# What's up with Inflation and the Business Cycle after the COVID-19 Shock?*

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### Abstract

We track the propagation of the Covid shock through the US economy, comparing it to the typical business cycles of the last three decades. We pay particular attention to the dynamics of inflation, because they are especially informative about the relative importance of supply and demand disturbances in the pandemic.

## 1  Learning about Business Cycles from the COVID-19 Shock

The COVID-19 outbreak is wreaking havoc on the global economy. The pandemic has unleashed a very unusual combination of large demand and supply disturbances that might propagate through the economy differently from typical business cycles. But will they? The objective of this note, which we are planning to update regularly as new data are released, is to address this question in real time. We will do so by tracking the post-Covid evolution of key U.S. macroeconomic variables, and by comparing it to their expected dynamics based on a VAR estimated

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on pre-Covid data. To control for the size and anticipated duration of the current recession, we condition these projections on the consensus future path of unemployment from the Survey of Professional Forecasters (SPF), as a comprehensive single indicator of the state of the business cycle. Essentially, we aim to examine whether macro variables behave as they usually do, after conditioning on a realistic expected path of unemployment—a path that may well be different from that of other recessions, given the peculiarities of the current shock.

We pay particular attention to the dynamics of inflation, because they are especially informative about the relative importance of supply and demand disturbances when quantities are falling. For instance, if inflation substantially exceeded our conditional forecast over the next few quarters, we would conclude that the pandemic is mostly disrupting supply rather than reducing demand. Of course the Covid shock might not only be a different mix of disturbances from those in previous business cycles, but it might also trasmit differently from them. For example, our VAR conditional forecasts are consistent with an important stylized fact of U.S. inflation in the last 30 years: its response to the business cycle has been muted, compared to the pre-1990 period—a phenomenon that Del Negro et al. (2020) attribute mainly to a flattening of the structural Phillips curve. Given this ovservation, if post Covid inflation were to fall more sharply than in our conditional forecasts, we would conclude not only that the Covid shock is mostly affecting demand, but also that it is transmitting through a steeper Phillips curve.[1]

## 2  The Forecasting-and-Tracking Exercise

We forecast the behavior of inflation and other U.S. macro variables by means ofthe VAR used in section 3 of Del Negro et al. (2020). The VAR includes the following quarterly variables: (i) *unemployment*, measured by the civilian unemployment rate; (ii) *natural unemployment*, measured by the CBO estimate; (iii) *core inflation*, measured by the annualized quarterly growth rate of the Personal Consumption Expenditures price index, excluding food and energy; (iv) *inflation*, measured by the annualized quarterly growth rate of the GDP deflator; (v) *real GDP*, measured by the logarithm of per-capita real GDP; (vi) *hours*, measured by the logarithm of per-capita hours worked in the total economy; (vii) *wage inflation*, measured by the annualized quarterly growth rate of the employment cost index (wages and salaries of all workers in private industries, ECI);[2]

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[1]As for the inflation data, it is important to aknowledge that some prices might be subject to severe measurement issues during the pandemic.

[2]This wage inflation series based on the ECI is different, but better than the one used in the baseline model of Del Negro et al. (2020). In that paper, we could not use it because it is not avaliable for the pre-1990 period, which was

and (viii) the *labor share*, measured by the logarithm of the share of labor compensation in GDP.

The estimation sample goes from 1989:Q1 to 2019:Q4, the period over which our earlier work found a muted response of inflation to business cycles. The VAR includes 4 lags and it is estimated with Bayesian methods and a standard Minnesota prior, given the relatively high number of variables and short sample size. The tightness of the prior is chosen based on the data-driven approach of Giannone et al. (2015).

The forecasts are computed based on the joint distribution of the variables implied by the estimated model, conditional on a future path for unemployment. In our baseline scenario, this path is the median SPF prediction for the next three years, as plotted in the first panel of figure 1. The other panels in the figure report the conditional forecasts of real GDP, unit labor costs, wage inflation and two measures of price inflation. According to the consensus SPF projections, unemployment will peak around 16 percent in 2020:Q2 and then decline below 9 percent by the middle of next year. Given this unemployment path, the VAR implies that real GDP will fall about 10 percent below its 2019:Q4 level in 2020:Q2, and then recover only gradually.

