports. That position goes further than the CDC has so far.

Some epidemiologists hope the pivot will refocus mitigation efforts on air filtration and better quality masks. Separately, the CDC has changed its policy allowing hospital visitors to wear N95s, not just surgical masks.
CIDRAP: White House Diverges From CDC, Focuses On Aerosol COVID Spread Yesterday the White House published a blog post titled "Let's Clear the Air on COVID," describing the virus as primarily transmitted through aerosols—small, tiny airborne particles. Though some experts around the world have been arguing that point for years, and subsequently advocating for respirator use and enhanced ventilation systems, this is the first time the White House has formally acknowledged that aerosol transmission has been the primary driver of the COVID-19 pandemic. In doing so, it has turned away from the language used by the Centers for Disease Control and Prevention (CDC). (Soucheray, 3/24)."
See also the striking Twitter comments on the CDC by Dr. Kimberly Prather of the Scripps Institute of Oceanography, whose work on COVID is internationally recognized. "My response to
@CDCDirector After nearly 3 years, I am beyond stunned at your recent Tweet...talks about washing hands and doesn't say a word about masks or cleaning indoor air. This has led me (as a member of four scientific academies) to write to you to beg you to please fix your message. COVID-19 is airborne. It is not on surfaces as CDC has reported (<1 in 10,000 chance of being infected from fomites). I am in complete disbelief after reading your tweet. I (and millions of others) would appreciate your clarification that COVID and other viruses like RSV are airborne." The text here consolidates three Tweets; see (Prather, 2022).
See also (Lancet COVID-19 Commission Task Force on Safe Work, 2022).

[21] The literature on school problem during COVID is immense, but not always illuminating. On the legacy testing problems and the sheer ineptitude of much advice and guidance coming from both the Trump and Biden administrations, see (Gurdasani, Alvelda, & Ferguson, 2021). Note that much recent literature has attempted to assess the degree to which the personal and education progress of students was harmed by lockdowns. But very few of these papers have clearly distinguished lockdowns from disastrous bouts of the pandemic. Often when districts persist in staying open through heavy outbreaks, conditions make teaching almost impossible anyway. So many teachers and students are sick that substitute teachers turn into home room supervisors. That condition needs careful assessment, particularly in the future, as further waves of illness without lockdowns loom.

[22] See (Seccareccia & Romero, 2022) for a very penetrating analysis of the paper by the two Federal Reserve economists.

[23] The issues here are too many to engage in this paper; we think the extensive use of the concept in empirical studies of labor markets is overdue for critical review. Note that because so many low paid jobs are affected, wage dispersion between top and bottom will fall, at least in the short and medium run.

[24] (Statistics, 2022).

[25] Misinformation about vaccines cannot have helped; this had a strongly partisan tilt in much of the pandemic, but the topic is too large to treat here. For the multiple causes of labor market withdrawal, see (S. Ferguson, 2022) and the discussion below.

[26] The data on robust wage growth and job changing are hardly compatible with claims that monopsony dominates labor markets, but that is a separate discussion.

[27] A striking example that we fear may be all too typical is the Massachusetts Bay Transportation Authority. A wave of retirements in the early stages of COVID led to over-reliance on the handful of experienced controllers who remained. They worked extremely long shifts. Accidents jumped markedly. See the discussion in (Mohl, 2022) and (WCVB, 2022).

[28] On the middle class, see (Donnan, Tanzi, Ballentine, & Low, 2022).

[29] See (Governors, 2022),
https://www.federalreserve.gov/releases/z1/dataviz/dfa/distribute/chart/#quarter:125;series:Corporate%20equities%20and%20mutual%20fund%20shares;demographic:networth;population:1,3,5,7;units:levels;range:2007.3,2022.3

[30] See the discussion above, particularly the Twitter "exchange" between CDC Director Wollensky and Dr. Kim Prather.

[31] A striking summary of research in this area is indexed on the Twitter feed of Dr. Jeffrey Gilchrist for October 22, 2022; https://twitter.com/jeffgilchrist/status/1605958004163084292

[32] The complexity of educational data makes us hesitant to pronounce, but data series such as those in FRED for "all employees, local government education" are anything but reassuring. Employment levels remain far down as of December 2022: https://fred.stlouisfed.org/series/CES9093161101

[33] (Swiss Re Institute, 2021); the quotation comes from the Institute's news release for this report: https://www.swissre.com/media/press-release/nr-20210422-economics-of-climate-change-risks.html See also (Swiss Re Institute, 2022) on the unusually high losses in 2021 and 2022.

[34] (Kindleberger, 1986), which first appeared a decade earlier, is usually credited with the basic insight. But he did not offer the view as a theory of international relations; that developed later, from authors outside of economics. An especially interesting discussion is (Kurth, 1998).
[35] For a review, cf. (Storm, 2017).