

## Review of "Oil Prices and the U.S. Economy: Where is the Boom?"

The impact of a change in oil prices on U.S. GDP is an important topic for economic forecasting. The paper raises a relevant question: Has the size of that impact changed in recent years? The paper offers two arguments that the impact is now smaller than it used to be: 1) oil production is now a larger fraction of the economy than it has been in the past; 2) higher debt levels have reduced the marginal propensity to consume from higher disposable income and thus the positive impact of lower oil prices. Although the paper offers some support for those arguments, the quantification of them is fundamentally flawed in the first case and ignored in the second.

The paper mentions a few times (without reference) that standard macro-economic models find that a 10 percent decrease in the real oil price produces a roughly 0.2 percent increase in real GDP. However, the paper never specifies how much that estimate has changed. Instead, the basic quantitative argument in the paper, summarized on pages 11-12, is that the negative direct and indirect effects of lower oil and gas production in 2015 exceed the positive direct and indirect effects of lower oil prices on consumer spending.

Regarding the impact of oil prices on consumer spending, the paper (pp. 7-8) cites Sahm et al (2015) that "balance sheet" households used the temporary payroll tax cut in 2011-2012 to pay down debt rather than to increase spending. However, Sahm et al do not quantify the change in the importance of such households over time, a critical issue for this paper. In fact, "Oil Prices and the U.S. Economy" ends up (p. 10) using a multiplier for consumer spending that is independent of the level of consumer debt, thus excluding the impact of high debt levels from the results. The impact of oil prices on consumption is calculated by applying that multiplier to an estimated change in real disposable income due to lower oil prices.

The calculation of the impact of lower oil and gas production on GDP has numerous flaws. First, the discussion on page 4 assumes that a multiplier for such production defined as the sum of gross oil and gas output plus the inputs to that industry from other industries. That is wrong. An industry's gross output equals its value added plus inputs from other industries. Adding inputs to gross output is double-counting. Instead, the multiplier equals the direct impact on production (usually demand) plus indirect impacts as workers in the directly-affected industries spend their increased income and firms in those industries increase investment. The paper mentions such impacts on page 5, but not in the context of a multiplier.

Second, the calculations of the "real" change in oil and gas production in 2009 and 2015 are not only incorrect but are of the wrong sign. On page 11, the paper says that "the value of oil and gas production fell a little less than \$170 billion between 2008 and 2009 (\$2009)." However, although the parenthetical implies that the change is in 2009 dollars, the calculation instead divides nominal production by the GDP deflator. Real production is calculated by dividing nominal production by the price of that production. While BEA does not

publish real gross output for oil and gas extraction, it does publish real value-added. In 2009, nominal value added fell by \$96 billion, but real value added increased by \$44 billion; real value added then fell in 2010. Similarly, page 12 cites EIA's May 2015 Short-Term Energy Outlook as saying that the value of oil and gas production will fall by around \$137 billion in 2015. However, that outlook projects the production of both oil and gas to increase in 2015. Nominal production only falls because the price of both oil and gas is expected to be sharply lower in 2015 than in 2014. If those calculations of real output were done correctly, the paper would find that, not only does the drop in oil and gas production in 2015 not offset the rise in consumption, as claimed, but that oil and gas production actually augment the rise in consumption.

A more promising approach to finding a negative impact of lower oil prices on GDP would be to look at investment in mining structures, mentioned on pp. 4-5, which fell sharply in the first half of 2015.