

Trump versus Biden: The Macroeconomics of the Second Coming

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ABSTRACT

The wafer-thin poll margins separating President Joe Biden and Donald Trump have surprised and baffled many analysts. This paper attempts no analysis of the election itself. It focuses instead on a clinical assessment of its macroeconomic context. Building on previous work, this paper looks first at inflation's overall effect on real wages and salaries. It then considers claims advanced by Autor, Dube and McGrew (2023) and others about wages of the lowest paid workers. Real wages for most American workers have declined substantially under inflation. We observe no sign of a radical transformation of the U.S. labor market in favor of the lowest-paid workers. The (modest) increase in real hourly wages of the bottom 10% of U.S. workers during 2021-2023 owed little to any policy change or declining monopsony power: It was a unique case of wages rising to

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subsistence levels as COVID exponentially multiplied risks of working at what had previously been relatively safe jobs at the bottom of the wage distribution.

The paper then analyzes inflation's persistence in the face of substantial increases in interest rates. We document the wealth gains made by the richest 10% of U.S. households during 2020-2023. These wealth gains, which have no peacetime precedents, enabled the richest American households to step up consumption, even when their real incomes were falling. Empirically plausible estimations of the wealth effect on the consumption of the super-rich show that the wealth effect can account for all of the increase in aggregate consumption spending above its longer-term trend during 2021Q1-2023Q4. Importantly, the lopsided inequality in wealth makes controlling top heavy consumption spending by raising interest rates much harder for the Federal Reserve, without interest rate increases that would bring the rest of the economy to its knees much earlier. We also show that the persistence of inflation in several key service sectors is heavily influenced by captive regulators – a condition that higher interest rates cannot remedy.

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Introduction

First, there was COVID. Then came surging inflation, two major shooting wars, food and climate calamities, and an intractable international debt crisis. Now as drones and missiles streak over the real plains of Armageddon almost every day, another apocalyptic event looms on the horizon – a genuine Second Coming: Despite January 6th, major business reverses, and myriads of court cases, prosecutions, and high-profile litigation, Donald Trump is locked in a tight race for the White House with President Joe Biden.

Just when he needed money the most, a stunning feat of financial engineering vaulted him back into the ranks of the American super-rich (Moore, 2024). Though some major business groups remain aloof (Goldmacher and Haberman, 2024), many billionaires who swore off ever supporting him again are flocking back to his standard, while companies that loudly proclaimed their determination to cut off campaign contributions to Republican legislators who supported the January 6th effort are pouring funds into the coffers of both the legislators and Trump’s campaign (Gold, 2024).¹ With a vast network of lavishly funded think tanks drawing up blueprints for drastically revamping government in the event Trump wins, Democratic leaders are plainly distressed (Arnsdorf, *et. al.*, 2023). Already mired in a blazing civil war over policy toward the Middle East, they are now weighing their responses to the United Autoworkers (UAW) electrifying success in organizing the Volkswagen plant in Chattanooga, Tennessee and the wave of unionization efforts its success is engendering as inflation stays stubbornly high.

The wafer-thin poll margin baffles establishment news and political analysts (Wallace Wells 2024; Krugman, 2024a). Wringing their hands in exasperation, they point to macroeconomic indicators indicating that the U.S. economy is humming along. Powering out of the COVID19 recession of 2020, the economy is growing at more than 3% (on an annual basis) in the first quarter of 2024. The official unemployment rate of 3.8% in March 2024 hovers near a fifty-year low; real earnings of U.S. workers have been rising for some months; and consumer price inflation has dropped from 8.6% in the second quarter of 2022 to 3.2% in the first quarter of 2024. The economy’s ability to defy widespread predictions of recession in the face of Federal Reserve monetary tightening had even fed hopes for a “soft landing” that could open the way for another round of interest rate cuts that could spur financial markets to new records – at least before the Chattanooga vote.

Many observers also extol the President’s landmark policy achievements: Not simply the vast aid programs for ordinary Americans that his administration launched as it came to power, but the series of dramatic industrial policy initiatives that startled the rest of the world. These include the Inflation Reduction Act (IRA), which set in motion far-reaching transformative programs of loans, grants, and tax credits to adapt the US to the realities of climate change; the Chips Act, which incentivizes industries to reshore production in strategically important industries; and a separate

¹ Partial inventories of major companies that promised not to fund election deniers are widely available on the internet. See, e.g., Piper and Montallero (2023). Fundraising for 2024 is massive and reporting lags behind the reality. We have checked enough to support our paper’s claims here.

infrastructure package worth more than a trillion dollars over time. Not to mention the other steps the administration took on behalf of racial justice, student debt relief, unions, and consumer protection.

The perplexity runs so deep that a cottage industry has sprung up generating ingenious explanations of why the election is so close. Their common core is the invocation of clear forms of irrationality – individual and social cognitive failures, mass amnesia about Trump’s actual record, or, inevitably, disinformation spread by any number of bad actors at home or abroad (Glasser, 2024; Krugman, 2024b).²

We view this situation as a trap, especially in the light of the UAW’s stirring victory and mushrooming campus protests. A year ago, as the Fed responded to inflation by abandoning its policy of quantitative easing – ultra low interest rates – and started rapidly raising them, we argued that the economic situation of most Americans was far more tenuous than commonly recognized (Ferguson and Storm 2023a). We contended that relying on central banks and fiscal policy tightening to contain the historically specific form of inflation raging through the economy would not work out well.

It was simply untrue, as Lawrence Summers and many other mainstream economists contended, that the inflation resulted from a US-specific wage/price spiral, set in motion by the President’s stimulus program. The time paths of inflation and the stimulus spending did not at all align; and, decisively, wages clearly lagged well behind prices. Since our paper, evidence against this view has continued piling up and we are not surprised that at a recent Brookings conference no one at all defended the position.

In fact, the inflation was worldwide and shocks to supplies were clearly its primary cause, though of course profit-maximizing firms took advantage of the fear and uncertainty to raise profit margins when they could (“profit inflation”).³

The most immediately disruptive of these supply shocks came from COVID – full stop. But other forces compounded the desperate situation. We pointed to accelerating climate change, with its dramatic effects on storm damages, floods, droughts, temperatures, and food prices, and an increasingly belligerent multipolar world economy that was redefining risks for value chains and national security.

² It is not news that partisans of each party tend to misperceive the state of the economy. The 2024 case quite clearly goes well beyond such effects. It obviously affects many Democrats, for example. The obvious insufficiency of this chestnut inspires the present flood of ruminations.

³ The literature is vast, but see Storm (2023); the question cannot be reduced to simple mark-up maintenance. Note that with so much inflation coming from the supply side, profit inflation can hardly drive the entire process. In this respect, a recent paper by the San Francisco Fed (Leduc, Li, and Liu, 2024) creates something of a straw man. They do not show detailed data, but it is interesting that “salient industries” show clear evidence that markup rose over time and that over the entire economy, their lowest estimate remains in positive territory, unlike the other recoveries they plot.

The customary response of central banks to inflation – raising interest rates – would do little to resolve any of the underlying problems. COVID and its supply chain snarls required active large-scale government interventions to increase supplies, reduce bottlenecks, and protect public health. In practical terms, that made inevitable a new round of massive borrowing by governments.

Neither would raising interest rates palliate supply problems. They were certain to discourage investments in climate change mitigation, given that many of the most promising forms of renewable energy require major upfront investments to scale up efficiently. Many renewables also return steady, but not flashy streams of revenue, so that higher interest rates could reduce their appeal to financial markets demanding rates of return at levels comparable to those of, for example, private equity. But slow walking efforts to counter climate change would guarantee further future rounds of price shocks and other adaptation costs as the climate worsened. Higher rates would also inhibit adjustments in value chains and production shifts required for resiliency and enhanced national security amid radically shifting international alliances and conflict threats.

We especially emphasized the potentially fatal implications for controlling spending via interest rates from the dramatic change in the wealth holdings of American's most affluent citizens. These swelled as a consequence of the Fed's latest round of quantitative easing after COVID hit. As the central bank's ultra-low interest rate policy levitated financial markets, wealth concentration quite exceeded levels reached earlier. Most gains went to the rich and super-rich. As COVID eased off in 2022 after vaccines were introduced, spending by the wealthy exploded, even as ordinary Americans struggled as the temporary government programs ran out. The increase in spending out of wealth, we estimated, was roughly the size of the entire Biden stimulus program. Coming online just as total government spending nosedived, it massively increased demands by the affluent for goods in short supply. In the inflation debate, this was the missing elephant in the room.

Our paper contended that upward shifts in wealth of this magnitude – which had no peacetime precedents – were producing dramatic shifts from quantity to quality in the structure of the economy. In the short run, the lopsided inequality in wealth would make controlling consumption spending by raising interest rates much more difficult. Consumption by the affluent would be far harder to slow, without interest rate increases that would bring the rest of the economy to its knees much earlier. The shift in wealth would also fuel illusions that high volumes of aggregate spending were reliable indicators of broad social welfare.

Which they were anything but. We showed that claims of broad wage gains under Bidenomics were specious. The opposite, in fact, was the rule: The U.S. was plainly in the throes not of a wage-price spiral but a price-wage merry go round, with real wages for most workers falling steadily behind prices. For one set of workers only this pattern did not hold true: workers at the very bottom of the wage distribution were indeed seeing pay raises in real terms. This owed little to any policy change: It was a unique case of wages rising to subsistence levels as COVID exponentially multiplied risks of working at what had previously been relatively safe jobs and workers at the bottom of the wage distribution left their jobs.

The increasing economic heft of the superrich exercised a magnetic attraction on the American economic structure, transforming parts of it quickly. In many instances, the result was plainly socially irrational: jobs in high-end restaurants were flourishing, while low-paid work in nursing homes, childcare, or education dried up. Long-COVID and related health problems continued to disorganize labor markets, leading many workers to withdraw in whole or in part from them and confusing analysts who judged according to older rules of thumb.

A year later, some of the points we made, especially concerning climate change, have been taken up, if not exactly taken to heart (Ferguson and Storm, 2023b). But the central parts of our macroeconomic message mostly have not, though recently some bank analysts and media accounts have begun to recognize the importance of the wealth effect that we pointed out already in January 2023 (Rugaber, 2024). But the issues of wealth effects and real wages, unfortunately, are crucial for understanding why an incumbent president presiding over a growing economy is scrambling to hold on. Or why, five years after COVID and four years after a Democratic President who pledged to be the most pro-union president in American history, the prospect of a real wage/price spiral (or “Kaleckian Moment”)⁴ might at last be a real possibility as the presidential race heads into its home stretch.

This paper is not directly a venture in election analysis. That would require attention to many issues we have no space for here, such as foreign policy, abortion, or immigration and border issues. We have a sinking feeling that the outcome of the 2024 election may now be in the lap of the gods – or, as statisticians might say, some Poisson distribution. With age an issue for both candidates, a public stumble by either could tip the outcome. So could any number of foreign policy surprises, including the course of several wars. OPEC+ is clearly trying to raise oil prices, which will certainly affect inflation. Whatever happens, Federal Reserve policy will surely be important. If the Fed responds, as so often in American history, to a belated wave of efforts by workers to catch up with inflation by tightening policy or holding rates up too long, it could indeed shorten the odds of a Second Coming.

Instead, this study is one of several papers that we are writing to illuminate the real macroeconomics of the Second Coming, which we emphasize that we do not consider inevitable. Our hope in this one is to explain how the macroeconomic problems in our earlier paper have blinded many participants and observers to the actual state of the American economy as the election approaches.

The current paper returns to the key questions of wages and incomes and how wealth effects cripple reliance on interest rates to control inflation. British studies (e.g., Alexandri *et al.* 2024), have drawn attention to COVID’s continuing impact and related medical issues on labor markets. In the United States, comparable discussions can be found only in specialized, public health-oriented circles. Most of the press, both political parties, the Biden administration, and the Fed, emphasize how well labor markets have rebounded. The importance of recent work identifying biomarkers

⁴ See, e.g., Ratner and Sim (2022), but also the acute critique in Seccareccia and Romero (2022).

associated with Long COVID or the ramifying hazards of reinfection (Alvelda, 2024; (Strulik and Grossman, 2024) has yet to be broadly recognized. We believe COVID and related public health problems continue to roil labor markets; the epidemic is not over, though its effects have become more subtle and complex. The present study treats COVID only as much as necessary to understand debates about low wages; we leave its broader effects on labor markets for a subsequent paper.

Our exposition divides, like Caesar's Gaul, into three parts. Part I analyzes the course of wages. It begins by surveying economy-wide evidence. The conclusion is inescapable that real wages for most Americans have dropped substantially during the Biden presidency. The cumulative losses for most are substantial. We then consider in more detail claims advanced by Autor, Dube and McGrew (2023) and others about wages of the lowest paid workers. Stressing the rebound in labor markets since COVID, they argue that these workers, at least, have enjoyed substantial gains – characterized at times as “unprecedented in a generation.” They also argue that differences between the highest and lowest wage levels have compressed significantly, concluding that “disproportionate wage growth at the bottom of the distribution [...] reversed almost 40% of the rise in 90-10 log wage inequality since 1980, as measured by the 90-10 ratio” (Autor *et al.* 2023, pp. 33-34).

These claims were not correct when they were put forward and they remain wide of the mark now. They draw mostly on evidence from hourly wage data, which have severe limitations. We will show that most gains by the lowest paid workers occurred in a few months in 2020. They largely reflect, as we argued before, rising premia for safety when low paid, but safe, jobs suddenly became low paid and deadly once COVID hit. Most definitely these wage gains do not reflect sudden changes in monopsony – the local domination of labor markets by one or a few employers. We buttress our conclusions by tracing how fitfully data for personal income, life expectancy and median household incomes have rebounded from their disastrous nadirs at the height of COVID. We are thus not surprised by the new wave of unionization efforts, though their success is hardly guaranteed.

Part II of our paper looks again at the evidence about wealth effects. Despite the sharp rises in interest rates, stock markets have surged again. The latest climb arguably reflects hopes for early interest rate cuts (now mostly dashed) but also the advent of epoch-making technological advancements. Whatever its causes, the surge has brought the wealth of affluent Americans back to record levels. And just as they did after Omicron waned, affluent Americans are again spending at prodigious levels. As before, interest rate checks on their consumption are feeble.

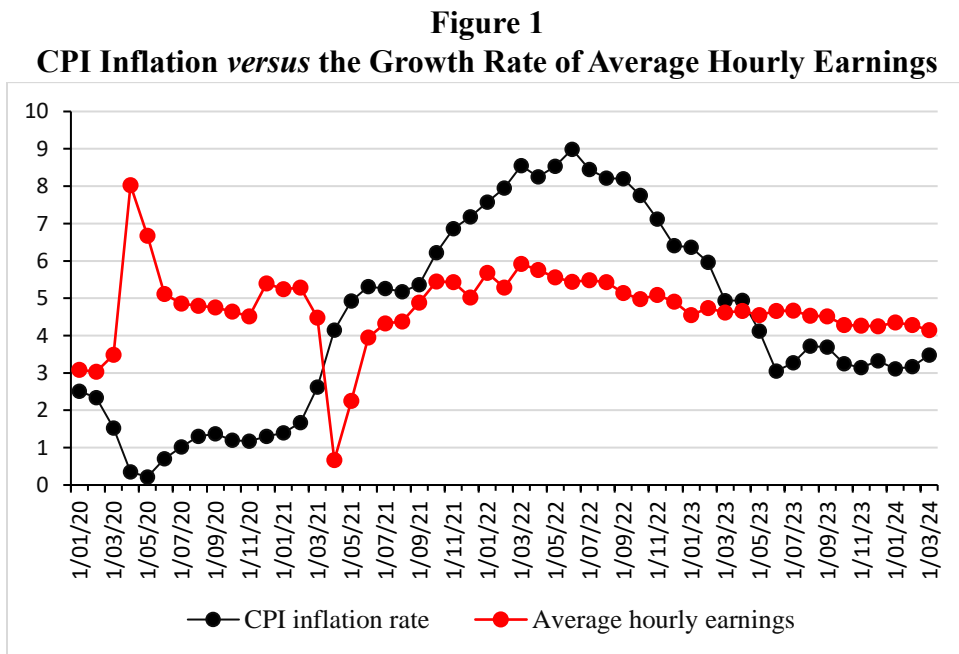
Our Conclusion shows how continuing demand, (mostly) by the affluent for services whose production conditions are controlled by captive public regulators, helps fuel inflation in the service sector. Raising interest rates to control inflation in such cases is pointless; policy has to address the underlying problem, not squeeze the rest of the economy to no end.

Part I

Wages, Inequality and Inflation

Simple extensions of the evidence we mustered in our previous study to dispel claims that inflation was wage-led show readily how far real incomes for most workers have deteriorated (Ferguson and Storm 2023a). Two graphs tell the tale.

Figures 1 and 2 plot the rate of inflation against the growth rates of average hourly earnings and average weekly earnings. Looking at both measures provides a fuller impression than relying on just one, since working hours have varied and in recent months have plunged sharply, as we will see later in this paper. That, of course, means that higher hourly wages can lead to lower weekly pay-checks – which in fact appears to be happening.



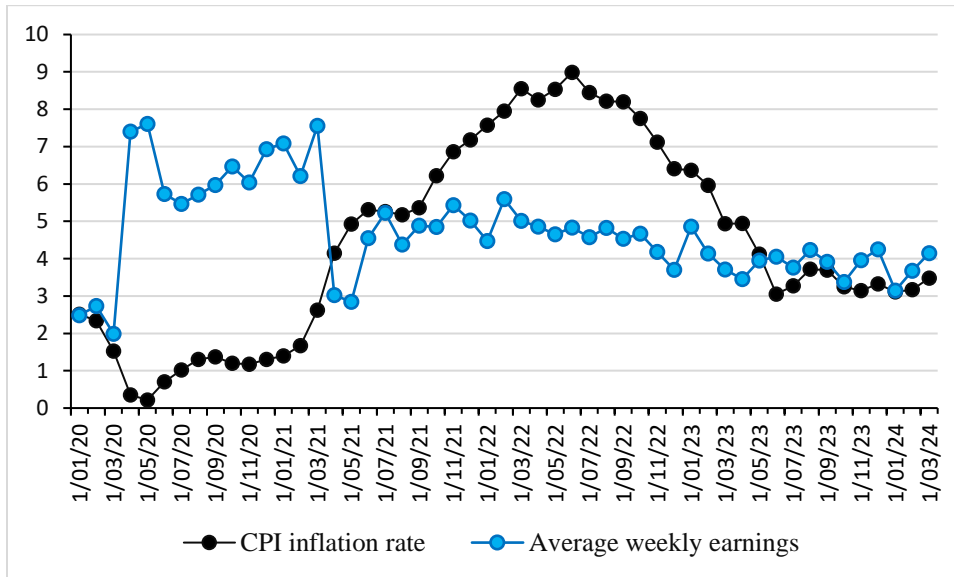
Source: FRED database and authors' calculations

From April 2021 to April 2023, inflation raced ahead of the growth rate of average hourly earnings – often far ahead. From May 2023 onwards, average hourly earnings growth recovered a bit, topping the CPI inflation rate by small amounts.

Roughly the same pattern holds for the rate of inflation compared to the weekly growth of average earnings, save that the latter turns up in June, not April of 2023. Average weekly earnings run below

the CPI inflation rate from April 2021 to June 2023. From July 2023 onwards, average hourly earnings growth is about equal to the CPI inflation rate.

Figure 2
CPI Inflation versus the Growth Rate of Average Weekly Earnings



Source: FRED database and authors' calculations

The overall effect of inflation on earnings assessed in terms of either yardstick is negative – and rather markedly so. Real wages, which adjust for the changes in the inflation rate, are clearly down. The cumulative loss in real average hourly earnings in March 2024 (compared to the base-year 2020 = 1.0) is 2.05%. The cumulative loss in real average weekly earnings – the more important figure, since it takes account of working hours – as of March 2024 (compared to the base-year 2020 = 1.0) is 2.50%.

The potential significance of these numbers for the election looms larger when they are counterposed to the behavior of real wages under Trump. Many economists and pundits have openly wondered if the readiness of so many Americans to say they prefer Trump's economic record to Biden's testifies to the working of some powerful distorting force or even large-scale amnesia.

We do not wish to be misunderstood: we do not think Trump's economic policies benefitted most Americans in the long run nor does his record stand out when measured against other administrations. Nor do we believe that voters retrospective evaluations of presidential administrations are unimpeachable – and certainly not now, in an age of “deep fakes” and disinformation.

But many economic evaluations of Trump’s record continue to strike us as one-sided. It is true that he benefitted from an upswing that began (weakly) under Obama. But his vigorous opposition to premature monetary tightening by the Fed did help to prolong the rise in the economy.

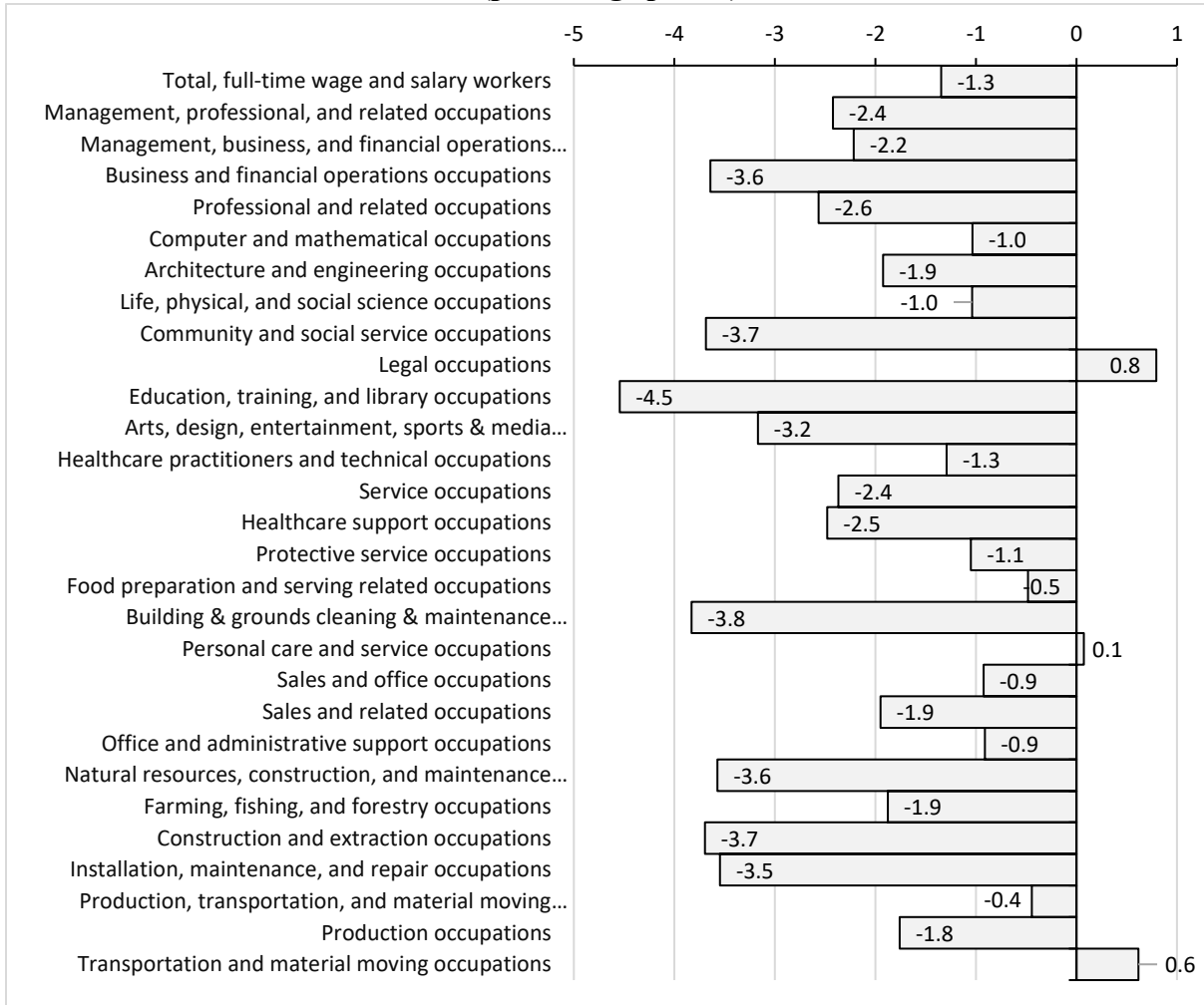
“But as 2018 turned into 2019 and inflation failed to take off despite story after story in the business press about the difficulties businesses were having finding workers, only the most doctrinaire economists could cling to traditional macroeconomic and central banking dogma. Wages were hardly rising despite the economic revival; that was precisely the important result for theory. But in the short run incomes were increasing because people could at last get more hours of relatively low paid work as employers became more willing to look at people they had previously written off. People were reentering the labor force and even long-term rates of unemployment were falling. It was also easier to find second and third precarious gig jobs, if people wanted them.” (Ferguson, Jorgensen, and Chen, 2021)

Unemployment rates for whites declined, but rates for Blacks and Hispanic fell to historically low levels. It is therefore not surprising if some minority voters retain impressions more favorable than analysts focused on tax rates, public goods provision, and similar issues.

Direct comparisons of how different occupations fared under the Trump and Biden administrations underscore the contrasting records (Figure 3). The picture is clear: almost all occupations are worse off under Biden’s watch. In fact, this result is almost a caricature of some famously one-sided partisan dismissals of Democratic Party politics: The group that did best under Biden was lawyers. But they, together with workers in other occupations that broke into positive territory, account for just 8% of all American jobs.

The reluctance of so many Americans to celebrate Bidenomics is thus easy to understand. If they are applying the famous test Ronald Reagan proposed during the last Great Inflation, the answer is stark: “Are you better off now than you were four years ago”? (CNN, 1996). One can reject the comparison as unfair or inappropriate – because of COVID; or because it is unreasonable to hold Biden responsible for an economic disaster that he inherited or that instead he deserves credit for a strong recovery. But such caveats are a bit like Phillips Curves: they cut little ice unless you are a communicant. If you are not or you simply expect your chosen political party to buffer you from storms, no matter where they come from, then its persuasive force is much less.

Figure 3
Difference in Average Annual Median Real Wage Growth by Occupation:
Biden (2021-2023) versus Trump (2017-2019)
(percentage points)



Source: BLS data.

1.1. The Fate of Low Wage Labor

As inflation picked up speed in the second half of 2021, arguments that most workers were benefitting became harder to sustain. At length, the Biden administration itself stopped touting “Bidenomics,” even avoiding the term (Thompson and Nichols, 2024). But a second, narrower line of argument continues to resonate with much more force: that between 2020-23, a dramatic rise in real wage growth at the bottom of the distribution has occurred that amounts to a major, if

not historic, reversal of the trend toward lower wages that has run for more than a generation. For example, while noting traces of an upturn in wage growth that predated COVID, David Autor, Arindrajit Dube and Annie McGrew (2023) press the case that under Biden rapid relative wage growth of the bottom 10% workers “counteracted nearly 40% of the four-decade increase in aggregate 90-10 log wage inequality.” They ascribed most of this to a loss of monopsony power by employers in the low end of the wage distribution, though they noted that various Biden administration policies may also have contributed to this result.

Other analysts place less weight on cracks in monopsony. They spotlight on the broad range of worker-friendly initiatives that the Biden administration pushed in the emergency, including its famous stimulus program and changes in National Labor Relations Board policy. They see this ensemble of measures as bringing about a ‘radical departure’ from decades of widening inequality and stagnant real wages at the bottom of the distribution. President Biden’s policies, they hold, produced a ‘dynamic job market’ powered by effective policies aimed at healing the scars of the COVID-19 pandemic and subsequent economic shocks. Elise Gould and Katherine deCourcy (2024), of the Economic Policy Institute (EPI), write:

“The fast growth over the last four years, particularly for low-wage workers, didn’t happen by luck: It was largely the result of intentional policy decisions that addressed the pandemic and subsequent recession at the scale of the problem. [...] Several large spending bills were passed in the first year of the pandemic, which provided enhanced and expanded unemployment insurance, economic impact payments, aid to states and localities, child tax credits, and temporary protection from eviction, among other measures [...]. These measures [...] fed the surge in employment, which gave low-wage workers better job opportunities and leverage to see strong wage growth.”

[Arindrajit Dube \(2024\)](#) concurs, concluding that

“America’s positive wage trajectory is not a fluke, but rather a testament to the effectiveness of the proactive fiscal policies implemented during the pandemic, particularly US President Joe Biden’s American Rescue Plan. By focusing on healing the labor market, the US managed to bring back jobs, mitigate the devastating effects of the downturn, and generate sustained wage growth despite global price shocks [...].”

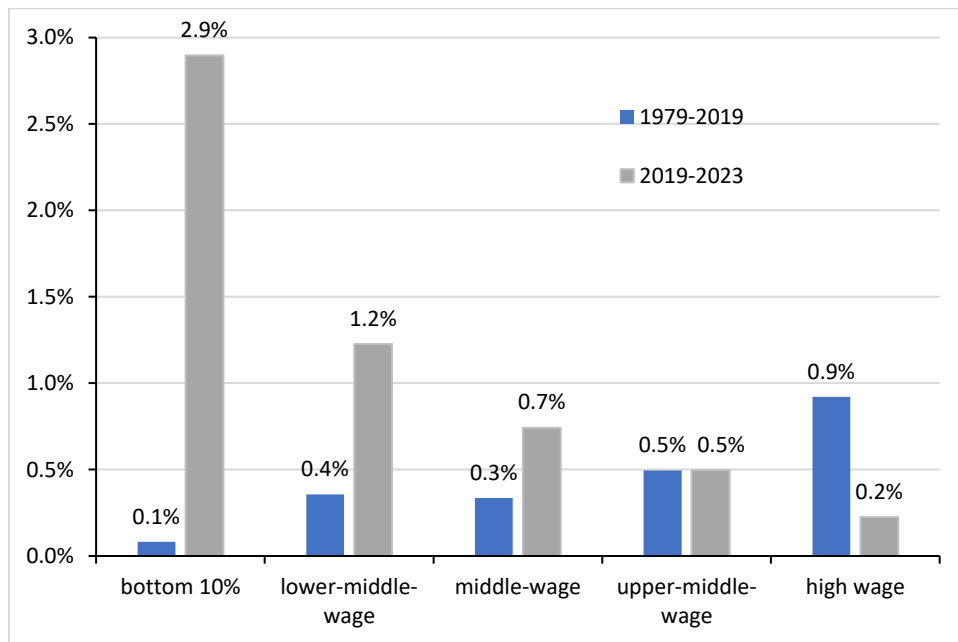
The plausibility of the claim that the low wage labor market has dramatically transformed is enhanced by widespread media talk of a hot, even “red hot” job market.

A detailed clinical assessment of the evidence, however, points to a very different reality that goes far to explaining why the election polls are so close. We begin with a look at three pieces of empirical evidence put forward as ‘proof’ of this transformation.

The first exhibit is Figure 4, taken from Gould and deCourcy (2024). This presents annualized growth rates of real hourly wages across the wage distribution during the (forty-year) period 1979-2019 and the (four-year) period 2019-2023.

On its face, the tale these graphs tell seems clear: real hourly wages of the bottom 10% of U.S. wage earners stagnated for four decades but are now growing at 2.9% per year. In contrast, real hourly wage growth of the high-wage earners has come down from 0.9% per year during 1979-2019 to just 0.2% per year during 2019-2023.

Figure 4
Annualized Real Hourly Wage Growth Across the Wage Distribution, 1979–2019 and 2019–2023

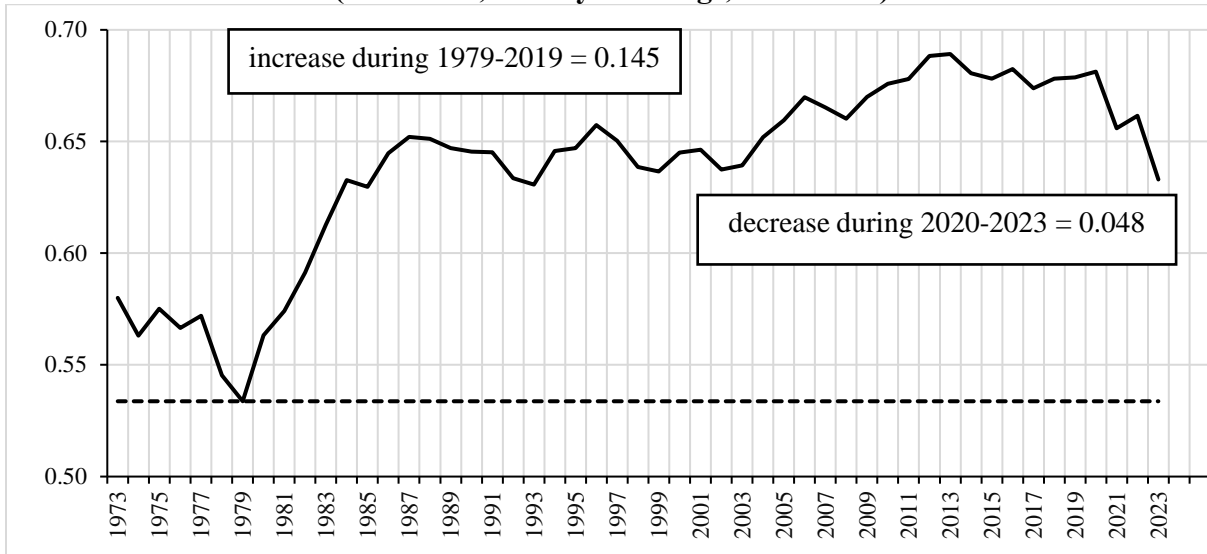


Source: Gould and deCourcy (2024), Figure B. Calculated based on data from Economic Policy Institute (2024), *State of Working America Data Library*, “Wages by percentile and wage ratios.” *Notes:* Low-wage is represented by the 10th percentile and high-wage is represented by the 90th percentile. The lower-middle-, middle-, and upper-middle-wages are the averages of the 20th–40th percentiles, the 40th–60th percentiles, and the 60th–80th percentiles, respectively.

