Discussion of "Rate Cycles" by Kristin Forbes, Jongrim Ha and Ayhan Kose

By Paolo Surico[1]

1 Introduction

It is a honour and a pleasure to read this very well crafted and technically executed paper by three leading monetary experts. The authors draw a beautiful analogy with the parable of "the blind men introduced to an elephant" in which several blind men are allowed to touch only one part of an elephant and use that to infer what they have touched: their resulting description varies widely based on what they touch, reminding us of the importance of understanding the whole picture as opposed to an isolated view. The elephant is, in the authors' view, the rate cycle and inflation scare of 2020-24 and the blind men (I presume) everyone that miss the complex and multi-dimensional nature of these last few years in favour of a simple, uni-dimensional interpretation.

So, what does the elephant look like? Well, "this time is different", which incidentally remind me of another elephant (though this is for a different discussion!). More specifically, the authors provide neat evidence that over time, monetary policy cycles have become more synchronized across countries. Furthermore, the expansion phase of the cycle tends to last longer than the tightening one. Finally, during the 2020-24 rate cycle: (i) both the tightening and holding synchronizations were unprecedented, and (ii) while the role of global supply shock has been more prominent than in previous episodes, global demand shocks have been the dominant source of inflation and thus of policy rate variation. These conclusions are based on several dynamic factor models for 24 OECD countries over the sample 1970-2024 using data (at different frequencies) on short-term interest rates, CPI inflation, industrial production and employment. The factors are then used in Factor-Augmented Vector AutoRegressions (FAVAR) which, coupled with zero and sign restrictions allow the authors to separate global demand from global supply shocks.

I enjoyed reading the authors' analysis. I found it extremely useful and ingenuous to exploit the international dimension of the 2020-24 crisis to identify differences and commonalities across countries, in an effort to offer novel insights to the blind men. In my discussion, I will follow the authors' lead and use a similar set of countries and samples and a similar statistical model --plus some findings from my own research-- to present my army of elephants (or perhaps of blind men, depending upon the reader's point of view). Before proceeding, I wish to emphasize that I agree with most of the points made by the authors and my discussion should be viewed as

complementary to the authors' analysis. More specifically, I am going to talk about three elephants: the "good" (aka wage inflation), the "bad" (aka service inflation) and the "ugly" (aka fiscal policy). I suspect data limitation has prevented the authors from focussing on these sets of variables. I will use some unbalanced panel and evidence on individual countries to make up for those limitations in data availability.

2   Wage inflation

In Chart 1, I report two statistics. The solid red line represents the first principal component of CPI inflation across 21 OECD countries over the sample 1970-2024;[2] the dotted black line is the first principal component (PC) of nominal compensation per hours worked. Unlike the former, the latter is based on an unbalanced panel covering a smaller number of countries over heterogeneous samples. All data have been demeaned and standardized before the principal component analysis and therefore movements in the PCs above (below) zero should be interpreted as periods in which the principal component is above (below) its sample average.

Two main results emerge from this simple descriptive analysis. First, the 1970s recessions were characterized by a strong synchronization between good inflation and wage inflation. In particular, the large fall in the wage inflation PC of both 1975 and 1982 are associated with a large drop in CPI inflation PC. The positive contemporaneous relationship between wage and good inflation during the 1970s and early 1980s may be interpreted as prima faciae evidence in favour of a wage-price spiral mechanism over that period.

