America In Recession since 2022?
A Critique

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Abstract: A recession is a broad based sustained decrease in economic activity, measured using a variety of indicators. The assertion by Antoni and St. Onge (2024) that real US economic output is lower in 2024Q2 than in 2019Q1 is based upon their use of a deflator that are at variance a number of other indicators of the price level. In general, it is not possible to replicate their result that output has declined since 2022.

Acknowledgments: None of the views contained here should be viewed as necessarily representing those of the University of Wisconsin or the NBER.

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1 Introduction

In a recent paper, Antoni and St. Onge (2024) argue that on the basis of a properly measured GDP, the United States has been in recession since 2022. In this paper, I recount the closest to official definition of a recession. I then dissect the Antoni and St. Onge argument, providing context to their assertions of improper deflator use. I cross check their discussion of their measured GDP with other measures of economic activity, particularly those not subject to the deflator critique. I conclude that their conclusions are unsubstantiated.

2 Recession Defined

The NBER's (2024) definition of recession is as follows:

> The chronology identifies the dates of peaks and troughs that frame economic recessions and expansions. A recession is the period between a peak of economic activity and its subsequent trough, or lowest point. Between trough and peak, the economy is in an expansion.
>
> The NBER's definition emphasizes that a recession involves a significant decline in economic activity that is spread across the economy and lasts more than a few months. In our interpretation of this definition, we treat the three criteria—depth, diffusion, and duration—as somewhat interchangeable. That is, while each criterion needs to be met individually to some degree, extreme conditions revealed by one criterion may partially offset weaker indications from another.

The NBER is usually considered the arbiter of recession and expansion onsets, largely because of the pioneering work by Mitchell (1927). As Poterba (2024) notes:

> Mitchell played a key role in the NBER's launch and early evolution. Recruiting a group of researchers dedicated to improving economic measurement, he guided projects during the 1920s on the estimation of labor's share of national income, the measurement of the unemployment rate, and the tracking of business cycle fluctuations. His 1927 monograph on business cycles introduced the term "recession" and provided the framework for much subsequent research on turning points in macroeconomic activity. One of Mitchell's recruits, his student Simon

> Kuznets, led the NBER research that laid the foundation for modern national income accounting.

What variables does the NBER put primary reliance on? NBER (undated):

> Because a recession must influence the economy broadly and not be confined to one sector, the committee emphasizes economy-wide measures of economic activity. The determination of the months of peaks and troughs is based on a range of monthly measures of aggregate real economic activity published by the federal statistical agencies. These include real personal income less transfers, nonfarm payroll employment, employment as measured by the household survey, real personal consumption expenditures, wholesale-retail sales adjusted for price changes, and industrial production. There is no fixed rule about what measures contribute information to the process or how they are weighted in our decisions. In recent decades, the two measures we have put the most weight on are real personal income less transfers and nonfarm payroll employment.
>
> The committee makes a separate determination of the calendar quarter of a peak or trough, based on measures of aggregate economic activity over the relevant quarters. Two measures that are important in the determination of quarterly peaks and troughs, but that are not available monthly, are the expenditure-side and income-side estimates of real gross domestic product (GDP and GDI). The committee also considers quarterly averages of the monthly indicators described above, particularly payroll employment.

The widely used rule-of-thumb that two consecutive quarters of negative GDP growth is not used by the NBER's Business Cycle Dating Committee (BCDC). From FAQs:

> Q: The financial press often states the definition of a recession as two consecutive quarters of decline in real GDP. How does that relate to the NBER's recession dates?
>
> A: Most of the recessions identified by our procedures do consist of two or more consecutive quarters of declining real GDP, but not all of them. In 2001, for example, the recession did not include two consecutive quarters of decline in real GDP. In the recession from the peak in December 2007 to the trough in June 2009, real GDP declined in the first, third, and fourth quarters of 2008 and in the first and second quarters of 2009. Real GDI declined for the final three quarters of 2001 and for five of the six quarters in the 2007–2009 recession.
>
> Q: Why doesn't the committee accept the two-quarter definition?

> A: There are several reasons. First, we do not identify economic activity solely with real GDP, but consider a range of indicators. Second, we consider the depth of the decline in economic activity. The NBER definition includes the phrase, “a significant decline in economic activity." Thus real GDP could decline by relatively small amounts in two consecutive quarters without warranting the determination that a peak had occurred. Third, our main focus is on the monthly chronology, which requires consideration of monthly indicators. Fourth, in examining the behavior of production on a quarterly basis, where real GDP data are available, we give equal weight to real GDI. The difference between GDP and GDI—called the “statistical discrepancy”—was particularly important in the recessions of 2001 and 2007–2009.

In addition, the substantial amount of revision that occurs to GDP series makes it problematic using this indicator. For instance, in discussing the two quarters of consecutive negative GDP growth in 2022H1, Antoni (2022) writes:

> In terms of how we define it or what marks a recession, the basic understanding is that when the economy shrinks for two consecutive quarters, so three months, and then another three months, that's a recession. The reason that the White House has been making a lot of hay of, oh, that's not official definition, blah, blah, blah. Okay. I suppose there is no technical official definition, but I've taught plenty of economics courses. That was what we used in every single class. That's what you'll see in most, if not all economics textbooks.

