



Why Has Consumption Been So Volatile in the New Millennium?

Yuliya Demyanyk, Dmytro Hryshko, Daniel Kolliner, María Luengo-Prado, and Bent Sørensen

U.S. consumption has gone through steep ups and downs since the turn of the millennium, but the causes of these fluctuations are still imperfectly identified. We describe research that quantifies the relative impact of nine significant determinants of consumption growth. The explanatory power of these factors varies by period, implying that successful modelling of this decade poses many challenges.

Total personal consumption—the sum of what individuals spend on goods and services—constitutes the lion’s share of GDP in the United States. For example, between 2000 and 2014 consumption averaged more than 67 percent of GDP, dwarfing GDP’s other components, such as investment and government purchases. But since 2000, consumption has not grown at a smooth pace; it has seen steep ups and downs. Now more than ever it seems clear that effective economic policy depends on having a better understanding of the factors that cause consumption to grow or decline over the business cycle.

Research and common knowledge indicate that two of the most important explanatory factors of consumption growth are unemployment and debt. However, we know little about the relative importance of these factors even though such knowledge could have important implications for economic policy. For example, if indebtedness explains a large fraction of the variation in consumption, an interest rate policy that lowers debt service may be a powerful stabilizer, but if unemployment is more important for consumption growth, fiscal policy in the form of increased public purchases may be more effective.

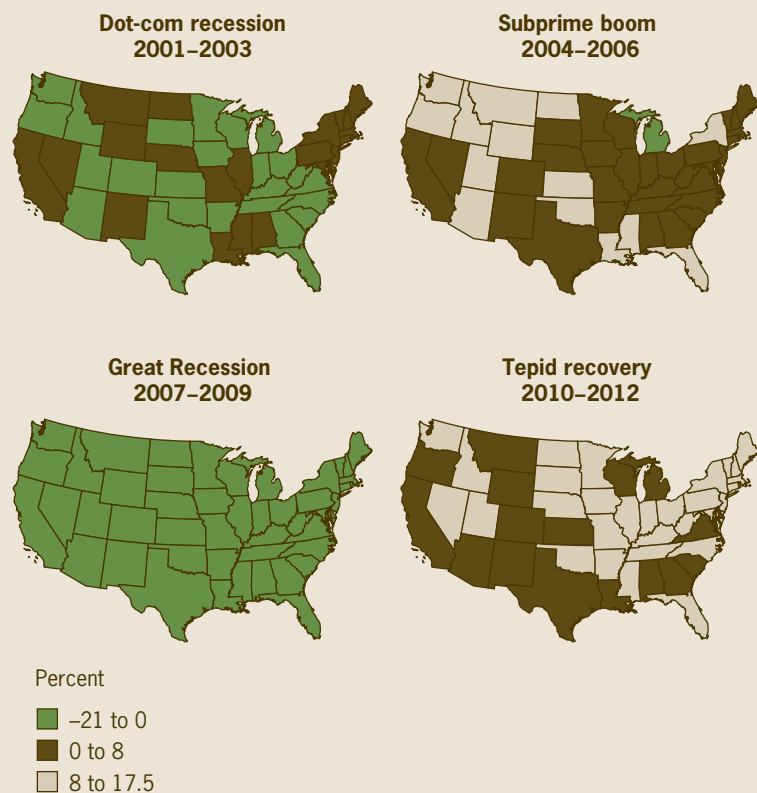
Moreover, unemployment and debt are not the only factors that affect consumption patterns. The economy has faced large variation in an array of other factors since 2000.

Gross housing wealth fell from \$20.7 trillion in 2007 to \$16.4 trillion in 2011 before recovering to \$17.5 trillion in 2012. Foreclosures ballooned from fewer than 800,000 in 2006 to 2.4 million in 2009. Stock market investors lost in excess of a staggering \$5 trillion as the capitalization of the S&P 500 index dropped from about \$13 trillion at the end of 2007 to about \$7.8 trillion at the end of 2008. By the end of 2012, the stock market had recovered almost all lost ground. Consumer confidence about future jobs and income eroded steeply from an index value of 106 in the third quarter of 2007 to an exceptionally pessimistic 30 in the first quarter of 2009, before gradually climbing back to 80 at the end of 2012. With so many factors varying so much, it is a challenge to unravel their relative contributions to consumption growth.