Second, in sharp contrast, during the 2020-2024 episode, good inflation and wage inflation clearly exhibit a negative contemporaneous correlation. This is consistent with the view that during the most recent episode, wages have followed the behaviour of inflation and once real wages will finally catch up, the fall in CPI inflation will lead to a drop in wage inflation. According to this narrative, the labour market is the dog who did not bark or, depending on the reader's zoological preferences the "good" elephant.
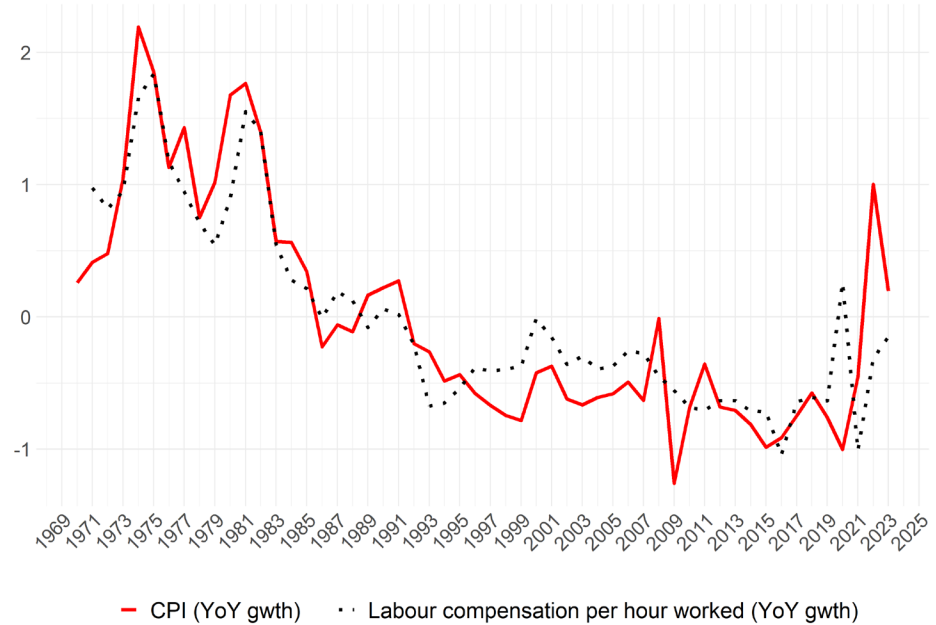
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[2]   The full list of countries is: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Japan, Netherlands, Norway, New Zealand, Portugal, Spain, Sweden, Switzerland, United Kingdom and United States.

Principal Components

CPI (YoY gwth) · · Labour compensation per hour worked (YoY gwth)

Sources: Haver Analytics (CPI); OECD (labour compensation per hour). Frequencies: monthly (CPI); yearly (labour compensation per hour). Countries: all listed in footnote 2 of the main text (CPI); Canada, Denmark, France, Germany, Italy, Japan, U.K. and U.S. (labour compensation per hour).
Notes: Variables are demeaned and standardized before extracting principal components, which implies that the only interpretation of the vertical axis is above average for values above zero and below average for values below zero.

3   Service inflation

In Charts 2, 3 and 4, I come to terms with the fact that service inflation is not available for many countries, and for those for which is available the sample span is too heterogeneous for running a PC analysis on the unbalanced panel. Instead, in Chart 2 I plot headline inflation (as red solid line) and service inflation (as dotted black line) for the United States since 1970, whereas in Chart 3 I report the corresponding series for the United Kingdom since 1989, which corresponds to the first year in which service inflation is available from the British ONS. Finally, in Chart 4, I draw the CPI inflation PC described in the previous section together with the first principal component of service inflation among all Euro-area countries (as dotted black line), which is available since 1997.

A stark contrast emerges between previous and the current inflation episodes. During the 1970s cycle in the U.S., the early 1990s recession in the U.K., and the great recession of 2007-09 in the Euro-area, headline inflation and service inflation are highly synchronized. On the other hand, during the 2020-24 episode, in all three parts of the world, service inflation not only peaks between six months to twelve months later than CPI inflation but also appears more persistent. As during most of 2023 and part of 2024, service inflation has accelerated in the face of slowing down headline inflation, this implies that non-service inflation must have been close to zero, if not negative.

The relative price effect across service and non-service sectors highlighted by Charts 2, 3 and 4 during the 2020-24 episode is consistent with the structural reallocation hypothesis put forward by Guerrieri et al. (2023) for the United States and by Guerrieri et al. (2023) for the Euro-area. As the economy shifts resources away from less productive sectors with weaker demand and towards more productive sectors with stronger demand, relative prices (both in the product and labour market) are the mechanism that regulates the speed of the transition: the more productive sector offers higher wages to attract workers from the less productive sectors, which further contributes to the inflation differential and to headline inflation. If one marries (at least partially) this view of the world, then there is a case to be made for monetary policy to be more accommodative than it would have otherwise been, in order to smooth and facilitate the transition. Under this scenario, inflation represents the symptom of an improved allocation of resources rather than the symptom of excessive demand that the central bank owes to contain. I consider this a "bad" elephant because it is inflationary but there is little useful that monetary policy can do to offset it. In fact, as shown in Guerrieri et al. (2023), raising interest rates to contain the inflation associated with this relative price effect is counterproductive because it slows down the structural reallocation of the economy.

