

## Economic Brief

August 2021, No. 21-25

# How Much Does Household Consumption Impact Business Cycles?

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We identify shocks to household consumption using cross-sectoral information. We find that those shocks have accounted for close to 40 percent of pre-pandemic business cycle fluctuations in the U.S. Such shocks have the characteristics of demand shocks: They increase (or decrease) output, inflation and interest rates. The results imply that one might be able to significantly stabilize business cycles by stabilizing consumption fluctuations.

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Household consumption is the largest expenditure component of GDP. Accordingly, policymakers and business economists pay a great deal of attention to its ebbs and flows. So when recessions hit, it isn't surprising that such attention translates into policy in the form of tax rebates or other transfers to stimulate consumption, as was the case in 2001 and 2008/2009.

Most recently, the large cash transfers to families mandated by the American Rescue Plan Act have generated debate on whether they would be too stimulative and "overheat" the economy. Despite the attention of policymakers, until recently, macroeconomic theory has mostly not considered household consumption as an independent driver of economic fluctuations.<sup>1</sup>

## Drivers of Business Cycles

Fluctuations in household demand as an important source of business cycles gained prominence after the 2007-09 recession.<sup>2</sup> Newly available evidence suggested that steeply declining housing prices led to destruction of household wealth and reduced consumption.<sup>3</sup>

Even then, debate remained over the extent to which the household demand channel was the most relevant one, as compared to losses of collateral for entrepreneurs and general curtailment of credit by the banking system.<sup>4</sup>

In our recently updated paper, "[The Consumption Origins of Business Cycles: Lessons from Sectoral Dynamics](#)," we use information available in the cross-section of industries to provide evidence that macroeconomic disturbances (or "shocks") that initially impacted household consumption were a key driver of GDP contractions and expansions prior to the pandemic. Apart from a loss of housing wealth that mainly affects consumption, such shocks might include fluctuations in consumer sentiments, consumer credit access or employment uncertainty. In our study, we find that such shocks combine to account for as much as 40 percent of output fluctuations since the mid-1970s.

We also find that those shocks behave like prototypical "demand" shocks, impacting not only aggregate consumption and output, but also inflation and interest rates. At the same time, consumption shocks had little impact on corporate credit spreads and measured total factor productivity, implying that they are distinct from shocks to corporate credit or productivity.

## **How We Examined Effects of Household Consumption Shocks**

To identify how shocks to consumption impact business cycles, we use information available in the cross-section of industries. Intuitively, a negative shock to household consumption should have most of its initial impact on sectors heavily oriented toward consumer goods production (such as the apparel sector), rather than on sectors also geared toward businesses (such as the software sector). Also, being demand shocks, they should lead to greater price changes in those consumption-oriented sectors.<sup>5</sup>

The strategy we use is designed to avoid a few potential pitfalls.

### *Sector Sensitivity*

The sensitivity of different sectoral prices and quantities to shocks is measured relative to their sensitivity to all shocks. This ensures that our methodology does not capture just the greater cyclical sensitivity of durable or luxury goods but also the increased sensitivity of particular sectors to particular business cycle shocks.

### *Categorizing Shocks*

Our procedure identifies shocks correctly even if there are other shocks that may have similar sectoral impact. For example, a generalized shock to the financial sector would affect household consumption as well as financing to firms. Our methodology allows us to exclude such possibilities through the common assumption that, being exogenous, the time-series behavior of different shocks is uncorrelated.

We further sharpen our results by explicitly identifying other candidate drivers of economic fluctuations using analogous schemes. Thus, for example, shocks to technological progress affects sectors that are more intensive in research and development, shocks to government

expenditures affects mostly those that sell most of their output to the government, and so on.