A recent research paper by Demyanyk et al. (2015) studies household consumption of goods and services at the county-level in each of four distinct periods: the “dot-com recession” (2001-2003), the “subprime boom” (2004-2006), the “Great Recession” (2007-2009), and the “tepid recovery” (2010-2012). The authors find that some factors, such as income growth and unemployment, had a fairly stable impact on consumption growth across all periods, while the impact of other factors varied quite a bit across periods.

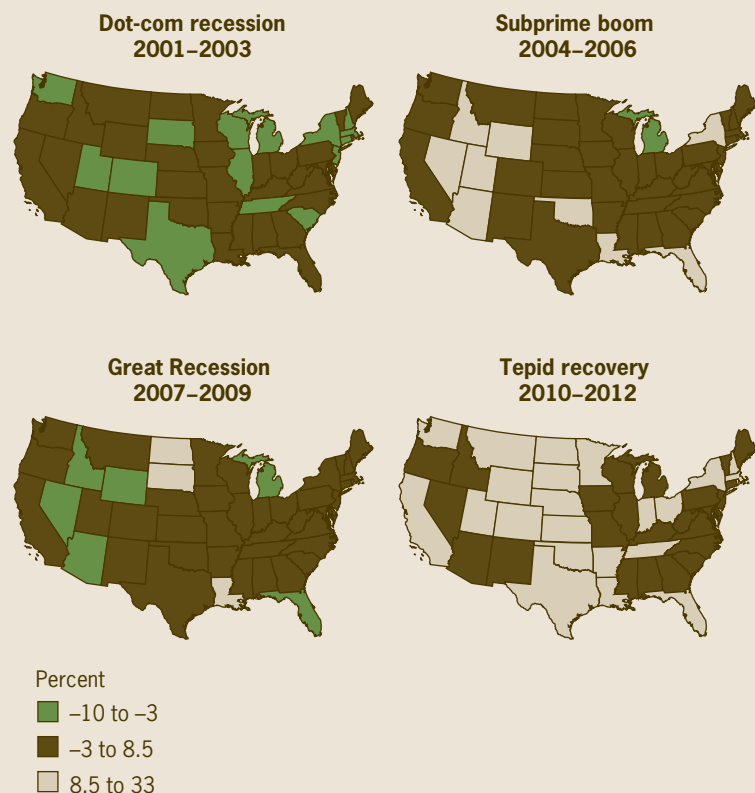


Figure 1A. Real Per Capita Consumption Growth



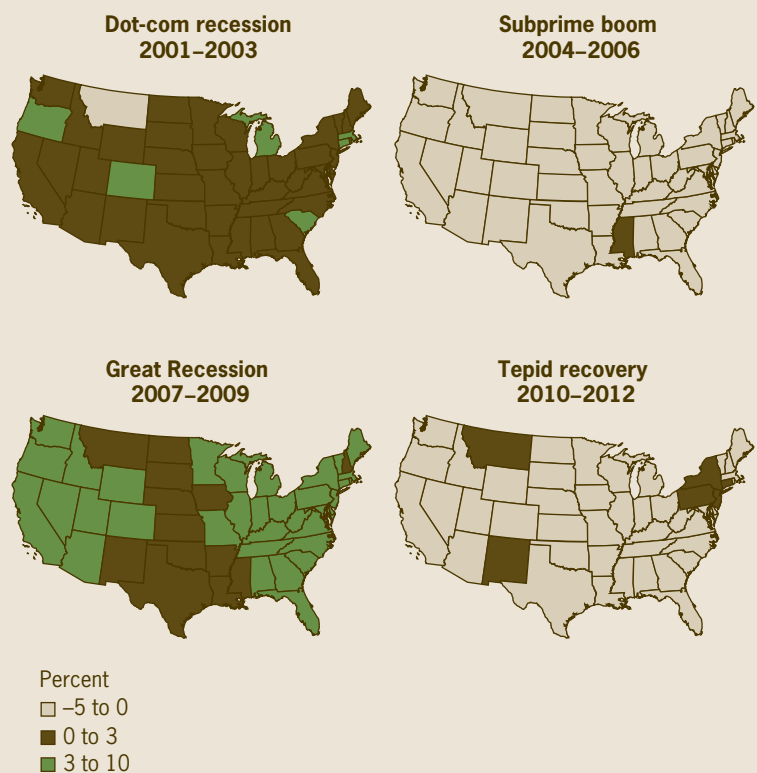
Source: Moody's Analytics; Bureau of Labor Statistics; Census Bureau.