As discussed in Del Negro et al. (2020), the VAR suggests that the wage Phillips curve remains active. This is reflected in the response of wage inflation (notice that the figure plots the response of year-on-year wage inflation) and the labor share, which are both projected to fall. Taking uncertainty into account, we would say that a sustained *rise* in the labor share and/or wage inflation would suggest substantially different dynamics for the Covid shock relative to past business cycles.

In terms of inflation, Del Negro et al. (2020) argue that business cycles over the past 30 years have been largely driven by demand shocks. As mentioned before, they also argue that the price Phillips curve has become very flat. Taken together, these two observations imply that, if this shock is "business cycles as usual," inflation will decline, but only gradually and mildly—at least relative to the size of the shock—over the next two years. Year-on-year core PCE inflation will reach a trough of about zero by 2022. A sustained rise of inflation well above 2 percent in the medium run, or a substantial decline into deflationary territory (at or below -2 percent) would suggest very different dynamic responses of inflation relative to those of the 1990-2019 period reported in Del Negro et al. (2020).

Figure 2 and 3 repeat the same exercise as before, but under more optimistic and pessimistic projections for the path of unemployment. For the brighter scenario, we pick the 25$^{th}$ percentile
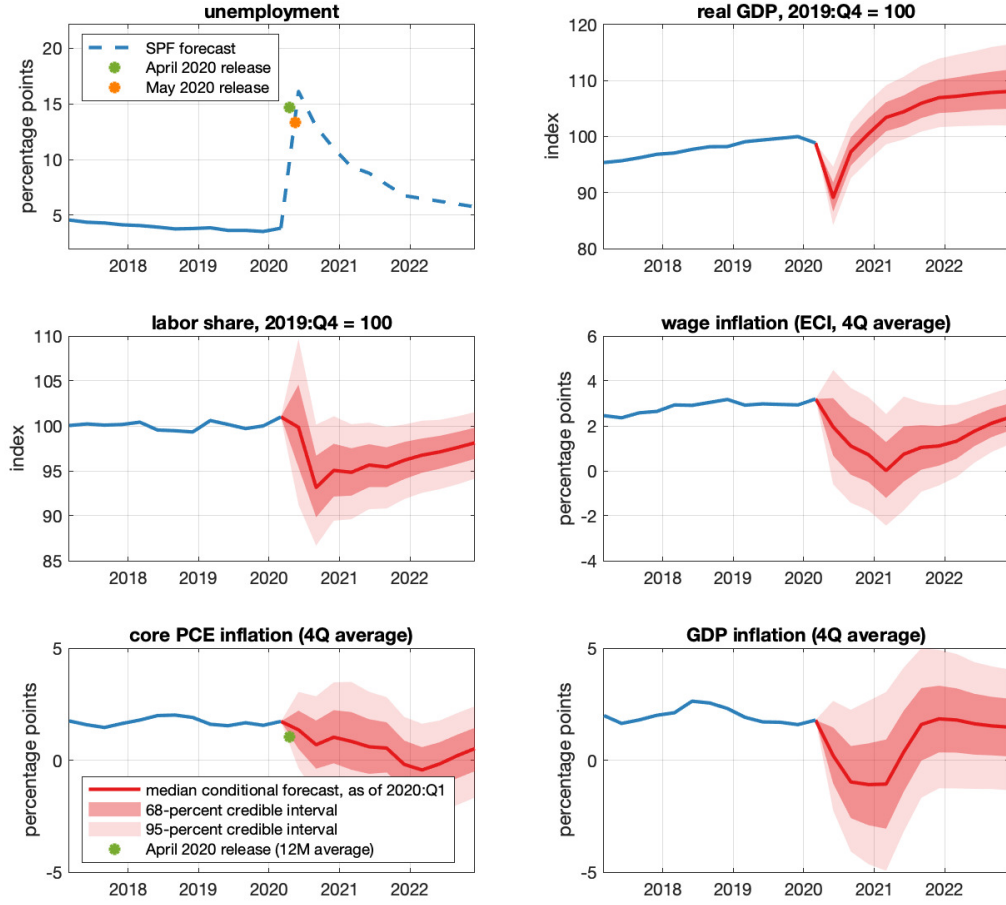
needed for our analysis.