Chart 2
CPI inflation and Service Inflation in the United States

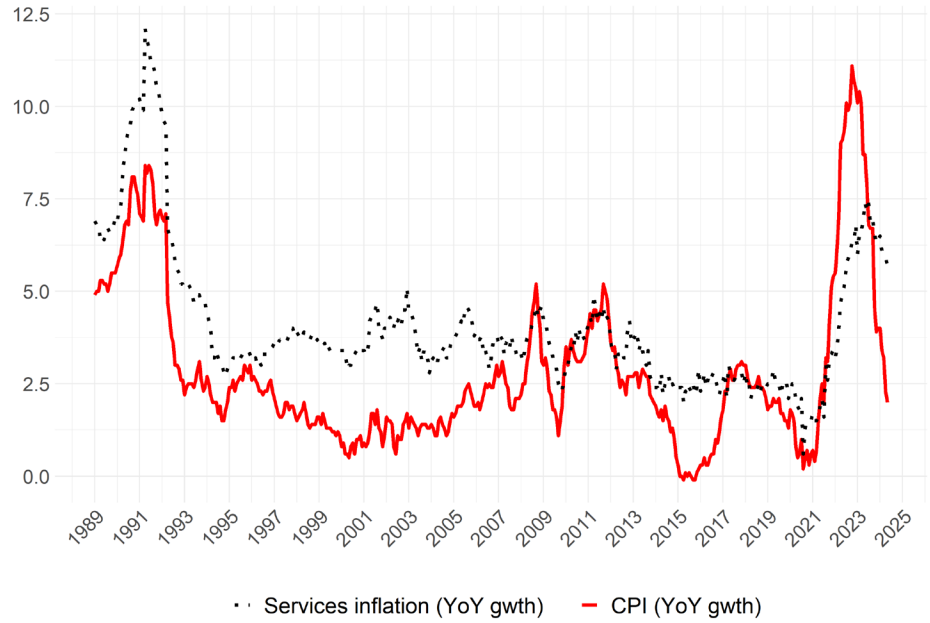(% change relative to same month in previous year)

·· Services inflation (YoY gwth) — CPI (YoY gwth)
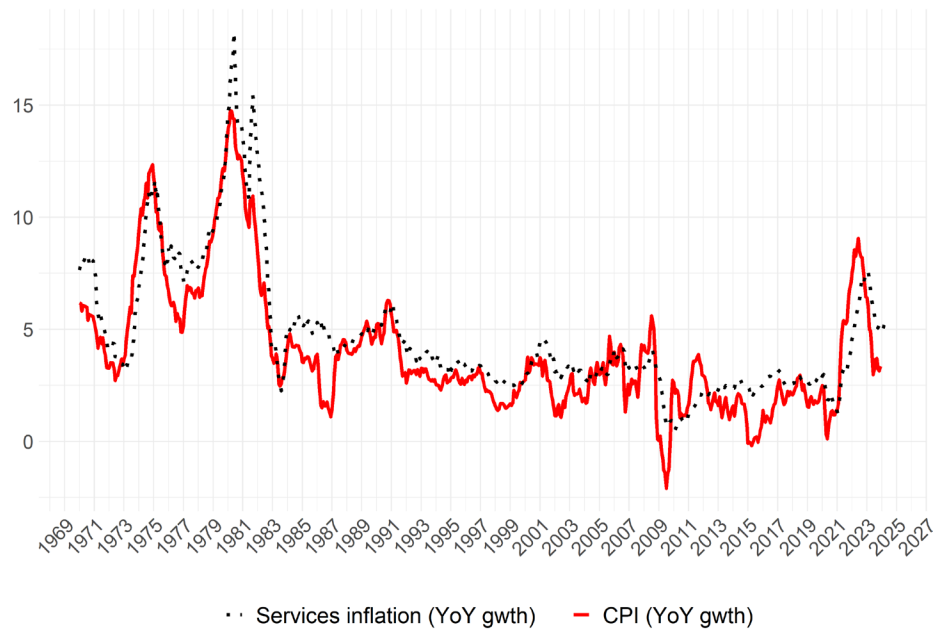
Sources: Fred. Frequency: monthly.