### *Using Multiple Assumptions and Averaging the Results*

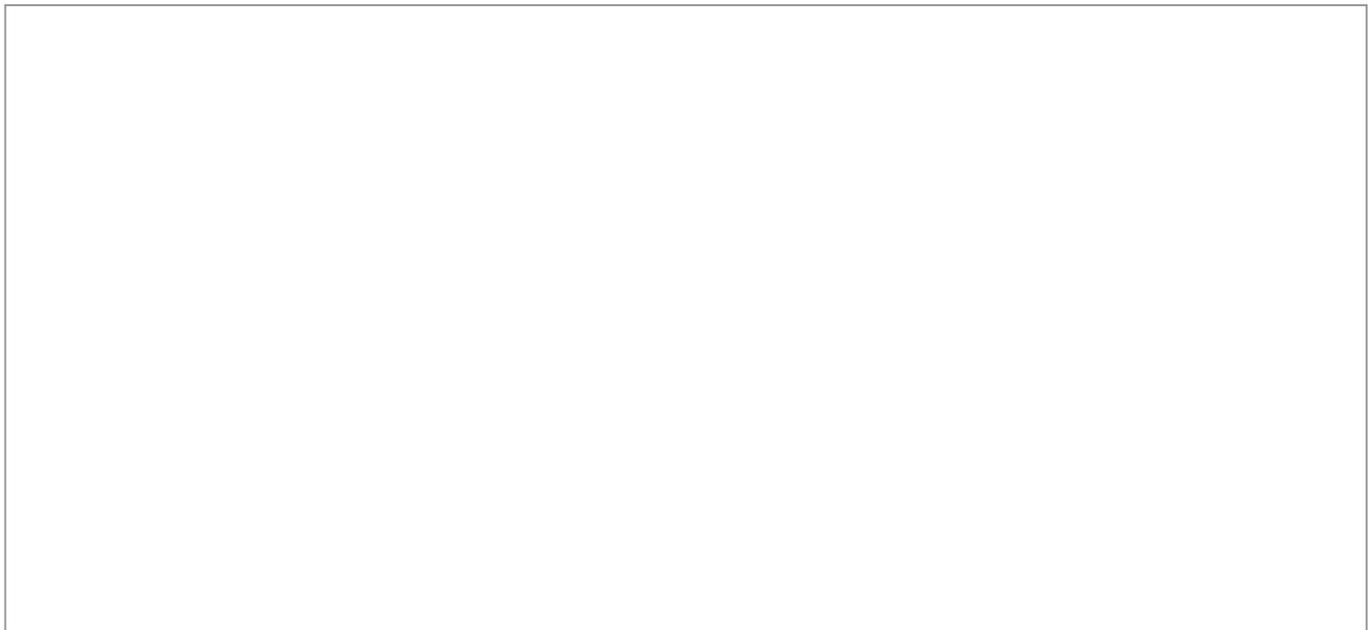
Our methodology explicitly considers that our identification assumption is imprecise and incorporates the resulting uncertainty in our estimation procedure. For example, a consumption shock may affect sectors differentially depending on their precise position on production networks.

We accommodate the possibility of model misspecification by identifying the consumption shock several times. In each case, we impose an identification assumption that is a little bit different from our preferred one. Our results are then (weighted) averages of those possibilities, and we describe the uncertainty surrounding those results incorporating those variants. (Said another way, we imposed our identification assumptions through Bayesian priors.) Because we use extensive cross-sectoral data, we can obtain fairly precise estimates.

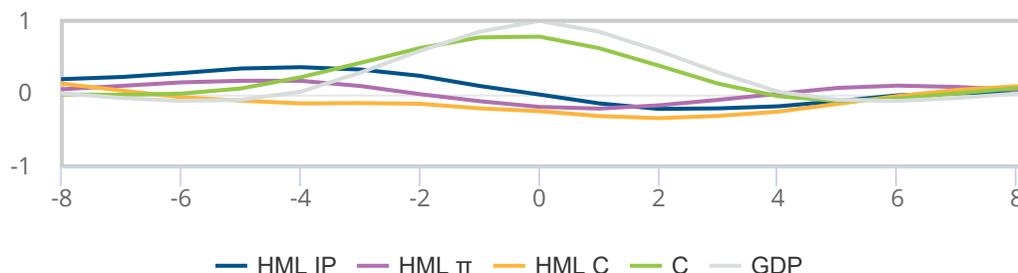
## **Correlations with GDP**

Figure 1 below validates our identification assumptions. It shows the correlation between various time-series and leads and lags of GDP:

- The gray line shows the autocorrelations for GDP. Its value is 1 at 0 lags and declines symmetrically around it.
- C shows consumption as measured by BEA aggregate consumption.
- HML IP shows the difference between high and low consumption share sectors in the FRB Industrial Production Index. HML  $\pi$  and HML C show the same difference for inflation and consumption growth among Bureau of Economic Analysis personal consumption expenditure categories, respectively.



**Figure 1: Correlation with Lags of GDP**



**Source:** Christian Matthes and Felipe Schwartzman, "The Consumption Origins of Business Cycles: Lessons from Sectoral Dynamics," Federal Reserve Bank of Richmond Working Paper No. 19-09, June 24, 2021.

**Notes:** The horizontal axis refers to the quarterly lag of GDP with negative numbers corresponding to leads. HML IP is the difference between high and low consumption share sectors in the Federal Reserve Board's Industrial Production Index. HML  $\pi$  and HML C refer to the same difference for inflation and consumption growth among BEA personal consumption expenditure categories.

The correlation of consumption with GDP is larger for negative lags, indicating that consumption precedes GDP fluctuations. The relationship is even more pronounced if we focus instead on the difference between high and low consumption-share sectors. Relative increases in the production or prices of sectors with high consumption shares tend to be most correlated with output one year afterwards.

## Impacts of Shocks on Output Fluctuations

We find that shocks originating in household consumption demand account for close to 40 percent of output fluctuations at business cycle frequencies. In comparison, we find that shocks to corporate credit account for 18 percent of output fluctuations, shocks to government consumption account for 14 percent and shocks to energy account for 11 percent. Monetary and technology shocks have the smallest impacts at 5.6 percent and 7.5 percent, respectively.

As mentioned above, household consumption shocks affect the economy in the way that one might expect aggregate demand shocks to do. We measure the responses to a one-standard deviation shock in several areas. We find that output, inflation and interest rates increase on impact, while total factor productivity, government spending and credit spreads do not. The impact on output, inflation and interest rates is persistent, lasting for more than two years and beyond.

How should we interpret the estimated household consumption shocks? We compare the time-path of the consumption shock inferred through our method with other time series that were not used in estimation.

Figure 2 shows how the consumption shock correlates with the household wealth of the bottom 90 percent of the wealth distribution.<sup>6</sup> The two series correlate well, especially after the late 1990s and very strongly around the 2007-09 recession.