**Figure 1:** Response of GDP, unit labor costs and wage, core PCE and GDP deflator inflation, conditional on unemployment following the path in the first subplot, which represents the the median SPF projection. These responses are computed using the baseline VAR of section 2, estimated using data from 1989:Q1 to 2019:Q4.

of the cross-sectional distribution of the individual SPF forecasts, which has the property of being approximately in line with the April and May data releases of unemployment. Under this scenario, the response of the other variables is milder than in the baseline, although not by much. As for the gloomier scenario, we pick the 75$^{\text{th}}$ percentile of the cross-sectional distribution of the individual SPF forecasts, which projects the unemployment rate above 15 percent in the current and the next quarter, falling to about 11 percent by mid-2021. In this case, the response of the other variables is of course a bit stronger. The VAR would predict the labor share to fall more significantly, and wage inflation to decline in negative territory. Given the magnitude and the persistence of the shock under this scenario, the response of inflation is still relatively subdued, although both core PCE and GDP deflator inflation would be likely to fall into negative territory.

## References

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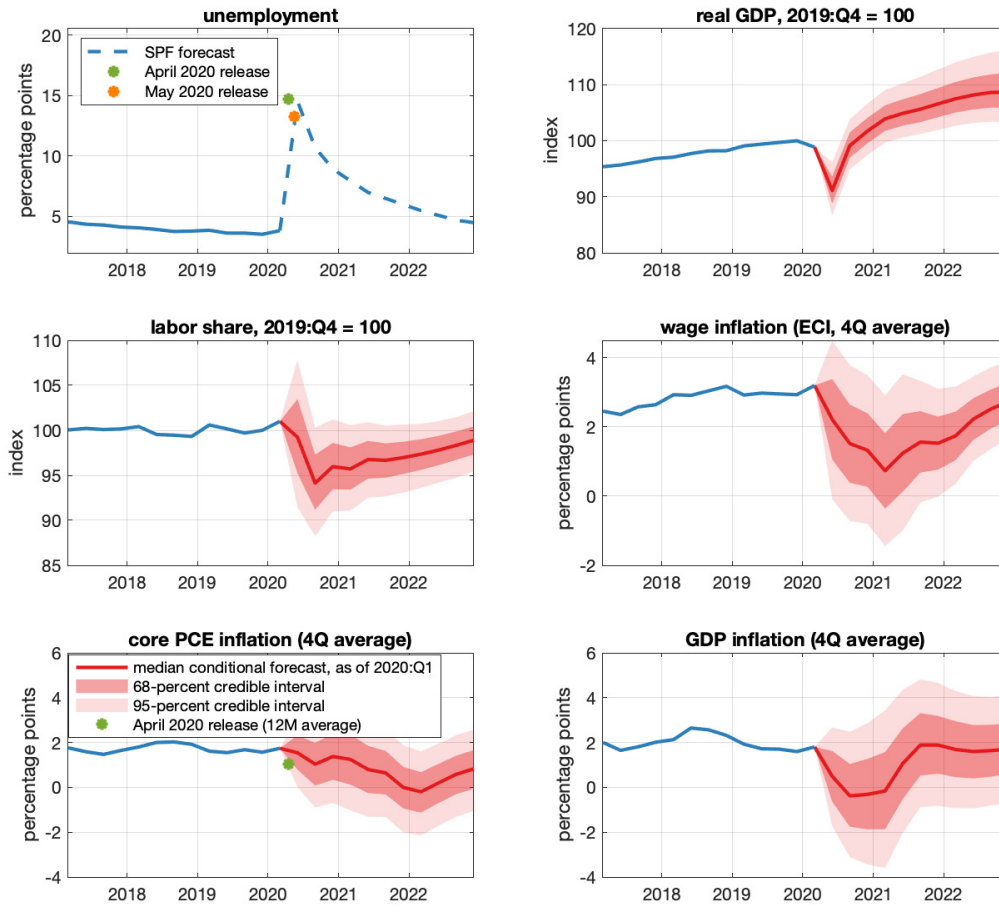
**Figure 2:** Response of GDP, unit labor costs and wage, core PCE and GDP deflator inflation, conditional on unemployment following the path in the first subplot, which represents the 25th percentile of the distribution of SPF projections. These responses are computed using the baseline VAR of section 2, estimated using data from 1989:Q1 to 2019:Q4.
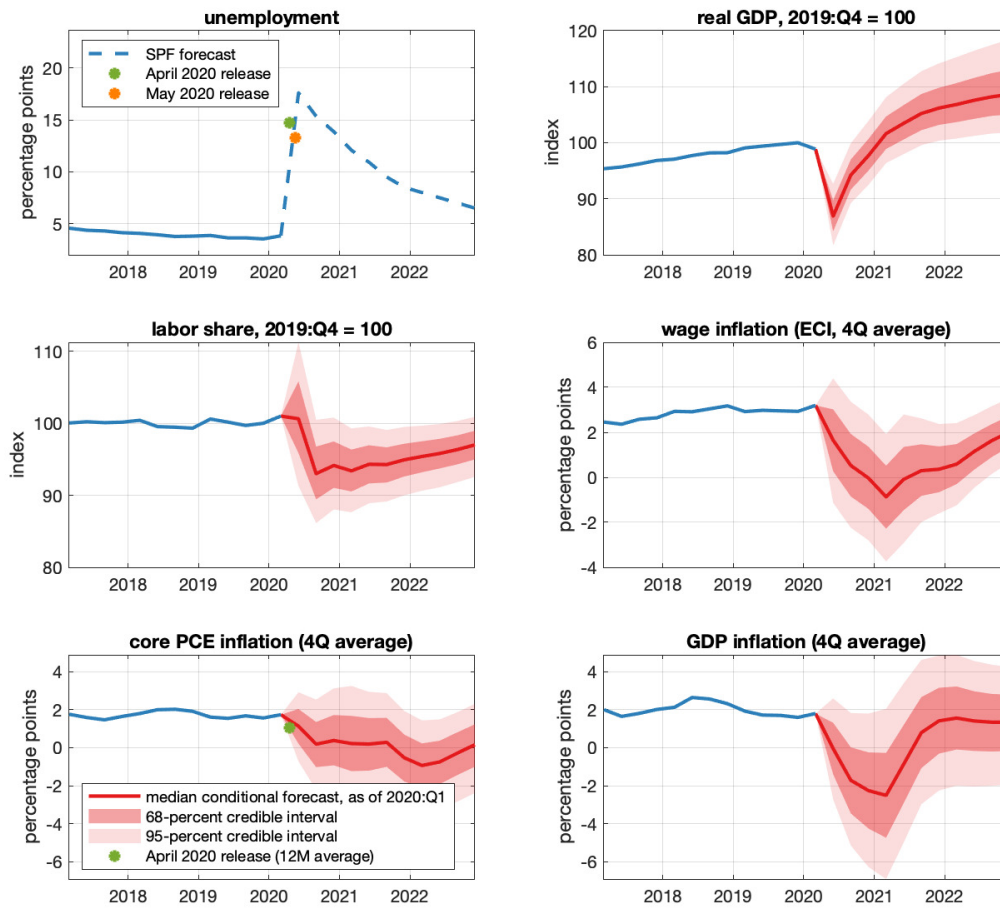
**Figure 3:** Response of GDP, unit labor costs and wage, core PCE and GDP deflator inflation, conditional on unemployment following the path in the first subplot, which represents the 75th percentile of the distribution of SPF projections. These responses are computed using the baseline VAR of section 2, estimated using data from 1989:Q1 to 2019:Q4.