We have no problems with this claim – as far as it goes. We agree that relative real hourly wage growth at the bottom of the wage distribution did change in a direction that reduced wage-gaps between low-wage and high-wage workers. This is illustrated in Figure 5, which shows the evolution of the 90-10 log wage ratio in the U.S. during 1973-2023. We use annual real hourly earnings data published by the Economic Policy Institute (EPI), which are, in turn, based on monthly CPS data. The U.S. 90-10 log wage ratio declined by 0.048 log-points during 2020-2023 and, consistent with the analysis in Autor *et al.* (2023), this counteracted one-third of the recorded

increase in hourly wage inequality by 0.145 log-points during 1979-2019. Hourly wage inequality in 2023 is similar to what it was in 2003, though still considerably higher than in 1979.

Figure 5
The Evolution of the 90-10 log Wage Ratio
(CPS Data, Hourly Earnings, 1973-2023)

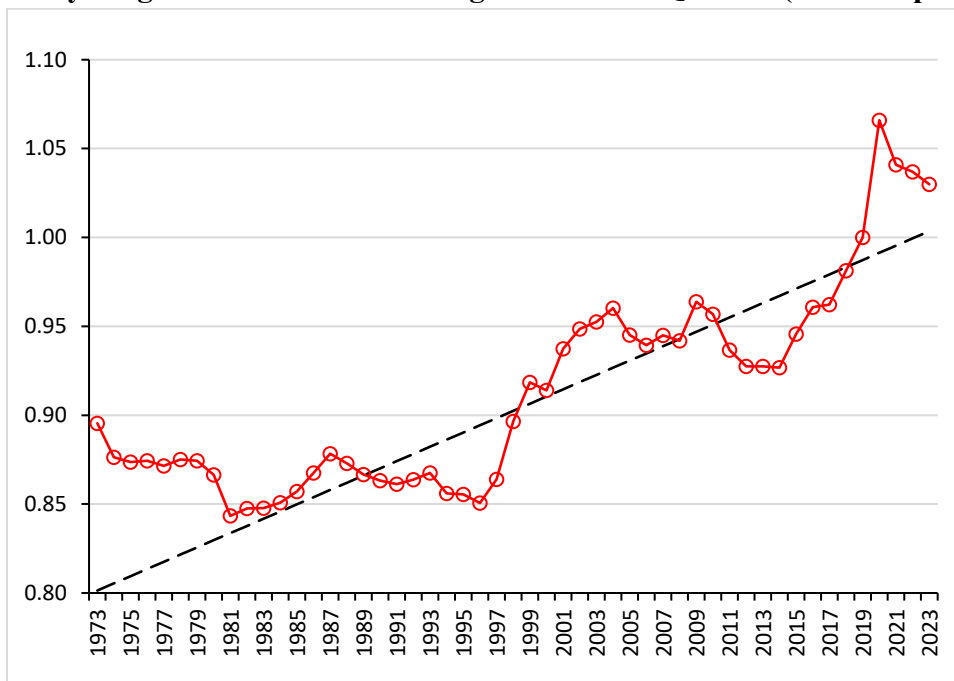


Source: Calculated based on data from Economic Policy Institute (2024), State of Working America Data Library.

The third piece of evidence is given in Figure 6, which displays the growth of the (annual) average hourly real wage of the middle quintile (40th-60th percentiles) of the American wage distribution. Again, the data are for hourly real wages. The hourly real wage for 2020 is scaled to equal 1. The hourly wage for most American workers has outpaced the spike in the cost of living that started in 2021. The inflation-adjusted average hourly wage of the middle quintile in 2023 is 3% higher than in 2019. Based on a figure that is similar to our Figure 6, Dube (2024) concludes the following:

“Using data from the household-based Current Population Survey through December 2023, the average wage for the middle quintile of workers (based on hourly earnings) stands higher than: 1) prior to December of 2019 (right before the pandemic), 2) December of 2020 (right before the start of the Biden presidency), and 3) what would be expected based on trends from the five years prior to the pandemic (2015-2019).”

Figure 6
Real Hourly Wages at the Middle: Average for Middle Quintile (40th-60th percentile)



Source: Calculated based on data from Economic Policy Institute (2024), *State of Working America Data Library*.

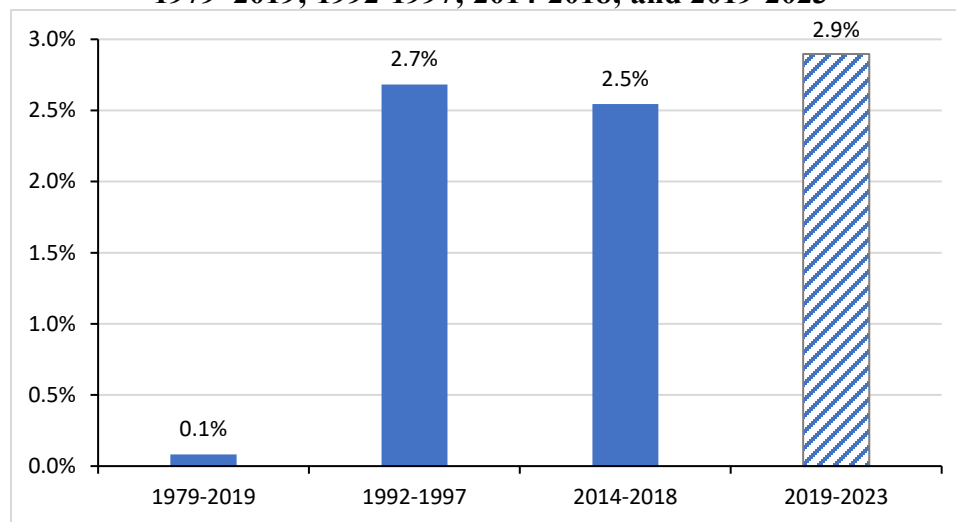
While this evidence looks clear and not controversial, there is a lot more to the ‘rosy’ picture drawn above than these figures indicate. Let us first consider the numbers in Figure 4 in greater detail.

1.2. Recent Real Wage Growth of the Bottom 10% is *Not* Without Precedent

Figure 4 is a key piece of evidence that purports to show that the fortunes of lower-wage workers in the U.S. have fundamentally improved. “Between 1979 and 2019, low- and middle-wage workers in the U.S. labor market experienced only a few short years of strong growth in real [...] wages. But, between 2019 and 2023, workers in the bottom half of the wage distribution have seen historically fast wage growth,” write Gould and DeCourcy (2024).

A structural break in wage patterns would indeed be big news. But reality is different. Using EPI data on real hourly earnings of the bottom 10% of U.S. wage-earners for the fifty-year period 1973-2023, we identify at least two other five-year sub-periods, in which average annual real wage growth of the 10th decile of U.S. workers was ‘extraordinarily high’ as well. We have been here before, in other words.

Figure 7
Annualized Real Hourly Wage Growth of the Bottom 10% of U.S. Wage Earners, 1979–2019; 1992–1997; 2014–2018; and 2019–2023



Source: Calculated based on data from Economic Policy Institute (2024), *State of Working America Data Library*, “Wages by percentile and wage ratios.”

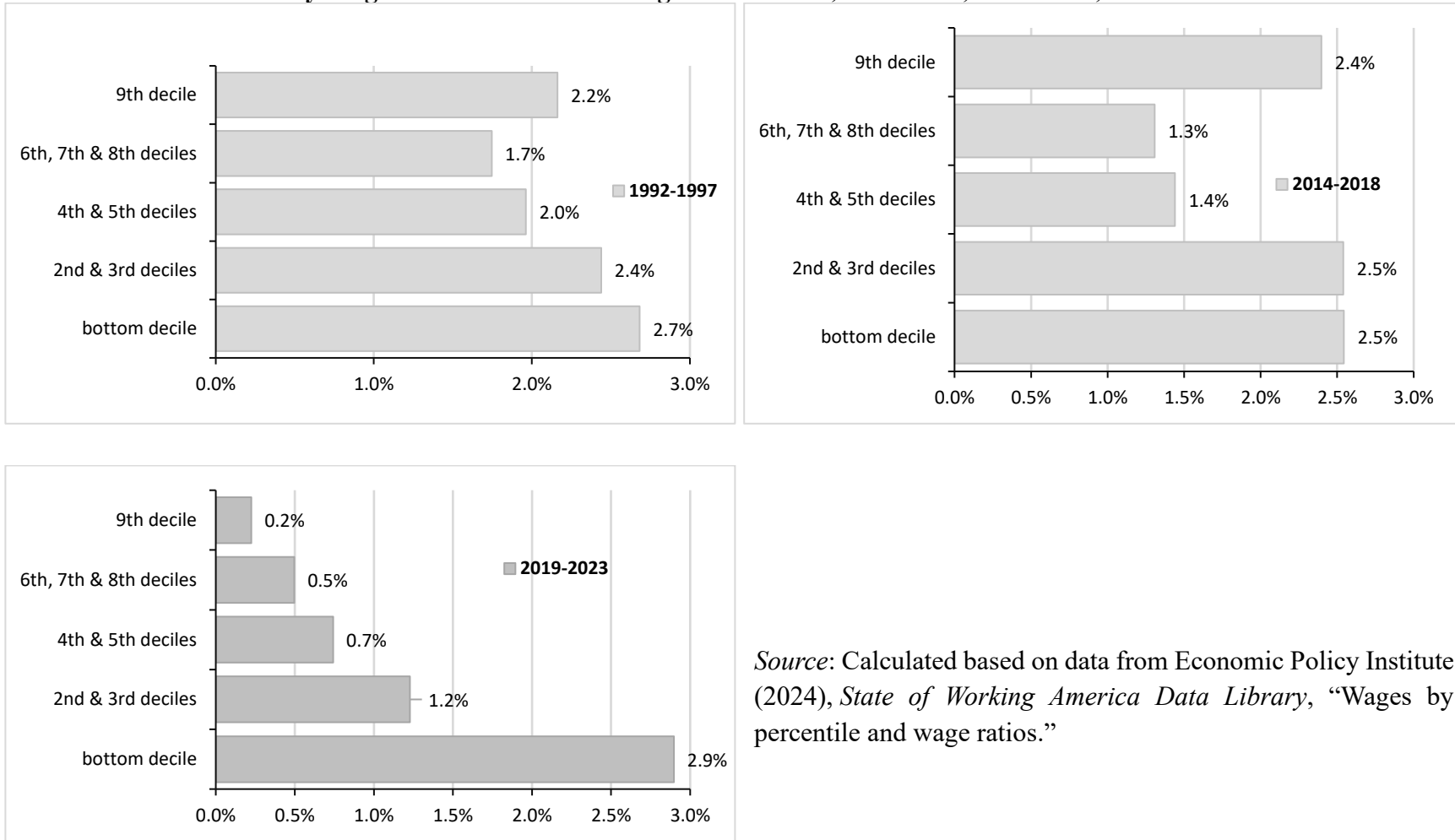
Specifically, America’s low-wage workers enjoyed a spell of rapid real wage growth during 1992-1997 (when their real wages were increasing by 2.7% per annum) and, more recently, during 2014-2018 (when their real wages increased by 2.5% per year). These two spells of high real wage growth for the bottom 10% of U.S. workers occurred during the four decades 1979-2019, during which their real wages rose by just 0.1% per year on average. This is important: it indicates that, in the absence of further evidence, there is no reason to regard performance during 2019-2023 as a decisive break in the pattern of real wage growth of low-wage and lower-middle wage workers. A single swallow does not a summer make. America’s apparent positive wage trajectory may well turn out to be a fluke, depending on what comes next.

However, the pattern of recent real wage growth across the distribution is historically unprecedented in one important sense. During the two earlier periods in which the real wages of the bottom 10% of workers were rising rapidly, real wages increased *across the board*, *i.e.*, wage earners in all deciles of the wage distribution were enjoying relatively rapid real wage growth. This is shown in Figure 8. Unlike before, in the period 2019-2023, hourly real wage growth was not broad-based and only low-wage and lower-middle-wage earners were making progress. What explains this is oddly deviant pattern of real wage growth?

The question is even more interesting in light of the claims about the U.S. labor market being historically tight during 2021-2023. In an ‘extremely tight’ labor market, one could reasonably expect (nominal and real) wage growth to be high across *all classes* of wage earners, not just the bottom 10% or 20%. This particular feature of the recent period needs to be explained, because it

is different from what occurred in the earlier periods of high—and broad-based— real wage growth (Figure 8).

Figure 8
Real Hourly Wage Growth Across the Wage Distribution, 1992-1997; 2014-2018; and 2019-2023



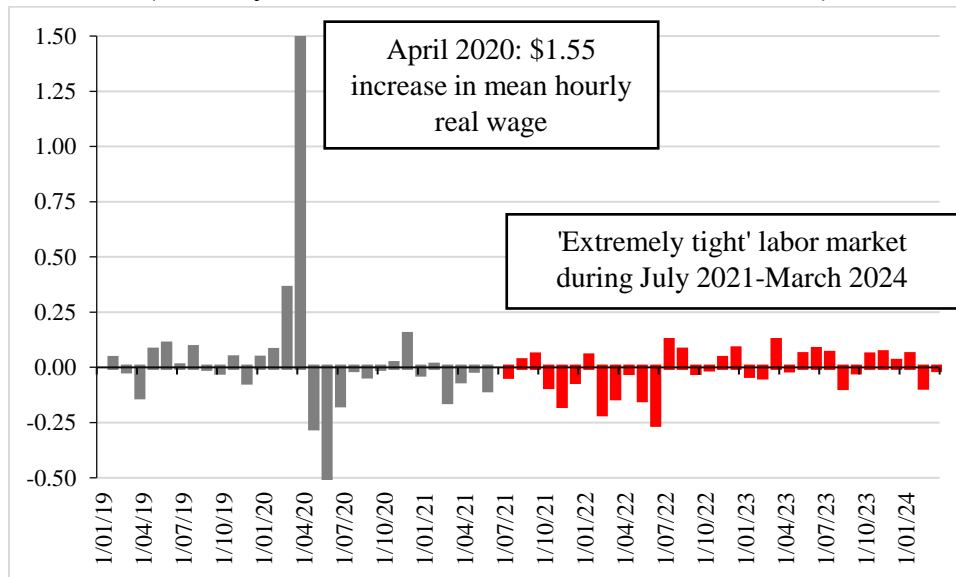
Source: Calculated based on data from Economic Policy Institute (2024), State of Working America Data Library, “Wages by percentile and wage ratios.”

The anomaly is in fact a vital clue that something in the argument has gone off the rails. As we will see, the recent pandemic-era period stands out, not so much because the real wage growth of the bottom 10% of U.S. workers is high, but because the real wages of the other 90% of American wage earners has been so low.

1.3. Taking Account of What Happened in the Exceptional Year 2020

The relatively rapid hourly real wage growth of the bottom 10% of U.S. workers looks very different when it is put in context. Calculating real wage growth for the recent period is complicated, because the year 2020 was so abnormal. It featured sharp, at times catastrophic changes in employment (and unemployment), in the industrial and occupational employment structure and in wages and hours worked from the lockdowns and the pandemic recession. The dramatic changes in monthly mean real wages (expressed in US\$ per hour of work in constant 2021 prices) during January 2019 and February 2024 are visible in Figure 9. The average monthly change in the mean real hourly wage at a rate of \$0.02 during March 2006-February 2020 and of -\$0.04 during May 2020-March 2024 was exiguous. But during March and April 2020, the average monthly mean real wage rose by \$0.36 and \$1.55 respectively – between 10 and 40 times more than ‘normal’.

Figure 9
Monthly Absolute Change in Real Average Hourly Earnings, All Employees
(January 2019-March 2024; Constant 2021 Prices)



Source: Calculated based on FRED data base.

It is clear from the figure that real wage changes over the period 2019-2024 are dominated by what happened in just these two months, and not by the real wage changes in later months when the labor market was supposedly ‘red-hot’. This is paradoxical: American workers apparently made their biggest gain in real hourly earnings in recent memory in April 2020, when the pandemic recession was at its worst and the U.S. economy lost 21 million jobs.

The sharp, one-month increase in reported average wages in April 2020 occurred because millions of *relatively low-paid* workers lost their jobs, especially those working in in-person, close-contact services in leisure & hospitality and retail, while relatively higher-paid workers remained employed. This shift in the composition of those employed meant that the mean wage rose. The rise in the average wage is, therefore, to a large extent due to a restructuring of employment, across industries and occupations. It does not (fully) reflect real wage growth. As is shown in Appendix 1, half of the increase in average wages in March-April 2020 must be attributed to this ‘composition effect’, defined here in terms of a restructuring of jobs across industries. Changes in monopsony power of employers had nothing to do with this. It was an effect of the sudden onset of COVID, which vastly increased the hazards of working for everyone, but especially older workers.

Because the wage growth in 2020 is to a large extent spurious, Gould and deCourcy (2024) decided to calculate the growth rate of real hourly wages for the years 2019-2023. They justified their decision as follows:

“Our analysis focuses on changes in real wages between 2019 and 2023, as well as historical comparisons of real wage changes between 1979 and 2019. Our focus on 2019 and 2023 *allows us to largely ignore the dramatic swings in employment and wages in 2020 and 2021, which were most impacted by the pandemic recession and initial recovery.*” [*italics added*]

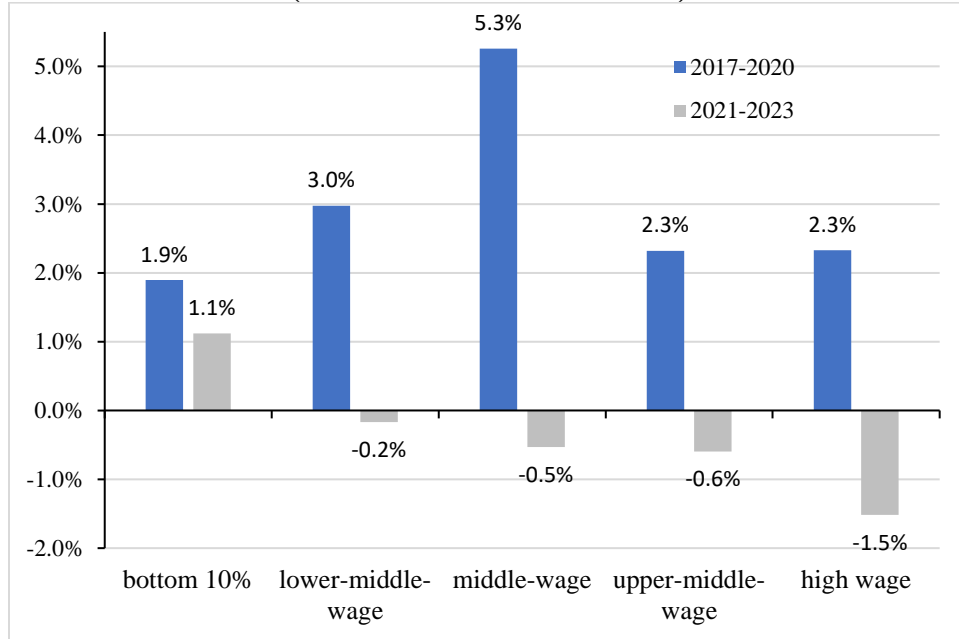
While this justification is in itself reasonable, one could have also adopted alternative approaches—for instance, one could simply exclude the observations for the turbulent and abnormal year 2020 altogether, and instead compare growth rates for real hourly wages by wage class for the pre-pandemic period 2017-2019 and the pandemic-era period 2021-2023.

This has been done in Figure 10, using the same (EPI/CPS) data as those used by Gould and deCourcy (2024). The overall picture changes rather dramatically. First, each wage class experienced higher real wage growth during 2017-2019 than during 2021-2023. Second, for the lower-middle-wage, the middle-wage, the upper-middle-wage and the high wage classes, *i.e.*, for 90% of American workers, hourly real wage growth is negative during the later period. Only the bottom 10% of wage earners enjoyed positive real wage growth during 2021-23, though their gains were still lower than during 2017-2020.

It is important to understand the message of Figure 10. Nine out of ten U.S. workers have been struggling and fighting hard for nominal wage increases over the inflationary period 2021-2023, only to then find inflation eating away more 100% of their pay increases. As a result, a majority of American workers were struggling to pay for their daily expenses and were forced to live paycheck

to paycheck during the pandemic-era inflation.⁵ It is perhaps no wonder that many American workers are a bit bitter.

Figure 10
Annual Real Hourly Wage Growth Across the Wage Distribution,
(2017-2020 versus 2021-2023)



Source: Calculated based on data from Economic Policy Institute (2024), *State of Working America Data Library*, “Wages by percentile and wage ratios.” *Notes:* see **Figure 4**.

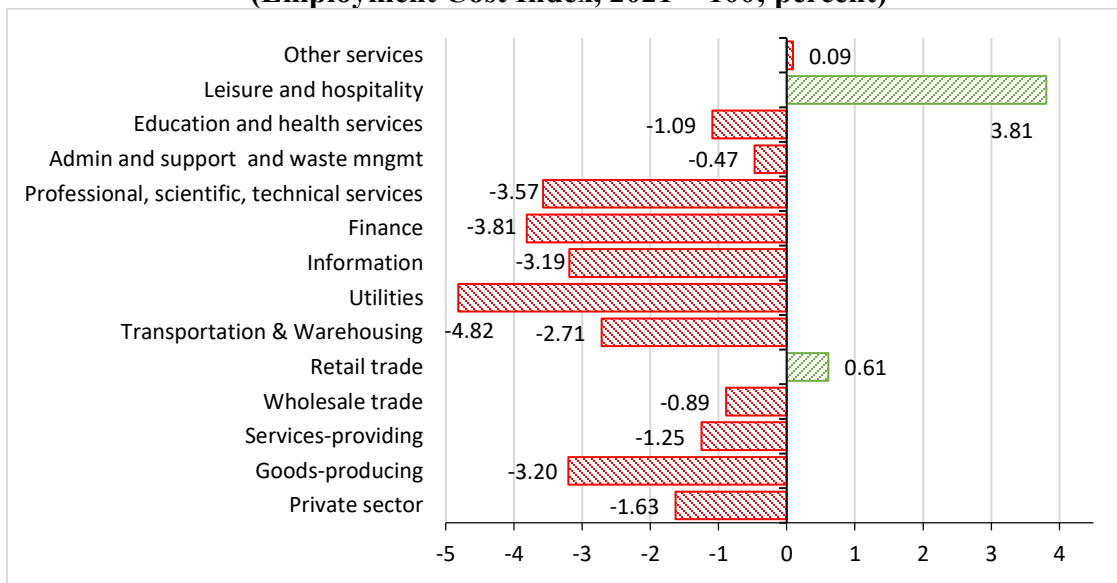
The point can be driven home by comparing results of an alternative approach. One can use the Employment Cost Index (ECI), published by the *Bureau of Labor Statistics* (BLS), instead of hourly earnings. The ECI data are quarterly data on wages and salaries, provided by establishments, which include some measures of non-cash benefits (e.g., insurance or retirement benefits) whereas hourly (and weekly) earnings only include cash payments. The ECI controls for changes in composition across occupations and industries. Specifically, it reflects changes in pay through time,

⁵ A 2023 survey by Payroll.org finds that 78% of Americans live paycheck to paycheck; a 2023 Forbes Advisor survey reports that 29% of respondents have an income that does not cover their standard expenses. See: <https://www.forbes.com/advisor/banking/living-paycheck-to-paycheck-statistics-2024/>

assuming a fixed share of workers in occupations and industries.⁶ Figure 11 presents real wage growth during 2019-2024Q1, calculated based on the ECI, for major private industries.

Once again, the picture is clear and anything but rosy: On average, real wages in the private sector declined by 1.6% during 2019 and 2024Q1. Real wages in goods-producing industries declined by 3.2% and in services-providing activities by 1.25%. Workers in all industries were hit by a decline in their average real wages, except for workers in retail trade (+0.6%) and leisure and hospitality (+ 3.8%). These latter are sectors in which many low-wage workers are employed in in-person close contact jobs and were widely recognized as dangerous. Hence, the pay rises in these sectors in the pandemic era surely include increased compensation for hazards, though virtually all analysts, but especially Autor *et al.* (2023), take no account of this rather obvious feature of the labor market.

Figure 11
Real Wage Growth between 2019 and 2024Q1
(Employment Cost Index, 2021 = 100; percent)



Source: FRED database

⁶ There is a way that the composition of workers within occupations and industries can still affect the ECI; for example, if firms hire lower-productivity workers in a particular occupation and industry and pay them lower wages than other employees, the ECI will go down (see East, Edelberg and Steinmetz-Silber 2023).

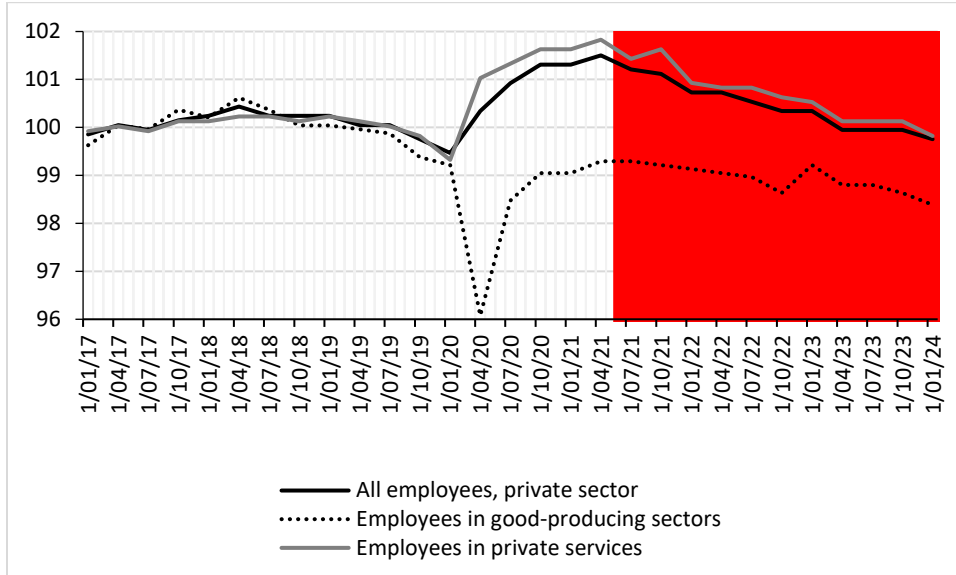
1.4. Hourly *versus* Weekly Earnings

The impression of rising wages and narrowing wage differentials conveyed in accounts of a transformed labor market in the Biden era is misleading in two other, even more fundamental ways. First, the claims of Autor *et al.* (2023) and Gould and deCourcy (2024) rest almost entirely on comparison of hourly wages. Such comparisons take no account of hours worked, which is a crucial determinant of income from work over time. Nor do they take account of other income received by the working poor, for whom earnings from work represents only a portion of income received.

Integrating these factors into the argument changes the picture even more dramatically. We consider reliance on changes in hourly wages as a yardstick first. The growth rates of real wages in Figure 4 were calculated based on data on *real hourly earnings*, deflated by the Consumer Price Index or CPI (published by the Bureau of Labor Statistics). Hourly earnings measure hourly wages paid to workers and include both hourly and salaried workers; these (establishment) data are reported by employers. Another measure of earnings is ‘usual weekly earnings’, which is the only measure of pay that uses employee-reported information. Weekly earnings directly capture changes in hourly earnings as well as in hours worked per week. These latter are very important, especially during the havoc created by the pandemic during 2020-2021, when they were affected by the lockdowns, the ability to work from home, the necessity for parents to support the remote schooling of their children, and the lack of safe, affordable daycare for the children of most workers.

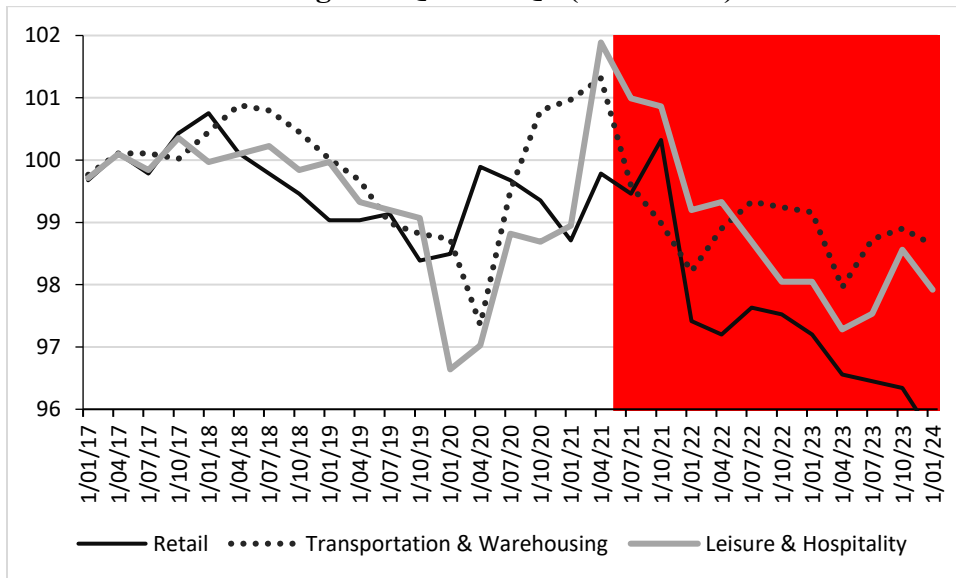
Working hours for employees declined on average between 2021-2024Q1, with the fall accelerating in recent quarters. Figure 12 shows the decline in average weekly hours for all employees. Figure 13 presents average weekly hours worked in retail, transportation and warehousing, and leisure and hospitality. Average weekly hours worked in goods production dropped by 4% in the second quarter of 2020 and remained 1 to 2% lower during 2021-2024Q1 than average hours worked in 2017. Average weekly hours worked in leisure and hospitality declined by 3.4% in the first quarter of 2020, then recovered strongly during 2020Q2-2021Q2, but next declined by more than 4 percentage points during the subsequent four quarters. Average weekly hours worked in retail were 4.4% lower in 2024Q1 than during 2017, while average weekly hours worked in leisure & hospitality were down by 2.1% in 2024Q1.

