Economics
The Open-Access, Open-Assessment E-Journal

Discussion Paper
No. 2015-48 | July 06, 2015 | http://www.economics-ejournal.org/economics/discussionpapers/2015-48

Oil Prices and the U.S. Economy: Where Is the Boom?

Vipin Arora

Abstract
The author argues that the economic benefits of low gasoline prices for the U.S. economy have fallen substantially since the reemergence of America as a major oil producer. The old rule-of-thumb that a 10% fall in the oil price raises inflation-adjusted U.S. GDP by 0.2% is too large—the impact on economic activity should be closer to zero, and may even be negative if consumption grows slowly. The reasons for this change are straightforward, if underappreciated: (i) the value of oil production accounts for a larger share of the U.S. economy; and (ii) consumers are not spending the windfall like they used to because of higher debt levels, limited access to credit, slow wage growth, and an older population.

(Submitted as Policy Paper)

JEL C67 E20 E60 Q43
Keywords Oil price; economic activity; input-output; consumption

Authors
Vipin Arora, ✉ U.S. Energy Information Administration, 1000 Independence Ave. SW, Washington DC, 20585, USA, vipin.arora@eia.gov

The analysis and conclusions expressed here are those of the author and not necessarily those of the U.S. Energy Information Administration. The author certifies that the research reported in this paper was not the result of a for-pay consulting relationship nor does his employer have a financial interest in the topic of the paper which might constitute a conflict of interest.

Citation Vipin Arora (2015). Oil Prices and the U.S. Economy: Where Is the Boom?. Economics Discussion Papers, No 2015-48, Kiel Institute for the World Economy. http://www.economics-ejournal.org/economics/discussionpapers/2015-48

Received June 9, 2015 **Accepted as Economics Discussion Paper** July 3, 2015 **Published** July 6, 2015
© Author(s) 2015. Licensed under the Creative Commons License - Attribution 3.0

Introduction

Every major forecast for the United States in late 2014 or early 2015—from public to private—sang the praises of lower oil prices for economic growth. It seems straightforward: putting an extra $100 billion into the wallets of drivers should lead them to spend more on cars, electronics, and travel.[4] But growth in consumption as well as real GDP have consistently been below expectations after oil prices began their decline in mid-2014, leading to questions about the size of this effect.[5] Indeed, recent increases in U.S. oil production have some of us asking about the direction, not just the size, of this assumption—could low oil prices actually be economically damaging?

The contention that oil is less important for U.S. economic activity than in the past is not controversial—many have advocated this position for over 25 years.[6] The traditional arguments for oil's declining importance are explanations about changes in its use—structural changes—and differences in monetary responses to oil price movements. The argument goes like this: not only have vehicles become more efficient, but oil is now used scarcely in generating electricity, manufacturing accounts for a smaller share of overall goods production, and monetary policymakers tend to focus more on price indices that exclude oil. In the end consumers still benefit from lower prices, just not as much as they used to.

Greater domestic production adds to this list in a direct way—less oil production and associated investment/employment counterbalance benefits to consumers when prices fall. But could this effect possibly be large enough to harm economic growth? Not according to standard macroeconomic models, which assume that, all else equal, a 10 percent decrease in the inflation-adjusted oil price corresponds to an increase of between 0.15%-0.25% in real U .S. GDP in the first year, declining after that.

The story is essentially about consumption, which accounts for around 70% of inflation-adjusted U.S. GDP. Consumers have greater disposable income and increase expenditures on non-fuel goods and services. These rises filter through to investment and employment, and are counterbalanced somewhat by higher imports. The reemergence of the U.S. as a major oil producer has complicated this narrative: lower prices have a negative effect on production, investment, and employment in oil and gas extraction and related sectors. The question is about the balance between these forces—holding everything else constant, do the falls in production/investment dent or even reverse gains in consumption?

I will argue in this paper that it is possible. The reasons are unsurprising: (i) oil production is a much larger part of the U.S. economy than in the past; and (ii) high debt levels, especially for low income families, have lowered consumer spending in response to cheaper gasoline prices. Access to credit, particularly home equity loans, has also slowed consumption growth, as has slow wage growth, and an ageing population.

[4] See Edelstein and Kilian (2009: introduction) for quantification of this effect.
[5] An alternative explanation is that other factors—such as appreciation of the U.S. dollar during this time period—masked any benefits from lower oil prices. I do not address such candidate explanations here.
[6] For a contrary view and further references see Ramey and Vine (2011: 339-347).