Figure 1B. Real Per Capita Income Growth



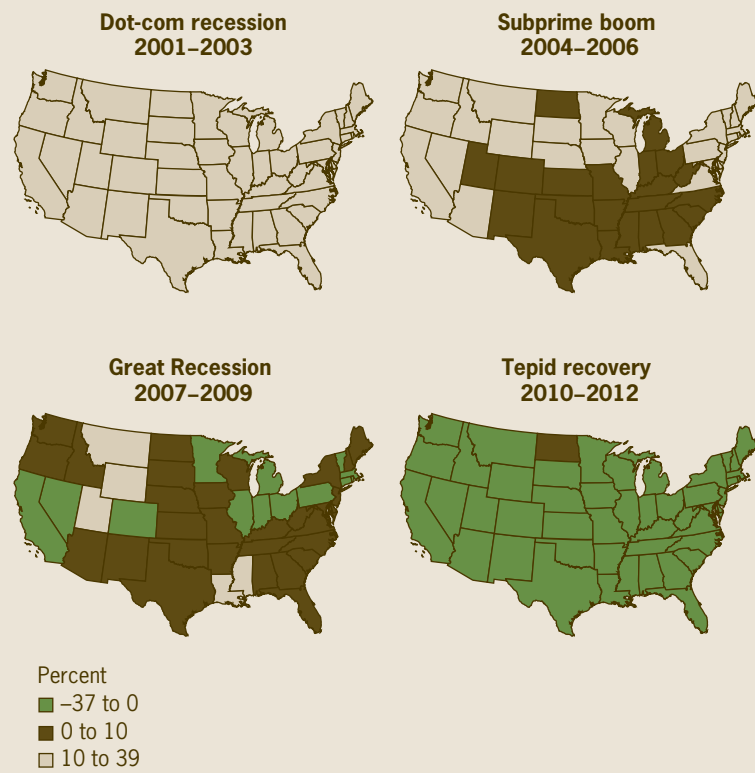
Source: Internal Revenue Services; Bureau of Labor Statistics; Census Bureau.

Figure 1C. Change in Unemployment Rate



Source: Bureau of Labor Statistics.

Figure 1D. Real Per Capita Debt Growth



Source: Federal Reserve Bank of New York, Consumer Credit Panel, Equifax; Bureau of Labor Statistics; Census Bureau.

General Trends and Variation in Consumption

Since 2000, consumption has not risen or fallen uniformly across time periods or locations. Figure 1 illustrates the geographical distribution of consumption growth rates across U.S. states and time periods.

During the dot-com recession, 25 states had negative consumption growth. During the subprime boom, only Michigan experienced negative consumption growth. During the Great Recession, consumption growth was negative in all 50 states, but the rate of decline varied: In one state (Hawaii), consumption fell almost 3 percent, in 4 states it fell between 5 and 10 percent, in 26 states it fell between 10 and 15 percent, and in 20 states consumption fell by more than 15 percent. During the tepid recovery, consumption growth was not uniformly distributed either: 20 states experienced weak consumption growth (positive growth rates lower than 8 percent), while consumption grew at rates above 8 percent in the remaining states.

Consumption growth has varied substantially even within states. For example, during the Great Recession, 95 percent of all counties had consumption declining by more than 5 percent, and about half of these counties experienced declines larger than 15 percent.