Figure 12
Average Weekly Hours Worked for All Employees
(16 Years and Over) during 2017Q1-2024Q1
(2017 = 100)



Source: FRED database

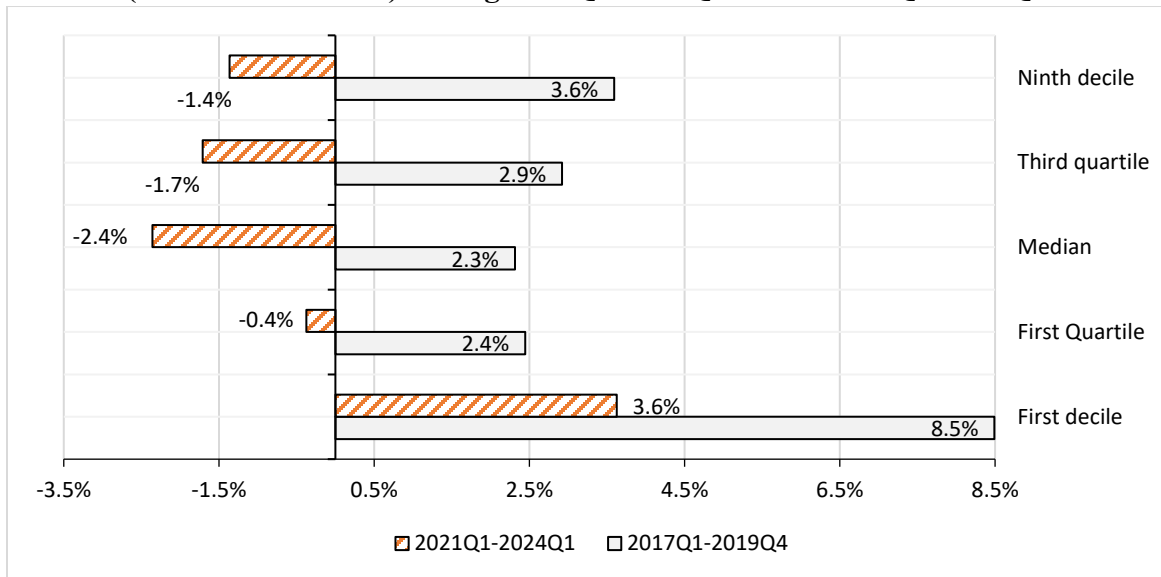
Figure 13
Average Weekly Hours Worked for All Employees (16 Years and Over)
in Retail, Transportation & Warehousing, and Leisure & Hospitality
during 2017Q1-2024Q1 (2017 = 100)



Source: FRED database

Not surprisingly, the declines in working hours sharply affected total earnings. We have calculated the change in real wages across the wage distribution during the periods 2017Q1-2019Q4 and 2021Q1-2024Q1, based on *usual weekly earnings*. The results appear in Figure 14 and exclude observations for the four quarters of 2020 from the analysis. First, all wage classes experienced a decline in the growth of real weekly earnings during 2021Q1-2024Q1 compared to the pre-pandemic period 2017Q1-2019Q4. Secondly, *median* real weekly earnings declined during 2021Q1-2024Q1, as did the real earnings of the first and third quartile and the ninth decile of the earnings distribution. Thirdly, although the bottom 10% of U.S. workers saw their real usual weekly earnings rise by 3.6% during 2021Q1-2024Q1, that represented a substantial drop from the immediate pre-pandemic period when their real weekly earnings increased by as much as 8.5%.

Figure 14
Percentage Change in Real Usual Weekly Earnings of Wage and Salary Earners
(16 Years and Over) during 2017Q1-2019Q4 versus 2021Q1-2024Q1



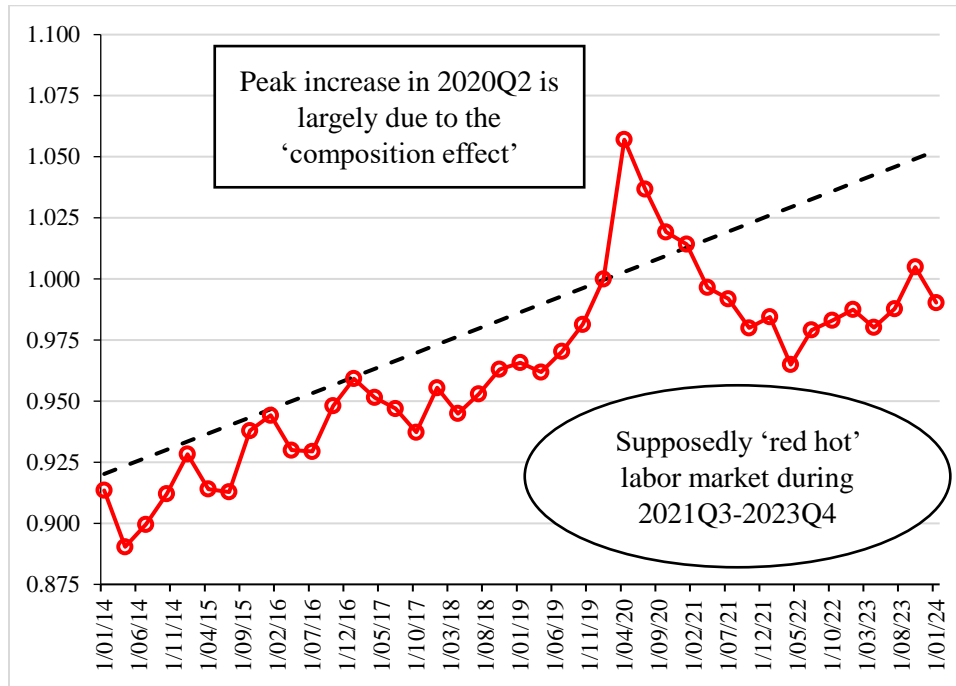
Source: FRED database.

Focusing on trends in median wages, as some advocates of the historic shift perspective also propose, does not change the conclusion.

Looking at median weekly real earnings instead of hourly real wages undermines this claim, too. Our Figure 15 shows the evolution of median usual weekly real earnings relative to its trend between the first quarter of 2014 and the first quarter of 2024. Median weekly real earnings during 2020Q1 are scaled to 1. The median real wage based on usual weekly earnings in the first quarter of 2024 stands 2.5% higher than in the 4th quarter of 2019 (right before the pandemic); but it is considerably lower than in the 4th quarter of 2020 (right before the start of the Biden presidency).

It is also much lower than be expected based on trends from the five years prior to the pandemic (2014-2019), as is shown in Figure 15.

Figure 15
Real Wages at the Middle:
Median Usual Weekly Real Earnings of Wage and Salary Workers,
16 Years and Over (2020Q1 =1.0; 2014Q1-2024Q1)

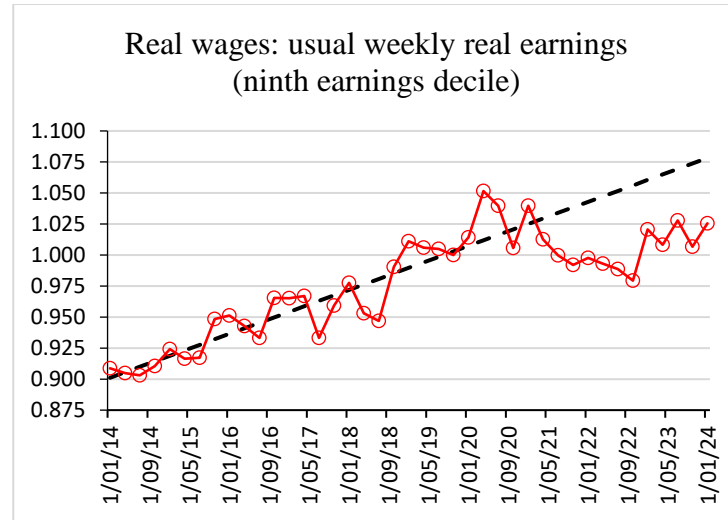
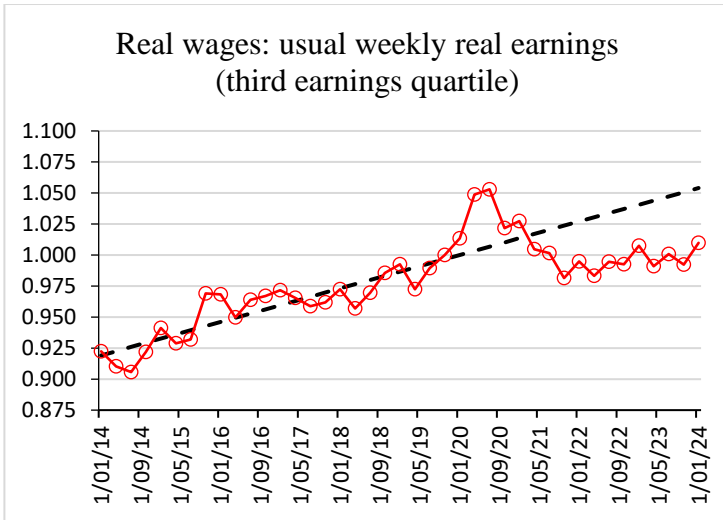
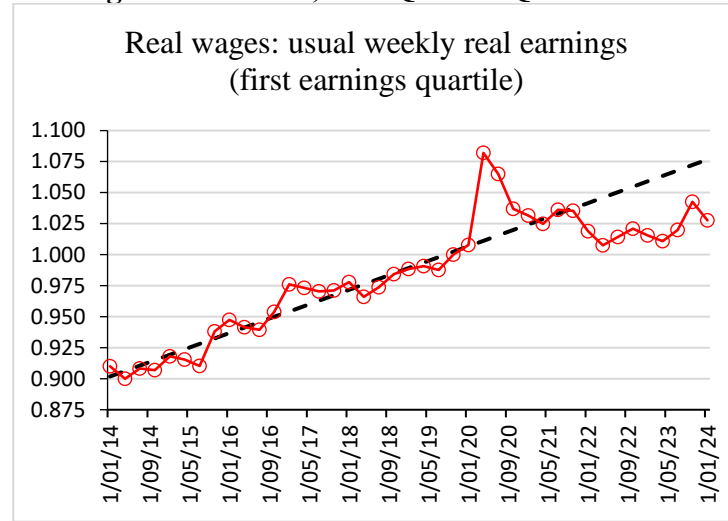
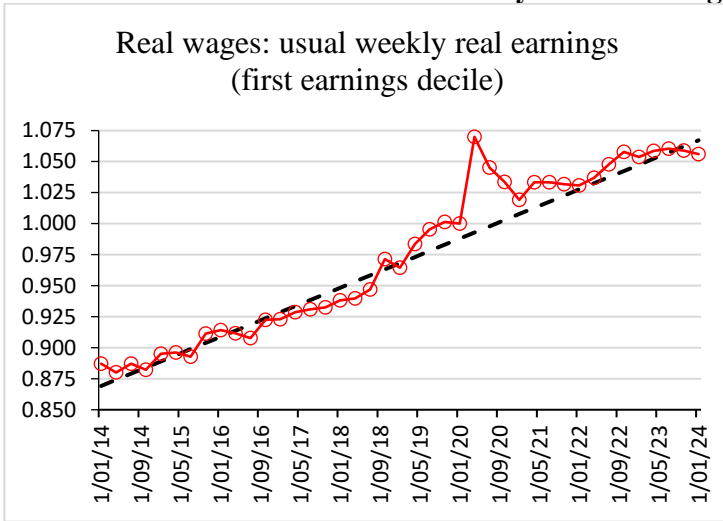


Source: FRED database.

We explore the evolution of real weekly earnings in more detail in Figure 16, looking at average real usual weekly earnings of the first *decile*, the first *quartile*, the third *quartile* and the ninth *decile* of the weekly earnings distribution. Real weekly earnings of the bottom 10% of U.S. wage earners have—roughly—continued to increase along trend; the trend was estimated for the period 2014Q1-2020Q1. Hence, during the Biden presidency (2021Q1-2024Q1) real wages of the bottom 10% of wage earners increased along the same trend as during the Obama and Trump administrations (2014Q1-2020Q1). There is nothing radically different (so it appears) about 2021Q1-2024Q1.

This finding is another reason for our doubts about claims of a weakening of employer monopsony power in the bottom end of the occupational income distribution (*e.g.*, Autor, Dube and McGrew 2023). Nothing in these figures suggests the one-sided power of, say, fast-food corporations such as McDonalds or on-line retailers such as Amazon to exploit largely non-unionized workers via wage markdowns has suddenly diminished. (Both companies have thus far beaten off major efforts to unionize their workforces with nearly complete success.) As the upper-left panel of Figure 16 shows, there has been no structural change from the pre-existing trend during the otherwise turbulent decade 2014Q1-2024Q1.

Figure 16
Usual Weekly Real Earnings Across the Wage Distribution, 2014Q1-2024Q1



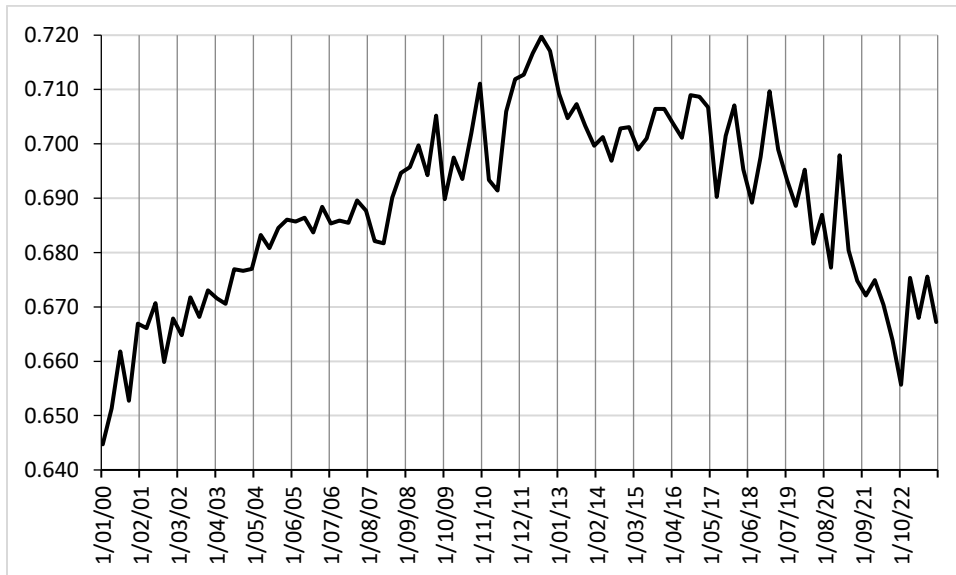
Source: FRED database.

However, weekly real earnings of the bottom 25% of U.S. wage earners have fared worse under Biden than during 2014-2019 as can be seen from the upper-right panel of Figure 16. Weekly real earnings have barely grown for these workers, as their nominal wage increases were almost completely eaten up by the surge in inflation during 2021Q1-2024Q1. Only during the third and fourth quarters of 2023 did weekly real earnings of the bottom quartile of American workers begin to rise (above their level in 2020Q1), but their real earnings declined again in 2024Q1.

The pictures for the third quartile and the ninth deciles of the weekly real earnings distribution are similar: as soon as the inflation rate begins to increase (*i.e.*, in mid-2021), weekly real earnings drop down—and stay depressed during 2022 and 2023. The American workers belonging to the third quartile and/or the ninth decile of the earnings distribution both have been doing considerably worse than could have been expected based on the 2014-2019 trend growth of their real earnings.

Not surprisingly, the trend in the 90-10 log wage ratio for weekly earnings from 2000 to 2023 shown in Figure 17 shows nothing like the marked drop visible in the hourly wage ratio plot in Figure 5, above. This difference is clearly related to the observed decline in average hours worked, especially in major low-wage industries. It is clear that one needs to be careful in drawing out strong inferences—concerning a ‘radical transformation’ of the U.S. labor market—exclusively based on changes in 90-10 log *hourly* wage inequality.

Figure 17
The Evolution of the 90-10 log Wage Ratio
(Quarterly Nominal Usual Weekly Earnings, 2000Q1-2023Q4)



Source: Authors’ calculation based on data from FRED database.

It is also worth pointing out that during the ten quarters of 2021Q3-2023Q4, when the labor market was arguably ‘red-hot’, 90/10 log wage inequality did not significantly decline (Figure 17), even as the vacancy ratio rose to a level of almost 2 job openings per unemployed worker. The ‘red-hot’ labor market did not lead to a meaningful compression of wage inequality. This is not surprising, because, as we argue in Appendix 2, the U.S. labor market is not as ‘tight’ as most observers believe it to be; other indicators suggest considerably less ‘tightness’ than the job vacancy ratio.

1.5. From Real (Hourly or Weekly) Earnings to Real Income

The importance of our results is easier to see if the facts about real earnings are situated within the context of people’s lives and, in particular, considered along with the rest of household incomes. Wages and salaries make up an important part of household incomes, but, as is shown in Table 1, wages and salaries make up only around 21%-31% of the bottom 20% of American households (in 2021).

Table 1
Household Income by Decile, 2021

Major Components of Household Income by Decile										
	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
Wages	21.6%	31.2%	39.3%	47.3%	54.2%	61.3%	68.1%	72.5%	74.7%	55.0%
Property Income	6.7%	8.7%	9.3%	10.8%	11.8%	13.8%	15.8%	18.6%	23.5%	46.9%
Net Public Transfers	71.8%	60.2%	51.4%	41.9%	34.0%	24.9%	16.1%	9.0%	1.8%	-2.0%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Shares in Income Category by Household Income Decile										
	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
Wages	0.8%	1.9%	3.1%	4.5%	6.1%	8.2%	10.8%	13.6%	18.2%	33.0%
Property Income	0.5%	1.1%	1.6%	2.3%	2.9%	4.0%	5.5%	7.7%	12.6%	61.8%
Net Public Transfers	10.3%	14.5%	16.1%	16.2%	15.4%	13.4%	10.3%	6.8%	1.7%	-4.7%

Source: Bureau of Economic Analysis (2023), Major Components of Personal Income and Disposable Personal Income by Decile.

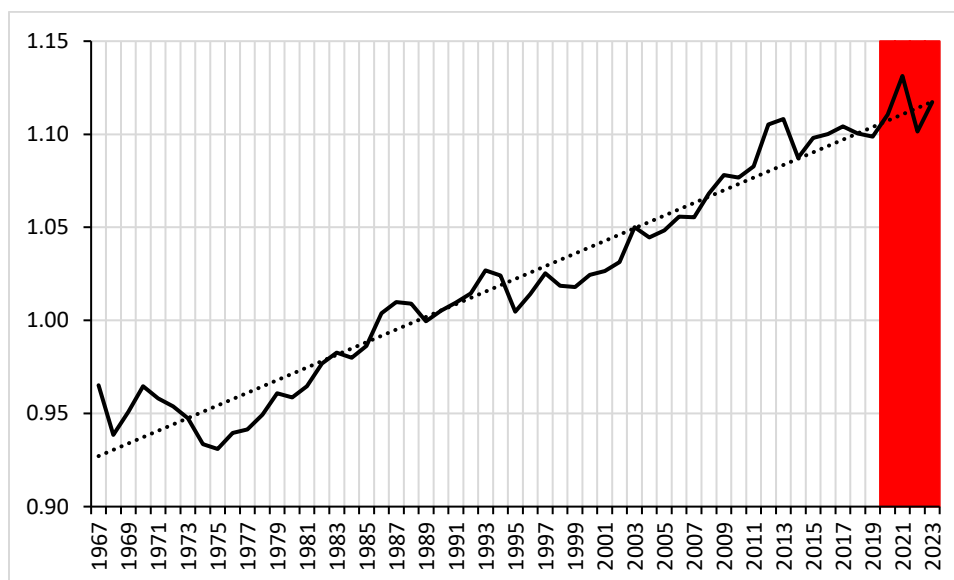
Incomes of the poorest 20% of U.S. households depends primarily on government social benefits, which include social security benefits, Medicare and Medicaid and unemployment benefits. In 2021, the contribution of government social benefits to household income was 71.8% in the case of the bottom 10% of American households (compared to circa 0% for the 20% richest households). This means that (real) household income of the 1st and 2nd income deciles is overwhelmingly determined by change in government social benefits, while wage income plays only the second fiddle.

The picture at the top of the household income distribution is very different: the incomes of the top-10% of American households depends on wages and salaries (55%) and property income (47%). Property income includes proprietors' income, rental income of households and household income receipts on assets (which includes interest and dividend receipts). The top-10% of U.S. households is the key property-owning income class, receiving 62% of aggregate property income in 2021, while the bottom 80% of households received around 25%.

Taken together, the dependency on social spending of the bottom 10% of households and the strong hold over property (income) of the top 10% of households means that the 90-10 log household income inequality ratio is largely determined by changes in relative government social benefits (received by the 1st decile of households) and in property income (monopolized by the 10th decile of households). Changes in the 90-10 log hourly wage ratio will not matter much for household income inequality. It follows that a compression of 90-10 log *hourly wage* inequality may not show up in a similar reduction in household income inequality. In addition, as we already saw above, off-setting changes in hours worked will also further constrain any effects of changes in hourly wage inequality.

Figure 18 presents evidence on the 90-10 log household income ratio; household income is measured before taxes. It is evident that household income inequality exhibits a long-run rising trend. The 90-10 log household income ratio increased by 0.17 log points during 1975-2019 and it increased by another 0.01 log points during 2020-2023. Hence, unlike the 90-10 log hourly wage ratio, which, as we saw, declined during 2020-2023, the 90-10 log household income ratio kept following its rising trend. There is, in other words, no radical reversal of fortunes for the low-income households in recent times.

Figure 18
The Evolution of the 90-10 log Household Income Ratio 1967-2023
(Annual)



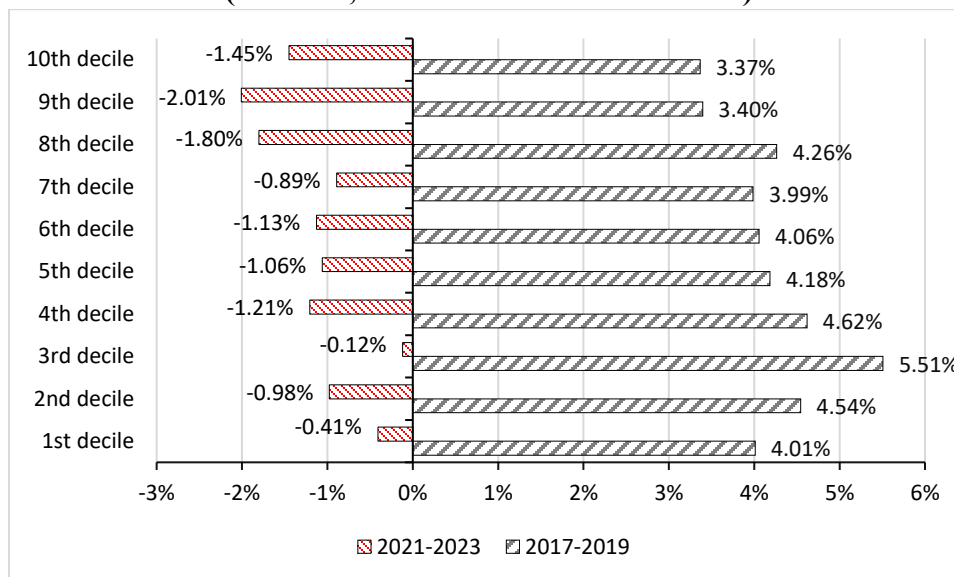
Source: Census data. *Note:* The 90-10 log ratio for 2023 has been estimated by the authors. See Appendix 3.

As Figure 18 shows, household income inequality *increased* rather strongly in 2021. This is remarkable, because one could reasonably have expected a fall in inequality, caused by the \$1 trillion of pandemic relief spending in that year by the Biden Administration. But BEA data show that aggregate property income rose by more than \$0.5 trillion in 2021, disproportionately benefiting the 10% richest U.S. households, who, on their own, gained \$325 billion. The impact on inequality of the rise in property income overwhelmed the redistributive effects of the pandemic relief spending, and as a result, the 90-10 log income ratio rose by 0.02 log points in 2021.

We estimated the percentage change in real household income by income deciles for the pre-pandemic years 2017-2019 and the pandemic era 2021-2023 (see Figure 19). While all deciles of the household income distribution enjoyed real income growth during 2017-2019, all income classes suffered a decline in real incomes during 2021-2023. The recent years thus have been a period of shared misery. It is true that the bottom three deciles of the household income distribution suffered smaller losses than the top three deciles—and were, in this narrow sense, better off.

But that is small consolation. The tangible impact of this slight compression at the household level must not be exaggerated.

Figure 19
Percentage Change in Real Household Income by Deciles
(Per cent; 2017-2019 versus 2021-2023)



Source: Census data and BEA data.

A breakdown of low wage workers by industries is revealing about the real conditions of life in the lower levels of income distribution. For a start, consider Table 2. It breaks down hourly wage thresholds earned by more than 23 million American workers in 10 broad categories of low-wage occupations for the year 2022, along with their industries' shares in total employment. When considering the earnings data in this table, one should bear in mind that any wage rate below \$15 an hour, earned by a full-time, year-round worker, is insufficient to meet a *one-person basic household budget* in any county or metro area in the United States (Gould, Mokhiber, and DeCourcy 2024). The table indicates that one in four workers in healthcare support, food preparation, building and grounds cleaning, personal care, sales, and transportation and moving materials earns less than \$15 per hour. One in ten workers in healthcare support, food preparation, building, sales and transportation earns less than \$13 per hour. These workers, numbering around 20 million women and men, belong to the working poor. Many survive thanks to federal assistance programs for food and health care.⁷

⁷ See, e.g., United States Government Accountability Office (2021). This fact has led critics to suggest that raising wages would actually reduce government spending, since people would not need government assistance to survive. An alternative way of looking at the problem considers the assistance a kind of subsidy to employers, who can pay a lower wage. In this view, the state is supporting low-wage employment policies.

Table 2
Hourly Wages by Occupation, 2022
(U.S. Dollars per Hour)

	Millions of workers (in the 1st quartile)	Share in total employment (%)	One in 10 workers earns less than:	One in 4 workers earns less than:
Educational Instruction and Library Occupations	2.12	1.44	13.90	18.23
Healthcare Support Occupations	1.70	1.15	11.57	14.01
Protective Service Occupations	0.86	0.58	13.38	16.20
Food Preparation and Serving Related Occupations	3.13	2.12	10.15	11.75
Building and Grounds Cleaning & Maintenance Occupations	1.08	0.73	11.37	13.72
Personal Care and Service Occupations	0.71	0.48	10.50	12.80
Sales and Related Occupations	3.30	2.23	11.14	13.61
Office and Administrative Support Occupations	4.67	3.16	13.80	16.46
Production Occupations	2.18	1.48	13.93	16.24
Transportation and Material Moving Occupations	3.39	2.29	13.03	15.10
All ten occupations	23.14	15.65		

Source: Bureau of Labor Statistics, Occupational Employment and Wage Statistics (OEWS) Survey, May 2022.

Most of the occupations listed in Table 2 are *low-paid service-sector jobs*. Individuals who are employed in service occupations are more likely to be among the low-wage workers and/or working poor than those employed in other major occupational groups. According to [Bureau of Labor Statistics data](#), education levels matter, as those with less than a high school diploma had the highest working-poor rate, almost 10 times higher than the rate for those with at least a bachelor’s degree and higher. Women are more likely than men to be among the working poor and families maintained by women are more likely to be living below the poverty level than families maintained by men. In addition, Hispanics or Latinos and Blacks or African Americans continued to be much more likely than Whites and Asians to be among the working poor.

Table 3 presents average annual growth rates of real *median* weekly earnings of full-time wage and salary workers by major occupation during the pre-pandemic years 2017-2019 and 2021-2023. The family resemblance to our earlier Figure 3 is not accidental; that displayed the change in the average annual real wage growth by occupation during 2021-2023 compared to that during 2017-2019. The average annual growth rate of real wages for all employees was 1.1% during 2017-2019 compared to -0.2% during 2021-2023. As we saw earlier, for almost all occupations, except in law, personal care, and transportation, real wage growth was lower during the pre-pandemic years than during the recent period. In fact, for most occupations, real wage growth has been negative during 2021Q1-2023Q4.

Table 3
Average Annual Growth Rates of Real Median Weekly Earnings of Full-Time Wage and Salary Workers by Occupation: Biden (2021-2023) versus Trump (2017-2019)

	2017-2019		2021-2023	
	Real wage growth	Share in employment	Real wage growth	Share in employment
Total, full-time wage and salary workers	1.1	100%	-0.2	100%
Management, professional, and related occupations	1.3	43%	-1.2	46%
Management, business, and financial operations occupations	1.1	18%	-1.1	19%
Business and financial operations occupations	2.4	6%	-1.2	7%
Professional and related occupations	1.1	25%	-1.4	26%
Computer and mathematical occupations	1.7	4%	0.6	5%
Architecture and engineering occupations	0.3	3%	-1.6	3%
Life, physical, and social science occupations	-0.3	1%	-1.3	1%
Community and social service occupations	1.6	2%	-2.1	2%
Legal occupations	1.9	1%	2.7	1%
Education, training, and library occupations	0.6	6%	-4.0	6%
Arts, design, entertainment, sports & media occupations	1.7	2%	-1.4	2%
Healthcare practitioners and technical occupations	0.3	6%	-1.0	7%
Service occupations	2.1	14%	-0.2	13%
Healthcare support occupations	2.2	2%	-0.2	3%
Protective service occupations	0.6	2%	-0.4	2%
Food preparation and serving related occupations	1.7	4%	1.2	3%
Building & grounds cleaning & maintenance occupations	3.2	3%	-0.6	3%
Personal care and service occupations	2.1	2%	2.1	1%
Sales and office occupations	0.6	20%	-0.3	18%
Sales and related occupations	2.1	9%	0.2	8%
Office and administrative support occupations	0.1	12%	-0.9	11%
Natural resources, construction, and maintenance occupations	2.0	10%	-1.6	10%
Farming, fishing, and forestry occupations	1.0	1%	-0.8	1%
Construction and extraction occupations	2.1	5%	-1.6	5%
Installation, maintenance, and repair occupations	1.3	4%	-2.3	4%
Production, transportation & material moving occupations	0.4	13%	-0.1	13%
Production occupations	0.9	7%	-0.8	6%
Transportation and material moving occupations	0.1	7%	0.7	7%

Source : BLS data

The conclusion has to be that there is no sign of radical transformation of the U.S. labor market during 2020-2023. Yes, during 2021Q1-2023Q2, weekly real earnings have grown for the bottom 10% and the first quartile of U.S. workers, but the real wage increase was on pre-pandemic trend for the bottom 10% and below pre-pandemic trend for the first quartile. Likewise, median weekly real earnings have increased, but less than could have been expected based on pre-pandemic trend. Weekly real earnings for the top 50% of U.S. workers have stagnated during 2021Q1-2024Q1.

This is anything but a “positive wage development” or an “unprecedentedly strong wage growth”. The plight of the bottom 10% of American workers has worsened, when one considers both hourly wages and usual weekly hours worked, compared to the pre-pandemic years, though it improved relative to all other earnings classes, who ran out of pocket in 2021-2023. The relative progress of the bottom 10% of wage earners stands out, in short, because most other earners have been experiencing decreases in real weekly earnings. We are not surprised that in 2021, the United States was one of the only two countries in the developed world (the other was Chile) in which life expectancy did not rebound from its shocking decline in 2020. It finally turned up in 2022, but continues to lag in international comparisons and, of course, by comparison with its pre-COVID level (Hoang, *et al.*, 2024; Wolff 2023).

1.6. Part I: Conclusions

While leading economists credit the Biden administration for the ostensibly good health of the U.S. economy, Bidenomics appears to be falling flat with a majority of American voters. In the recent nationwide *New York Times/Siena College* [poll of February 25-28, 2024](#), 74 in 100 respondents said the American economy was fair or poor. 65% of the respondents said that the American economy is worse than four years ago and their main concerns are wages, (gas) prices (inflation) and the housing market. And 43% of the respondents think that the policies of the Biden administration have hurt them personally, while 39% thinks these policies made not much of a difference either way.

The economic experts, convinced by a set of selected key indicators signaling the good health of the Biden economy, are perplexed by the ‘Great Disconnect’ between their view of the state of the American economy and the views of large sections of the American population—and the only way they can explain the dissatisfaction with Bidenomics is by claiming that American voters are somehow misunderstanding reality or are being misled by populist messaging and ‘fake news’. However, a detailed and clinical look at the data on real (hourly and weekly) wages, number of hours worked, and wage inequality has shown that the optimism of the experts is unwarranted.

Based on our analysis, the conclusion is inescapable that real wages for most Americans have dropped substantially during the Biden presidency. The cumulative losses for most are substantial. We have considered in detail claims advanced by Autor, Dube and McGrew (2023) and others about wages of the lowest paid workers, but we observe no sign of a radical transformation of the

U.S. labor market during 2021-2024. The plight of the bottom 10% of American workers has worsened, when one considers both hourly wages and usual weekly hours worked, compared to the pre-pandemic years, though it improved relative to all other earnings classes, who ran out of pocket in 2021-2023. The relative progress of the bottom 10% of wage earners stands out, in short, because most other earners have been experiencing decreases in real weekly earnings. The same is true for real household incomes: While all deciles of the household income distribution enjoyed real income growth during 2017-2019, all income classes suffered a decline in real incomes during 2021-2023. The recent years thus have been a period of shared misery. Hence, it is no wonder that voter sentiment on the state of the U.S. economy and on Bidenomics is negative.

There is no reason to think that the U.S. labor market has been going through a structural transformation in favor of (the lowest-paid) workers, supposedly because firms' monopsony power declined. The (modest) increase in real wages of the bottom 10% of U.S. workers owed little to any policy change or to declining monopsony power: It was a unique case of wages rising to subsistence levels as COVID exponentially multiplied risks of working at what had previously been relatively safe jobs and workers at the bottom of the wage distribution left their jobs. A new and significant health hazard has been internalized in somewhat higher wages. The fact that the (nominal and real) wage growth of the poorest and most exposed workers turned out to be so small (as it has been) speaks volumes to the continued lack of bargaining power of these same workers.