As Chinn (2024) notes, the annual update has revised away the two consecutive quarters. There is only one quarter of negative growth in 2022, according to the latest vintage.

This is not to deny that anybody can use any metric to declare a recession. However, the fact that the two-quarter rule can change determinations over time, as the data gets revised makes this criterion problematic.

Other measures that rely upon GDP, but are not sensitive to data revisions, include Chauvet and Hamilton (2006), which uses a regime switching model to determine peaks and troughs. Other

indicators that do not rely solely or even primarily on GDP are reported by the OECD and the private firm ECRI (the latter relies upon a NBER BCDC-like approach).

3 Is the GDP Deflator Really 20% Higher than Reported?

Antoni and St. Onge (2024) argue that (1) standard price measures used by the BEA in calculating real GDP are flawed, and (2) using a properly constructed deflator results in real GDP being much lower than reported. In fact, according to their calculations, 2024Q2 real GDP is less than that reported in 2019Q1. The basic result is summarized in this graph reproduced from their paper.

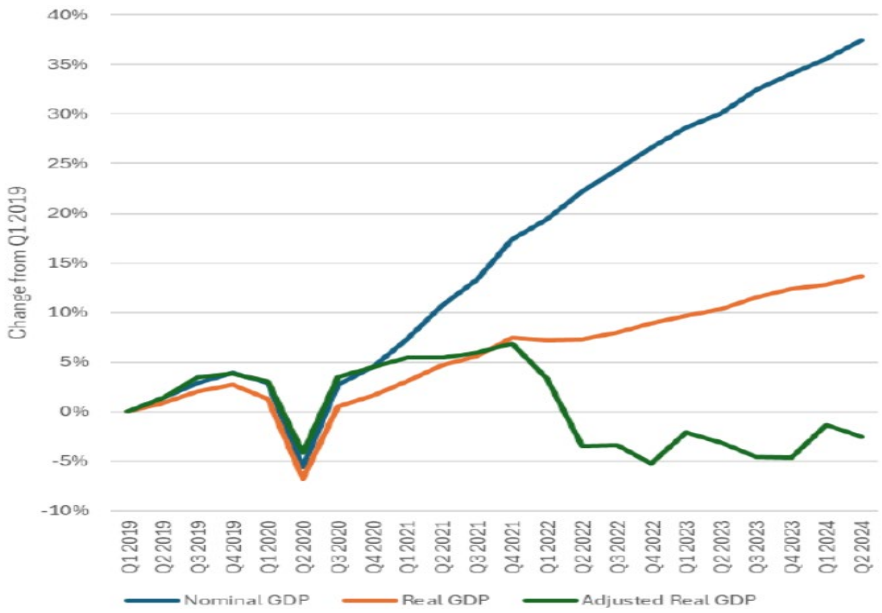

Figure 1: *Nominal GDP (blue), real GDP from BEA (orange), and real GDP calculated by authors (green), all relative to 2019Q1. Reproduced from Antoni and St. Onge (2024).*

In their graph, the peak in economic activity was 2021Q4. The wide divergence in estimates of real output comes from their alternative deflator, which is shown in the following figure, with comparison to the BEA deflator (both relative to 2019Q1).

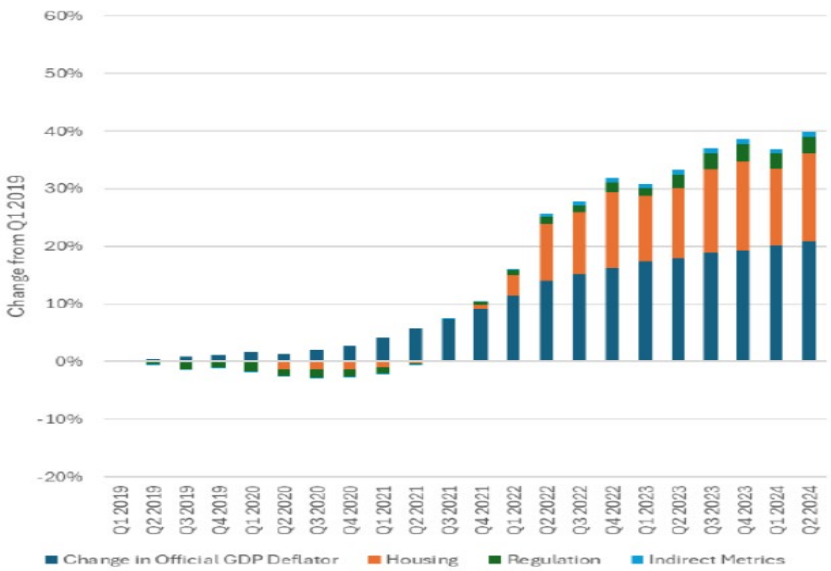

Figure 2: *Change in GDP deflator from BEA (blue bars), including housing adjustment (orange bar), including regulation (green), including indirect metrics (light blue bar). Reproduced from Antoni and St. Onge (2024).*