Chart 3

CPI inflation and Service Inflation in the United Kingdom

(% change relative to same month in previous year)
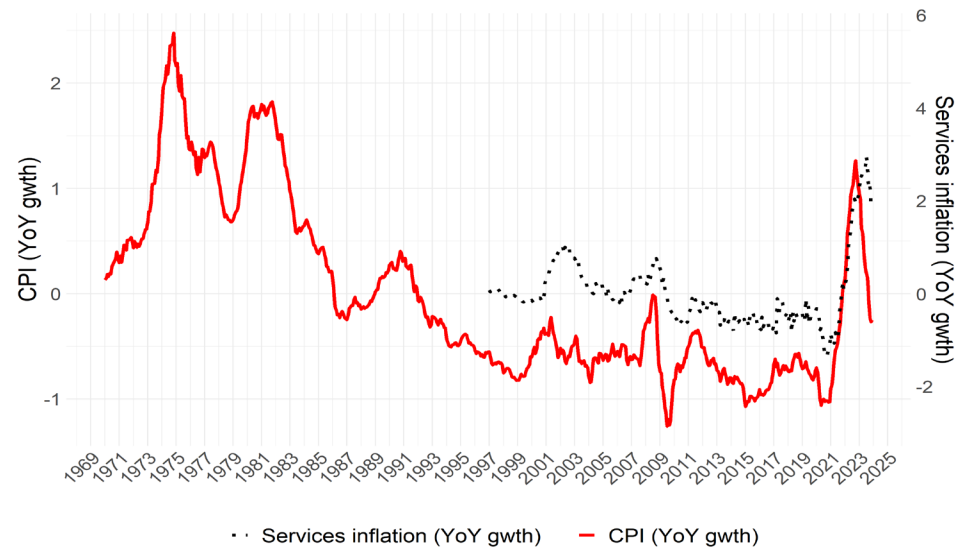

Services inflation (YoY gwth) —— CPI (YoY gwth)

Sources: Office for National Statistics (ONS). Frequency: monthly.

Chart 4

Global CPI inflation and Euro-area Service Inflation

Principal Components

Services inflation (YoY gwth) —— CPI (YoY gwth)

Sources: Haver Analytics (CPI); Eurostat (service inflation). Frequencies: monthly. Countries: all listed in footnote 2 of the main text (CPI); all Euro-area countries (service inflation).
Notes: Variables are demeaned and standardized before extracting principal components, which implies that the only interpretation of the vertical axis is above average for values above zero and below average for values below zero.

4 Fiscal Policy and the fiscal-monetary mix

In the last part of my discussion, I want to move to the "ugly" elephant: fiscal policy. I dub it as "ugly" for two main reasons: (i) it depends on the mix of the fiscal and monetary regimes, and therefore it is at least partially out of the reach of central banks' actions; (ii) there seems to be little quantification available in the literature of its possible contribution to the latest inflation scare, especially in the Euro-area. I will start with some reduced-form international evidence that follows the statistical model I have used in the rest of my discussion, and then I will move to some causal evidence on the effects of government spending on inflation in the U.S. and its implications for the Euro-area, drawing upon my own research.

4.1 Reduced-form international evidence

In Chart 5, I report the first principal component of GDP growth for all countries over the full-sample as blue solid line and the first principal component of the fiscal surplus/deficit (as a % of GDP) for an unbalanced panel of countries as black dotted line. The GDP falls associated with both the 2007-09 financial crisis and the pandemic recession of 2020 were very large and unprecedented by historical standards. However, Chart 5 shows that the great recession was characterized by a slow recovery that lasted until 2019, when the GDP growth PC finally went back to its sample average. In contrast, the 2020 recession was followed by pent-up demand and the cumulated output loss was much smaller than in the 2007-2019 cycle.

It is interesting to note that both fiscal and monetary policies differed markedly in those two episodes. In the aftermath of the large government spending increase triggered by the great financial crisis, several governments around the advanced world embraces the fiscal austerity mantra. This proved to be recessionary and slowed down the recovery. Furthermore, the large liquidity injection orchestrated by most central banks under the heading of quantitative easing were, at least in their first phases, targeted to recapitalize banks rather than expand credit. In other words, neither fiscal policy (because of austerity) nor monetary policy (because of banks' recapitalization) made a significant contribution, if any, to aggregate demand in the aftermath of the great recession of 2007-09, which in turn resulted in a slow recovery and little inflation (see Chart 6).