Part II

Wealth Effects, Interest Rates and the Persisting Strength of Consumption

Our earlier paper warned that climate change and geopolitical conflicts would complicate using interest rates to control inflation going forward (Ferguson and Storm 2023a). But a major focus of the paper was on another factor that would for sure play havoc with traditional interest rate tools going forward: the sudden, historically unprecedented increases in the wealth of affluent Americans. Their portfolios have been swelling over many years for a variety of reasons we cannot pause to examine here. But when the Fed abandoned its efforts to slowly unwind its balance sheet when COVID struck and turned once again to massive quantitative easing, the impact on affluent Americans' holdings of financial instruments and housing was stunning. Within months, the value of their wealth soared past previous historical levels (see Appendix 4). Changes of this magnitude, while not unprecedented in wartime or financial disasters, normally take much longer to mature.

In the years before COVID, several prominent economists including Lawrence Summers and Paul Krugman had wondered out loud if blowing financial bubbles might be the only way the US could grow rapidly in the future. 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)

Yet as housing and stock markets rocketed upward in a fiscal regime that for the first time in American history taxed billionaires at lower rates than ordinary workers, virtually no policymakers or economists foresaw what happened: As vaccines diffused and Omicron waned, consumption by the affluent exploded in an economy still reeling from supply constraints. They were equally oblivious to the consequence of such a lopsided distributional pattern: normal interest rate increases – even a whole series of them – could not hope to contain this spending.

Now, as the Federal Reserve and the administration struggle with inflation's persistence and observers everywhere marvel over the strength of consumption, a trickle of stories has begun to point the finger in the right direction (VISA 2024; Rugaber 2024).⁸ With leading bankers and economists speculating that even higher interest rates may be necessary to bring inflation back under control, it is urgent to understand why there is no light at the end of this tunnel. As Paul Volcker proved, interest rate rises can kill off inflation, but only at vast costs to the economy and the population. It is time to find better ways.

But first, the facts. We start in Part II by contrasting income and consumption under Trump and Biden, then break down income and spending patterns by deciles of income. We supplement this evidence with a more formal estimate in national income terms of consumption. Both exercises

⁸ The title of a recent news article of April 29, 2024, is telling: “Affluent Americans are driving US economy and likely delaying need for Fed rate cuts” (Rugaber 2024).

provide strong evidence that the steady increases in consumption in the American economy under Biden derive mostly from spending by wealthy Americans.

2.1. Income and Consumption in Two Regimes

The *Bureau of Economic Analysis* (BEA) publishes data on aggregate real personal income and its disposition. Using these data, we created Figure 20. This shows the average annual growth rate of real (disposable) personal income, its components and real personal consumption expenditures during the Trump era (2017-2019) and the Biden period (2021-2023). We exclude observations for the turbulent year 2020, for reasons explained earlier.

Figure 20
Annualized Growth Rates of Real Personal Income and Real Personal Consumption Expenditure during 2017-2019 versus 2021-2023 (Percent)



Source: Bureau of Economic Analysis (BEA), Table 2.1. Note: Income and expenditure are in constant prices (2017 = 100), calculated using the PCE price index. The growth rates of real personal consumption expenditure are given in red.

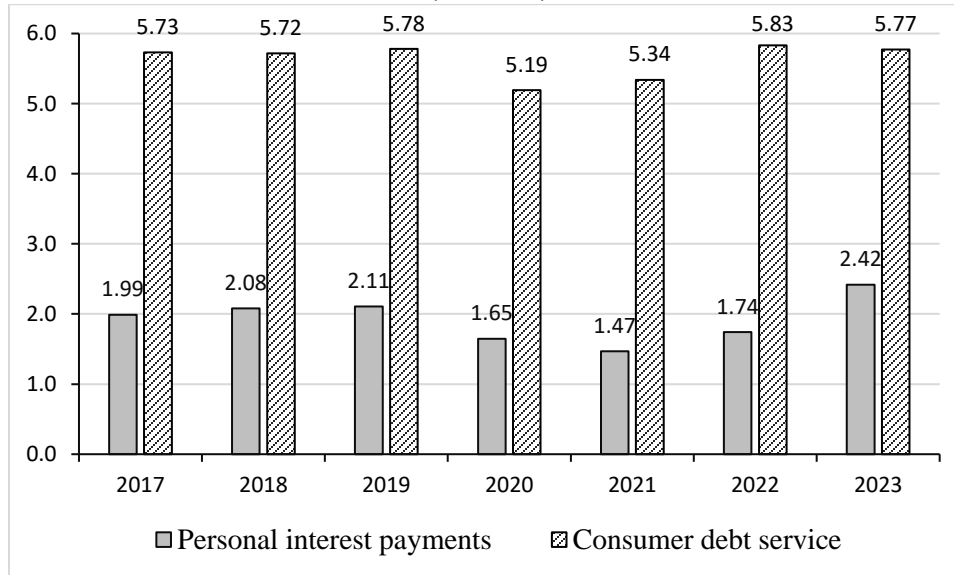
During the period 2017-2019, aggregate real personal income increased by 3.2% per year. All three components of personal income, *i.e.*, compensation of employees, property income and net government transfers, were growing at 3%-3.5% per annum during the pre-pandemic period. During the Trump years, real personal consumption expenditure rose by 2.4% per year, while real disposable personal income increased by 3.3% (Figure 20). As a result, personal savings increased in this period.

Under Biden, the situation worsened for U.S. households overall. Average annual real personal income growth turned negative, declining by 1.4% per year during 2021-2023. Both compensation of employees and property income recorded lower rates of growth than during the pre-pandemic period, but both did continue growing, albeit at lower rates. But the big decline in real personal income during the Biden years lies in the scaling down of spending for pandemic relief during 2021-2023 (Figure 20).

Real compensation of employees increased by 1.4% per year during 2021-2023, which was considerably lower than the average annual growth (by 3%) achieved during 2017-2019. Real compensation of employees *increased*, even when (as we have shown above) most Americans suffered (hourly and weekly) real wage losses during the Biden years. The difference is due to two reasons. First, the *Bureau of Economic Analysis* (BEA) uses the PCE Price Index to deflate compensation of employees, whereas we used the CPI to deflate real (hourly and weekly) earnings. Using the CPI (instead of the PCE Price Index), the growth rate of real compensation of employees equals 0.5% per year during 2021-2023, which is still positive, but considerably lower. The second reason why the growth rate of real compensation differs from the growth rates of real hourly and weekly earnings is that ‘compensation’ includes benefits such as paid leave, other supplemental cash benefits (e.g., overtime), insurance benefits, retirement and saving benefits, Social Security, unemployment benefits, Medicare and severance pay, as well as employer-provided benefits and in-kind payments. These benefits are not included in the measures for hourly and weekly earnings. The increase in real compensation of employees during 2021-2023 is, therefore, consistent with a decline in real (hourly and weekly) earnings for most Americans (East, Edelberg and Steinmetz-Silber 2023).

Remarkably, real personal consumption expenditure (colored in red in Figure 20) continued to rise at the same rate during 2021-2023 as during 2017-2019, namely at 2.4% per year. Hence, despite the decline in aggregate real income, American households have, on average, continued to increase their consumption spending. To some extent, households have funded the additional consumption spending by drawing down their savings accounts; however, the average rate of savings (defined as personal savings as a percentage of personal income) did not change much during 2017-2019, when it was 5.7%, or 2021-2023, when it was 5.6%. U.S. households have also funded some of the additional spending by means of additional credit card debt. Figure 21 shows that U.S. households spent 2.4% of disposable income on interest payments in 2023, compared to 2.1% during 2017-2019. But total consumer debt service (as percent of disposable income) did not change during 2017-2023 (Figure 21).

Figure 21
Personal Interest Payments and Consumer Debt Services
as a Share of Personal Disposable Income (2017-2023)
(Percent)

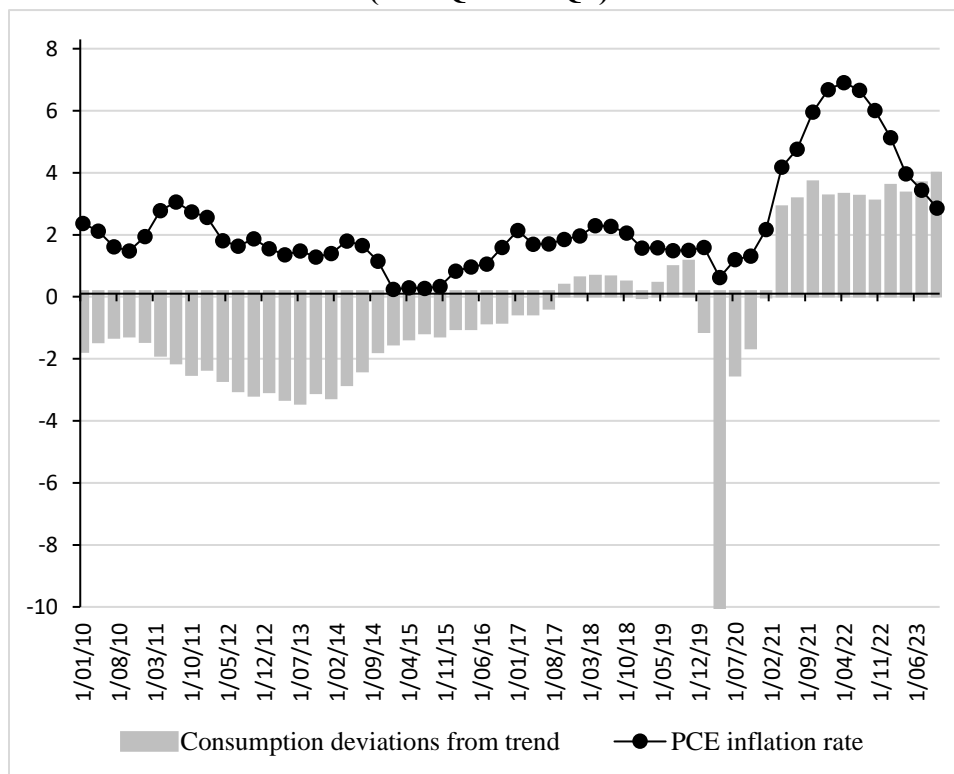


Sources: Bureau of Economic Analysis (BEA), Table 2.1; FRED database.

Real consumption growth during 2021-2023 has been higher than could have been expected based on its past trend. We estimated the (exponential) trend in real personal consumption expenditure based on observations for 1990Q1 – 2019Q4 ($\bar{R}^2 = 0.99; n = 120$). Figure 22 plots deviations from trend during the period 2010Q1-2023Q4. Real personal consumption expenditure was below its long-run trend during 2010Q1-2017Q3, as the U.S. economy was slowly recovering from the recession triggered by the Financial Crisis of 2008-09. During 2017Q4-2019Q4, real consumption expenditure evolved close to its long-run trend, but falling deeply below trend in 2020, when the COVID19 crisis struck.

But real consumption spending recovered in 2021Q2, surging 2.7% higher than the trend and remaining significantly above trend throughout the recent period 2021Q2-2023Q4. According to our estimates, the cumulative excess in actual consumption (compared to trend) amounted to \$ 1.3 trillion during 2021Q2-2023Q4.

Figure 22
Consumption Deviations from Trend and the PCE Inflation Rate
(2010Q1-2023Q4)



Source: Estimated by the authors based on BEA data.

It can be seen in Figure 22 that the PCE inflation rate, which had hovered close to and around the Fed’s inflation target of 2% during 2010-2019, began to surge in 2021Q2, right when consumption spending rose above its trend. It is clear that the strong recovery of consumer spending (in 2021) has been driving the rise in inflation, in a period of time of very significant supply-side constraints (Ferguson and Storm 2023a).

However, neither draining household savings nor rising household indebtedness can account for the substantial growth of consumption expenditure during 2021-2023 (shown in Figure 22), while real incomes were shrinking across all deciles of the income distribution (see Figure 15). Real consumption expenditure rose by \$0.708 trillion during 2021-2023, while households’ interest payments rose by \$155 billion. The additional \$0.863 trillion of household spending had to be funded out of a real disposable income that declined by \$0.327 trillion. This means that U.S. households managed to obtain \$1.190 trillion to fund their outlays. Where did the funding come from?

The answer emerges with great clarity when one breaks down the growth of real personal consumption expenditure by income classes. It is clear that the extra demand during 2020/21-2023 disproportionately originated from the richest 10%-20% of American households. They financed this spending spree out increases in wealth that, as we detail below, had no historical precedent. In plain English, the recovery of economic growth that is hailed as a singular achievement of Bidenomics, must be attributed to the unprecedented increases in asset prices, which occurred despite eventual monetary tightening by the Federal Reserve and which boosted consumption of the (super-)rich through the wealth effect.

In the next section, we document that U.S. demand growth has not been broad-based, but has been heavily skewed in favor of the rich households. In section 2.3., we consider the wealth effect on U.S. consumption in more detail.

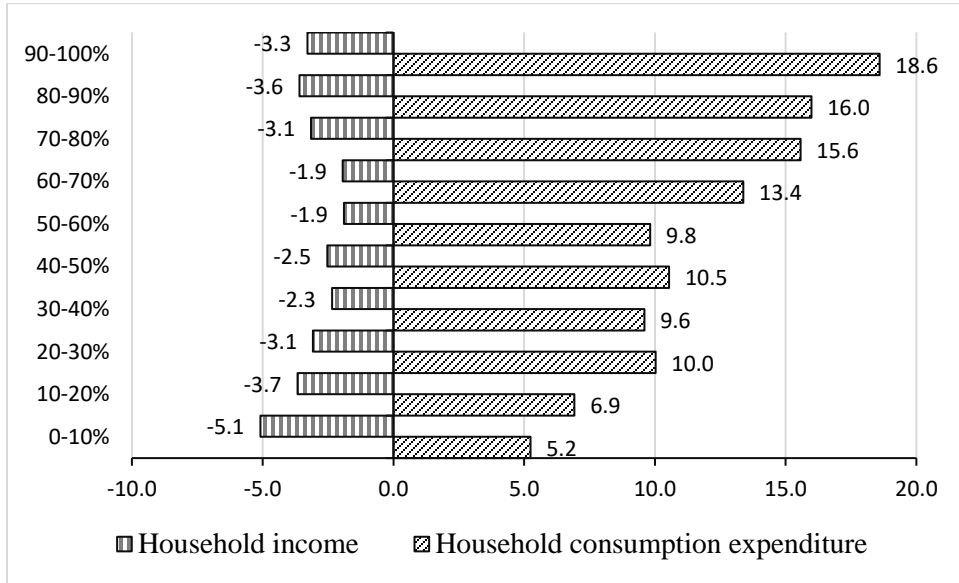
2.2. Income Distribution and Consumption Growth

The bias in favor of the rich is also visible when one considers consumption growth in greater detail—at the level of major categories of goods and services. Let us first consider the (estimated) growth of real consumption expenditures by income decile during 2020-2023, relative to the growth of real incomes, in Figure 23. We estimated personal consumption expenditures by item and income decile for the year 2023, assuming that the consumption structure by item and decile in 2023 is the same as the average consumption structure during the five-year period 2017-2021 (see Appendix 5).

According to official BEA numbers, real aggregate consumption expenditure increased by 13.6% during 2020-2023. According to our estimates, real consumption expenditure by the poorest 10% and the second income decile of U.S. households increased by 5.2% and 6.9% during 2020-2023. In contrast, real consumption expenditure by the richest 30% of American households increased by more than 15.6% during 2020-2023, while their real incomes were declining.

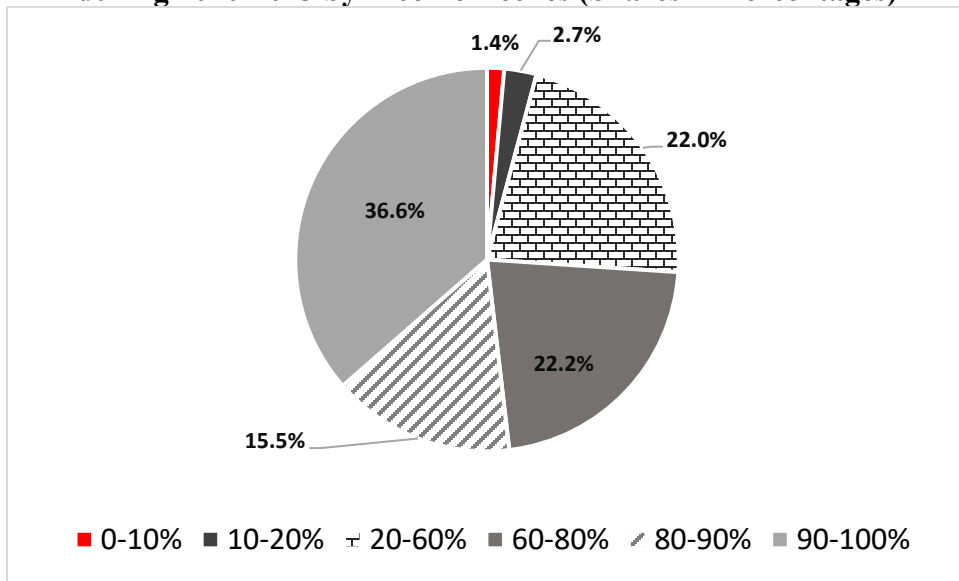
Consumption growth is thus heavily skewed in favor of the rich. The point can usefully be elaborated. U.S. household consumption expenditure rose by \$1.85 trillion (in constant 2022 prices) during 2020-2023. As is illustrated in Figure 24, 36.6% of this increase in real consumption spending came from the richest 10% of households; households in the ninth richest income decile were responsible for another 15.5% of this increase in consumption. The richest 20% of U.S. households are, therefore, responsible for 52.1%, or \$964 billion, of the consumption increase during 2020-2023 – a sum that, as we noted in our earlier paper, is roughly equivalent to the size of the much-maligned Biden stimulus program that had already faded as the wealth effect kicked in. The poorest 20% of U.S. households, in contrast, were responsible for a mere 4.1% of the increase in real consumer spending, or \$76 billion out of a total increase in consumption of \$1.85 trillion.

Figure 23
Percentage Change in Real Household Consumption Expenditure and Real Household Income by Income Deciles (2020-2023)



Source: BLS and BEA data. *Note:* Real household consumption expenditure by income deciles in 2023 has been estimated by the authors. See Appendix 5.

Figure 24
Increase in Real Aggregate Household Consumption Expenditure during 2020-2023 by Income Deciles (Shares in Percentages)



Source: BLS and BEA data. *Note:* Real household consumption expenditure by income deciles in 2023 has been estimated by the authors. See Appendix 5.

The first column of Table 4 shows the increase in prices by major type of product and service during 2020-2023. The aggregate PCE price index rose by 15% during these three years. The price index for goods rose by 15.3%, while the price index for services increased by 14.9%. Prices of motor vehicles and parts increased by 24.6%, of food and beverages by 19.4%, and of gasoline and energy goods by 58.8%. Housing rents and utilities' prices rose by 17.5%, transportation services by 25.1% and prices of food services & accommodation by 20.9%. Table 4 also gives the weight of these categories of goods and services in the PCE price index.

The third column of Table 4 displays the percentage changes in real consumption expenditure during 2020-2023. Aggregate personal consumption expenditure (in constant prices) increased by 13.6% during 2020-2023. Real spending on goods increased by 13.9% and on services by 13.5%.

Table 4 next decomposes the total change in personal consumption expenditure on major categories of goods and services into the (weighted) contributions by each of the household income deciles. Let us consider motor vehicles and parts first. The demand for motor vehicles and parts increased by 12.7% during 2020-2023. The richest 10% of U.S. households accounted for 10% of this demand increase, while households in the eighth- and ninth-income deciles just below them were responsible for 30% and 39% of this demand increase, respectively. Taken together, the richest 30% of American households accounted for 79% of the growth in the demand for motor vehicles and parts during 2020-2023 (think Tesla, but also other high-priced models including full sized SUVs).⁹ Prices of motor vehicles and parts rose by a remarkable 24.6% during this period, while, as we discuss below the cost of insuring vehicles – even older ones – also leaped up.

Table 4 next presents a breakdown of the total change in consumption of goods and services in (percentage) contributions per income decile. We have already seen that the richest 10% of households accounted for 37% of *aggregate* real consumption growth during 2020-2023 (Figure 24), but, as Table 4 shows, spending by the top 10% households accounted for 46% of the demand growth for durable goods, and for 73% of the demand growth of recreational goods & vehicles. Increased spending by the highest decile of U.S. households accounted for 54% of the demand growth for food & beverages and one-third of the demand growth for gasoline & other energy goods. The rich also spent massively on services: demand from the top income decile accounted for 39% of the demand growth for services. Higher spending by the richest 10% was responsible for 49% of the demand increase for recreation services and 40% of the demand growth for food services & accommodation.

It is evident that the consumption boom during 2020-2023 has been very lop-sided, as 65% of the demand growth originated from the richest 30% of households, with the richest decile on its own accounting for 37% of the demand increase. The poorest 30% of U.S. households, in contrast, were responsible for just 8.8% of the aggregate consumption growth.

⁹ See: <https://www.carscoops.com/2023/10/americans-love-big-suvs-and-the-pandemic-helped-turbocharge-sales/>

**Table 4: Change in Real Personal Consumption Expenditure, 2020-2023
(Percent)**

Percent change in PCE Price Index	Weight	Total	Change in real personal consumption expenditure: contribution to total change by household income decile										
			0-10%	10-20%	20-30%	30-40%	40-50%	50-60%	60-70%	70-80%	80-90%	90-100%	
Personal consumption expenditures	15.0	1.000	13.6	1%	3%	5%	5%	6%	6%	10%	13%	15%	37%
Goods	15.3	0.349	13.9	2%	4%	5%	6%	7%	6%	10%	13%	15%	32%
<i>Durable goods</i>	11.3	0.132	21.3	1%	2%	2%	3%	2%	4%	9%	13%	19%	46%
Motor vehicles and parts	24.6	0.039	12.7	1%	3%	2%	9%	1%	-1%	15%	30%	39%	10%
Furnishings and durable household equipment	14.0	0.027	10.9	0%	5%	4%	1%	5%	7%	26%	18%	25%	13%
Recreational goods & vehicles	-1.3	0.050	36.1	1%	1%	1%	2%	1%	5%	3%	4%	8%	73%
Other durable goods	4.7	0.018	32.0	2%	3%	3%	6%	6%	7%	7%	13%	16%	38%
<i>Nondurable goods</i>	17.6	0.218	10.0	3%	5%	7%	7%	10%	7%	11%	12%	12%	26%
Food and beverages purchased for off-premises consumption	19.4	0.075	1.0	-8%	-3%	23%	17%	27%	-17%	7%	9%	-8%	54%
Clothing and footwear	10.2	0.032	28.0	3%	6%	6%	7%	8%	7%	10%	12%	15%	26%
Gasoline & other energy goods	58.8	0.021	14.8	-1%	3%	4%	7%	8%	7%	12%	14%	16%	33%
Other nondurable goods	9.9	0.090	12.6	3%	5%	6%	7%	10%	9%	11%	14%	12%	23%
Services	14.9	0.653	13.5	1%	2%	4%	4%	6%	7%	9%	13%	16%	39%
Housing and utilities	17.5	0.166	4.3	-6%	1%	4%	0%	2%	7%	12%	18%	19%	45%
Health care	7.8	0.170	18.1	3%	5%	9%	9%	10%	8%	10%	10%	12%	24%
Transportation services	25.1	0.030	34.6	2%	3%	3%	5%	6%	6%	13%	15%	16%	32%
Recreation services	14.3	0.038	33.8	1%	1%	2%	3%	5%	8%	6%	12%	15%	49%
Food services & accommodation	20.9	0.068	37.3	1%	2%	3%	4%	5%	8%	9%	12%	17%	40%
Other services	9.7	0.087	19.2	3%	2%	4%	4%	4%	7%	8%	11%	14%	43%

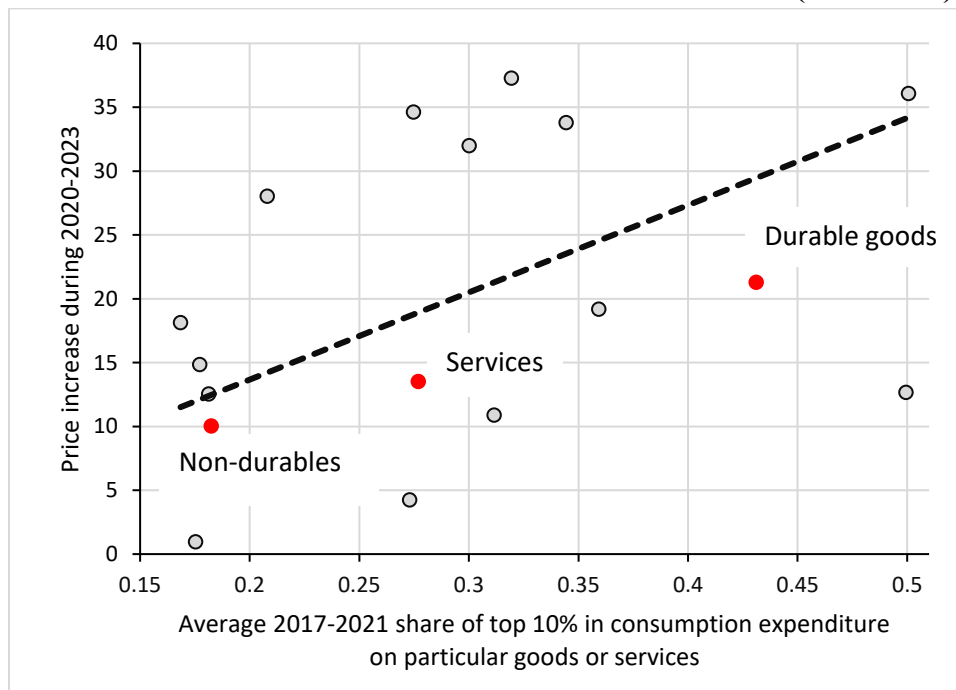
Source: Based on BEA and BLS. See Appendix 5. Real consumption expenditure was estimated using the PCE price index, published by the BEA.

This spending spree by the richest has, without doubt, contributed to the recent surge in the U.S. inflation rate. As shown by Figure 22, real personal consumption spending in the U.S. economy during 2021-2023 was significantly above trend. The \$1.3 trillion higher-than-expected consumption spending fueled price pressures for particular goods and services, especially those favored by the wealthy), in the midst of persisting supply-side squeezes, originating from the COVID19 lockdowns, disruptions of global supply chains, cost shocks from the Ukraine war, OPEC+, and rising geopolitical tensions (Ferguson and Storm 2023a).

The importance of the spending by the richest income decile is illustrated in Figure 25, in which we plot the average share of the top 10% of American households in the consumption spending on particular goods and services during 2017-2021 against the cumulative increase in the price of these goods and services during 2020-2023. The three observations colored in red are for larger (overarching) categories of durable and non-durable consumer goods and services. The other observations in the figure are for the 14 consumption items listed in Table 4. A larger share in consumption of the richest 10% of households is statistically significantly associated with higher price increases during 2020-2023, as is indicated by the dashed (regression) line in Figure 25. Our Appendix 5 presents a similar figure, but for 54 instead of 14 categories of consumer goods and services. Again, we find that a larger share in consumer spending of the top 10% of American households is significantly associated with higher price growth during 2020-2023.

Figure 25

A Scatter Plot of the Share of the Top 10% of U.S. Households in Consumption Expenditure on Particular Goods and Services *versus* Price Increases (2020-2023)



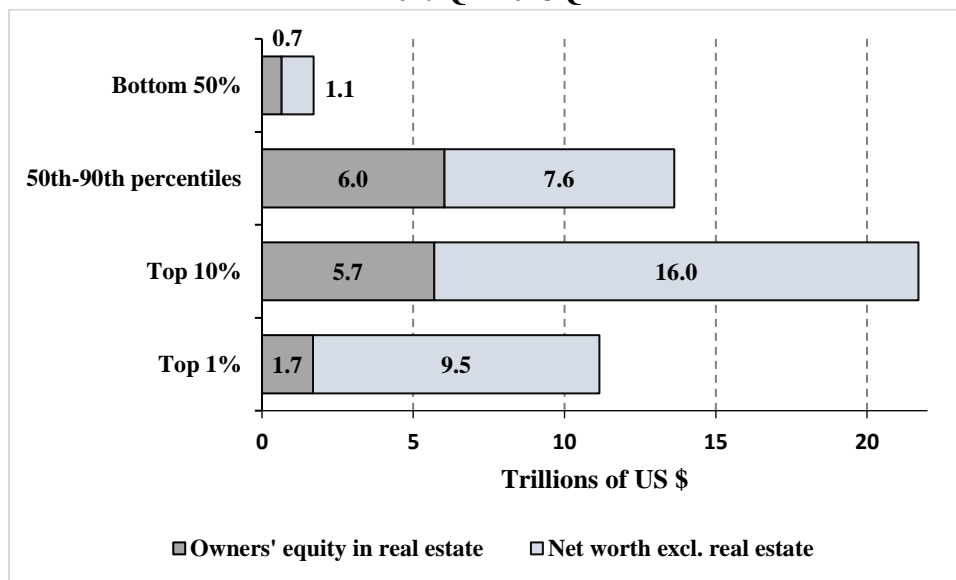
Sources: BLS data and estimations given in Table 4.

2.3. The Wealth Effect on U.S. Consumption

The richest households funded their much higher consumption levels not out of (declining) real incomes, but out of the record gains in their wealth, following unprecedented increases in house prices and the stock market. The unparalleled asset price inflation was the direct result of the decade-long quantitative easing pursued by the Federal Reserve and the accompanying low interest rates, but especially the dramatic resumption of that policy after COVID hit. The asset price inflation has continued, with some dramatic hiccups, in the face of the Fed's drastic monetary tightening during 2021-2024. It is an irony of history, not well understood, that much of the recent surge in U.S. inflation has been caused by Federal Reserve policies—and worse, the lopsided inequality in wealth makes controlling consumption spending by raising interest rates much harder for the Fed. Consumption by the affluent is far harder to stop, without interest rate increases that would bring the rest of the economy to its knees.

In Appendix 4, we present evidence on the unprecedented increases in housing wealth (defined as owners' equity in real estate) and financial wealth of households (defined as corporate equities and mutual fund shares) in recent years – and on the sharp increase in wealth concentration. Figure 26 presents the wealth gains, made during 2019Q4-2023Q4, from housing wealth and financial wealth, when taken together, for the top 1%, the top 10%, the 50th-90th percentiles and the bottom 50% of the U.S. wealth distribution. Total household wealth rose by \$37 trillion during these four years, as American society and the U.S. economy were going through a pandemic, a recession and an uncertain recovery process that included a significant rise in the inflation rate.

Figure 26
Increase in Net Worth of U.S. Households by Wealth Percentile,
2019Q4-2023Q4



Source: *Distributional Financial Accounts* of the Federal Reserve.

Three conclusions can be drawn from our analysis in Appendix 4. First, aggregate U.S. household wealth has shot up by \$37 trillion during 2020-2023, rising 45% above its longer-run trend. Second, the distribution of the aggregate wealth gain is heavily biased in favor of the rich. The wealthiest 1% of households captured 30% of this spectacular rise in financial wealth; the wealthiest 10% seized 59% of the wealth gains (amounting to \$21.7 trillion). The bottom 50% of the wealth distribution, in contrast, received a pitiful 5% of the aggregate increase in household wealth (or \$1.8 trillion). Third, in view of the unprecedented increases in household wealth, it is reasonable to expect some impact on household consumption, especially consumer spending by the wealthiest 10% (or 20%) of U.S. households, and through that, on inflation, exactly as we already argued in our earlier paper (Ferguson and Storm 2023a).

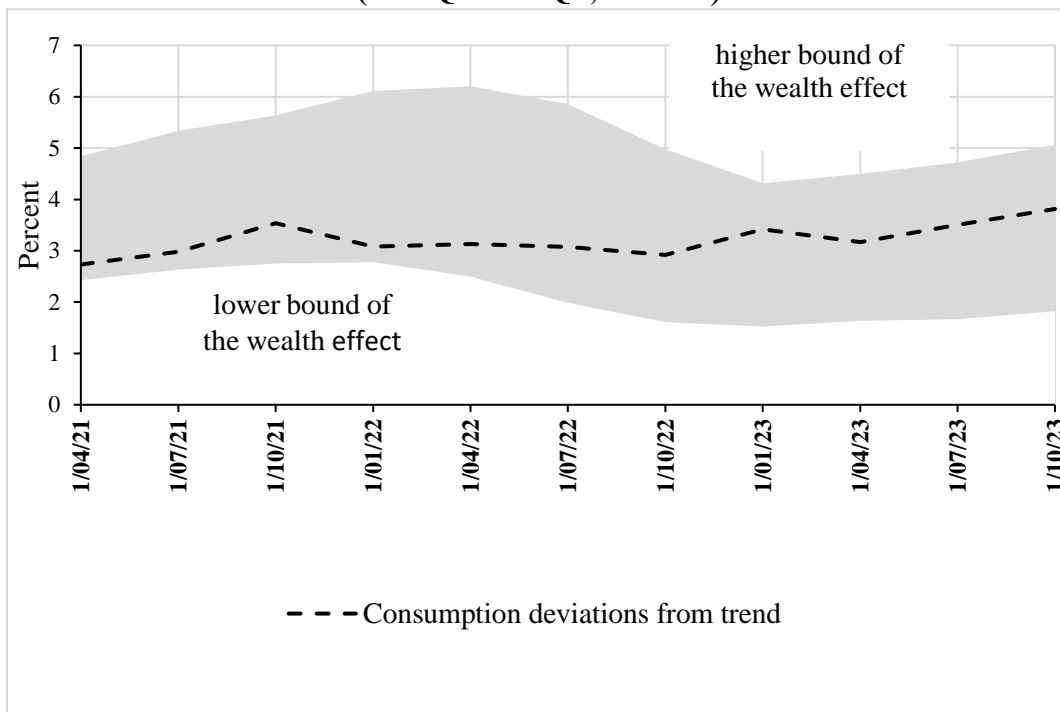
Our (empirical) approach to estimating the housing wealth and financial wealth effect on U.S. consumption is explained in Appendix 6. Given the parametric uncertainty and the time-lags involved, we estimate lower and upper bounds for the wealth effect on consumption; we assume that the wealth effect occurs with a lag of three quarters following the change in household wealth. The results for the period 2021Q2-2023Q4 appear in Figure 27. The dashed line in Figure 27 represents the quarterly (percentage) consumption deviation from trend. Our estimation results for the longer period 2010Q3-2023Q4 can be found in Appendix 6; our specification of the wealth effect performs rather well as well over this longer period.