The main constituent of the difference in deflator is the treatment of housing. The others (indirect measures of costs, e.g., insurance, and regulatory costs, are relatively minor).[1]

> One of the most cited inflation gauges is the consumer price index (CPI). It measures the change in price for a fixed basket of goods and services over time. While the index contains a proxy for the cost of homeownership, it does not actually account for this directly. Instead, the CPI imputes this value from rents, without observing home prices or interest rates.4 Called "owners' equivalent rent of residences," this category has a relative importance of over 26 percent, meaning it makes up more than a quarter of the CPI.
>
> If the costs to rent and own change commensurately over time, then this methodology will be relatively accurate. Unfortunately, the cost of owning a home has risen much faster than rents over the last four years and the CPI has grossly underestimated housing cost inflation. The cost of housing services in the National

[1] Note that their interpretation of regulatory costs are such that, for instance, imposition of a seatbelt mandate (which increases costs) yields no welfare benefits to consumers.

> Economic Accounts published by the Bureau of Economic Analysis suffers from similar methodological problems.

They describe the construction of their alternative measure thusly:

> To produce an alternative inflation metric that more accurately reflects the rise in the cost of living, several alterations must be made to the typical price indices used in the national accounts. These changes can be broadly categorized into three groups: housing, regulatory burdens, and indirectly measured prices.
>
> The housing component has had the largest impact in terms of adjusting for the true cost of living; in the second quarter of 2024, it increased the cumulative change in the GDP deflator by roughly 75 percent. This was due to the combination of not only higher home prices but also higher interest rates. That is, a mortgage payment is made of the amount borrowed and the interest rate, and if both house prices and interest rates are rising then the cost of home ownership rises on both fronts.
>
> ...

The exact mechanics of the calculation is not detailed in their paper.

One problem with their approach is that it implicitly treats housing costs of house price and mortgage payments as fully a consumption expenditure, rather than an investment expenditure. The currently in use measure of shelter costs is operationalized by calculation of the Owner Equivalent Rent (OER) which "measures how much money a property owner would have to pay in rent to be equivalent to their cost of ownership." BLS (2024) describes in detail the methodology.

Previous to the January 1983 implementation of the use of the OER, BLS had used house prices and mortgage rates, as discussed by Bolhuis et al. (2024). Note, however, that there is a distinction between whether homeowners "feel" house prices and mortgage rates better reflect costs than the OER, and which one is a better measure according to price theory.

A second problem is their deflator – even just accounting for housing costs – is not reproducible. To see this, consider the BLS OER (primary residence) vs the Case-Shiller national House Price Index and the 30 year mortgage rate.

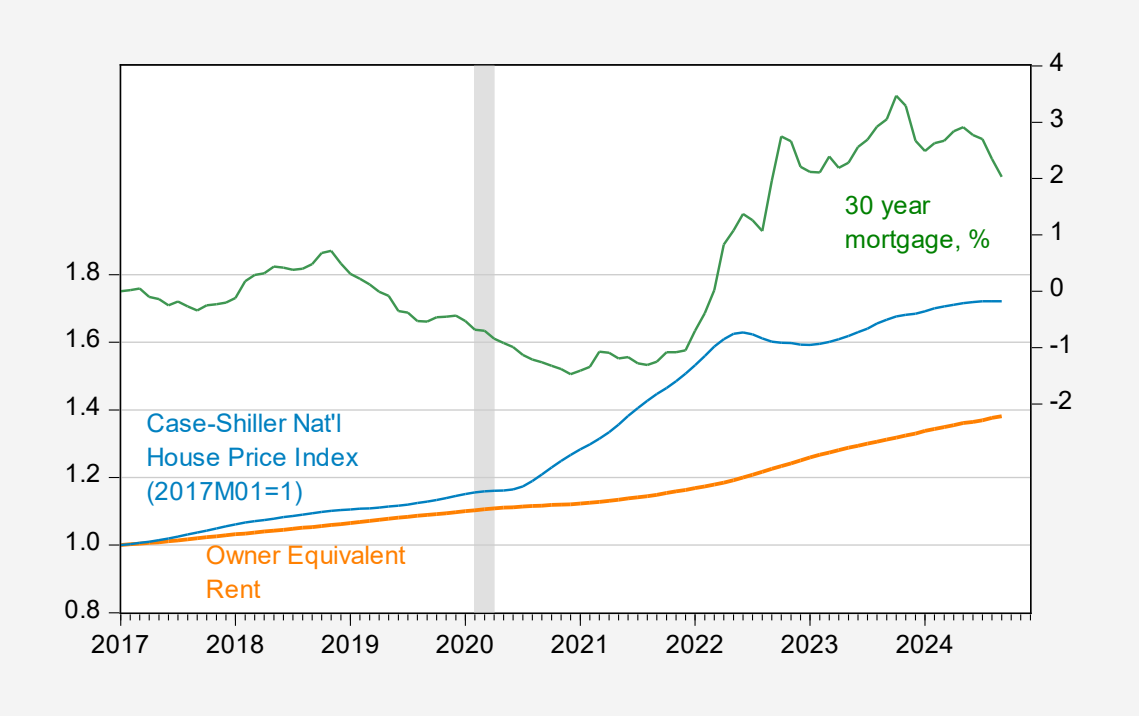

Figure 3: *Owner Equivalent Rent for primary residence (orange), Case Shiller national house price index (light blue), both 2017M01=1; 30 year mortgage rate, % (green, right scale). NBER defined peak-to-trough recession dates shaded gray. Source: BLS, S&P, Fannie Mae via FRED, NBER>*