In contrast, in the aftermath of the global pandemic and of the energy price spike associated with the Russian invasion of Ukraine, not only fiscal deficits were cumulatively larger than during the great financial crisis, but many governments were pumping money into the economy directly to households and firms, in the form of subsidies to energy and wage bills (e.g. furlough schemes). Against this backdrop, the reverse in the fiscal deficit-to-GDP ratio of 2021-24 was driven by an increase in the denominator (because of pent-up demand and the fast recovery) rather than by a decrease in the numerator (there have been literally no talk –let alone sign-- of austerity). Meanwhile, central banks have focused on making significantly more funds available for lending to firms and households while intervening much less in government bonds market than in the aftermath of the financial crisis or the

European sovereign crisis. In other words, the difference in the policy mix of fiscal and monetary regimes between 2009-2019 and 2021-2024 might not only explain why aggregate demand was much more resilient and the recovery faster this time around but might have also contributed to the post-pandemic inflation scare visible in Chart 6, over and above the cost pressures associated with the energy price spikes and the supply chain disruptions.

Chart 5

Global GDP growth and Global Fiscal Deficit (% GDP)
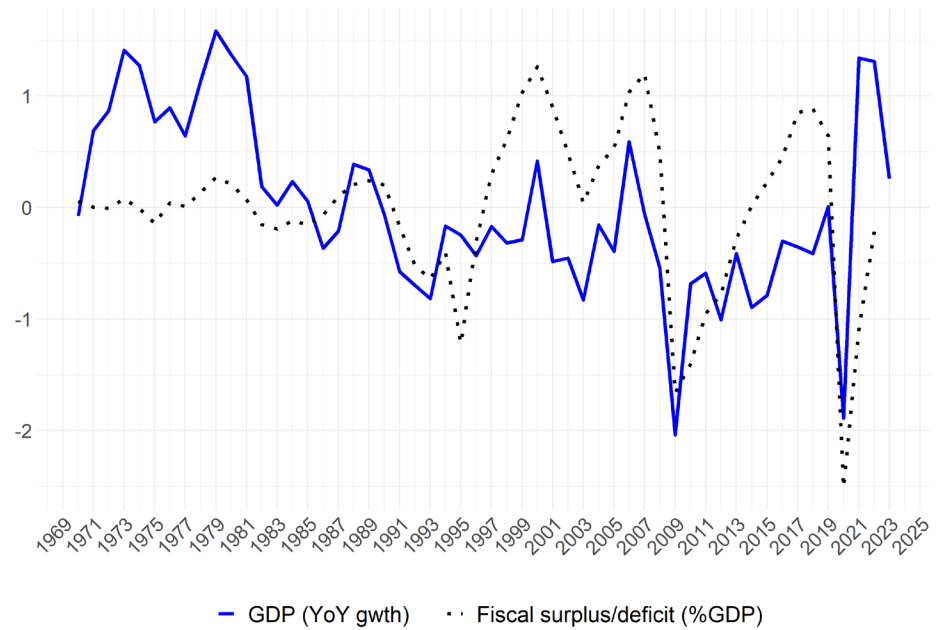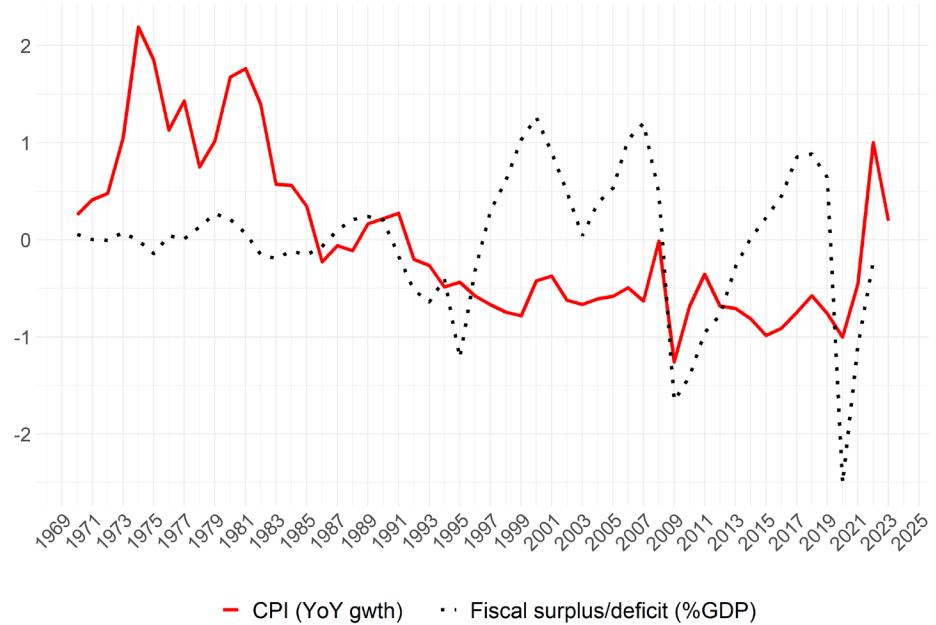
Principal Components