It can be seen that the post-2021Q2 consumption deviations from trend fall within the band defined by the upper and lower bounds of the wealth effect on consumption. This suggests that changes in wealth, according to our simple calculations, can account for all of the observed consumption fluctuations of the past eleven quarters. During 2021-2022, consumption deviations from trend are relatively close to the (conservatively estimated) lower bound of the wealth effect, but are moving closer to the upper bound of the wealth effect during 2023, as the wealth gains continued to persist.

The cumulative magnitude of the wealth effect on consumption expenditure (in constant 2017 prices) during 2021Q2-2023Q4 is estimated to range from \$0.9 trillion (in the lower-bound scenario) to \$2.2 trillion (in the upper-bound scenario). The mean cumulative size of the wealth effect during 2021Q2-2023Q4 during this period is \$1.55 trillion of additional consumer spending (in constant 2017 prices).

The estimated range of plausible wealth effects over time must be read as a proof of principle: for empirically realistic ranges of parameter values for the effects of change in housing and financial wealth we find that actual increases in household wealth do account for all (or almost all) of the consumption deviations from trend during 2021Q2-2023Q4. This finding underscores our conclusion that the recent surge in U.S. inflation has been caused by Federal Reserve policies—which, by generating lopsided increases in wealth in favor of the richest households, enabled the growth in consumer spending in excess of its trend that is closely associated with the recent surge in U.S. inflation. The chickens have finally come home to roost for the Fed.

Figure 27
Estimated Wealth Effect on Personal Consumption: The U.S.
(2021Q2-2023Q4; Percent)



Source: Constructed by the authors. See Appendix 6.

2.4. Part II: Conclusion

The richest 10% of U.S. households saw their wealth increase by \$21.7 trillion during 2020-2023, notwithstanding sharp rises in interest rates. These wealth gains which have no peacetime precedents, have enabled the richest American households to step up consumption, even if their real incomes were falling. Empirically plausible estimations of the wealth effect on the consumption spending of the super-rich show that the wealth effect accounts for all of the increase in aggregate consumption spending above its longer-term trend during 2021Q1-2023Q4. Affluent Americans have been spending at prodigious levels. In the short run, the lopsided inequality in wealth would make controlling lopsided consumption spending by raising interest rates much harder. Consumption by the affluent will be far harder to slow without interest rate increases that would bring the rest of the economy to its knees much earlier. The shift in wealth would also fuel illusions that high volumes of aggregate spending were reliable indicators of broad social welfare. They are not.

3. Conclusions: The Macroeconomics of the Second Coming

Discussions of the 2024 American presidential campaign have been enveloped in an intellectual fog, which this paper has sought to dispel. We have argued that the fog arises not from fits of madness or social amnesia, but from mistaken macroeconomic judgments about the situation of most voters. President Biden has many achievements to his credit, especially by comparison with other administrations, and it is not obvious that blaming him for many things that have gone wrong is always sensible. People can reasonably (or unreasonably) debate those.

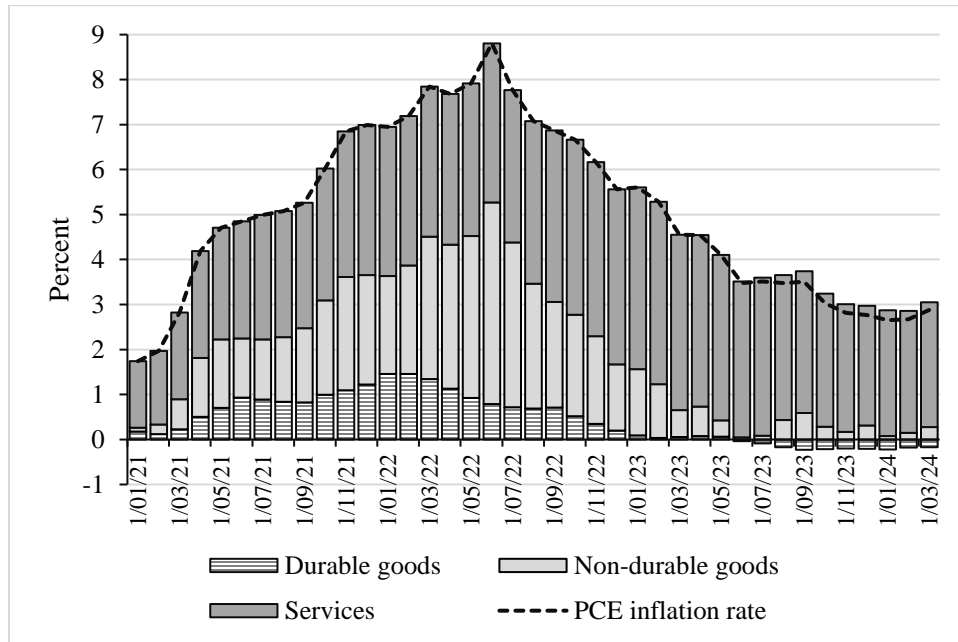
But that will not change the fact that during his presidency, most Americans have lost big from inflation; their real wages have not kept up. Nor have real wages for the lowest paid Americans vaulted past historic benchmarks. What has blown past all previous records are the wealth holdings of affluent Americans. Thanks to Federal Reserve monetary policy (and favorable tax policies), this epoch-making stock of wealth allows the American rich to consume almost regardless of interest rates, as more and more of the economy reorients itself around their demands.

The problems this makes for the Biden administration as the campaign heads into its home stretch, are apparent. Though establishment media talk of “Goldilocks” scenarios for the economy, even likely Democratic voters remain deeply skeptical, to say nothing of independents or Republicans. Meantime, the inflation dragon refuses to die ([Powell 2024](#)). Contrary to what almost everyone expected, the Federal Reserve’s highly touted campaign to reduce its balance sheet and normalize interest rates has not quelled inflation. Even at interest rates of 5%, consumption remains very strong, with service sector inflation persisting and sometimes increasing, even as earlier supply shocks fade. As is shown in Figure 28, in which we decompose the (annualized) monthly PCE inflation rate into contributions of durable goods and non-durable goods inflation and services inflation, the surge in the PCE inflation rate during January 2021-June 2022 was driven both by rising (durable and non-durable) goods prices and services inflation. The steady decline in the PCE inflation rate after mid-2022 has been caused by the gradual decline in goods inflation. During March 2023-March 2024, (PCE) inflation has been almost exclusively caused by stubbornly rising services prices. In this sense, Team Transitory ([Stiglitz 2023](#)) should really not be celebrating either: climate, war, and the restructuring of the economy toward higher levels of demand from the affluent keep churning things up (Ferguson and Storm 2023a).

A major point of our paper, of course, is that all this should not have come as a surprise. With wealth holdings so concentrated, the fiction that one can analyze macroeconomics without reference to distribution has worn thin. It needs to be abandoned once and for all. The U.S. economy now behaves differently, because of the massive concentration of wealth at its top. Interest rates constrain consumption by the affluent much less than the consumption spending by the bottom ninety percent of the income distribution. More affluent consumers can afford simply to shrug and

keep buying as rates creep up. This is the first major macroeconomic consequence of the distributional shift that most economists and the Federal Reserve have failed to recognize.

Figure 28
The Monthly PCE Inflation Rate
(Annualized; January 2021-March 2024)



Source: Authors' calculations based on *Bureau of Economic Analysis (BEA)*, Table 2.3.4U. Price Indexes for Personal Consumption Expenditures by Major Type of Product and by Major Function and Table 2.3.5U. Personal Consumption Expenditures by Major Type of Product and by Major Function.

There are others. The current situation with regard to spending by the wealthy points up the hollowness of the principle of Ricardian equivalence – the bromide that some mainstream macroeconomic theorists still champion. In this view, government deficit spending cannot increase overall spending because people foresee the tax bill coming due down the road. Because their lifetime incomes do not change, they do not consume more; instead, they immediately start saving to pay the taxes. Total spending therefore does not change.

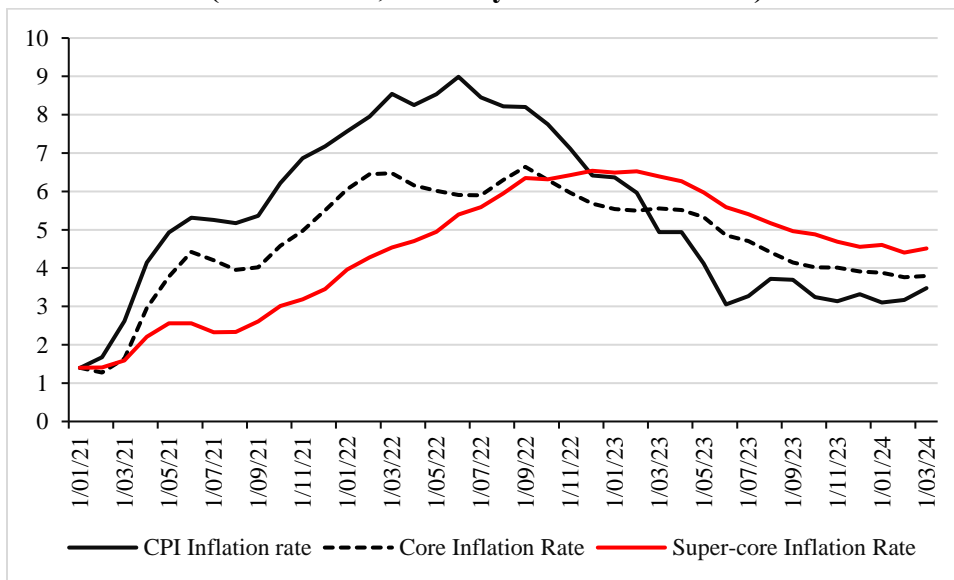
The American political system has always stood out internationally for the startlingly direct ways it unapologetically translates big money into political power (Ferguson 1995) (Ferguson, Jorgensen, and Chen, 2022). But there is a real question whether the concentration of wealth in the last few years has perhaps brought this process of “affluent authoritarianism” to a tipping point. As a group, the American rich are not saving up to pay future taxes. They are consuming on a vast

scale, but also spending important sums on politics and lobbying to shift the burden of taxation elsewhere and secure even more benefits from public expenditures (Ferguson *et al.* 2021)

Money in politics has exploded. Enormous sums derived from Trump’s tax cuts and the Fed’s quantitative easing cascade through the political system. Campaigns to cut social security, promote flat taxes, and extend the Trump tax cuts past their 2025 expiration date are all in high gear, even if they are rarely mentioned in the heat of the campaign. So are munificently funded efforts to ensure that captive regulators of American businesses stay captive – at every level of government.

The macroeconomic significance of these money flows is completely unheralded. As it came to power, the Biden administration broke with recent precedents and launched several major initiatives in antitrust and the regulation of financial fees and bank capital. It has battled to restrain cryptocurrencies, shifted the National Labor Relations Board in a direction more favorable to labor, and changed policy on many, though not all, environmental issues. But the central thrust of many key regulatory policies has been little affected. Discussions of sticky prices, especially in the service sector, rarely even nod to the important role regulatory failure is playing in inflation’s persistence. As is shown in Figure 29, the super-core sticky price inflation rate has been refusing to come down much during 2023 and 2024, and is still running at 4.5% in March 2024 (which is much higher than the Fed’s inflation target).

Figure 29
CPI Inflation, Core Inflation and Super-core Sticky Price Inflation
(Annualized; January 2021-March 2024)



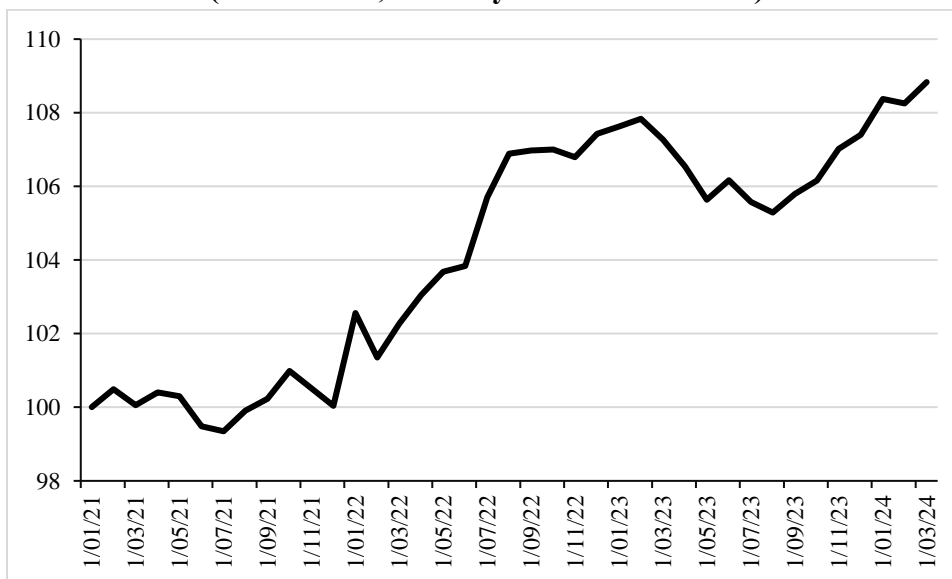
Source: FRED database; series CPIAUCSL_PC1; CPILFESL_PC1; CORESTICKM159SFRBATL. Notes: The core CPI inflation rate excludes the direct contributions of energy and food prices. The super-core CPI inflation rate is based on a

weighted basket of CPI components that change price relatively slowly, and it excludes food and energy prices.

Some cases almost defy belief. Consider, for example, the behavior of one of the most important prices in the system: the price of electricity in US cities (Figure 30). Public debates over increases in oil and gas prices and other power sources, including nuclear energy, are well known. We fully concur with the widespread judgment that energy prices clearly show the influence of oligopolies operating at several levels and genuine profit inflation. But even during COVID and wars, oil and gas prices do not go up forever. They move up and down, at least a little. By contrast, a key final product of these energy inputs – the cost of electricity in U.S. cities – has during January 2021-March 2024 gone in one direction only: up. Inflation is falling, but households' electricity bills are not.

As Figure 30 shows, during this period, the price index of electricity has increased around 9 percentage more than the aggregate CPI. Economists will, of course, point to the high and rising costs of key fuels for generating electricity, notably liquified natural gas (LNG) that remains in short supply in the U.S. Tighter supplies of LNG which fuels more than one-third of Americans' electricity, have raised costs for consumers. Liquified natural gas is scarcer because the U.S. is shipping record amounts to Europe to replace lost imports from Russia, which have dropped dramatically amid the war with Ukraine. That situation is unlikely to change anytime soon.

Figure 30
Price Index of Electricity in U.S. cities Relative to CPI Price Index
(Annualized; January 2021-March 2024)



Sources: FRED database.

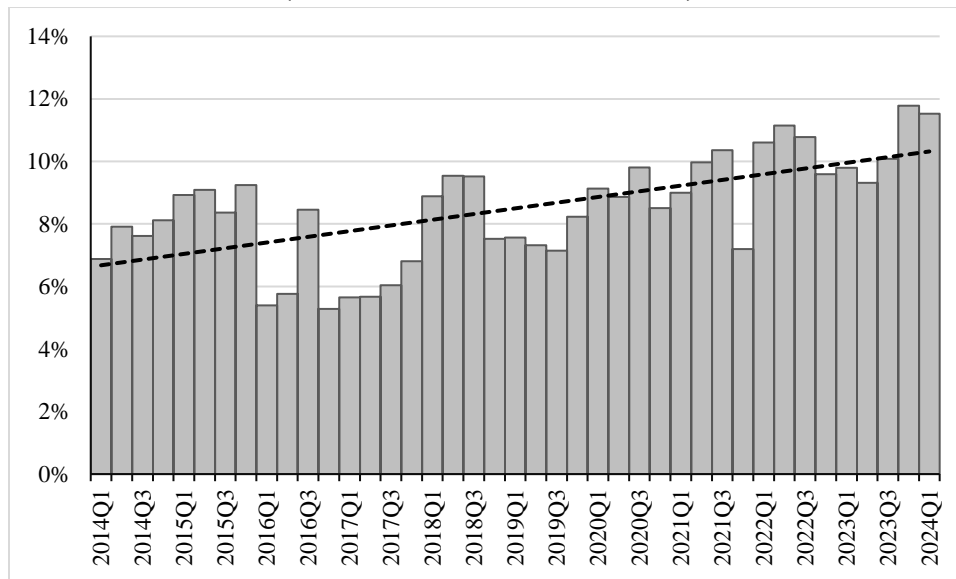
Economists will also point to rising operating costs, including rising wage costs. Labor shortages and tighter supplies have pushed up wages and other costs for electric utility companies. However, what they do not tell is that electricity producers and distributors have managed to raise their net profit margin in recent years, notwithstanding the increases in fuel and operating costs. The net profit margin of electric utilities rose from an average of 7.9% during 2017-2020 to 10% during 2021Q1-2024Q1 (Figure 31).

How this marvel was accomplished would require an essay in itself. Here we can afford only to point out the obvious – that utilities and the power sector are heavily regulated and notoriously influenced at many levels of government by lobbying and political money. The advent of electric cars, Artificial Intelligence (especially big platform Large Language Models), and crypto-currency operations are all driving up demand for electricity. But entry into both generation and distribution markets is often fiercely resisted, not just by fossil fuel companies, but existing renewable producers.¹⁰ Higher interest rates will do nothing to change this; indeed, as we have observed before, they will actually discourage increased production of renewables. Only aggressive antitrust and regulatory monitoring by big government acting in the interest of the whole population can change this.

Other cases are less egregious, though if one does not start from the premise that some iron law of full cost-pass through to consumers is a given, then the ease with which many other regulated industries keep their prices almost even with or ahead of inflation is likely to excite wonder. (The contrast with the situation of most workers and consumers is glaring.)

¹⁰ One celebrated industrialist whose establishments depend critically on electricity, for example, has declared that “the next shortage will be electricity” (Blain, 2024); more generally, cf. St. John (2023) On utility efforts to restrict entry, see, *inter multa alia*, Hausman (2024); for the efforts of one large renewable to block rivals, see Storrow (2024); for other cases, mostly from fossil fuel dominated concerns, see Ariza and Swartz (2024) and Mehta (2024).

Figure 31
Net Profit Margin of U.S. Electric Utilities
(Annualized; 2014Q1-2024Q1)



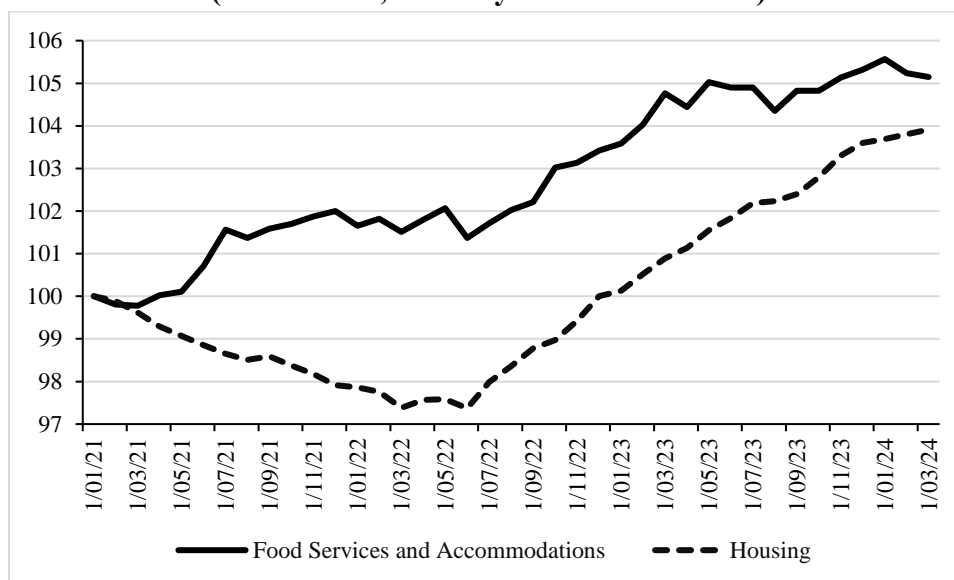
Sources: CSI Market Data.

https://csimarket.com/Industry/industry_Profitability_Ratios.php?ind=1201

The lingering inflation in the service sector is what is worrisome to the Federal Reserve. But, as we argued, the stubborn persistence of services inflation must be blamed on the rich: demand from the top income decile accounted for 39% of the demand growth for services (Table 4). Higher spending by the richest 10% was responsible for 40% of the demand growth for food services & accommodation. The price index of food services & accommodation increased by 21.6% during January 2021-March 2024, which is more than 5 percentage points faster than the PCE Price Index (Figure 32).

Figure 7.6 (in Appendix 7) presents the monthly price index of (urban) shelter during January 2017 and March 2024. The cost of shelter rose by 24.4% during 2019 and March 2024, which is more than the increase in the aggregate PCE Price Index (see Figure 32). However, Fed officials continue to regard elevated housing inflation as a temporary problem and not as good a measure of underlying prices. Our earlier paper noted the advent of algorithms that help landlords to set prices; we think the evidence on this requires more scrutiny than it has so far received.

Figure 32
Price Index of Food Services & Accommodations and Price Index of Housing
Relative to PCE Price Index
(Annualized; January 2021-March 2024)



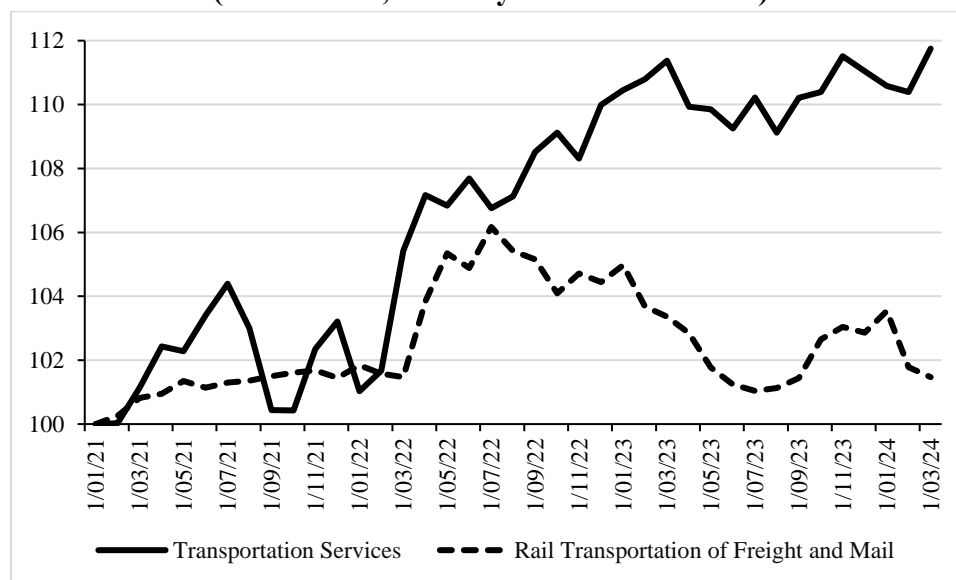
Sources: BEA and FRED database.

Let us consider other services prices. For example, average transportation services have strongly risen in price, as is illustrated in Figure 33. During January 2021-March 2024, prices of transportation services rose by 29.3% during January 2021-March 2024, which is almost 12 percentage points more than the PCE Price Index. The (producer) price index of railway freight and mail, which is an important, heavily regulated sector, increased by 17.4% during January 2021-March 2024, which is also faster than the PCE Price Index (see Figure 33). The railroad corporations managed to raise their net profit margins during 2021Q1-2024Q1, compared to 2019Q1-2020Q4.

And, after 2008, is anyone really surprised that price rises in regulated financial industries typically zoom past standard inflation rates? Fed Chair Jerome Powell himself commented on how rising insurance costs have added to inflation, noting that “Insurance of various different kinds — housing insurance, but also automobile insurance, and things like that — that’s been a significant source of inflation over the last few years.”¹¹ Certain price series for insurance, such as those for private automobile insurance, show this clearly. Figure 33 shows a notable increase in the metric for auto insurance. This metric, encompassing physical damage, liability, and miscellaneous insurance coverage for private passenger vehicles, is (in March 2024) 26% higher than the CPI (Figure 33).

¹¹ See Quiroz-Gutierrez (2024).

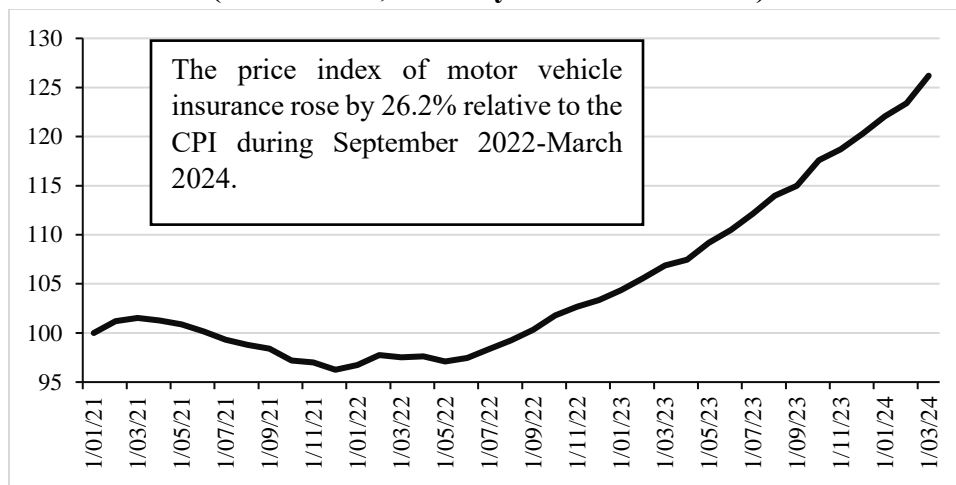
Figure 33
Price Index of Transportation Services and Price Index of Rail Transportation
Relative to PCE Price Index
(Annualized; January 2021-March 2024)



Sources: BEA and FRED database. *Note:* The price index of rail transportation is the producer price index.

The situations in other parts of the insurance industry are less easily summarized, because non-price rationing (withdrawal from the market), often motivated by adverse climate changes, plays an important role. However, a study conducted by [S&P Global Market Intelligence](#) unveiled a sharp 11.3% increase in homeowners’ insurance premiums in 2023 (Woleben 2024). The increasing frequency of extreme weather events, attributed to climate change, is significantly increasing risk exposure for insurance companies. Record levels of weather-related losses in recent years have directly contributed to a notable uptick in insurance costs, as outlined in the study.

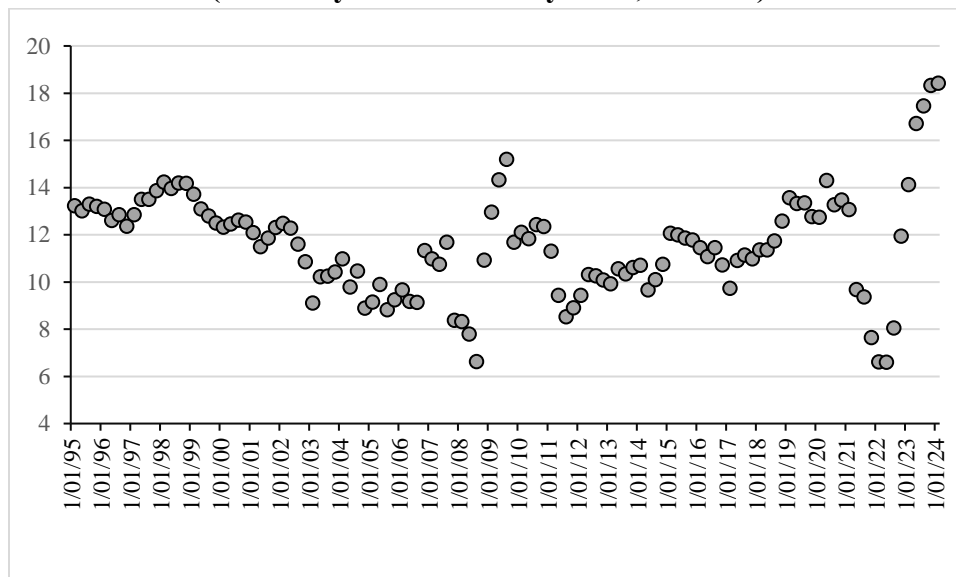
Figure 34
Price Index of Motor Vehicle Insurance in U.S. Cities Relative to CPI Price Index
(Annualized; January 2021-March 2024)



Sources: BLS data.

Finally, the Fed itself has contributed to the rise in the cost of living. Even mainstream economists have noted that interest charges on bank credit cards soared, going up more than other interest rates. Figure 35 presents the real interest rate on credit card plans, which increased from 11.7% on average during 2020-2021 to 17% on average during February 2023-February 2023.

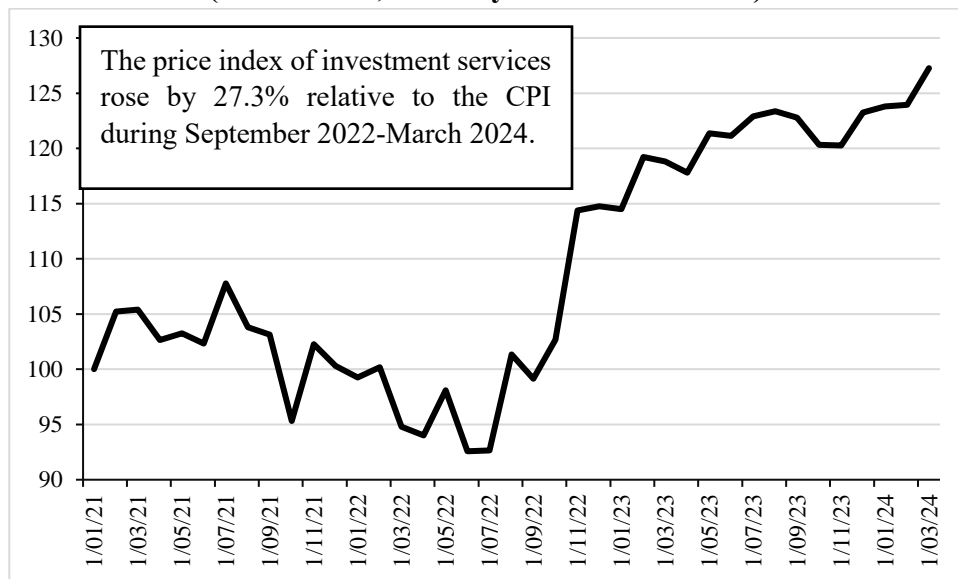
Figure 35
Real Interest Rate on Credit Card Plans
(February 1995-February 2024; Percent)



Source: FRED database. *Note:* The real interest rate has been calculated as the nominal interest rate minus the (annualized) monthly CPI inflation rate.

Many indexes of producer prices in the financial sector exist. Not every segment increased, but many of the most important show explosive rises. Figure 36 plots the producer price index of investment services as a ratio of the CPI for the period January 2021-March 2024. The price index of investment services rose by more than 51% during these years, which is more than 27.3 percentage points more than the CPI. There can be little doubt that if an occupational summary existed for investment advice and counseling, it would likely run ahead of gains we saw earlier of lawyers (in Figure 3).