I attempt to replicate the Antoni-St Onge PCE deflator. (The data on a quarterly basis are available at https://www.ssc.wisc.edu/~mchinn/data_recession2022a.xlsx). I rebase the Case-Shiller national housing price index (national series; the 20 city version would be slightly higher) to 2017 = 1. I multiply this by the mortgage rate factor (1+i). In Figure 4, I present the BEA consumption housing deflator, the Case-Shiller housing price index, and the index adjusted by the 30 year mortgage rate. The resulting quarterly series look like the following.

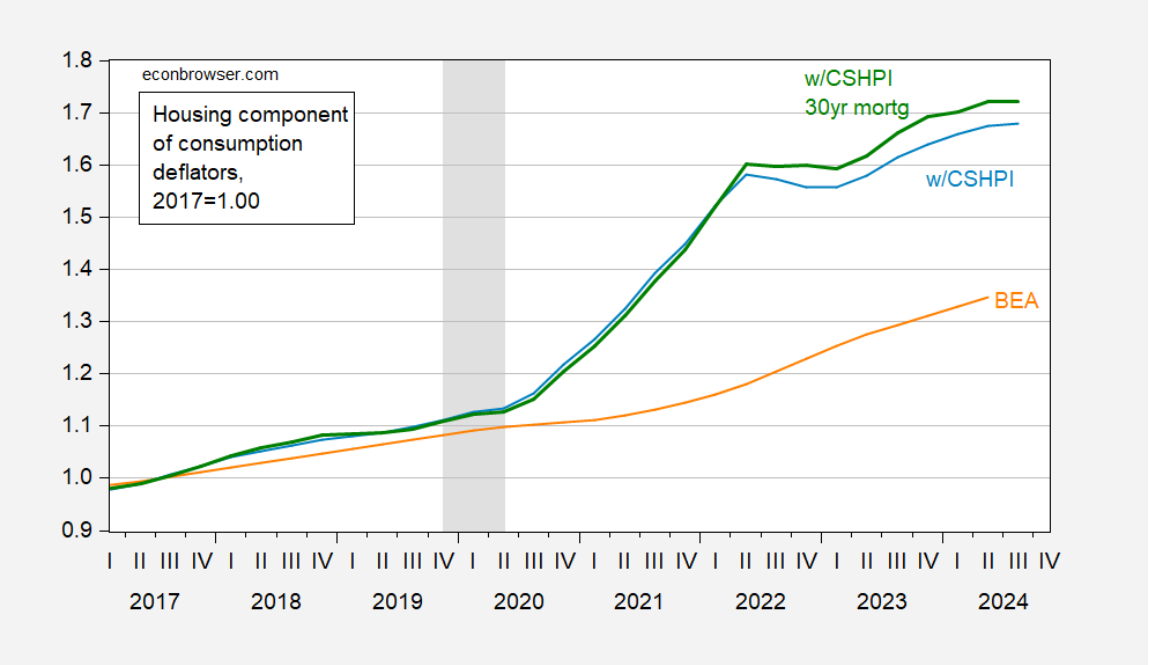

Figure 4: *BEA shelter component of the PCE (orange), Case-Shiller House Price Index – national (light blue), house price times mortgage rate factor index (bold green), all 2017=1.00. NBER defined peak-to-trough recession dates shaded gray. Source: BEA, S&P Dow Jones, Fannie Mae via FRED, NBER, and author's calculations.*

In the PCE deflator, shelter accounts for about 15% of the total weight (less than the 26% in the CPI), and calculate the overall alternate consumption deflator as:

$$P_{alt\_PCE} = [(P_{CSHPI} \times (1+i_{mort30y})]^{0.15} \times (P_{rest\text{-}of\text{-}PCE})^{0.85}$$

How does the use of this alternative consumption deflator impact estimated GDP? Applying this alternative consumption deflator to consumption only, and then adding alternative consumption to real GDP ex-consumption, yields the light green line below.