Possible Explanatory Factors

The factors typically suggested to explain such variation include income, unemployment, consumer debt, and housing wealth. All of these factors have also fluctuated significantly since 2000 across time as well as location, and the links between each of them and consumption are not easy to disentangle.

Consider income. States and counties experiencing declining consumption have not always had declining incomes. During the dot-com recession, five states had rising income and declining consumption. Though consumption fell sharply in every state during the Great Recession, income did not show the same pattern. During this period, 35 states had positive income growth, and five of those states had real per capita income growth of more than 8.5 percent. During the tepid recovery, income growth was high for a large fraction of states; 23 states had income growth higher than 8.5 percent. Consumption growth was strong overall but some states with high income growth underperformed states with more modest income gains.

Unemployment trends were also diverse across states and counties during these periods. In the dot-com recession, unemployment increased more than 1.5 percentage points in 32 states, mainly outside the Southeast and the Rocky Mountains. In the subprime boom, almost all states had increasing unemployment. During the tepid recovery, the change in unemployment was quite scattered across states.

Consumer borrowing during the subprime boom is often blamed for the severity of the recession that followed and for the slow speed of the tepid recovery. However, as shown in figure 1, all but one state had debt growing by more than

10 percent during the dot-com recession, while during the subprime boom, only 29 states had debt growing by more than 10 percent. By the time consumption plummeted in all states and counties in the Great Recession, only 12 states had deleveraged to such an extent that their debt was shrinking on average; however, in the tepid recovery, debt was shrinking in all states except North Dakota, which was booming due to rapidly expanding oil production. Further, although not visible in figure 1, 36 states deleveraged by more than 10 percent during this period, and of those, 16 states deleveraged by more than 15 percent.

The availability of housing wealth for collateral greatly affects consumers' ability to borrow. The difference in housing wealth accumulation (or loss) between the two recessions is dramatic: in the dot-com recession, states either had rapidly growing or fairly constant housing wealth, while in the Great Recession, no state had significant growth in housing wealth, and 14 states had housing wealth declining by more than 15 percent. During the tepid recovery, 35 states had housing wealth declining by more than 15 percent.

Another problem that makes it hard to identify the relative impact of any one variable on consumption is the mutual interaction of many variables with consumption. While many factors affect consumption, changes in consumption affect some of the factors back in turn. For example, when consumption declines, income and employment also tend to decline. As consumers put off buying goods and services, the production of these items declines, leading to further job losses. Lost jobs lead to further declines in consumption and so on.

Measuring the Factors' Impacts

The research reported in Demyanyk et al. (2015) provides some insight into this issue. It documents the impact of nine significant determinants of consumption growth: income, unemployment, income inequality, housing wealth, credit scores, debt, consumer confidence, foreclosures, and cash-out refinancing in different counties across the United States and in each of four time periods.

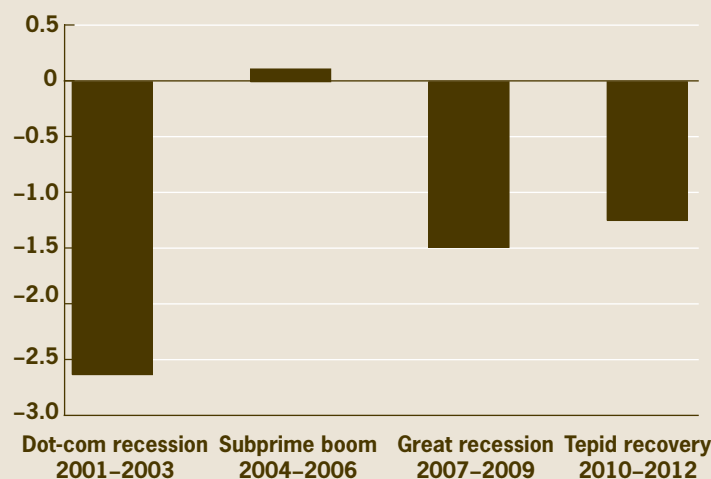
The study isolated the impact of each variable using a multiple regression statistical model. This allows the impact to be measured in two different ways. The first way (measured by the estimated coefficient) is to identify how much a change of a given magnitude in one variable is predicted to affect consumption. This is often the result of interest for policymakers. The second way (measured by the partial R-squared) is to identify how much of the change in consumption is explained by each variable. For example, it is possible that consumption is very sensitive to changes in income but, during a particular period, income growth is so similar across counties that it does not explain a lot of the variation in consumption at that time. Likewise, consumption might not be very sensitive to changes in house prices, but in some period, house prices could have varied so dramatically across counties that they end up explaining a large fraction of the variation in consumption in that period.