Figure 36
Producer Price Index of Investment Services Relative to CPI Price Index
(Annualized; January 2021-March 2024)



Sources: FRED database. Note: Investment services include securities brokerage, dealing, investment advice, and related services

This list could be extended and one would also find contrary cases. The complicated case of medical care could also be explored, where not one, but a whole series of oligopolies, including major insurers, hospital chains, pharmacy benefit manufacturers, medical specialty concerns, and private equity firms battle each other, with regulators largely missing in action, and where the Biden administration’s initial effort to negotiate prices for ten drugs met unyielding resistance from pharmaceutical companies whose main products benefited from years of government support at

the developmental stage.¹² While executive pay increased in many hospital chains, complaints about burnout among workers became common, and many employees left the field.¹³ We are confident that the rapid entry of private equity into this sector, along with steady pushback from Big Pharma, hospitals, and other major players, does not bode well for inflation control, but the topic is too complex to tackle here. Our point is that this is not a sector where raising interest rates can much affect prices, save by driving some vitally needed firms, often hospitals, into bankruptcy from time to time.

Our earlier paper discussed other kinds of cases where the pull of concentrated wealth was leading to obvious structural changes with disastrous social externalities. For example, as low wage workers moved into higher end restaurants or hotels, nursing home care withered. This process has continued. Total employment in nursing homes is way down from before COVID. Adjustment in this sector is likely affected by a condition that affects many other sectors: the inability of public institutions (as distinct from regulatory commissions) and non-profits to compensate employees quickly as the costs of living rise.

The situation defies easy summary; many parts of education, elder and day care, and public health are likely affected. The situation is certainly not all of one piece: some states and localities have, for example, increased support for universities and schools. But many have not, and we expect that over time a very familiar pattern will intensify: a dual economy, in which services and vital goods for less affluent Americans wither, while boutique practices for well-off clients flourish (Storm 2017; Taylor & Ömer 2020; Temin 2017). It is striking that while even affluent school districts betray evidence of hard hits from COVID, many appear to be raising wages. That is certainly not happening in all lower-income areas.

Survey evidence shows that many Americans report longer waits for medical care and services. Now that virtually all the aid from the Biden stimulus package has ended, even for daycare, we expect that increasing numbers of citizens, both in cities and the countryside, will become increasingly impatient. In the future, we think scrutiny of basic indicators, such as variations in life expectancy by income groups, racial and ethnic affiliations, and areas will provide more reliable guides to welfare than GDP indicators.

Our earlier paper borrowed a leaf from Keynes and suggested that spending by higher income Americans could be regulated by using bond sales (that paid interest; no one suggested confiscation, though higher tax rates on high incomes of course would also mitigate the problem). We think this is still a good idea, along with cyclically adjusted fiscal policies. Both would be much

¹² The oligopolistic character of medical pricing and the industry's major players are the subject of a literature too large to survey here. But for the critical role of federal funding in the development of virtually all new drugs approved for sale in the US between 2010 and 2019; see Cleary, Jackson, and Ledley (2020).

¹³ The number of nurses working in skilled nursing care facilities in March 2024 is around 10% lower than during 2017; see <https://fred.stlouisfed.org/series/CES6562310001> For top executive pay trends, see Herman, Parker, Feuerstein, Lawrence, and Ravindranath (2023).

better than raising interest rates or holding them up too long) as the rest of the economy crumbles and wealth falls to a level that reduces consumption by the affluent.

But in 2024 such measures are not going to be implemented. Meanwhile it is possible that a new round of wage increases kicks off as long delayed unionization spreads in the wake of the UAW's victories. A reversal of the steady fall in unionization during the Biden presidency might invigorate the President's campaign, but it could also prove to be a double-edged sword if inflation reignites.¹⁴

We thus repeat our earlier caution that this paper is not an election analysis; it is a macroeconomic background analysis of some key issues. Concerns that are almost without precedent will figure in this election, including the future of democracy itself. Abortion, foreign policy, the course of several wars, along with other issues we have not treated at all will all play roles, as we noted, and the scope for chance outcomes is frighteningly large. The campaign also has many months to run and neither Trump nor Biden have been formally nominated yet, even though they have agreed to debate one another. But we doubt that any purpose is served by questioning why so many people regard their current economic situation as precarious and stressful. It is hard to imagine that anything good can come from glossing over this crucial point. Democrats, in particular, run the risk of missing signals like those that flashed in the run up to the First Coming in 2016, when national election surveys identified important groups of former Democratic voters who told pollsters that they could not perceive differences between the parties that mattered in their lives (Ferguson, Page, *et al.*, 2020).

¹⁴ Rates of unionization have fallen steadily during the Biden presidency to a record low in 2023. See United States *Bureau of Labor Statistics*, 2024. Note that the absolute number of unionized workers did increase in some years, but not as rapidly as total wage and salary workers.

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Appendix 1. Decomposition of Aggregate Real Wage Change

The economy-wide real wage in period $t+1$, w_{t+1} , is the weighted average of the real wages earned in industries $i = 1, \dots, n$, or $w_{t+1} = \sum_{i=1}^n \vartheta_{i,t+1} w_{i,t+1}$, where ϑ_i = the share of industry i in aggregate employment. Using this definition, we write the change in the aggregate real wage between periods $t+1$ and t as follows:

$$\begin{aligned} \Delta w &= w_{t+1} - w_t = \sum_{i=1}^n \vartheta_{i,t+1} \Delta w_i && + \sum_{i=1}^n w_{i,t} \Delta \vartheta_i \\ &= \text{within-industry real wage growth} && + \text{the composition effect} \end{aligned}$$

where $\Delta w_i = w_{i,t+1} - w_{i,t}$ and $\Delta \vartheta_i = \vartheta_{i,t+1} - \vartheta_{i,t}$. The economy-wide real wage change is decomposed into (a) the sum of changes in within-industry real wage growth rates, and (b) the composition effects which capture the impact on the economy-wide real wage of the restructuring of employment/jobs across industries. The results of the decomposition of the change in the economy-wide hourly real wage during January 2019-February 2024 are shown in Table 1.1.

It can be seen that the composition effect was negligibly small during January 2019-February 2020; the economy-wide real wage rose by \$0.23 due to real wage increases within industries. The two months March-April 2020 show enormous increases in economy-wide real hourly wages (by \$1.80 in total). Half of the aggregate real wage increase is due to an employment structure shift—away from leisure & hospitality (-\$0.84) and towards other services (professional and business services and education and healthcare). This is explained by COVID, which forced a move out of low-pay in-person close-contact services toward professional & business services and education and health; firms in hospitality and leisure had to raise wages to lure people to come back, if only because of increased health hazards, as our earlier paper discussed (Ferguson and Storm 2023a).

The third period runs from May 2020-February 2024 (almost 4 years). The economy-wide real wage declined cumulatively by \$1.54. That is, the March-April 2020 real wage gain has been almost fully annihilated (this happened when the labor market was, supposedly, very hot). But real wages in goods production (manufacturing) declined, and goods-production jobs also declined. The biggest cause for the decline in the economy-wide real wage is the return of workers to leisure & hospitality. The employment share of leisure & hospitality rose, and wages in this industry (which are far below average) rose as well. But employment shares of professional & business services and education and health care declined; real wages in these sectors also declined.

**Table 1.1. A Decomposition of Average Hourly Real Wage Changes, January 2019-February 2024
(All Numbers In US\$ at Constant Prices)**

	Total	Goods	Services	Retail	Transportation & Warehousing	Professional & business services	Education & health services	Leisure & Hospitality
January 2019-Feb. 2020 (13 months)								
Increase in average hourly real wage	0.23	0.00	0.23	-0.01	0.02	0.07	0.04	0.05
• due to real wage changes	0.24	0.05	0.19	0.04	0.00	0.08	-0.03	0.02
• due to changes in employment structure	-0.01	-0.05	0.04	-0.05	0.02	-0.01	0.07	0.02
March-April 2020 (2 months)								
Increase in average hourly real wage	1.80	0.40	1.40	0.18	0.14	0.69	0.42	-0.73
• due to real wage changes	0.90	0.16	0.74	0.13	0.04	0.31	0.13	0.11
• due to changes in employment structure	0.90	0.24	0.66	0.04	0.10	0.38	0.29	-0.84
May 2020-February 2024 (33 months)								
Increase in average hourly real wage	-1.54	-0.49	-1.05	-0.26	-0.03	-0.49	-0.28	0.80
• due to real wage changes	-0.81	-0.21	-0.60	-0.14	-0.02	-0.27	-0.07	0.01
• due to changes in employment structure	-0.73	-0.28	-0.45	-0.12	-0.01	-0.23	-0.21	0.79

Source: FRED database. *Notes:* The decomposition involves other industries than the ones listed here. But for these industries, the changes were very small and are not reported in the table.

Appendix 2. Is the U.S. Labor Market Really ‘Extremely Tight’?

Autor, Dube and McGrew (2023) champion the cause that under Biden rapid relative wage growth of the bottom 10% workers “counteracted nearly 40% of the four-decade increase in aggregate 90-10 log wage inequality.” They ascribed most of this to a loss of monopsony power by employers in the low end of the wage distribution, though they assert that various Biden administration policies have contributed to this result by leading to an overheated labor market. According to Autor *et al.* (2023), the post-pandemic labor market tightness has been strongly predictive of *real* wage growth among low-wage workers and of aggregate wage compression.

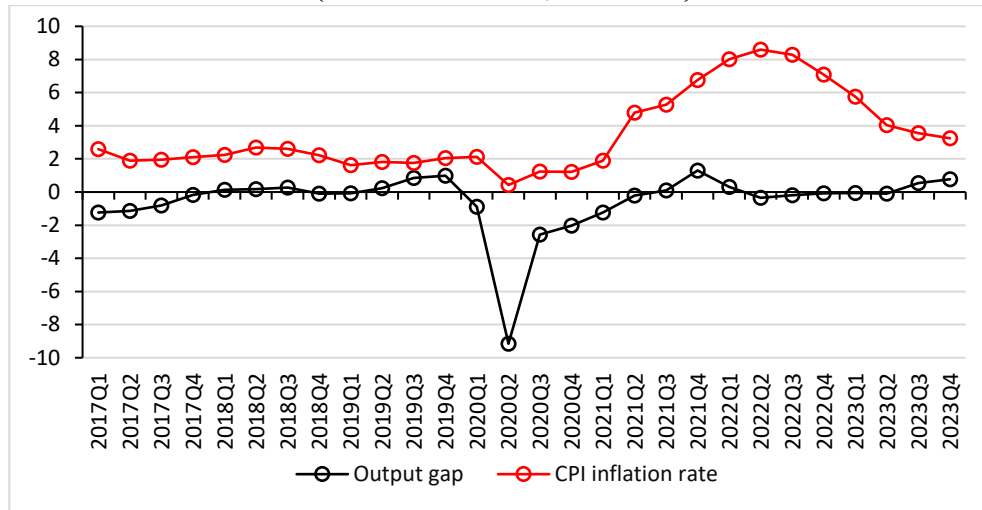
This appendix explores the issues involved by addressing the following two issues. First, did President Biden’s ‘excessive’ COVID relief spending and the even more ‘cavalier’ \$1.9 trillion American Rescue Plan (ARP) stoke inflation by pushing actual output above potential and by considerably overheating the labor market (Blanchard 2021; Summers 2021)? Second, has the post-pandemic ‘red-hot’ labor market led to a loss of monopsony power of firms, resulting in higher-than-expected real wage growth of low-wage workers and to wage compression (Autor *et al.* 2023)?

On the first issue, Lawrence Summers has been the main propagator of the establishment’s narrative that the ‘excessive’ fiscal stimulus would lead to unsustainably low unemployment and thus wage-driven inflation. But the evidence is compelling that a wage/price spiral was not the primary driver of pandemic-era price growth. Disbursal of the stimulus funds and the take-off of inflation were quite out of phase, as we showed in our previous paper (Ferguson and Storm, 2023a). Worldwide supply shocks were the driving force, as analyzed in our main text. Evidence in Bernanke and Blanchard (2023) confirms that the surge in the CPI inflation rate – from 2.8% in the fourth quarter of 2020 to a peak of 9.7% in the second quarter of 2022 – was overwhelmingly due to supply-side shocks that raised production costs. These supply-side shocks have been responsible for around two-thirds to three-fourths of the surge in the inflation rate.

Bernanke and Blanchard (2023) further conclude that ‘initial conditions’ (which include the constant terms in their estimated equations as well as exogenous rate of labor productivity growth) contributed around 2 percentage points to the U.S. inflation rate over the period of analysis. And crucially, the contribution to inflation of tight labor-market conditions was negative during the first two quarters of 2021 and positive but *miniscule* during 2021Q3-2023Q2.

The finding that the supposedly ‘extremely tight’ labor market cannot be blamed for the sudden burst in U.S. inflation, conflicts with Summers’ narrative of fiscal largesse causing inflation. Figure 2.1 also contradicts the accepted narrative. It shows that the Congressional Budget Office’s estimate of the output gap of the U.S. economy hovered around zero during 2021Q1-2023Q4, right when the rate of CPI inflation began its surge. The (close to) zero output gap clearly does not signal an overheating American economy—and it is also not aligned with claims of a ‘red-hot’ labor market (Storm 2024).

Figure 2.1
U.S. CPI Inflation and the Output Gap
(2017Q1-2023Q4; Per Cent)



Source: FRED database (*series* CPIAUCSL and $100*(GDPC1-GDPPOT)/GDPPOT, 100$).
Notes: Inflation is measured using the Consumer Price Index for All Urban Consumers: All Items in U.S. City Average. The inflation rate is calculated on an annualized basis. The output gap is calculated as the difference between real and potential GDP as a percentage of potential GDP. Real potential GDP is the Congressional Budget Office’s estimate of the output the economy would produce with a high rate of use of its capital and labor resources.

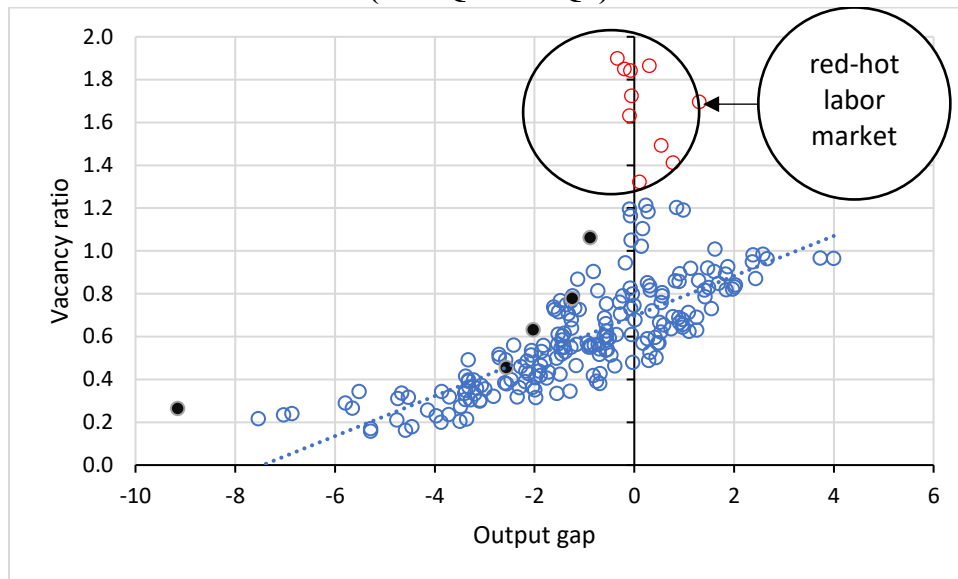
Figure 2.2 explores the issue in greater detail. It plots the U.S. output gap against the vacancy ratio (defined as the number of job openings (v) per unemployed worker (u)) for all quarters during 1970Q1-2023Q4. The observations for the post-pandemic period are appropriately colored in red, indicating the quarters when America’s labor market is widely considered to have been ‘red hot’. The observations for the four quarters of 2020 appear in black.

The elevated levels of v/u during 2021Q2-2023Q4 are obvious outliers, and not related to the magnitude of the output gaps during the post-pandemic period. Figure 2.2 suggests a significant disconnect between the overall state of the U.S. economy (as measured by the output gap) and the dramatic rise in the vacancy ratio during 2021Q2-2023Q4.

The established narrative blaming the inflation on the Biden relief spending during 2021 gets another blow when one considers Figure 2.3, which shows the contribution of the fiscal policy stance to real GDP growth during 2017Q1-2023Q4. It shows that the contribution of fiscal policy to real GDP growth has been negative during 2021Q2-2023Q3, amounting to -4.6% in the second quarter of 2022. During 2021Q2-2023Q3, fiscal policy has been a significant drain on economic growth.

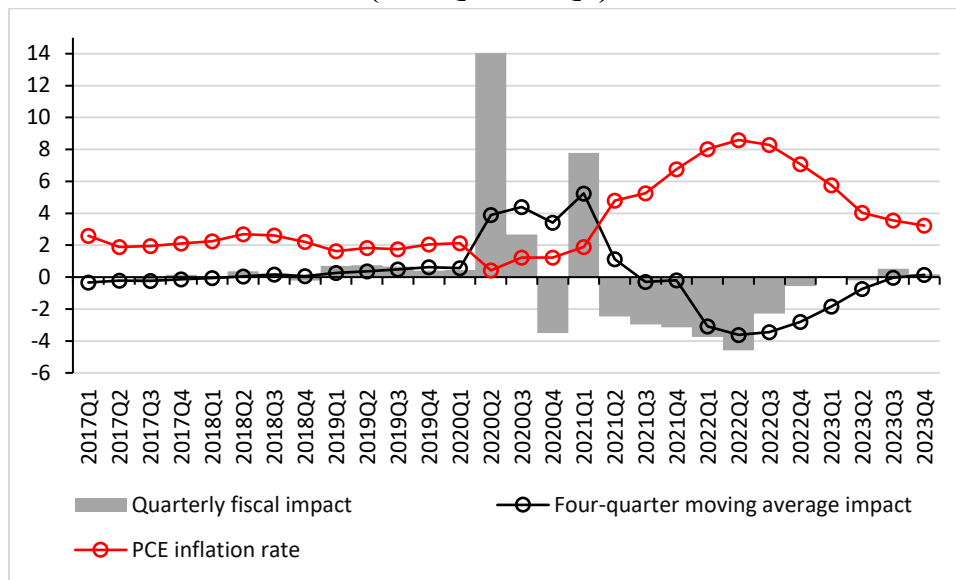
It is not plausible to attribute the surge in U.S. inflation to the *de facto* fiscal austerity of the Biden administration. It is, therefore, also not plausible that various Biden administration policies have contributed to a decline in monopsony power of firms.

Figure 2.2
The Output Gap versus the Job Vacancy Ratio: The U.S. Economy (1970Q1-2023Q4)



Source: FRED database.

Figure 2.3
U.S. CPI Inflation and Fiscal Policy
(2017Q1-2023Q4)

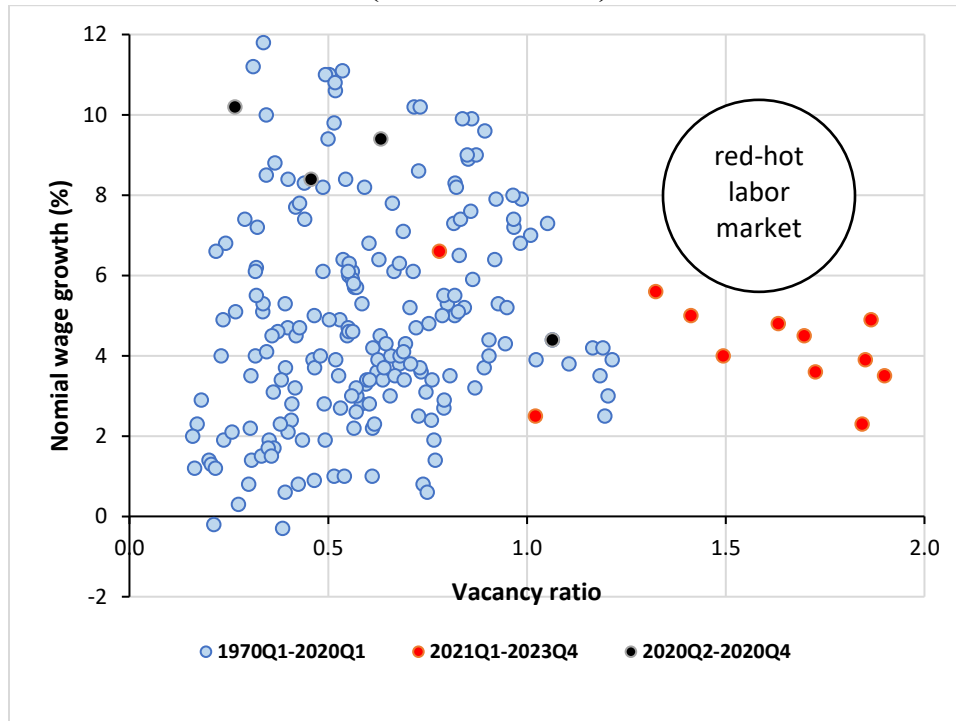


Sources: FRED database (*series* CPIAUCSL); Hutchins Center Fiscal Impact Measure Contribution of Fiscal Policy to Real GDP Growth, published by the Hutchins Center on Fiscal and Monetary Policy at Brookings.

Finally, Figure 2.4 presents direct quarterly evidence on the relationship between the vacancy ratio and nominal wage growth for 53 years (1970Q1-2023Q4). Nominal wage growth is measured by the growth rate of hourly compensation of all workers in the U.S. non-farm business sector. The U.S. vacancy ratio rose from less than 1 job opening per unemployed worker during the first quarter of 2021 to 1.9 job openings per unemployed worker in the second quarter of 2022. This is a level of v/u considerably greater than in any earlier period since these data have been collected; the long-run average level of the job vacancy ratio (during 1970-2023) is 0.65.

If one takes the vacancy ratio seriously as an indicator of labor market tightness, the American labor market has not been this tight as during 2021Q3-2023Q4, in any period since 1970. The observations for the ‘tight-labor-market’ period appear in red; the four observations for the year 2020 are in black. It is evident that the period 2021Q3-2023Q4 is historically unique when it concerns the level of the vacancy ratio, but is completely ordinary or average in terms of the growth rate of nominal earnings.

Figure 2.4
Scatterplot of Nominal Wage Growth versus the Job Vacancy Ratio
(1970Q1-2023Q4)

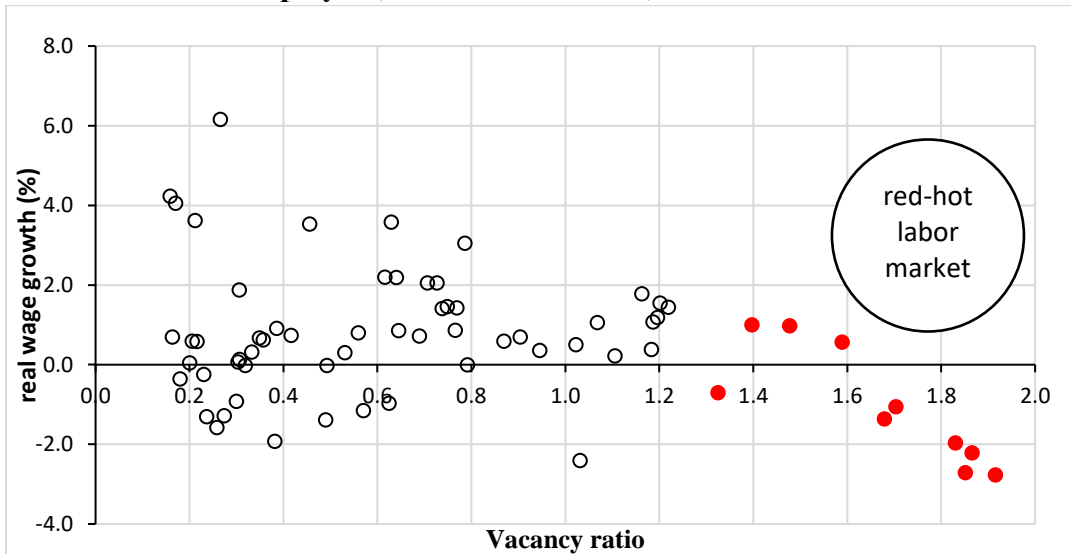


Sources: Calculated based on FRED database (*series* JTSJOL, UNEMPLOY and PRS85006101) and Barnichon (2010). *Note:* quarterly nominal wage growth is measured by the growth rate of hourly compensation for all workers in the non-farm business sector.

We now turn to the second issue: has the post-pandemic labor market tightness been strongly predictive of *real* wage growth among low-wage workers and of aggregate wage compression? Let us consider a few measures of real wage growth relative to the ‘historically unprecedented’ rise in the job vacancy ratio during 2021Q3-2023Q4. Figure 2.5 presents a scatterplot of the job vacancy ratio versus the quarterly growth rate in real average hourly earnings of all (non-farm) private-sector employees (percent change from a year ago) during 2001Q1 – 2023Q4. The observations for the ten quarters during 2021Q3-2023Q4 are pictured in red.

Two inferences can be drawn from Figure 2.5. First, a higher vacancy ratio does not correlate with a higher growth rate of real average hourly earnings of all private-sector employees. Second, the extremely high values for the job vacancy ratio during 2021Q3 – 2023Q4 are coinciding with low, and mostly, negative average real wage growth. On average, U.S. workers have been unable to effectuate a rise in their nominal wages in line with the CPI inflation rate, and this failure supposedly occurred in an ‘extremely tight’, even ‘red-hot’ labor market.

Figure 2.5
The Job Vacancy Ratio and Growth of Real Average Hourly Earnings:
All Employees, Private Non-Farm, 2001Q1 – 2023Q4



Source: FRED database.

In Figure 2.6, we consider the vacancy ratio (a proxy of labor market tightness) and the growth rate of *median* real usual weekly earnings of wage and salary workers (who are 16 years and above). The period of analysis is 2001Q1-2023Q4. The conclusions are exactly the same as those concerning real average hourly earnings in Figure 2.5.

Figure 2.6
The Job Vacancy Ratio and Growth of Median Real Weekly Earnings:
All Employees, Private Non-Farm, 2001Q1 – 2023Q4



Source: FRED database.

In Figure 2.7, we consider the growth rate of real usual weekly earnings of the *first decile* of wage and salary workers (of 16 years and above) during 2001Q1-2023Q4. The observations for the ten quarters during 2021Q3-2023Q4 are pictured in red. The growth rate of real usual weekly earnings of the bottom 10% of US workers has been positive throughout the recent period, 2021Q3-2023Q4.

Figure 2.7
The Job Vacancy Ratio and Growth of Real Weekly Earnings:
First Decile, 2001Q1 – 2023Q4



Source: FRED database.

However, the real weekly earnings growth of the first decile of workers is far from spectacular, compared to real earnings growth during the pre-pandemic period 2001Q1-2019Q4. Even more strikingly, the non-spectacular real weekly earnings growth of the bottom 10% of workers coincided in time with an extremely elevated job vacancy ratio. If this is the best outcome that can be achieved in a ‘red-hot’ labor market, then workers must fear what will happen once the labor market cools down.

Figure 2.8, finally, considers the growth rate of real usual weekly earnings of the bottom 25% of wage and salary workers in the U.S. (during 2001Q1-2023Q4). It speaks for itself. The bottom 25% of US workers suffer negative real wage growth during the pandemic era. The ‘extremely high’ vacancy ratio is not associated with higher real wage growth of workers in the first quartile of the wage distribution.

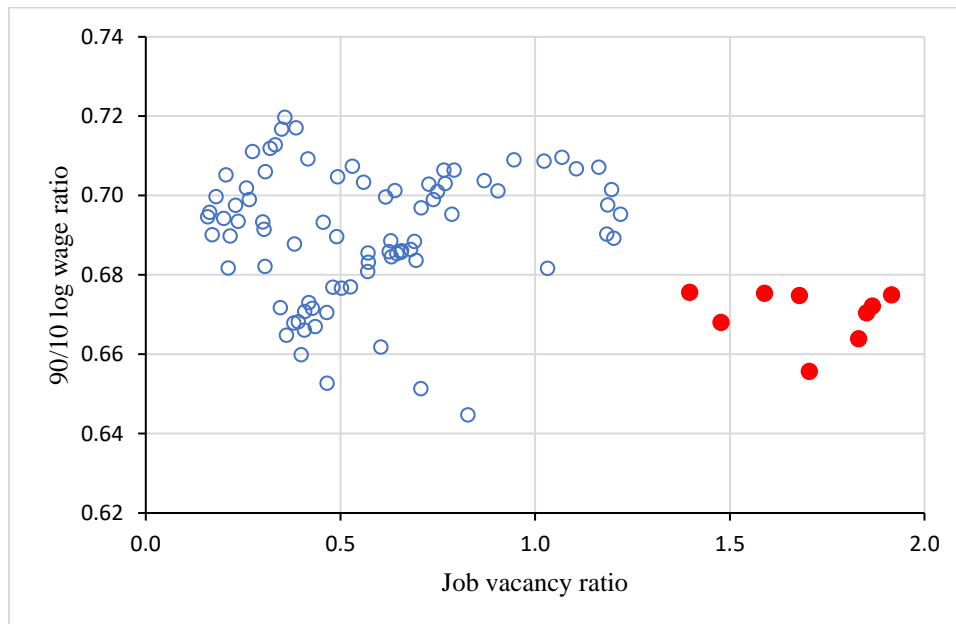
Figure 2.8
The Job Vacancy Ratio and Growth of Real Weekly Earnings:
First Quartile of Workers, 2001Q1-2023Q4



Source: FRED database.

Autor *et al.* (2023) are wrong in asserting that the post-pandemic labor market tightness is strongly predictive of *real* wage growth among low-wage workers. It is not. The high job vacancy ratio is also not predictive of a decline in the 90/10 log wage ratio (defined in terms of usual weekly earnings), as is shown in Figure 2.9.

Figure 2.9
The Job Vacancy Ratio and the 90/10 log Wage Ratio:
Usual Weekly Nominal Earnings, 2001Q1-2023Q4



Source: FRED database.

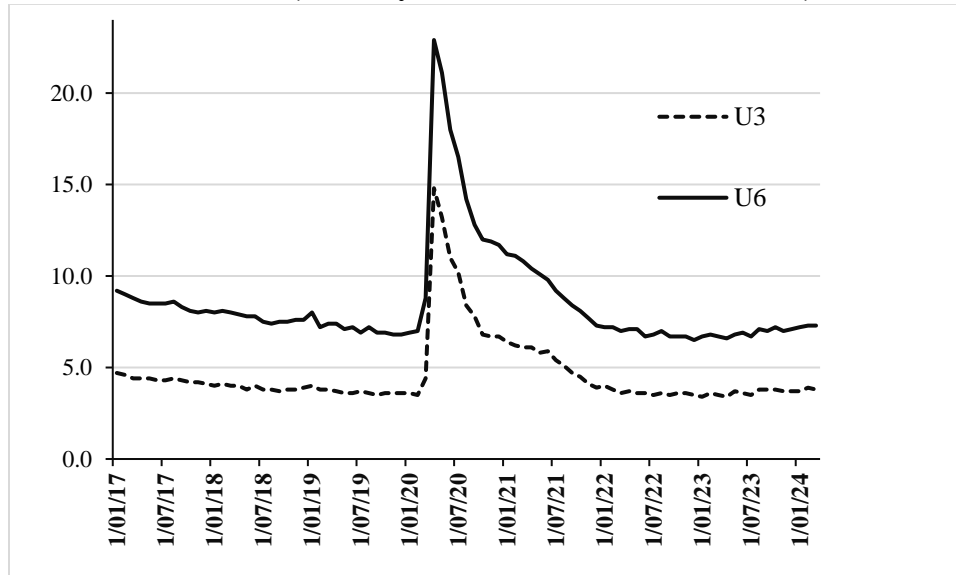
Most indicators of labor-market tightness do not signal an extremely tight labor market (Storm 2024). For instance, as is shown in Figures 12 and 13 (in the main text), weekly hours worked declined during 2021-2024 and the U.S. output gap did not signal an overheating economy (Figure 2.2). The extremely high job vacancy ratio during 2021-2023 is associated with mostly negative average and median real wage growth, while real wage growth for the bottom 10% of American workers was not spectacular at all. Wage inequality declined (somewhat), but primarily because real wage growth of the ninth decile of workers was negative.

Furthermore, as is shown in Figure 2.10, the slack in the U.S. labor market, as measured by the broad unemployment rate (U-6), continued to persist more or less unchanged (at more than 7%), or even slightly increased, throughout the period 2021Q2-2024Q1, when the labor market was held to be ‘red hot’.