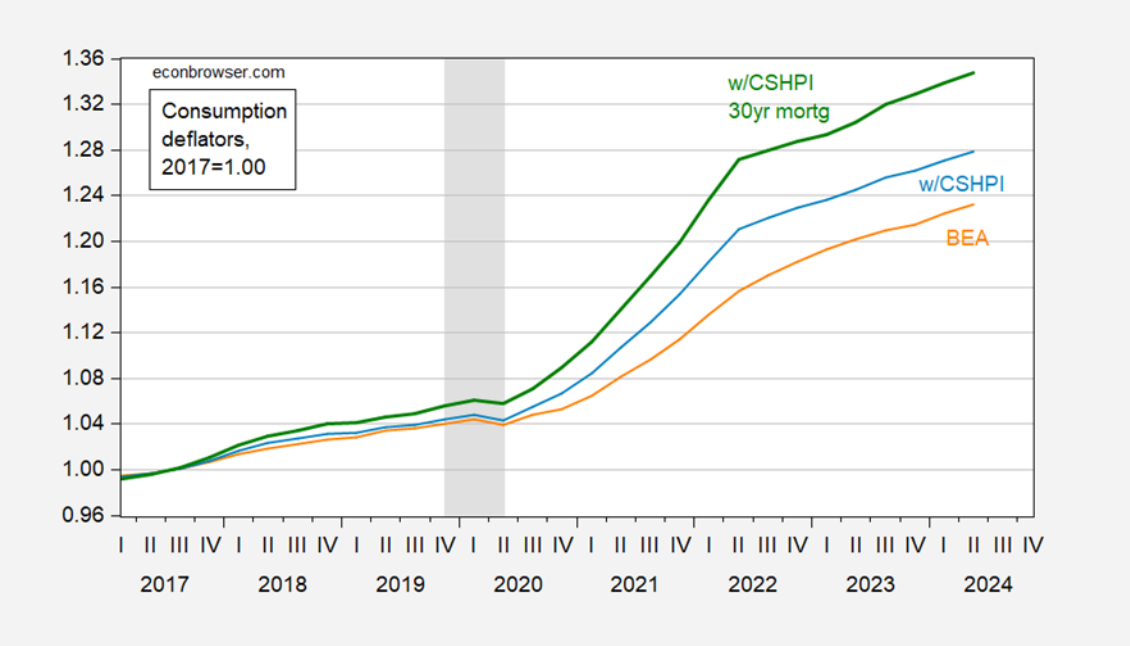

Figure 5: *BEA PCE deflator (orange), Case-Shiller House Price Index – national (light blue), house price times mortgage rate factor index (bold green), all 2017=1.00. NBER defined peak-to-trough recession dates shaded gray. Source: BEA, S&P Dow Jones, Fannie Mae via FRED, NBER, and author's calculations.*

How does the calculation of this alternative consumption deflator impact estimated GDP? Applying this alternative consumption deflator to consumption only, and then adding alternative consumption to real GDP ex-consumption, yields the light green line below. Clearly, as shown in the in Figure 6 below, the Antoni and St. Onge result (2024Q2 value at red square) cannot be replicated using the aforementioned calculation.

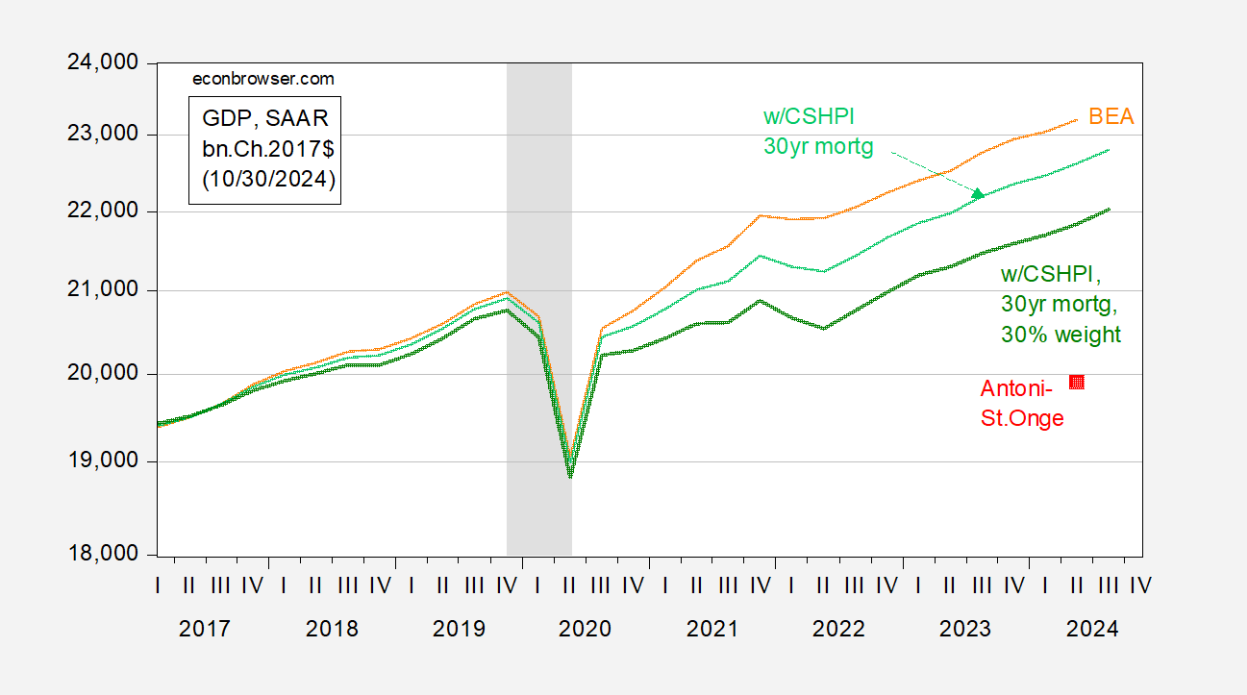

Figure 6: *BEA GDP (orange), GDP incorporating PCE using Case-Shiller House Price Index – national times mortgage rate factor index, using BEA weight of 15% (light green), using 30% weight (dark green), Antoni-St. Onge estimate (red square), all in bn.Ch.2017$ SAAR. NBER defined peak-to-trough recession dates shaded gray. Source: BEA, S&P Dow Jones, Fannie Mae via FRED, NBER, and author's calculations.*