The study's findings for the first type of impact (the estimated coefficients) can be summarized as follows:

- **Income.** Income growth is an important predictor of consumption growth in all four periods. An increase in income growth of 10 percent is associated with 1 percent higher consumption growth.
- **Unemployment.** The effect of unemployment is stable across periods: a 1 percentage point increase in unemployment decreased consumption by 1 percent. Job loss is typically associated with an income decline. However, even after the effects of income are taken into account, unemployment still affects consumption, which may indicate that unemployment also signals high income uncertainty or weaker income growth going forward.
- **Income inequality.** Economic theory predicts that less-affluent households or individuals have a higher propensity to consume when their income rises—spending a larger fraction of their income gains—than their more-affluent counterparts, but this pattern is observed only in the tepid recovery. During this period, consumption reacts significantly more to the income growth of less-affluent households than to the income growth of more-affluent households. In the dot-com recession, higher income growth of both more- and less-affluent households is associated with higher consumption. During the subprime boom, the income growth of high-income households is associated with higher consumption growth, but the income growth of low-income consumers has no effect. This is likely because easier mortgage credit made it possible for the less-affluent households to substitute away from goods and purchase real estate. But whatever behavior underlies these findings, they highlight that consumption is driven by more than average income—income gains accruing to the high- and low-income individuals have differential impacts on consumption depending on the state of the economy.
- **Share of wealthy households.** Consumption fell less in wealthy counties during both recession periods, while the impact of this factor was close to zero in both the subprime boom and the tepid recovery. This result is consistent with the hypothesis that high-income consumers typically have high wealth, so they might be able to better withstand negative income shocks and keep their level of consumption relatively unchanged by adjusting their asset holdings.
- **Housing wealth.** As house prices fluctuate, homeowners accumulate or lose housing wealth. Rising housing wealth helped to stabilize the economy during the dot-com recession, but later rising housing prices helped fuel the subprime boom, while collapsing housing wealth severely hurt the economy in the Great Recession. In the tepid recovery, the rebound in house prices had little effect on consumption growth.

- **Debt overhang.** This is measured as total personal debt per capita at the beginning of each period. It was a powerful explanatory factor of consumption growth in every period. However, in the dot-com recession high debt was associated with higher consumption growth, while in the other periods high debt was associated with declines in consumption. The differential impact of debt on consumption in the dot-com recession can be explained by the sharp decline in interest rates that took place, making debt less burdensome allowing indebted consumers to increase spending (see figure 2). During the subprime boom, interest rates increased, and the burden of carrying debt became onerous, depressing consumption. When the Great Recession hit and credit conditions got much tighter, consumption was depressed even when interest rates were declining.
- **Subprime credit.** The availability of subprime credit—measured by the fraction of consumers with credit scores less than 661—was an important predictor of consumption growth during the subprime boom, with no effect in other periods. This result reflects the ease in obtaining credit for such consumers during that period.
- **Cash-out refinancings.** These helped stabilize the economy during the tepid recovery and no other period. It is likely that borrowers with good credit scores were able to refinance into lower-interest-rate mortgages, which freed up more income to consume.
- **Foreclosures.** The number of foreclosures in a county is associated with lower consumption in the county in all periods except the Great Recession. Foreclosures are costly and limit future access to credit severely. Also, in the run-up to foreclosure, many consumers may

Figure 2. Mortgage Rates at Origination



Source: Black Knight Financial Services.

cut back consumption hoping to avoid it. We find no effect of foreclosures during the Great Recession simply because foreclosures were so widespread at that time. Our statistical model, which captures differences across counties, cannot capture their effect in this period.

