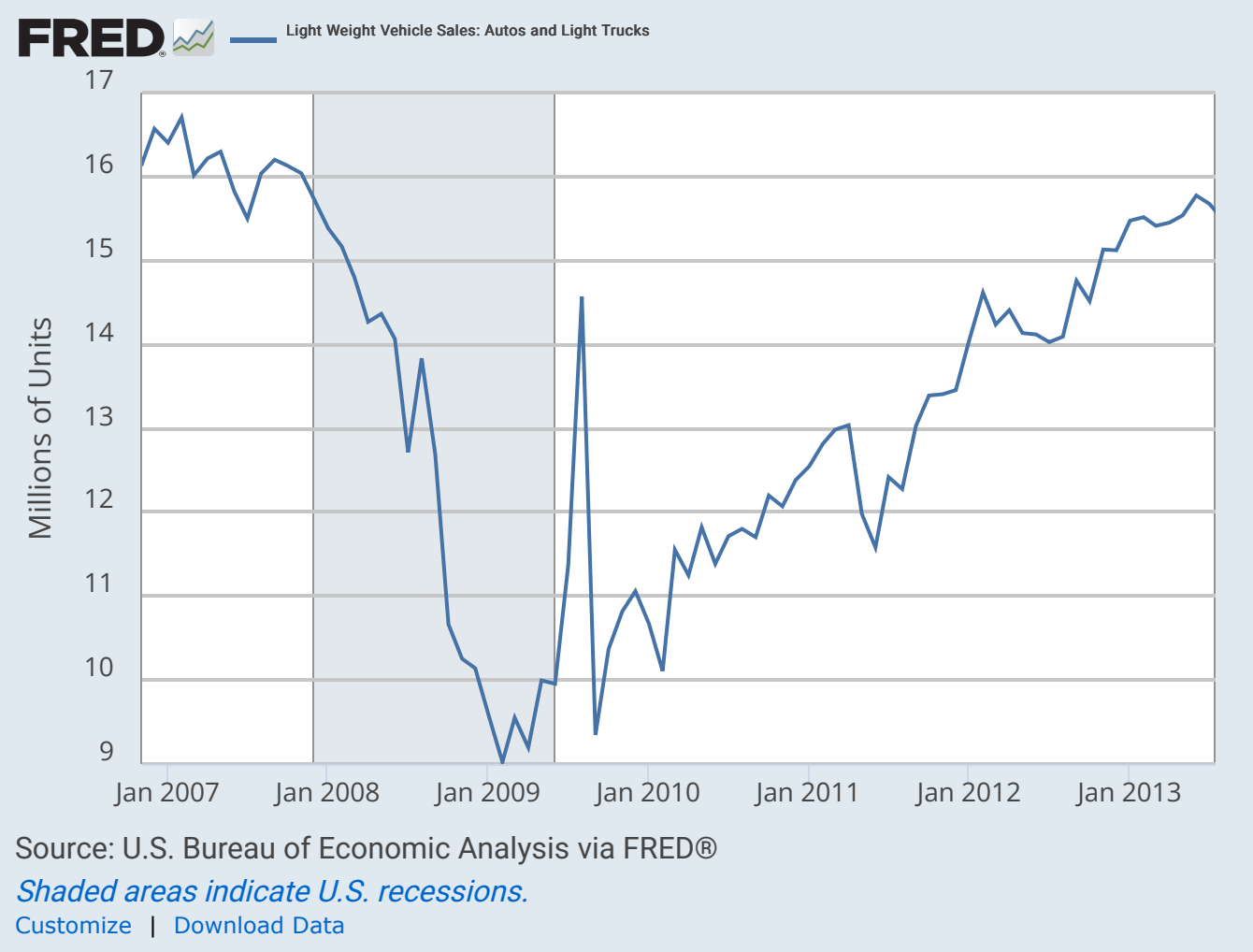
FEDERAL RESERVE BANK of ST. LOUIS

Auto Sales and the 2007-09 Recession

July 05, 2019

By **Bill Dupor**

One of the hardest-hit sectors during the most recent recession was autos (see figure). New vehicle sales fell nearly 40 percent. Motor vehicle industry employment fell over 45 percent. Faced with bankruptcy, Chrysler and General Motors were bailed out by the U.S. government using TARP funds. At one point, the federal government owned 61 percent of General Motors.[1]



SOURCE: FRED®, Federal Reserve Bank of St. Louis, Light Weight Vehicle Sales: Autos and Light Trucks, accessed June 25, 2019.