Since the authors do not explain the construction of their alternative PCE deflator, but do explain the CPI construction, I conjecture they are using the CPI weights instead of the PCE deflator weights. I calculate the consumption deflator using the 30% weight associated with the CPI (instead of the 15% in the PCE. This yields the dark green line — which is still far above the Antoni-St. Onge estimate.

In sum, with the documentation provided, I cannot replicate the Antoni-St.Onge result declining GDP since 2022 (technically, peak in 2021Q4). Until the authors provide a data appendix or the data they have used, I conclude that their result is irreproducible.

3 Perspectives from Alternative Series: NIPA Based and Other

As is well known, GDP is an imperfect measure of aggregate economic activity. Other series include GDI, and GDO (the arithmetic average of GDP and GDI). Furman (2016) notes the relative usefulness of GDO in tracking national output.

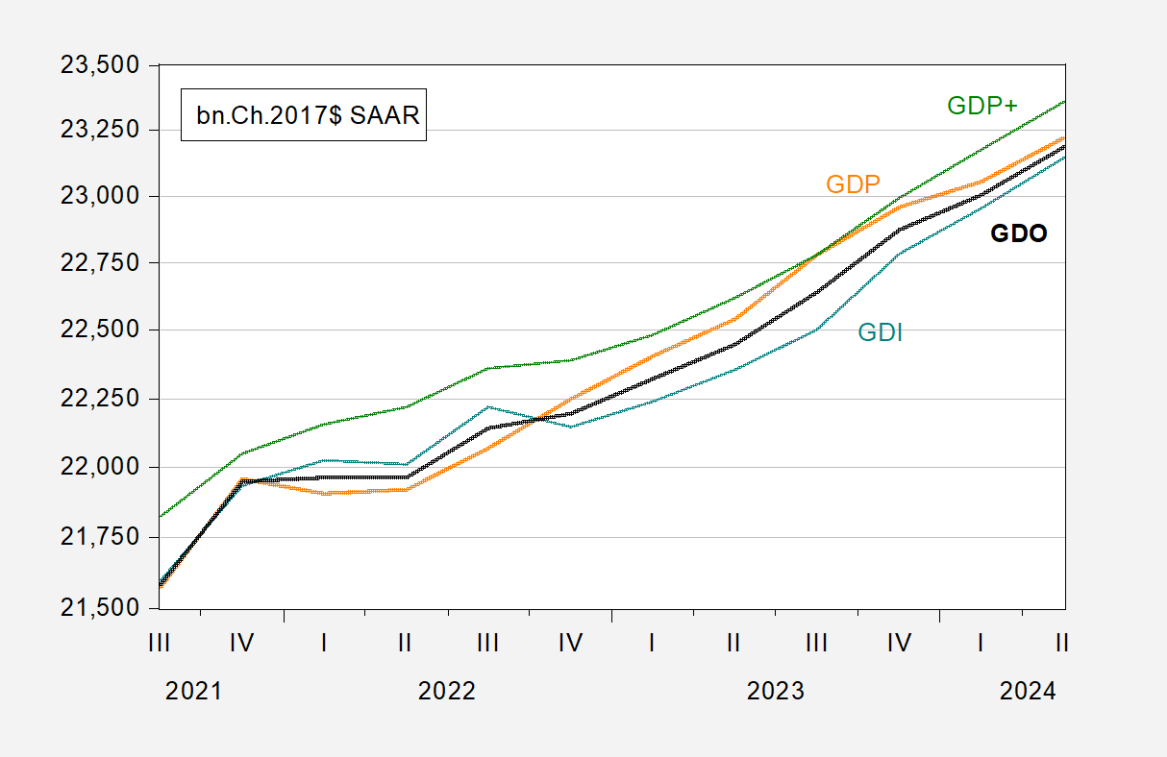

Figure 7: *GDP (orange), GDI (teal) and GDO (bold black), GDP+ (green), all in bn.Ch.2017$ SAAR. GDP+ level calculated by iterating growth rates on 2019Q4 GDP. Source: BEA, Philadelphia Fed, author's calculations.*

Note that GDO flattens, but does not decline, during 2022H1. Moreover, GDO is indisputably higher than it was in 2022.

As indicated in Section 2, the NBER BCDC does not place primary reliance on GDP. Rather it focuses on a series of variables, with heavy reliance on employment and personal income excluding transfers. Figure 8 depicts these series all normalized to 2021M11.