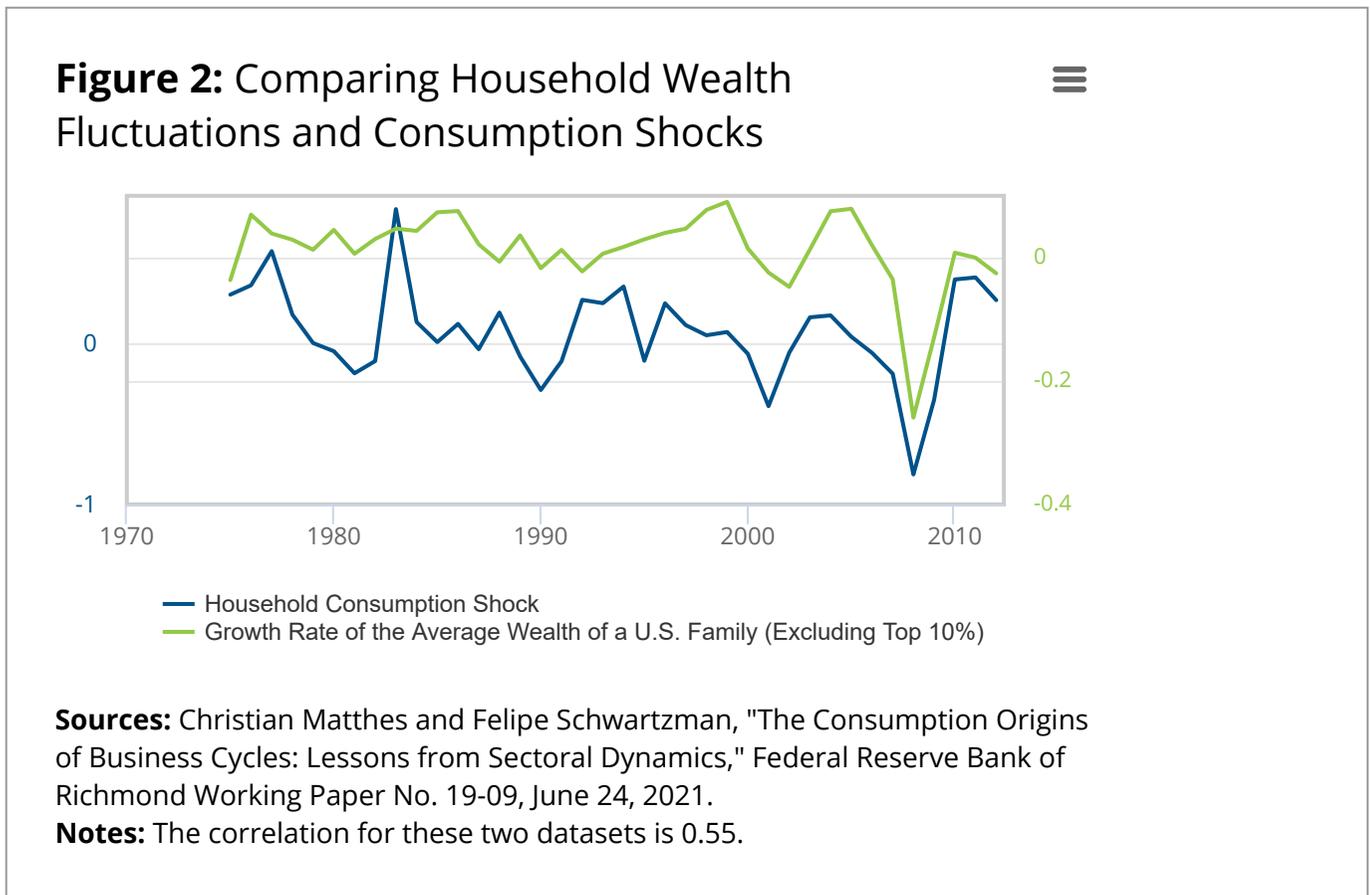
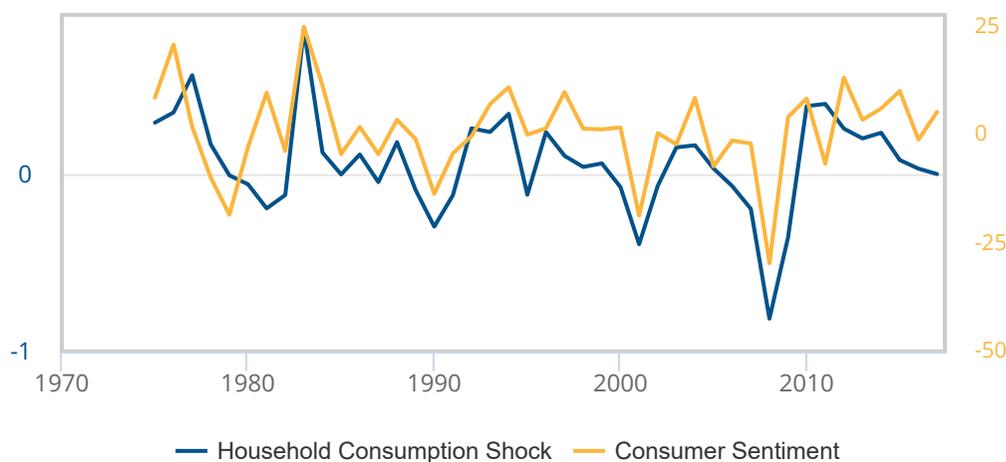