GDP (YoY gwth) ···· Fiscal surplus/deficit (%GDP)

Chart 6

Global CPI Inflation and Global Fiscal Deficit (% GDP)

Principal Components

CPI (YoY gwth) ·· Fiscal surplus/deficit (%GDP)

Sources: Haver Analytics (CPI); Eurostat (service inflation). Frequencies: monthly (CPI); yearly (fiscal surplus/deficit). Countries: all listed in footnote 2 of the main text (CPI); Australia, Belgium, Canada, Denmark, Finland, France, Germany, Italy, Japan, Netherlands, U.K. and U.S. (fiscal surplus/deficit).
Notes: Variables are demeaned and standardized before extracting principal components, which implies that the only interpretation of the vertical axis is above average for values above zero and below average for values below zero.

4.2   Structural evidence for the U.S.: lessons for the EA

The evidence in the previous section is reduced-form and therefore only suggestive. In this section, I will try to distinguish correlation from causation by drawing on a recent paper of mine about the long-run effects of government spending in the United States over a long historical period: 1890Q1-2015Q4. That research relies on the military spending news series constructed by Ramey and Zubairy (2018) as an instrument to identify exogenous variation in U.S. government spending. As argued by Hall and Sargent (2022), the fiscal response of the U.S. government to Covid was comparable to those during WWI and WWII along at least two main dimensions: (i) the increase in government spending was extremely large by any historical standard, both in absolute value and as share of GDP; (ii) it was mostly financed by borrowing through a sequence of fiscal deficits rather than by raising taxes. Hall and Sargent (2022) go as far as referring to Covid as WWIII, at least judging from the fiscal response it generated.

In Chart 7, I report the results from the Bayesian VAR with sixty lags proposed by Antolin-Diaz and Surico (2024), using the same seven variable dataset in Ramey and Zubairy (2018). This includes the time series of their military spending news, government spending, GDP, GDP deflator, a short-term interest rate, government debt to GDP ratio and fiscal surplus/deficit as share of GDP. All variables in level are expressed in log, real and per-capita terms. As argued by Antolin-Diaz and Surico

(2024), a generous lag length selection is crucial to identify long-run effects in VAR analyses. Finally, the inclusion of a short-term rate is important to control for the response of the monetary authorities.

The government spending shock is identified using a Choleski factorization, where the military spending news instrument of Ramey and Zubairy (2018) is ordered first; this approach has been popularized under the name of VAR with an external instrument. All panels below report the response of an endogenous variable in the VAR to a military spending news shock that increases government spending by 1% of GDP during the first year after the shock. In Chart 7, we formally confirm the observation in Hall and Sargent (2022) that military spending is typically associated with large and persistent surges in government spending (left panel), which are funded by running large and equally persistent (around four years) fiscal deficits (as a share of GDP in the right panel).