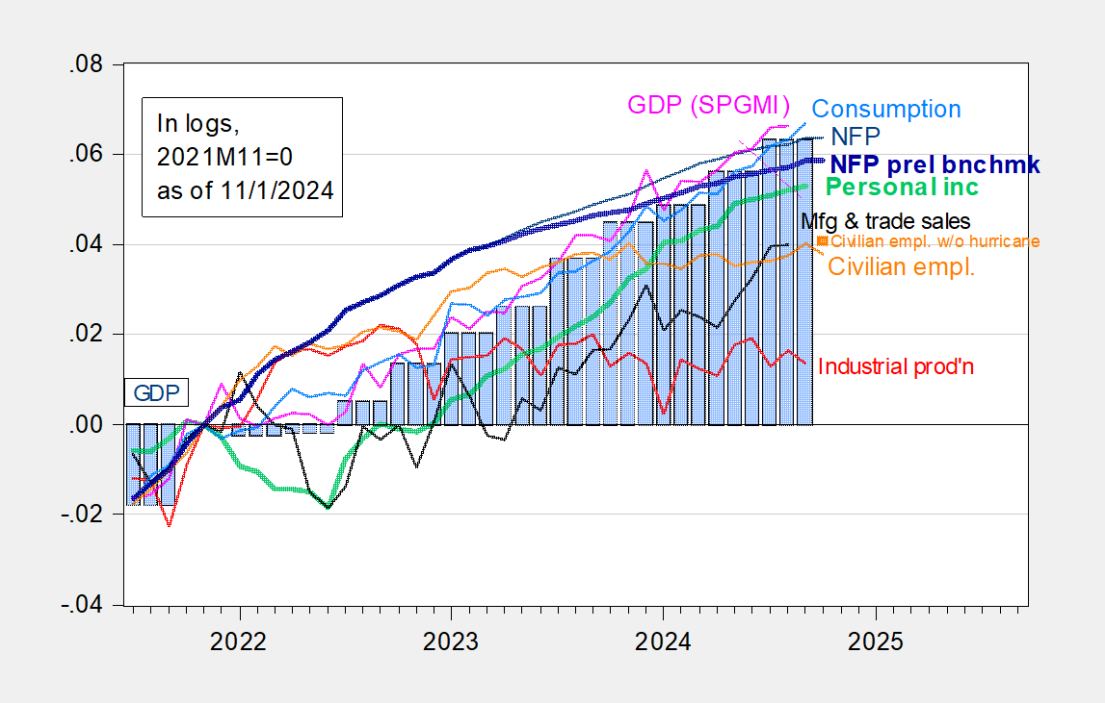

***Figure 8**: Nonfarm Payroll (NFP) employment from CES (blue), implied NFP from preliminary benchmark (bold blue), civilian employment (orange), civilian employment in October adding in unemployed for weather (orange square), industrial production (red), personal income excluding current transfers in Ch.2017$ (bold light green), manufacturing and trade sales in Ch.2017$ (black), consumption in Ch.2017$ (light blue), and monthly GDP in Ch.2017$ (pink), GDP (blue bars), all log normalized to 2021M11=0. Source: BLS via FRED, Federal Reserve, BEA 2024Q3 1st release, S&P Global Market Insights (nee Macroeconomic Advisers, IHS Markit) (11/1/2024 release), and author's calculations.*

2021M11 is the middle of the 2021Q4 quarter tagged by Antoni and St. Onge as the peak. While manufacturing and trade sales as well as personal income ex.-current transfers dropped in 2022H1, both nonfarm payroll employment and civilian employment (from the establishment and household surveys) rose during that period. The only series lower than where it was in mid-2022 is industrial production. However, a variety of other measures in that sector have continued to rise. Industrial production value added now comprises about 17% of GDP (recall a recession has to be a broad-based decline in activity), so it's unclear how relevant that is to the issue of recession.

Antoni and St. Onge have critiqued the use of official deflators. Those deflators have been applied to personal income, consumption etc. Hence, it makes sense to consider series that are *not* subject to deflation issues. Figure 9 shows some employment, aggregate and industrial production numbers.