NOTE: Gray bars indicate recessions as determined by the National Bureau of Economic Research (NBER).

Economists have offered a few explanations for this sector's decline. In this essay, I discuss two existing explanations and add a third. I draw this analysis from my recent working paper, "The 2008 U.S. Auto Market Collapse," authored with Rong Li, Saif Mehkari, and Yi-Chan Tsai.[2]

First, some researchers have pointed to the oil price increases in 2007 and 2008 as important factors in the auto sales decline.[3] Immediately preceding the oil market collapse, oil prices spiked over 50 percent. My co-authors and I look at the relationship between oil price changes and auto sales growth between 1975 and 2005. This sample includes several plausibly exogenous oil price spikes, including two related to the 1970s oil crises. We show that, while there is a negative relationship between oil prices and auto sales, quantitatively it is not significant enough to explain most or even the majority of the auto market collapse. At most, oil price increases explain less than one-fifth of the auto sales decline.

Next, we consider the impact of the decline in home prices on auto sales. According to one view, as

homeowners saw home prices fall, they cut their new auto purchases because they viewed the fall as a decline in wealth. This effect might be intensified if falling home prices made homeowners more borrowing constrained.[4]

To investigate this possibility, we study the relationship between auto sales and home prices at the county level between 2007 and 2010. If the home price explanation were important, one might expect to see that auto sales fell more in counties where home price declines were the largest. We show that, while there is a statistically significant relationship between these two variables, the relationship is quantitatively weak: Falling home values explain roughly 17 percent of the overall new auto sales reduction during this period.

Thus, more than three-fifths of the auto sales decline remains unexplained after accounting for oil price and home price changes during the 2007-09 recession. Searching for another driver of the decline brought us to consumer survey evidence from the period. Not surprisingly, when consumers were asked about whether it was a good or bad time to purchase a new car around the auto market collapse, there was a large spike in responses of it being a bad time relative to previous months. Moreover, for those who stated it was a bad time, they were then asked why they thought so. The most frequent responses were related to their pessimistic views of the overall economy or personal economic situations in either the present or their expected future.

This suggested to us that one cornerstone of the economic theory of consumption, the permanent income hypothesis, may have been at play. This hypothesis holds that a person's current consumption is chosen based on not only their current income, but also their expected income in future years.[5] Together, these two factors make up the person's permanent income. It is important to note that an explanation based solely on current income is insufficient to explain the auto market collapse because per capita current income during those years fell by only a small amount.

Using a calibrated economic model, we show that a slowdown in the growth rate of real income expected to last only a few years is capable of reducing permanent income by a large enough amount to explain the observed auto sales reduction. Intuitively, as households viewed their worsening economic future, they responded by delaying replacement of their existing autos with new ones. This proved to be an effective way to "smooth their consumption" over the business cycle. As evidence, we demonstrate that even though auto sales fell, the quantity of vehicle miles traveled changed very little during the recession.

Looking ahead, economists should continue to recognize the important role of the auto sector in understanding recessions. As Martin Zimmerman, then chief economist at Ford Motor Company, wrote in 1998, "I cannot think of an industry more cyclical or more dependent on the business cycle than the auto industry." This statement held true during the past recession and is likely to remain true in future ones.

Notes

1. Whoriskey, P. "GM and Chrysler, Owned by the Government, Lobby the Government."*Washington Post*, February 26, 2011. TARP, Troubled Assets Relief Program.

2. Dupor, B.; Rong L.; Mehkari M.S. and Tsai, Yi-C. "The 2008 U.S. Auto Market Collapse" (PDF). Working Paper 2018-019A, Federal Reserve Bank of St. Louis, September 2018.

3. See, for example, Hamilton, J. "Causes and Consequences of the Oil Shock of 2007-08" (PDF).

Brookings Paper on Economic Activity, 2009, *40*(1), pp. 215-83.

4. See, for example, Mian, A.; Rao, K. and Sufi, A. "Household Balance Sheets, Consumption, and the Economic Slump." *Quarterly Journal of Economics*, 2013, *128*(4), pp. 1687-726.

5. The permanent income hypothesis also states that consumption choice additionally depends on that person's current level of financial wealth.

Note: This blog post originally appeared as an *Economic Synopses* essay. View the full *Economic Synopses* archive in FRASER, the St. Louis Fed's digital library.

ABOUT THE AUTHOR

Bill Dupor

Bill Dupor is an economist and senior economic policy advisor at the Federal Reserve Bank of St. Louis. His research interests include fiscal policy and dynamic economics. He joined the St. Louis Fed in 2013. Read more about the author and his work.