Chart 7
The Effects of Government Spending on Fiscal variables in the U.S.: 1890-2015
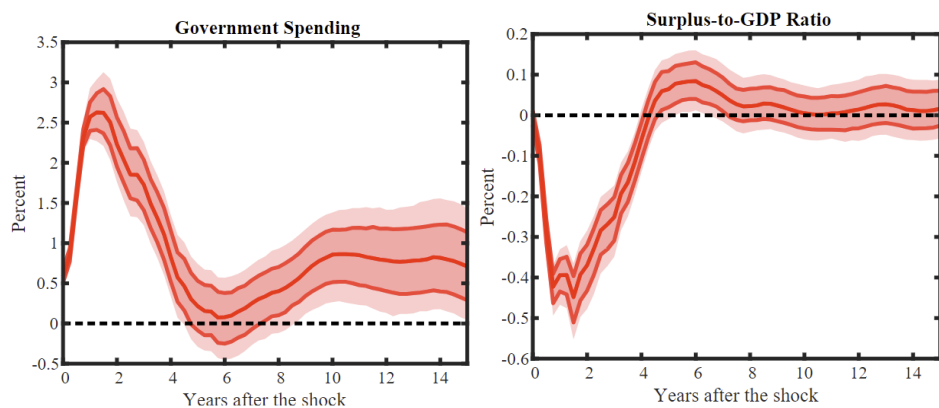
(% change relative to pre-shock level)

Sources: Antolin-Diaz, J. and P. Surico, (2024), "The Long-Run Effects of Government Spending", American Economic Review, forthcoming.
Notes: impulse response function of government spending and fiscal surplus/deficit (as % of GDP) to a Ramey-Zubairy's military spending news that increase government spending by 1% of GDP in the first year after the shock.

In Chart 8, I display the responses of real GDP per-capita (left panel) and the GDP deflator (right panel) to the government spending shock described above. The dynamic effects of government spending on GDP are the main result in Antolin-Diaz and Surico (2024): in the short-run, military spending shifts the composition of government outlays towards public consumption and public investment, whereas in the medium to long-run the composition of public spending is dramatically tilted towards government R&D. The latter drives a medium-term increase in innovation (as measured by patents), which leads to long-lasting effects on productivity first and then on GDP and consumption. In other words, a surge in public consumption (and to a lesser extent public investment) is responsible for the first hump of the GDP response in the short-term whereas the very significant increase in government R&D (and to a lesser extent public investment) is responsible for the second hump over the medium-run (see Antolin-Diaz and Surico, 2024).

The right panel of Chart 8 reports the response of the log of the GDP deflator. So, the slope of that impulse response measures the effects of government spending on inflation. The main result of this exercise is that during the first four years after the shock --when both government spending and GDP are significantly above their sample average (see left panel of Charts 7 and 8)— inflation goes up by 0.6% following an increase in public spending by 1% of GDP.

We can now use this elasticity to provide some back-of-the-envelope calculations for the contribution of fiscal policy to inflation in the Euro-area. During 2020, public spending in the Euro-area as a whole increased by about 6.5% of Euro area GDP, before reverting significantly after about two years. According to the estimates for the U.S. in Antolin-Diaz and Surico (2024), the surge in Euro-area public spending in 2020 is likely to have contributed 3.9% (=0.6*6.5) to the Euro-area inflation spike of about 10% in the late 2022-early 2023, with confidence bands between 2.6%(=0.4*6.5) and 5.2%(=0.8*6.5). Using a very different methodology and exploiting only cross-sectional variation for 37 OECD countries over the period 2020-22, Barro and Bianchi (2023) produce estimates in the same ballpark.

Chart 8

The Effects of Government Spending on Inflation and Output in the U.S.: 1890-2015
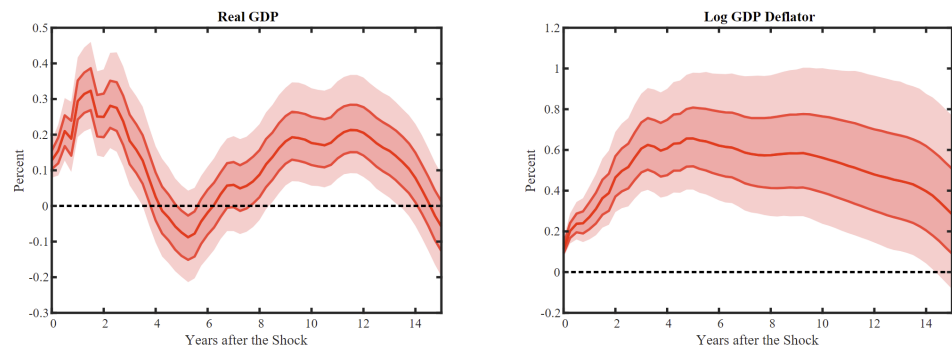
(% change relative to pre-shock level)

Sources: Antolin-Diaz, J. and P. Surico, (2024), "The Long-Run Effects of Government Spending", American Economic Review, forthcoming.
Notes: impulse response function of real GDP per capita and the log GDP deflator to a Ramey-Zubairy's military spending news that increase government spending by 1% of GDP in the first year after the shock.