- **Consumer confidence.** This factor had a sizable effect on consumption in all periods except the tepid recovery, confirming that consumers act on their expectations and increase consumption when economic conditions are expected to improve.

The contribution each factor made in explaining differences in consumption growth (the partial R-squared) also varied across time and geographies. For example, unemployment and debt explained a large fraction of the variation in consumption growth across all counties throughout the entire 2000-2012 period. The contribution of other factors varied by period (figure 3).

The third most important factor in terms of variation explained in the dot-com recession was the share of income received by the top 10 percent of households: counties with more high-income residents weathered the dot-com recession better and therefore experienced smaller declines in consumption. Consumer confidence helped fuel consumption growth in the subprime boom, while the loss of housing wealth helped explain the large decline in spending in the Great Recession. The growth of cash-out refinances stimulated consumption in the tepid recovery.

Conclusions

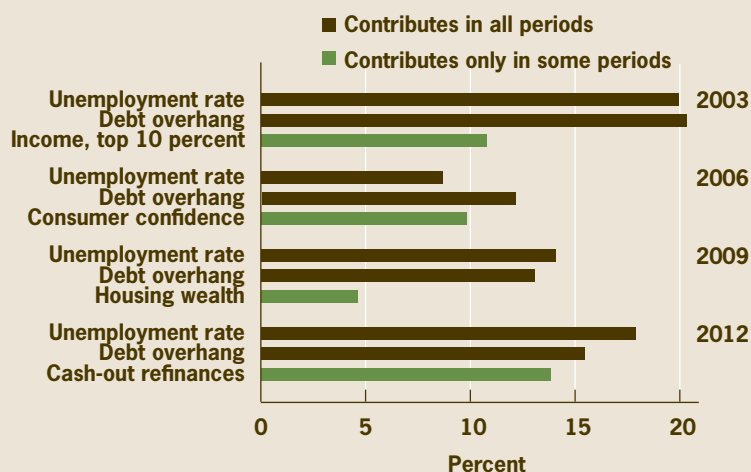
Policymakers are concerned that consumption has not fully recovered this long after the Great Recession. Demyanyk et al. (2015) contribute to a body of literature that tries to uncover the determinants of consumption growth.

During the 2000s, the impact of some factors like income growth and unemployment was fairly stable over time, but the impact of other factors was quite heterogeneous across periods. This poses a unique challenge for economic policymakers. If, for instance, house price appreciation was an important determinant of consumption growth throughout, policymakers could stabilize the economy with policies aimed at supporting house prices. However, as Demyanyk et al. (2015) found, the statistical relation between house-price appreciation and consumption growth is unstable, sometimes important, other times not. This result implies that economic policy needs to rely on economic models which depart from more fundamental determinants of consumer behavior. Pinning those down is still a major challenge for economic research.

Reference

Demyanyk, Yuliya, María José Luengo-Prado, Dmytro Hryshko, and Bent E. Sørensen, 2015. “The Rise and Fall of Consumption in the ‘00s,” Federal Reserve Bank of Cleveland, working paper no. 15-07.

Figure 3. Contribution to Consumption Growth



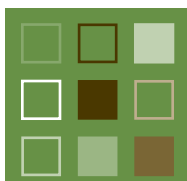


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Yuliya Demyanyk is a research economist at the Federal Reserve Bank of Cleveland, Dmytro Hryshko is an associate professor at the University of Alberta, Daniel Kolliner is a research analyst at the Federal Reserve Bank of Cleveland, María Luengo-Prado is a senior economist at the Federal Reserve Bank of Boston, and Bent Sørensen is the Lay Professor of Economics at the University of Houston. The views they express here are theirs and not necessarily those of the Federal Reserve Bank of Cleveland, the Board of Governors of the Federal Reserve System, or Board staff.

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