A final piece of evidence that contradicts the claim that the American labor market is ‘extremely tight’ appears in Figure 2.11. Figure 2.11 presents the regression-based gender wage gap (estimated by the Economic Policy Institute) which controls for race and ethnicity, education, age and geographic location. This regression-based wage gap presents a sounder picture of what has happened to the pay gap between women and men than a direct comparison of wages. It is reasonable to expect a decline in the gender wage when the overall labor market is extremely tight. But as Figure 2.11 shows, there has been little to no progress in closing the gender wage gap since

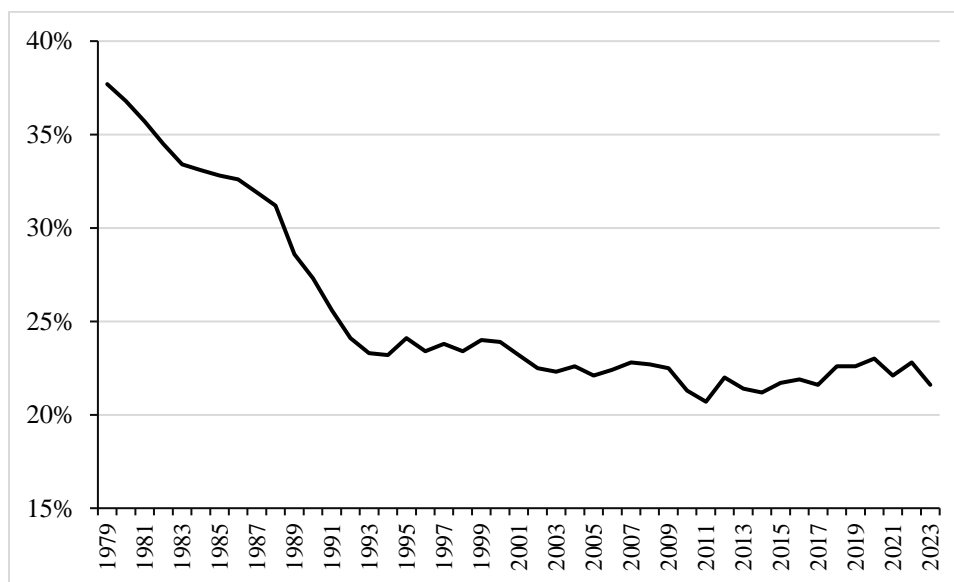
the year 2002: women were paid 22.5% less on average than men in 2002, after controlling for race and ethnicity, education, age, and geographic division, 22.8% less in 2022 and 21.6% less in 2023. The average gender wage gap during 2002-2023 is 22.3%.

Figure 2.10
Narrow Unemployment (U3) versus Broad Unemployment (U6):
The U.S. (January 2017 – March 2024; Percent)



Source: FRED database. *Note:* The Broad Unemployment (U6) Rate is defined as 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.

Figure 2.11
The Regression-Based Gender Wage Gap (1979-2023)



Source: Economic Policy Institute (2024), *State of Working America Data Library*, “Gender wage gap series”.

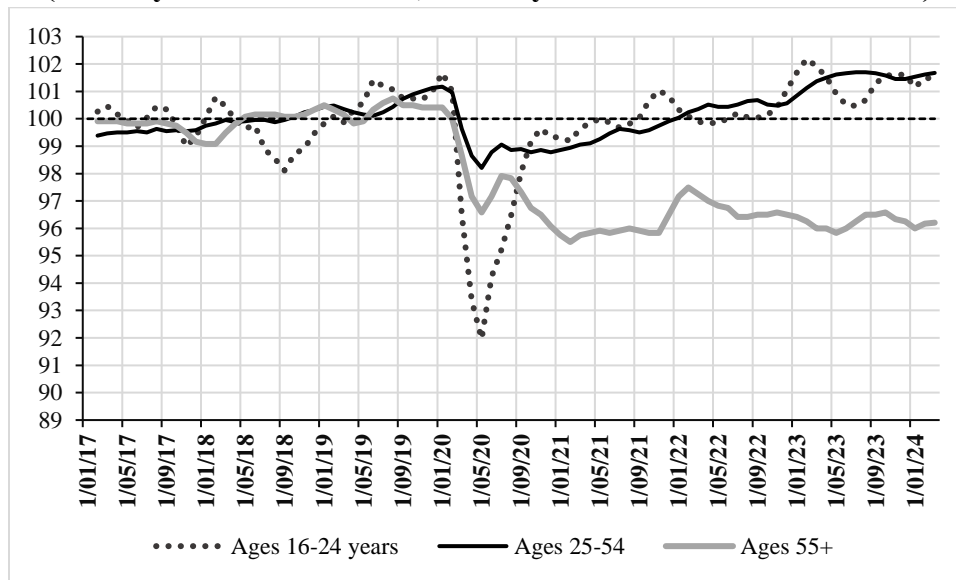
In our diagnosis, the U.S. labor market is not tight (in the usual sense of the term), but in deep turmoil because of the COVID-19 upset. Because a comprehensive analysis of the ways in which COVID upset the American labor market is beyond the scope of this paper, we will briefly sketch out our diagnosis of what has happened during 2020-2024.

Due to the COVID-19 shock, the *aggregate* U.S. labor force participation (LFP) rate declined sharply in April 2020—from a period-average of 62.9% during January 2017-December 2019 to 60.1% in April 2020. More than 7.2 million workers dropped out of the labor force. Four years later, the aggregate LFP rate has almost bounced back from the upset caused by the pandemic, reaching a level of 62.7% in March 2024. However, the U.S. labor force in March 2024 still has around 535,000 fewer workers than would have been the case if the LFP rate would have remained at its average level during January 2017-December 2019.

The labor force participation rates of young workers (aged 16-24 years) and prime-age workers (aged 25-54) have recovered and are somewhat higher now than during the pre-pandemic years (Miskanic, Petrosky-Nadeau and Zhao 2024). This is shown in Figure 2.12, which plots LFP rates for major age groups between January 2017 and the latest available *Current Population Survey* data from the *Bureau of Labor Statistics*. For ease of comparison, the participation rates for each group are normalized to 100 based on the average age-group LFP rates during January 2017-December 2019, as LFP rates vary significantly across age groups. The rates are typically around

56% for young workers, compared with 83% for prime-age workers and around 40% for older workers (aged 55 and over).

Figure 2.12
Rates of Labour Force Participation by Age Group: The U.S. Economy
(January 2017-March 2024; January 2017-December 2019 = 100)



Source: FRED database and authors’ calculations. *Note:* Labor force participation rates are three-month moving averages, with all rates normalized to 100 based on the average rates during in January 2017-December 2019.

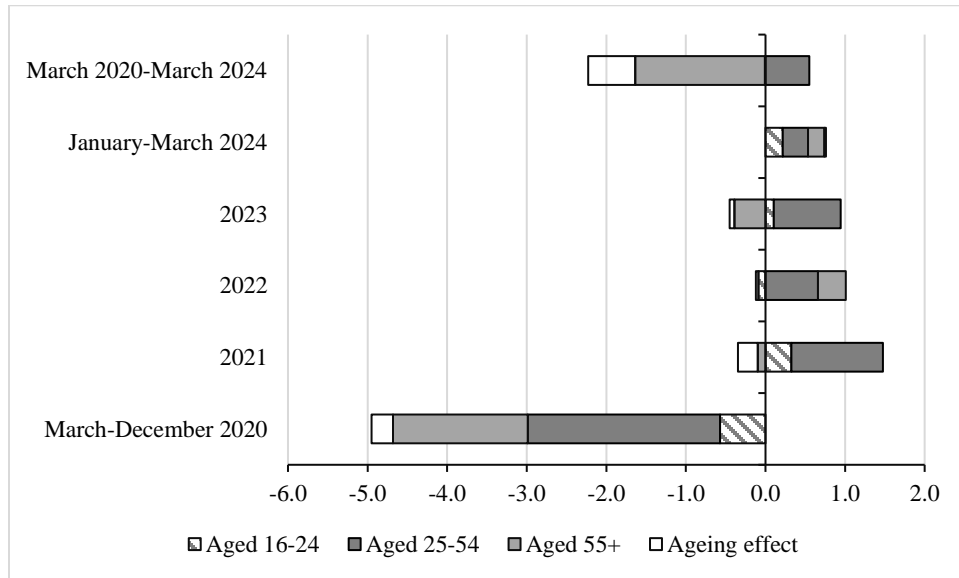
Young workers (dashed line) experienced the largest decline in LFP at the onset of the pandemic, quickly falling 9% relative to their participation rate during the pre-pandemic period. The decline for prime-age workers, though still large, was more muted (black line). Their participation rate in the labor market fell 2% relative to 2017-2019. Among older workers (grey line), the decline in participation was larger, with a 3.5% drop in May 2020.

The LFP rates of the young and prime-age workers recovered to earlier levels during 2021. The labor market participation rate for workers aged 55 and older not only failed to recover but declined even further. In March 2024, the LFP rate for workers aged 55 and older is 3.8% below their LFP rate during 2017-2019. By our estimates, this represents around 1.5 million older workers who otherwise would have been in the labor force in 2024 absent the COVID-19 health crisis.

The reason for the drop in LFP of workers aged 55 and older is clear. COVID-19 exposed workers aged 55 and older to significantly greater health risks than younger workers. Rates of severe symptoms, death and hospitalization were estimated to be four to six times greater for this group compared with the general population. This fact is most likely to have induced strong and persistent changes in behavior.

We have decomposed the change in the aggregate LFP rate during March 2020 – March 2024 into (a) changes in the LFP rates by age group; and (b) the effect of an ageing population, which is measured by changes in the age-composition of the population. The results of the decomposition appear in Figure 2.13.

Figure 2.13
Percent Change in the Labor Force Participation Rate by Age Group:
A Decomposition (March 2020-March 2024)



Source: FRED database and authors' calculations.

The cumulative (absolute) change in the aggregate LFP rate during March 2020-March 2024 is -1.68 percentage points. This decline in the LFP rate must be attributed to two factors. First, a decline in the LFP rate of workers aged 55 and older, which is (on its own) responsible for a decline in the aggregate LFP rate of 1.63 percentage points. Second, population ageing accounts for a decline in the aggregate LFP rate of 0.59 percentage points. The share of the population aged 55 and older in the total American population is rising, and as LFP is structurally lower for older workers than for prime-age workers, population ageing leads to a drop in the LFP rate. Taken together, these two effects would have depressed the aggregate LFP rate by 2.22 percentage points. The increase in the LFP rate of prime-age workers has partly countered this impact, contributing +0.55 percentage points to the aggregate LFP rate. The impact of the cumulative change in the LFP rate of young workers on the aggregate LFP rate has been insignificant.

The structural decline in the aggregate LFP rate is, therefore, primarily due to the decline in the participation rate of older workers and population ageing (Abraham and Rendell 2023). Miskanic, Petrosky-Nadeau and Zhao (2024) find that the bulk of the participation shortfall for this age group

is concentrated among workers *without a college degree*, while participation among college-educated workers is currently at its pre-pandemic trend. The difference can be explained by the fact that workers without a college degree have disproportionately, and mostly involuntarily, dropped out of the labor force—predominantly because of loss of their job, having COVID19, having Long COVID or fearing Long COVID (Abraham and Rendell 2023; CLEAR 2024). Remote work is also an option that is less frequently available to non-college educated workers.

Continuing research into Long Covid is bringing to light many new insights. Some of these are quite worrisome. We hope to address these more fully in work with specialists in the area in the future. For this paper, it seems safe to conclude that rates of long COVID continue to remain steady. Roughly 7.5% of all U.S. adults—roughly 17 million people—reported currently having long COVID in March 2024 (Figure 2.14). Among the 60% of U.S. adults who have had COVID, roughly 3 in 10 report having long COVID at some point and roughly 1 in 10 report having long COVID now. (Note that the gap between the percent of adults who have long COVID now and the percent who have ever suffered from it highlights that some people may be recovering or at least improving.)

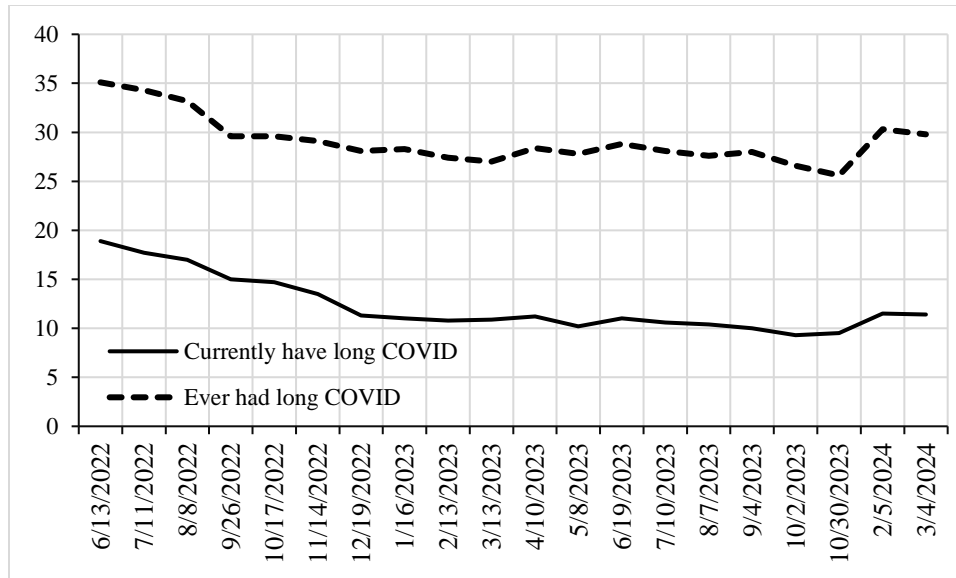
According to data of the *Centers for Disease Control and Prevention* (CDC), 43 million U.S. adults report ever having had long COVID, 27 million of whom report having had it in the past but not having it currently (in March 2024). The Pulse Survey, an experimental survey conducted by the *Census Bureau* and *National Center for Health Statistics*, asked respondents whether they had any symptoms of COVID that had lasted longer than 3 months and among adults who respond "yes," whether the symptoms limit their day-to-day activities "a lot," "a little," or "not at all." The survey characterizes "a lot" responses as "significant" activity limitations. One in four respondents report long COVID limits their activities a lot; this means that 4.25 million Americans reported significant activity-limitations during 2022-2024. These numbers have changed little since the Pulse survey first started asking about activity limitations in September 2022 (Burns 2024). The debilitating impacts of Long COVID have very likely hindered a significant proportion of workers from working full-time ([Perlis et al. 2023](#); CLEAR 2024).

Research has further shown lower employment rates among adults with long COVID. Although much is still uncertain, recent work suggests that the net reduction in the labor force stemming from long COVID is equivalent to about one million workers (Abraham and Rendell 2023). That perhaps could change, though, if, as seems likely, repeat infections increase over time as the virus mutates and continues to circulate (Alvelda, 2024) (Strulik and Grossman, 2024).¹⁵ Recent research

¹⁵ A presentation at a recent British Academy conference by Phillip Alvelda is sobering in this regard. Note that the flu epidemic of 1918 also left significant numbers of victims with longer term impairments. One fears the long-run consequences of the absence of strong public efforts to improve ventilation and public health monitoring systems. The latter are being rolled back substantially as funding and political will dries up. That the US, UK, and other countries keep shifting ways they count and report COVID cases does not help, either; nor do rollbacks in levels of surveillance.

on biological markers that help identify the disease will likely improve diagnosis and, hopefully, treatments (Czyzewski and O’Hare, 2024).

Figure 2.14
Percentage of adults reporting they currently or ever had long COVID
among those who have had COVID (June 2022-March 2024)



Source: Burns (2024).

An often-heard explanation for the decline in the LFP rate of workers aged 55 and older relative to pre-pandemic levels was that relatively generous pandemic relief support was discouraging people from looking for work and encouraging them to retire early. However, as shown by Abraham and Rendell (2023), this ‘Great Retirement’ explanation of the decline in LFP is not at all plausible. Reported elasticity estimates of labor supply with respect to household wealth (increases) are low and would imply only a very small decline in LFP in response to pandemic relief support for households. Besides, given that much of the money the federal government directed towards households during the pandemic offset lost earnings and inflation-induced increases in cost of living, rather than representing a net addition to household balance sheets, any negative effects of this spending on labor supply can only have been negligible.

Extant research, reviewed by Abraham and Rendell (2023), indicates that short-term fluctuations in the stock market and short-term house price movements do not significantly affect the timing of retirement. According to Abraham and Rendell (2023), the impact of healthier household balance sheets on the LFP rate and on hours worked has been negligible. In contrast, Long COVID and the fear of Long COVID are found to have put considerable downward pressure on the participation rate and on hours worked.

COVID-19, along with the well-known weaknesses of the American public health system, in other words, is the alpha and omega of the prolonged turmoil in the U.S. labor market.

Appendix 3. Estimation of the 90-10 log Household Income Ratio for 2023

We estimated the 90-10 log household income ratio for 2023 as follows. Data on aggregate personal income, compensation of employees, property income and household net current transfer receipts (from the government) are obtained for 2023 from *Bureau of Economic Analysis* (BEA), NIPA Table 2.9. ‘Personal Income and Its Disposition by Households and by Nonprofit Institutions Serving Households’.

We assume that the distribution of these categories of personal income across household income deciles in 2022 and 2023 is similar to that in 2021; the 2021 distribution is given in *Bureau of Economic Analysis* (2023), ‘Major Components of Personal Income and Disposable Personal Income by Decile’ and in Table 3 in the main text. The nominal data for 2023 have been converted to constant 2022 prices using the CPI-AUCSL.

The household income distribution in income categories is relatively stable over time. We have also used the 2018 income distribution (see Table 3.1) to estimate household incomes by deciles in 2023 and obtained a similar estimate for the 90/10 log ratio (of 1.12) in 2023.

Table 3.1
Household Shares in Income Category by Decile, 2018 and 2021

2018										
	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
Wages	1.2%	2.3%	3.1%	4.2%	5.8%	7.8%	10.4%	13.7%	18.4%	33.1%
Property Income	0.6%	1.0%	1.5%	1.9%	2.5%	3.5%	5.1%	7.0%	11.8%	65.1%
Net Public Transfers	12.2%	16.5%	18.7%	19.7%	18.4%	14.1%	9.6%	3.1%	-1.2%	11.1%
										-
2021										
	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
Wages	0.8%	1.9%	3.1%	4.5%	6.1%	8.2%	10.8%	13.6%	18.2%	33.0%
Property Income	0.5%	1.1%	1.6%	2.3%	2.9%	4.0%	5.5%	7.7%	12.6%	61.8%
Net Public Transfers	10.3%	14.5%	16.1%	16.2%	15.4%	13.4%	10.3%	6.8%	1.7%	-4.7%

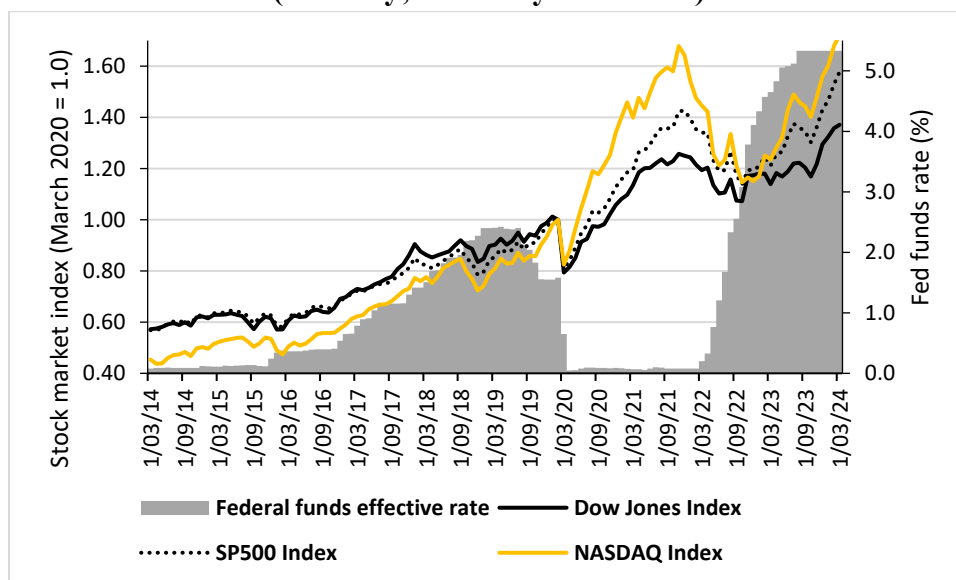
Sources: Bureau of Economic Analysis (2023), ‘Major Components of Personal Income and Disposable Personal Income by Decile’; and https://www.bea.gov/system/files/papers/measuring-inequality-in-the-national-accounts_0.pdf

Appendix 4. Wealth Concentration in the U.S. (2020-2023)

U.S. household wealth exploded between 2020 and 2023. Total net worth of US households increased by \$32.3 trillion – from \$110.1 trillion in the fourth quarter of 2019 to \$142.4 trillion in the third quarter of 2023. This rise in household net worth is caused by sustained increases in stock market wealth and in home prices.

Let us first consider stock market wealth, based on three main stock market indicators: the Dow Jones Industrial Average; the S&P500 Index; and the NASDAQCOM Index (Figure 4.1). The three indicators have been normalized, setting the observations for February 2020 = 1.0. It can be seen that U.S. stock markets have been booming for a long time, as all indicators have been exhibiting an upward trend, only fitfully affected by interest rates. The three indicators are strongly correlated (the correlation coefficients are 0.99).

Figure 4.1
U.S. Stock Market Indicators, March 2014-March 2024
(Monthly; February 2020 = 1.0)

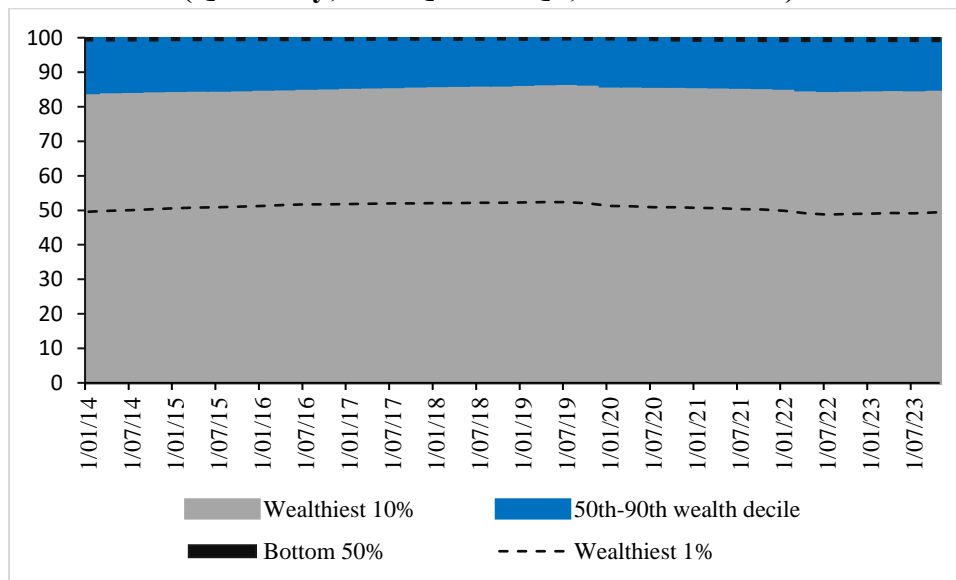


Source: FRED database.

For our purposes, we zoom in on the period March 2020-March 2024. During these 48 months, the Dow Jones Industrial Average rose by 37%; the S&P500 Index increased by 58%; and the NASDAQCOM Index rose by 72%. To compare, U.S. real GDP rose by 9.7% during 2020-2023. In terms of market capitalization, the S&P500 Index increased from around an estimated \$25.3 trillion on February 28, 2020 to \$44.1 trillion on March 31, 2024—which represents an increase in shareholders’ wealth of \$18.7 trillion.

Despite many claims to the contrary, not many households in the U.S. own corporate equities (and mutual fund shares). In fact, as is shown in Figure 4.2, the bottom 50% of households in the wealth distribution own less than one percent of total outstanding stocks and mutual fund shares. The ownership distribution of corporate equities and mutual funds shares is very stable. Households belonging to the 50th-90th wealth percentiles own 12% of corporate equities and mutual fund shares. The wealthiest 10% of US households own more than 87% of stocks and mutual funds shares—and, hence, these households are the main beneficiaries of the stock market gains. Note that the wealthiest 1% of American households own 51% of corporate equities and mutual fund shares. Half of the massive increase in shareholders’ wealth during 2020Q1-2024Q1 has accrued to the top 1%.

Figure 4.2
Ownership of Corporate Equities and Mutual Fund Shares by Wealth Percentiles
(Quarterly; 2014Q1-2023Q4; Percent shares)



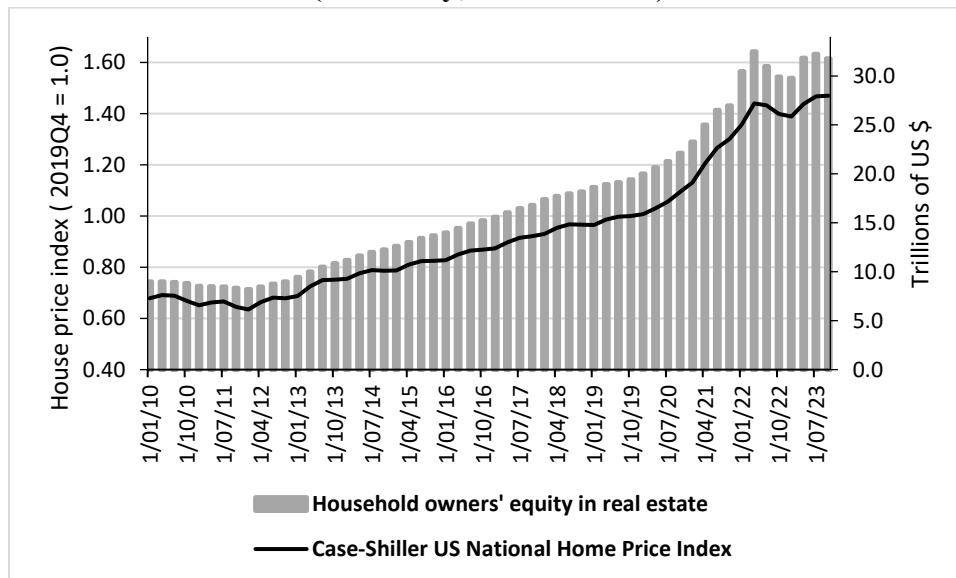
Source: Distributional Financial Accounts of the Federal Reserve.

Stock market wealth rose sharply during March 2020-November 2021, after the Fed funds rate was lowered to the zero lower bound. However, monetary tightening by the Federal Reserve during

2022-2024 (when the Fed funds rate was ramped up to 5.33%) did not reverse the rise in the stock markets, though it did briefly create some dramatic runs on small banks. By March of 2024, stock markets were higher than in December 2021 (Figure 4.1).

Home ownership is the other major source of household wealth. Average U.S. house prices rose by 47% during 2019Q4 and 2023Q4 (Figure 4.3). As a result, the value of household owners' equity in real estate increased by \$12.4 trillion from \$19.4 trillion in 2019Q4 to \$31.8 trillion in 2023Q4 (*i.e.*, by 64%). This is also illustrated in Figure 4.3.

Figure 4.3
U.S. Home Prices and Owners' Equity, 2010Q1-2023Q4
(Quarterly; 2019Q4 = 1.0)



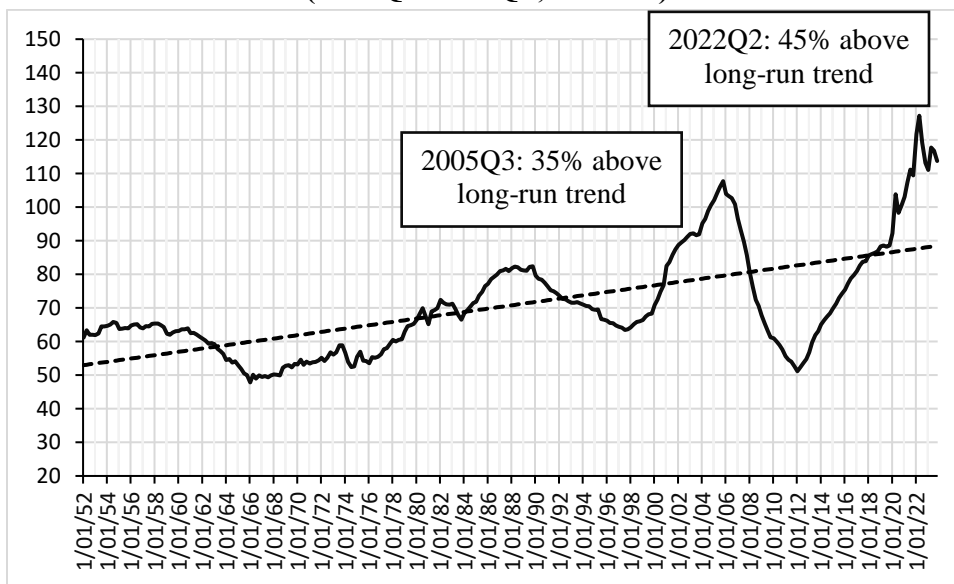
Source: FRED database including Distributional Financial Accounts.

It is important to see that this recent increase in owners' equity in real estate is historically unprecedented. As is shown in Figure 4.4, which depicts the evolution of owners' equity as a percentage of GDP, owners' equity has grown considerably faster during 2020-2023 than could be expected based on its long-run trend. In fact, the ratio of owners' equity to GDP rose by more than 45% above trend in the second quarter of 2022, considerably exceeding the earlier peak deviation from trend (of 35%) that was recorded in the third quarter of 2005. We duly note that the peak in the third quarter of 2005 was the highpoint of the housing market bubble that ended in the financial crisis of 2008. The recent growth in owners' equity as a percentage of GDP puts the exuberant housing market during 2004-2007 in its shade.

The wealthiest 1% of US households own around 18% of total home equity and the next 9% of households own another 34% (Figure 4.5). American households in the 50th-90th wealth percentiles own 42% of total home equity in the US, while the bottom 50% of households own just 6%.

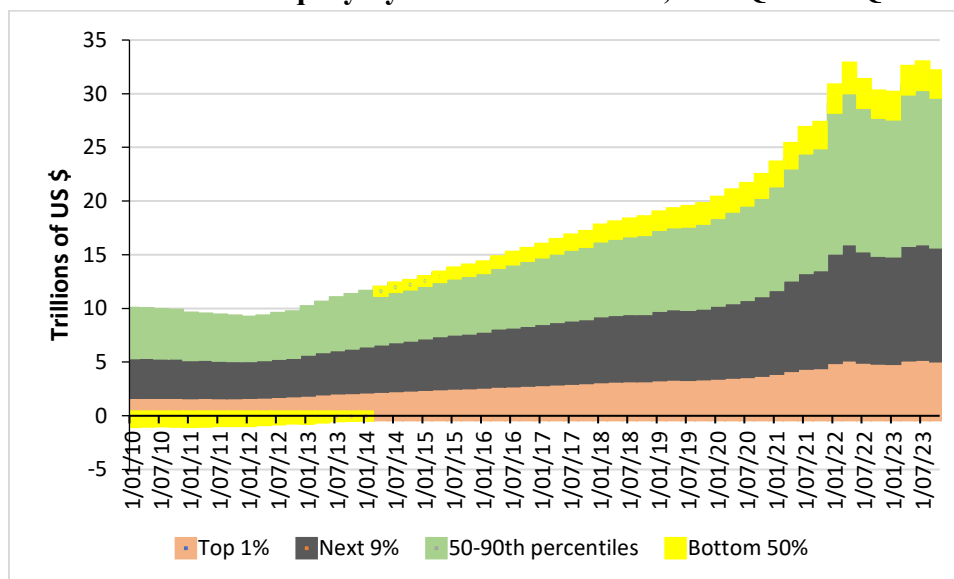
The increase of \$ 12.4 trillion in owners' equity during 2019Q4-2023Q4 is distributed quite unequally. The bottom 50% of households (in the wealth distribution) saw their home equity rise by \$0.7 trillion. The top 1% of households and the next 9% enjoyed a home equity rise of \$1.7 trillion and \$4 trillion, respectively. The households in in the 50th-90th wealth percentiles gained \$6 trillion in home equity during these three years.

Figure 4.4
U.S. Owners' Equity in Real Estate as a Share of GDP
(1952Q1-2023Q4; Percent)



Source: FRED database including *Distributional Financial Accounts*.

Figure 4.5
U.S. Owners' Equity by Wealth Percentiles, 2010Q1-2023Q4



Source: *Distributional Financial Accounts* of the Federal Reserve.

Appendix 5. Estimation of Personal Consumption by Major Type of Product and Income Decile in 2023

The *Bureau of Labor Statistics* (BLS) offers data on ‘Personal Consumption Expenditures by Major Type of Product and Decile’ for the years 2017-2021. The data on consumption by item and by income decile for the year 2023 are not yet available. We estimated personal consumption expenditures by item and income decile for the year 2023, based on the actual (realized) data on personal consumer spending in 2023, published by the *Bureau of Economic Analysis* (BEA), Table 2.3.5. Personal Consumption Expenditures by Major Type of Product. We reproduce these consumption data for 2023 in Table 5.1.