But there is another fascinating lesson from Chart 8 that goes to the heart of the current discussion on the relative contribution of demand versus supply shocks during the post-pandemic years. Four years after the shock, when GDP has gone back to its pre-shock level, inflation stabilizes at zero for a few years. And, when GDP peaks up again in the left panel eight years after the shock, the price level reverts its tendency and the economy experience deflation. In other words, when public spending is dominated by government consumption (during first four years after the shock), output and inflation move in the same direction, or to use the most popular jargon in the macro literature, government spending looks like a demand shock. But when government spending shifts significantly its composition towards R&D, then output and inflation move in opposite direction over the medium-term, or to use again the most popular jargon in the macro literature, government spending looks like a supply shock.

To the extent that the fiscal response to Covid is comparable to the government response to world wars (as argued by Hall and Sargent, 2022), the findings reported in Chart 8 suggests two conclusions about the post-pandemic inflation. First, whether government spending is best described as demand or supply shock depends, profoundly, on its composition: whenever the share of public consumption becomes relative larger, it looks like a demand shock; but whenever the share of public R&D becomes relative larger, it looks like a supply shock.[3] Second, any attempt to look at the current inflation episodes (and possibly others) through the lenses of a demand shock-supply shock decomposition (as opposed to focussing on the underlying mechanism that drives inflation and productivity at different horizons), it is likely to blur, if not obscure, the identification of the underlying shock, whose effects can be arbitrarily assigned to demand or supply depending on specific (and often arbitrary) choices of the horizon, country and sample of interest. From this point of view, it is possibly not surprising that four years since the global pandemic struck, the dust has not yet settled on the controversy of whether the 2020-24 cycle is best described as driven by demand or supply shocks.

As a matter of fact, in each historical episodes over the past 125 years, government spending in the U.S. (and probably in most advanced economies) has never been entirely focused on consumption, investment or R&D only, in any single episode. Rather, increases in public spending have always been a combination of these three categories, with the mix significantly changing over time. As for policy implications, this result on the composition of fiscal policy suggests that whenever the government spending mix is tilted more towards government consumption, central banks may face an incentive to tighten monetary policy by more. In contrast, whenever the government spending mix is shifted more towards public R&D (i.e. there is a much smaller but still non-negligible public consumption component) then interest rates may need to be raised by less, if at all (i.e. depending on the specific composition of public spending in each particular episode).

5   Conclusions

Seeing the economy through the lens of demand and supply shocks has been an extremely useful device not only to organize our thoughts around important historical episodes but also as an effective communication tool to explain the public and non-practitioners the trade-offs faced by policy makers, and central banks in particular. But at times in which the underlying shocks cut across demand and supply as well as change their nature and transmission over the short- and medium-term, perhaps that very same optical black-box device of demand and supply shocks may turn users blind as in the elephant parable.

My reading of the pandemic recession, the inflation scare that followed and the rate cycle of 2020-24 is that these events may be best summarized by an unusual combination of multiple factors, blended around: (i) two major commodity price

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[3]   The response of monetary policy adds an additional layer of complication in interpreting government spending as either a demand or a supply shock, depending on whether the central bank decides to accommodate or fight the inflation surge.

surges and supply chain disruptions, (ii) a relative price effect across sectors, and (iii) an accommodative fiscal-monetary regimes mix. I have argued that at least two of these three elements are likely to represent a complex combination of what in the current jargon of macroeconomics would be dubbed as demand and supply shocks, with very heterogenous effects over the short- and the medium-term.

The bad news from the argument developed in this discussion is that identification efforts aimed to establish the relative importance of demand versus supply shocks in a cycle like the 2020-24 are likely to be inclusive. Indeed, this may explain the lack of consensus in most recent studies, which reach different conclusions depending on slightly different identifying assumptions on the correlation between inflation and output at different horizons across different countries. The good news, however, is that –once we focus on understanding the underlying sources of propagation-- the divide between demand and supply shocks may not matter after all!

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