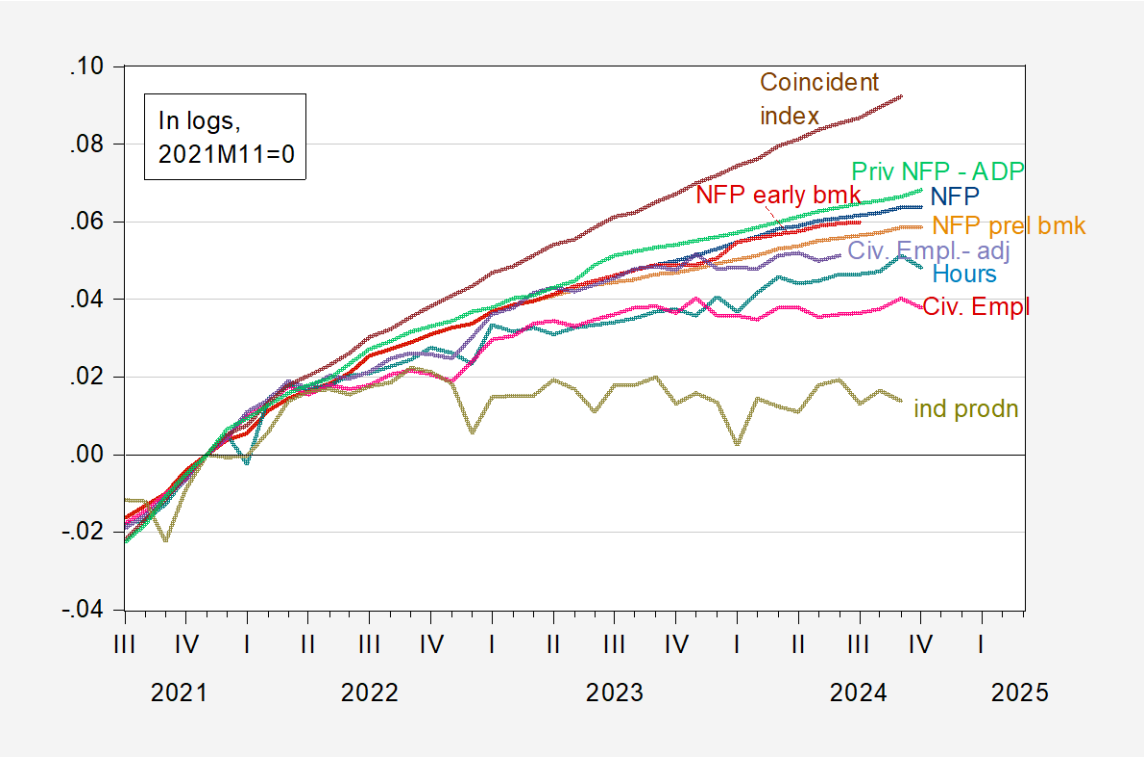

Figure 9: *Nonfarm payroll (NFP) employment (blue), preliminary benchmark NFP (tan), early benchmark (red), aggregate hours in private sector (light blue), private NFP employment fm ADP (light green), civilian employment (dark red), civilian employment using population controls implied by CBO estimates of immigration (lilac), industrial production (chartreuse), coincident index (purple), in logs 2021M11=0. Source: BLS, Federal Reserve Board via FRED, Philadelphia Fed, and author's calculations.*

Figure 9 displays nonfarm payroll employment series as reported, the nonfarm employment series incorporating the preliminary benchmark, and the Philadelphia Fed's early benchmark nonfarm payroll employment series. All of these – including the preliminary benchmark nonfarm payroll

series that indicated 819 thousand fewer jobs than the official – have risen throughout the period after 2021M12. Total hours worked in the private sector have also risen over time.

Antoni (2024a) has cast doubt on the reliability of BLS establishment survey based employment numbers, with special reference to the preliminary benchmark.

> Something is clearly wrong at the Bureau of Labor Statistics, given how consistently the number of jobs has been overestimated. The Bureau owes Congress and the American people an explanation as to how their statistical models have been so wildly off the mark and why they have done nothing to correct them.

Antoni (2024b) makes the following assertion.

> While there's not yet a smoking gun, some suspect government statisticians are committing lies of omission.

A counter to that claim is that an independent measure of employment – the ADP's private nonfarm payroll employment series which is collected by way of administrative means -- has grown consistently since 2019M12.

Civilian employment as measured by the household survey has at points declined, but as of September is up from recent peaks (and certainly up from 2021M12). As discussed in Edelberg and Watson (2024) and Orrenius et al. (2024), the CBO has argued that the CPS estimates of immigration are too low, resulting in too low estimates of labor force and employment. An adjusted civilian employment series calculated by the author, incorporating CBO estimates of immigration, has generally risen more strongly than the official series. As of June 2024, the adjusted series is 1.5 percentage points higher than the official.

The coincident index compiled by the Philadelphia Fed -- based on "nonfarm payroll employment, average hours worked in manufacturing by production workers, the unemployment rate, and the sum of wages and salaries with proprietors' income (two components of personal income) deflated by the consumer price index" – has risen faster than GDP. While one component out of four is deflated by a CPI, the other three are not, so this measure is somewhat insensitive to the deflator critique.

Industrial production is the one series that has shown some decline since mid-2022 (0.9% down since 2022M09). However, both it and manufacturing production (not shown) are up since 2021M11. In addition, it is arguable that industrial production is representative of overall economic activity. Industrial production constitutes 17% of value added as of 2024Q2, and 8.1% of nonfarm payroll employment as of September 2024.

4 Conclusion

The assertion that the US economy has been in recession, in the sense that the word is conventionally used, is without merit. First, the conclusion that real GDP is lower as of 2024Q2 than it was in 2019Q1 is not backed up by any calculation using defensible deflators a sensible economist would use. Second, other non-deflator sensitive indicators of real economic activity do not exhibit a downward decline from 2022 onward. The closest is industrial production, which is within one percentage point of recent peak, and above end-2021 levels.

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