Table 5.1
Personal Consumption Expenditures by Major Type of Product, 2023
(Billions of U.S. Dollars)

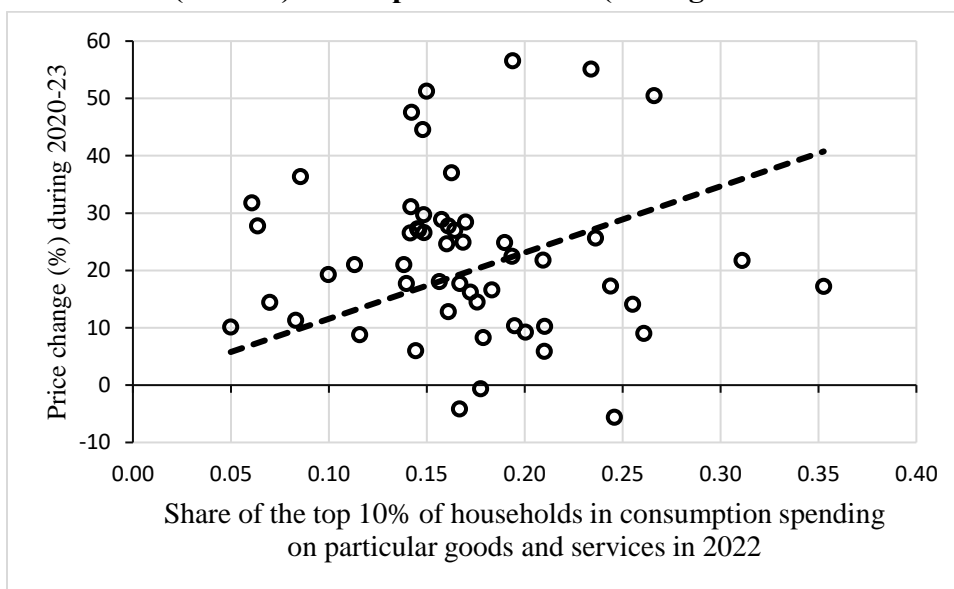
Personal consumption expenditures	18570.6
<i>Goods</i>	6191.5
Durable goods	2198.8
Motor vehicles and parts	768
Furnishings and durable household equipment	478.3
Recreational goods and vehicles	681.6
Other durable goods	271
Nondurable goods	3992.7
Food and beverages purchased for off-premises consumption	1442.3
Clothing and footwear	516.9
Gasoline and other energy goods	471.2
Other nondurable goods	1562.4
<i>Services</i>	12379.2
Household consumption expenditures (for services)	11828.7
Housing and utilities	3278.7
Health care	2999.6
Transportation services	604.2
Recreation services	716.3
Food services and accommodations	1367.4
Financial services and insurance	1321.9
Other services	1540.6
Final cons. expenditures of nonprofit institutions serving hhs	550.4

Source: Bureau of Economic Analysis, Table 2.3.5. Personal Consumption Expenditures by Major Type of Product.

To estimate personal consumption expenditures by item and income decile for the year 2023, we assumed that the consumption structure by major type of product and decile in 2023 is the same as the average consumption structure during the five-year period 2017-2021, derived from the published BLS data on ‘Personal Consumption Expenditures by Major Type of Product and Decile’.

Figure 5.1 presents a scatter plot of the share of the top 10% of U.S. households in consumption expenditure on particular goods and services (in 2022) *versus* price increases (during March 2020-March 2024). The data are from BLS *Consumer Expenditure Surveys*. The dashed line represents the statistically significant regression line ($\bar{R}^2 = 0.61$; $n = 54$; t -value of slope coefficient = 9.50).

Figure 5.1
The Share of the Top 10% of U.S. households in consumption expenditure on particular goods and services (in 2022) versus price increases (during March 2020-March 2024)



Source: BLS Consumer Expenditure Survey data.

Appendix 6. Estimating the Wealth Effect on U.S. Consumption

When consumers gain wealth, their spending typically increases. This can occur when the market has helped them achieve their savings goals—for example, because the value of their corporate equity holdings and mutual fund shares has increased—allowing them to purchase more goods and services today. On other occasions, when wealth increases, consumers borrow against their assets (such as owners’ equity in real estate) to fund current consumption. As home equity goes up, homeowners often tap home equity lines of credit to fund consumer spending. In addition, retirees may sell corporate equity or downsize their homes, using the proceeds to supplement their reduced incomes.

The theoretical justification for a wealth effect on consumption spending is uncontroversial (Cooper and Dynan 2016). But while the extensive empirical literature on wealth effects on consumption agrees that the wealth effect is real (Carroll, Otsuka, and Slacalek 2011; Cooper and Dynan 2016; Chodorow-Reich, Nenov and Simsek 2021), there is no consensus on the magnitude of the impact; estimates of the wealth effect vary across studies, depending on country (countries)

under investigation, the time period of the analysis, the use of macro- versus micro-data, and the econometric approach that has been employed (see Table 6.1).

In addition to the parametric uncertainty, the extant research also shows that it takes time for higher housing wealth and stock-market wealth to translate into higher spending, with changes starting to occur within a quarter of the wealth increase but tending to peak from one to two years afterward. For example, Carroll *et al.* (2011) find for the U.S. that the immediate (next-quarter) marginal propensity to consume from a \$1 change in housing wealth is about 2 cents, with a final eventual effect after several years of around 9 cents.

We estimate the wealth effect on U.S. personal consumption using standard tools of national income analysis. In our (simulation) approach to estimating the wealth effect on U.S. consumption, we distinguish two main categories of wealth: housing wealth (defined as owners' equity in real estate) and financial wealth (defined as corporate equities and mutual fund shares). Housing wealth and financial wealth are defined as ratios of aggregate personal consumption expenditure. The housing wealth and financial wealth ratios for the year 2017, when personal consumption was roughly on trend, are used to normalize the wealth ratios over the period of analysis.

Given the parametric uncertainty and the time-lags involved, we estimate lower and upper bounds for the wealth effect on consumption. For the lower bound, we assume, conservatively, that a one-dollar deviation from trend in housing wealth and financial wealth translate into a 2.5-cent deviation in consumption. For the upper bound we follow Carroll *et al.* (2011) and assume that a one-dollar deviation from trend in housing wealth should translate into an 8.7-cent deviation in consumption. We follow Chodorow-Reich *et al.* (2021) and assume that a one-dollar deviation from trend in financial wealth translates into a 3.2-cent deviation in consumption. In each case, the wealth effect occurs with a lag of three quarters following the change in household wealth.

Table 6.1 presents recent estimates of the marginal propensity to consume out of housing and financial wealth. It can be seen that estimates vary considerably. The estimates we used in our scenarios are relatively conservative, also for the upper-bound simulation, compared to findings in the extant literature.

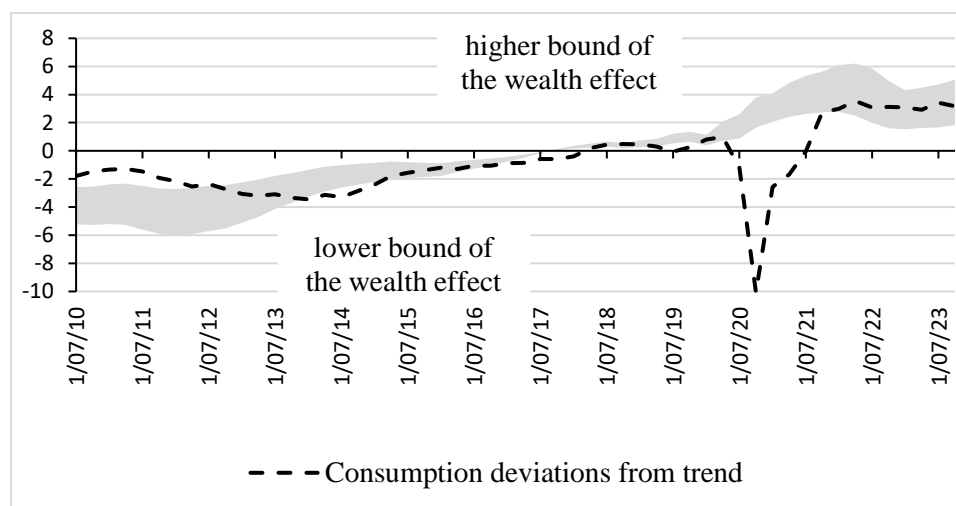
Given the parametric uncertainty and the time-lags involved, we estimated lower and upper bounds for the wealth effect on consumption (Table 6.1). In each case, the wealth effect, defined as a three-quarter moving average, occurs with a lag of three quarters (in quarter $t+3$) following the change in household wealth in quarter t . Figure 6.1 shows that our specification of the wealth effects tracks consumption deviations from trend relatively well over the longer period 2010Q3-2023Q4.

Table 6.1
Estimates of the Marginal Propensity to Consume out of Wealth: The U.S. economy

	Housing-wealth effect	Stock-market wealth effect
Kerdrain (2011)	0.050	0.050
Carroll <i>et al.</i> (2011)	0.087	—
Case, Quigley and Shiller (2013)	0.065 – 0.068	0.028 – 0.029
Zandi, Poi, Hoyt and Best (2018)	0.082	0.133
Chodorow-Reich <i>et al.</i> (2021)	—	0.032
VISA (2024)	0.200	0.240
Estimates used in simulation:		
• Lower bound	0.025	0.025
• Upper bound	0.087	0.032

Source: Constructed by the authors.

Figure 6.1
Estimated Wealth Effect on Personal Consumption: The U.S.
(2010Q3-2023Q4; Percent)



Source: Constructed by the authors.

Appendix 7. Where does the inflation come from?

As we have shown (see Table 4; Figure 25; and Figure 5.1), the surge in U.S. inflation is largely caused by the growth in consumer demand of the richest 10% (or 20%) of American households. The consumption boom during 2020-2023 has been very lop-sided, as 65% of the demand growth originated from the richest 30% of households, with the richest decile on its own accounting for 37% of the demand increase. The poorest 30% of U.S. households, in contrast, were responsible for just 8.8% of the aggregate consumption growth.

In this Appendix, we document the evolution of the U.S. (PCE) inflation rate, highlighting four key facts. First, during January 2021 and July 2022, when inflation peaked, the general price level was rising because of rising goods prices and rising services prices. However, during 2023-2024, U.S. inflation has been almost completely caused by rising services prices.

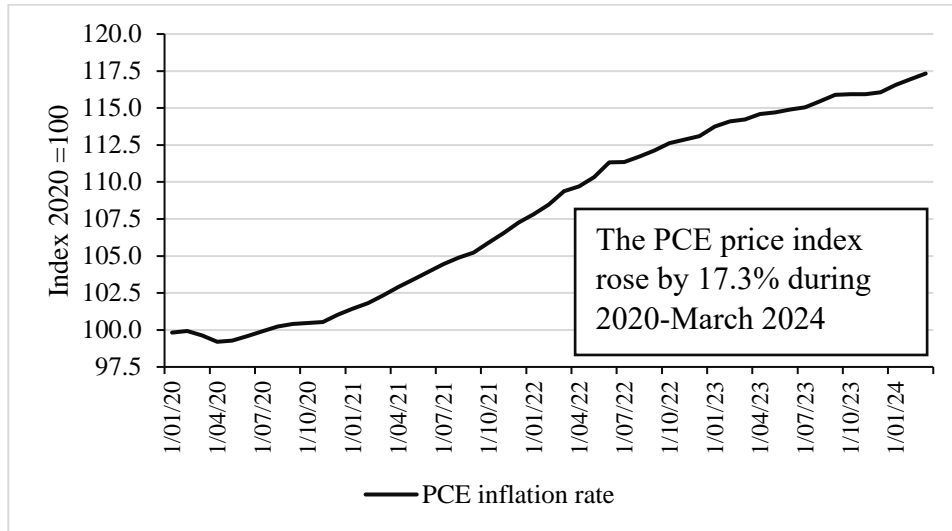
Second, the goods inflation during January 2021-July 2022 resulted from shortages of supply, caused by the COVID lockdowns and global supply chain breakdowns, and steady (or rising) demand, mostly originating from the richest 10%, who accounted for 46% of the demand growth for durable goods, 54% of the demand growth for food & beverages and one-third of the demand growth for gasoline & other energy goods (Table 4).

Third, the stubborn persistence of services inflation must be blamed on the rich as well: demand from the top income decile accounted for 39% of the demand growth for services (Table 4). Higher spending by the richest 10% was responsible for 49% of the demand increase for recreation services and 40% of the demand growth for food services & accommodation.

Fourth, continuing demand by the affluent for services whose production conditions are controlled by captive public regulators helps fuel now famously sticky “service sector” inflation. This hard-core of sticky services prices can be measured by the so-called super-core PCE inflation rate. This gauge measures services inflation excluding food, energy and housing and it has stubbornly refused to decline to a level consistent with the Fed’s inflation target of 2%.

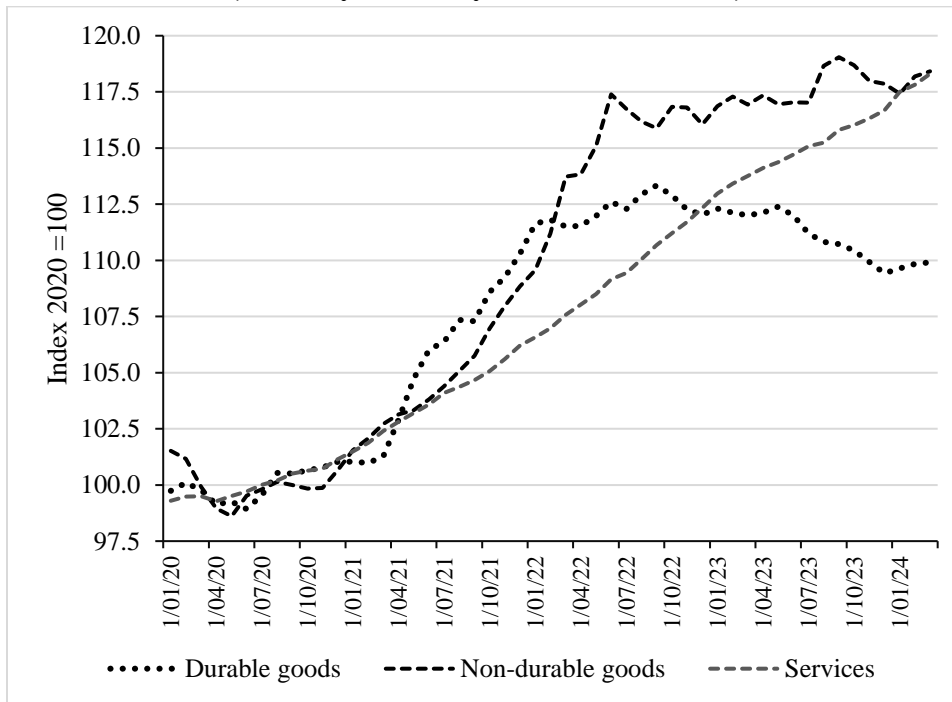
Let us consider the PCE Price Index in Figure 7.1. The PCE Price Index in March 2024 was 17.3% higher than in 2020. Prices of both goods and services have increased. As is shown in Figure 7.2, the cumulative increase in the price index of durable goods during 2020-March 2024 is 9.9% (which is considerably below average), while the cumulative increase in the price index of non-durable goods is 18.4% over the same period 2020-March 2024. The cumulative increase in the price index of services, which have an average weight in the aggregate PCE Price Index of almost two-thirds, is 18.3% over the same period (Figure 7.2).

Figure 7.1
The PCE Price Index (Monthly; January 2020-March 2024)



Source: Bureau of Economic Analysis (BEA), Table 2.3.4U. Price Indexes for Personal Consumption Expenditures by Major Type of Product and by Major Function. The PCE Price Index = 100 for the year 2020.

Figure 7.2
The PCE Price Index: Durable and Non-Durable Goods and Services (Monthly; January 2020-March 2024)

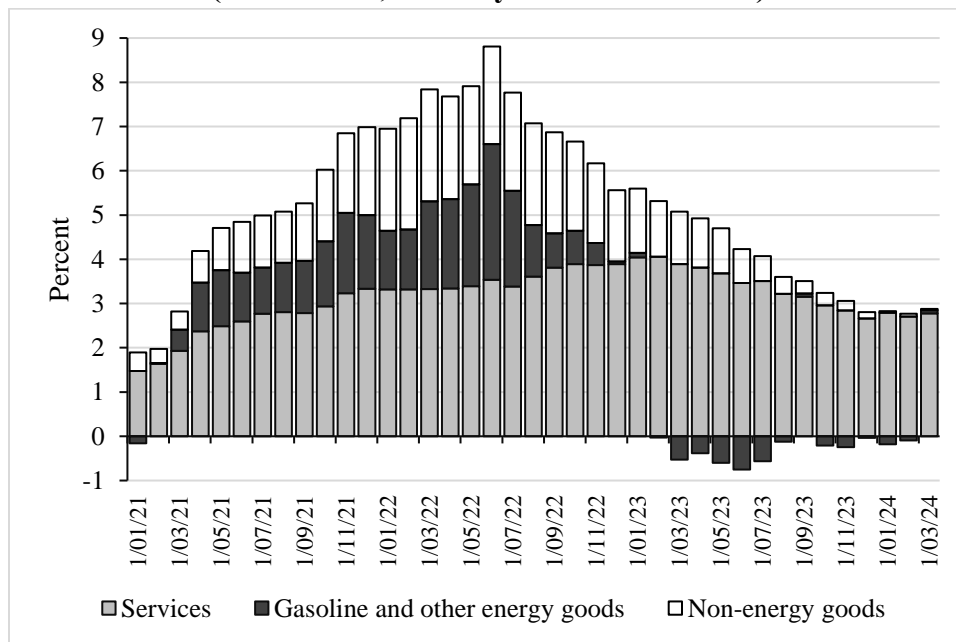


Source: Bureau of Economic Analysis (BEA), Table 2.3.4U. Price Indexes for Personal Consumption Expenditures by Major Type of Product and by Major Function. The PCE Price Index = 100 for the year 2020.

In Figure 28 (main text), the (annualized) monthly PCE inflation rate has been decomposed into contributions of durable goods inflation, non-durable goods inflation, and services inflation. The PCE inflation rate rose from 1.74% in January 2021 to a peak of 8.81 percent in June 2022; inflation next began to decline, to 2.65% in January 2024, after which it rose to 2.88% in March 2024. The surge in the PCE inflation rate during January 2021-June 2022 was driven both by rising (durable and non-durable) goods prices and services inflation. The steady decline in the PCE inflation rate has been caused by the gradual decline in goods inflation. During March 2023-March 2024, (PCE) inflation has been almost exclusively caused by rising services prices.

Figure 7.3 decomposes the PCE inflation rate into contributions of price growth of energy goods, non-energy goods and services. Energy price inflation contributed 3.1 percentage points to the peak inflation rate of 8.81% in June 2022, which means that energy price inflation was responsible for more than one third of overall inflation in mid-2022. Global supply chain disruptions in combination with the Ukraine war and speculation in energy (oil) markets (Breman and Storm 2023) were the causes of the sharply rising energy prices. The contribution of energy price inflation to overall inflation declined after June 2022 and became negative during February 2023-February 2024, as global supply chain problems eased and energy markets calmed down.

Figure 7.3
The Monthly PCE Inflation Rate: Energy Goods, Non-Energy Goods and Services
(Annualized; January 2021-March 2024)

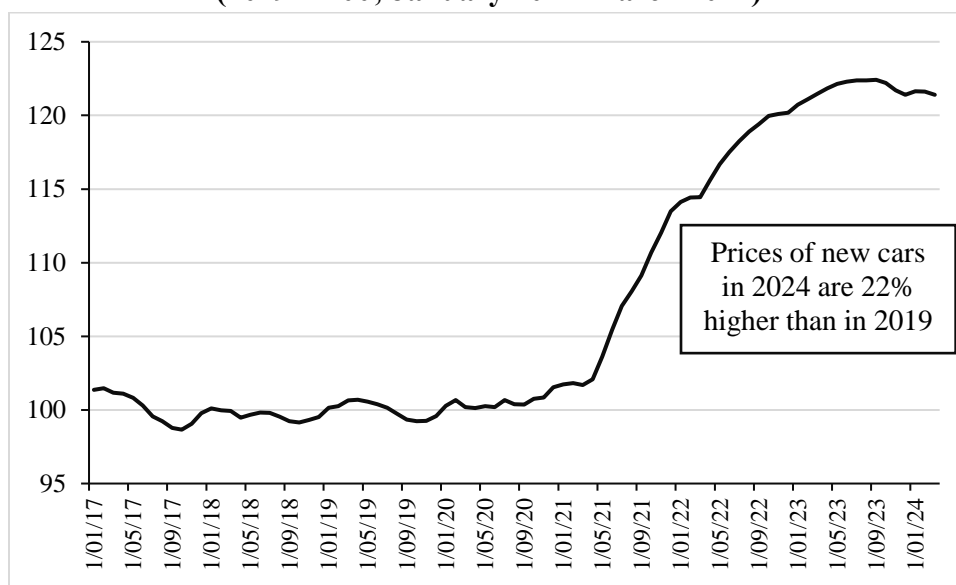


Source: See Figure 28.

Non-energy goods' inflation also made a significant contribution to overall inflation during 2022, accounting for 31% of the (rising) aggregate PCE inflation rate in that year. The rise in non-energy prices, in turn, was largely due to rising prices of (new and second-hand) motor vehicles and parts (Figure 7.4). Rising car prices, on average, accounted for almost half of the growth in non-energy prices during 2021 and a quarter of rising non-energy prices during 2022.

The rising prices of (new and second-hand) cars were primarily caused by the repeated breakdowns of global supply chains due to the COVID lockdowns during 2020-22. But the inflationary pressures originating in non-energy goods faded almost fully during 2023 and 2024, while prices of services continued to grow at rates (far) higher than the Fed's inflation target of 2%.

Figure 7.4
The Consumer Price Index: New Vehicles
(2019 = 100; January 2021-March 2024)

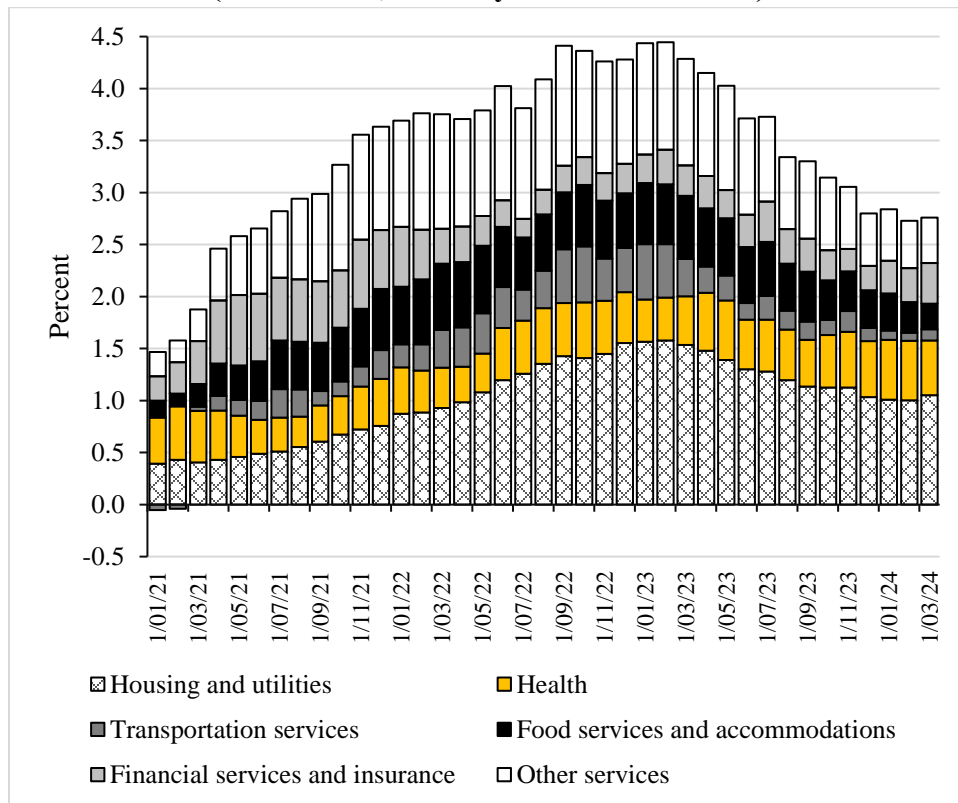


Source: FRED database.

In Figure 7.5, we take a closer look at the inflation originating in services and distinguish the contributions to the overall PCE inflation rate of (i) housing and utilities; (ii) transportation services; (iii) financial services and insurance; (iv) healthcare; (v) food services and accommodations; and (vi) other services. It can be seen that the contribution of housing and utilities to overall inflation was significant during 2022-2024, accounting for more than one-third of aggregate PCE inflation during January 2023-March 2024.

Rising health care costs accounted for 15% of aggregate PCE inflation during January 2023-March 2024, while financial services and insurance contributed another 9%. Taken together, housing & utilities, health care, and financial services & insurance are responsible for close to 60% of services inflation during 2023-2024.

Figure 7.5
The Monthly PCE Inflation Rate:
Contributions of Price Increases in Selected Services
(Annualized; January 2021-March 2024)



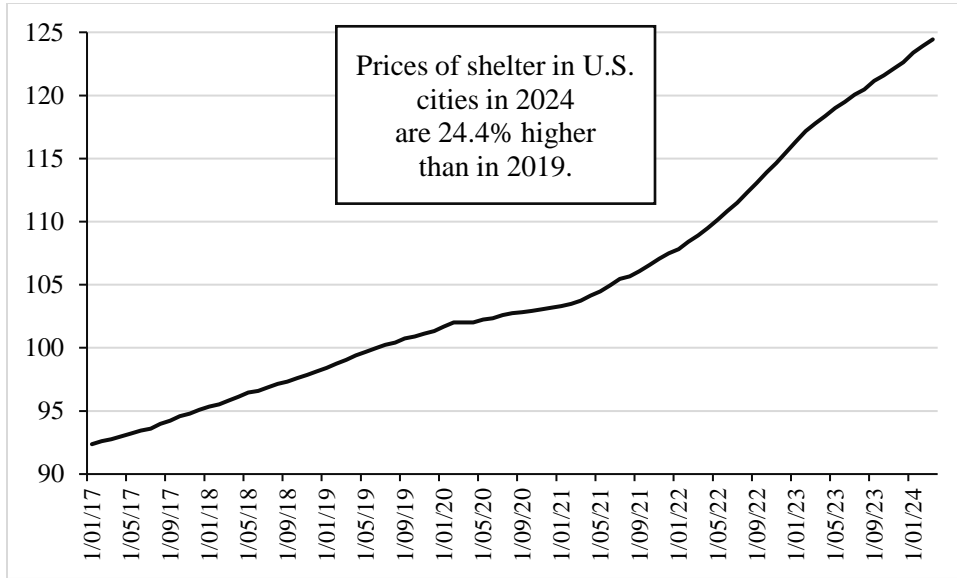
Source: See Figure 28.

Figure 7.6 presents the monthly price index of (urban) shelter during January 2017 and March 2024. The cost of shelter rose by 24.4% during 2019 and March 2024, which is more than the increase in the aggregate PCE Price Index (Figure 7.1). However, Fed officials see elevated housing inflation as a temporary problem and not as good a measure of underlying prices.

Figure 7.7 presents evidence on the monthly price indices of electricity and utility (gas) services. U.S. electricity prices increased by 31% during 2019 and March 2024. Utility (gas) prices rose by more than 60% during 2021 and 2022 (compared to 2019); utility (gas) prices in March 2024 were

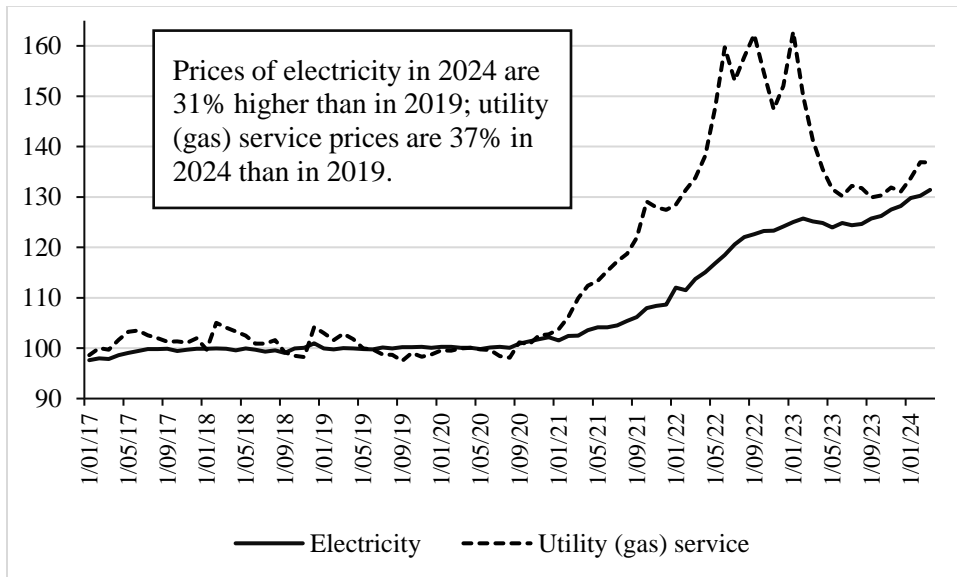
37% higher than during 2019. Electricity and utility prices increased significantly faster than the PCE Price Index.

Figure 7.6
The Consumer Price Index: Shelter in the U.S. City Average
(2019 = 100; January 2021-March 2024)



Source: FRED database.

Figure 7.7
The Consumer Price Index: Electricity and Utility (Gas) Service
(2019 = 100; January 2021-March 2024)

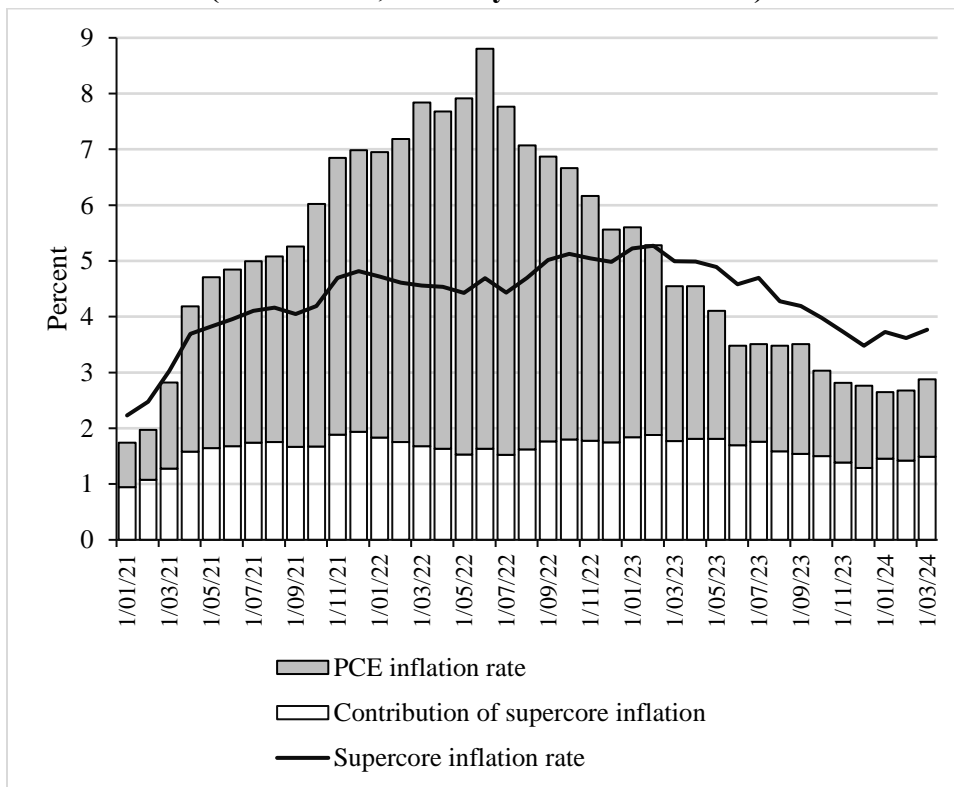


Source: FRED database.

U.S. inflation during 2023-March 2024 is almost completely originating from rising services prices. The Fed is concerned about the services inflation, especially because there is a hard-core of services prices (including prices of electricity, utilities and financial services and insurance) that are ‘relatively sticky’ and not very sensitive to tighter monetary policy.

This hard-core of sticky services prices can be measured by the so-called super-core PCE inflation rate. This gauge measures services inflation excluding food, energy and housing and it has stubbornly refused to decline to a level consistent with the Fed’s inflation target of 2%. As is shown in Figure 7.8, the super-core inflation rate has, on its own, contributed 2 percentage points to the aggregate PCE inflation rate during 2023-March 2024. This means that the Fed cannot lower the aggregate PCE inflation rate to 2% if the super-core inflation rate refuses to go down.

Figure 7.9
The Monthly Super-core PCE Inflation Rate
(Annualized; January 2021-March 2024)



Source: See Figure 28.