Figure 3 shows the correlation with consumer sentiment, and the correlation is even stronger than with housing wealth. Together, those exercises suggest a role for shocks to both household wealth and consumer sentiment as central driving forces in business cycles.

**Figure 3:** Comparing Consumer Sentiment and Household Consumption Shocks



**Sources:** Christian Matthes and Felipe Schwartzman, "The Consumption Origins of Business Cycles: Lessons from Sectoral Dynamics," Federal Reserve Bank of Richmond Working Paper No. 19-09, June 24, 2021.

**Notes:** The correlation for these two datasets is 0.68.

## Conclusion

As the U.S. economy recovers from the COVID-19 pandemic, debate has emerged around the extent to which unprecedented government assistance might lead to a stronger recovery and inflationary pressures. Our results suggest that shocks that led to increased consumption in the last decades have had such effects and, in fact, have explained a large fraction of business cycle fluctuations in the U.S. More generally, they validate consumption stabilization policies as a useful lever for broader business cycle stabilization.

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<sup>1</sup> At the same time, it has long been recognized that survey measures of consumer "sentiments" — which ask consumers about their perception of current and future economic conditions — are useful metrics for the state of the economy, as explored in the 1995 paper "Consumer Confidence and Economic Fluctuations" by John G. Matsusaka and Argia M. Sbordone. This connection has also been explored in structural work by the 2019 working paper "Survey Data and Subjective Beliefs in Business Cycle Models" by Anmol Bhandari, Jaroslav Borovicka and Paul Ho. Accordingly, in some theories, shocks affecting those sentiments have been elevated to major sources of economic fluctuations, as seen in the 2013 papers "Animal Spirits, Financial Crises and

*Persistent Unemployment*" by Roger E.A. Farmer and "*News or Noise? The Missing Link*" by Ryan Chahrour and Kyle Jurado.

<sup>2</sup> Previously, early theories of business cycles tended to focus on the ebbs and flows of inventories, fixed investment and housing. John Maynard Keynes, for example, famously connected fluctuations to the "animal spirits" of capital investors. Regarding other theories, monetarists focused on the unsteady hand of policymakers, and real business cycle theorists focused on the acceleration or slowing of technological progress.

<sup>3</sup> For example, see my (Felipe's) working paper "*Local Scars of the U.S. Housing Crisis*," co-authored with Saroj Bhattarai and Choongryul Yang.

<sup>4</sup> A 2015 book by Atif Mian and Amir Sufi, "*House of Debt*," argues for the consumption demand channel, whereas a 2015 paper by Manuel Adelino, Antoinette Schoar and Felipe Severino, "*House Prices, Collateral and Self-Employment*," emphasizes the collateral channel as being more important. A 2018 paper by Mark Gertler and Simon Gilchrist, "*What Happened: Financial Factors in the Great Recession*," put greater emphasis on the shortfall of banking credit as captured by higher bond spreads.

<sup>5</sup> The strategy of using information about the different sensitivity of cross-sectional units to a shock to identify it in the time-series follows my (Felipe's) own prior work using a structural model (as seen in my 2014 paper "*Time to Produce and Emerging Market Crises*") and historical narrative (as seen in my 2015 paper "*The Benefits of Commitment to a Currency Peg*" with Scott Fulford). The strategy that we adopt here provides an alternative to those approaches.

<sup>6</sup> The bottom 90 percent of the wealth distribution is as measured by Emmanuel Saez and Gabriel Zucman in their 2016 paper "*Wealth Inequality in the United States Since 1913*."

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