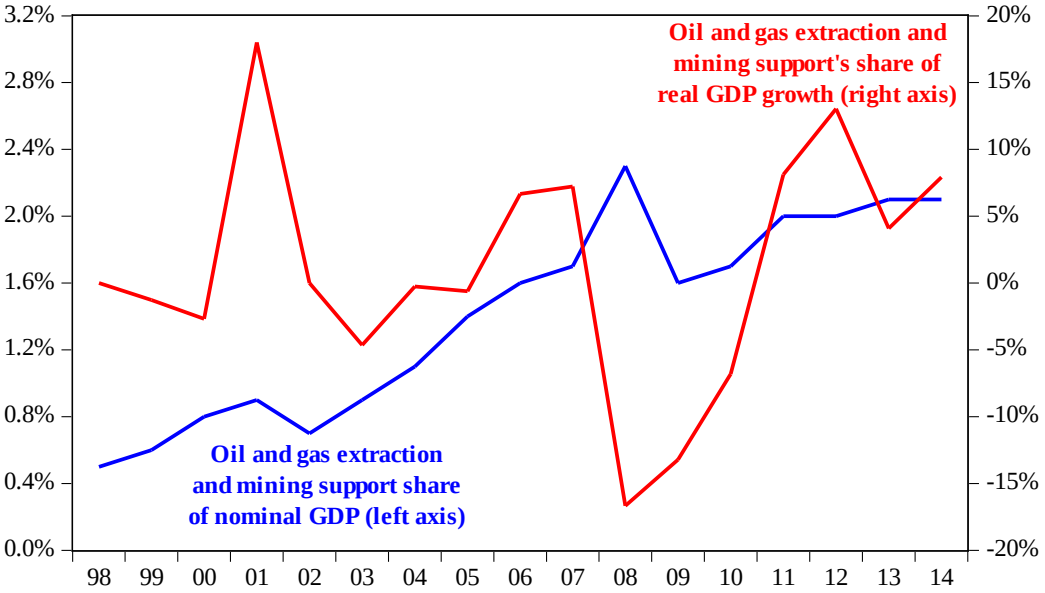
In making this argument I believe it is important to expand the traditional focus beyond consumption and investment—the expenditure side of the national accounts—to what is actually produced in the oil and gas industry. Using the U.S. Bureau of Economic Analysis's (BEA's) production accounts, which provide detail on the value of production and value added at the sectoral level each quarter, gives a more comprehensive view of the economic size and scope of U.S. oil production.

For example, they allow me to estimate the economy-wide impacts of a change in the value of oil and gas production through a simple multiplier. Such production changes are what many organizations forecast on a regular basis. That is not to say that the expenditure side is unimportant. I will also use these accounts when looking at consumption and investment responses to lower oil prices, both the gains to drivers and the losses for those associated with the oil industry.

The Value of Production in Oil and Gas Extraction

The share of the U.S. economy accounted for by oil and gas extraction and mining support has increased steadily since the turn of the century, flattening just above 2%—more than double its value in 2003, and almost five times the share it had in 1998 [Figure 1, left axis]. The pattern for gross output is similar: oil and gas extraction and mining support's share of total gross output rises from 0.6% in 1998 to 1.7% in 2013. In terms of either value added or gross output, the mining sector has at least doubled in size relative to the U.S. economy over the last 15 years.

Figure 1: Oil and gas extraction and mining support share of nominal U.S. GDP and its share of real GDP growth[7]



Source: BEA (2015a)

Not only is the sector larger in absolute size, adding to the level of GDP, but oil and gas extraction and mining support have also contributed more to growth in recent years [Figure 1,

[7] There is no data available for these sectors in 2014. The share of nominal GDP in 2014 is assumed to be the same as 2013 for both sectors, and the 2014 contribution to real GDP growth is the same as the overall mining sector.

right axis]. After bottoming out around zero in 2005, their contributions to real GDP growth have fluctuated between a low of -17% [2008] and a high of 13% [2012].

These numbers only include direct production in oil and gas extraction and mining support, not any associated output generated in other industries as a result. Such aggregate impacts can be approximated using a total requirements multiplier from the BEA's input-output accounts for the oil and gas extraction sector.[8] The BEA data indicates that an additional $1 billion worth of oil and gas production in 2013 required about $1.3 billion in total domestic industry output—a multiplier of 1.3. This multiplier is on the low end of other estimates for this sector.[9]

To put these numbers into perspective consider some rough approximations. The BEA estimates that the value of output in oil and gas extraction grew by about $50 billion in 2013; applying the multiplier yields total economy-wide output growth due to oil and gas extraction of over $66 billion [$50 million * 1.3 ~ $66 billion]. This was nearly 6.5% of total gross output growth in the economy during 2013, and five times greater than oil and gas extraction's share of total gross output alone. In fact, if the oil and gas extraction sector had not grown between 2012 and 2013 then, all else equal, growth in total gross output would have been almost 0.25% lower.

We can actually go a step further to nominal GDP. In 2013 about 73% of production in the oil and gas sector was value added. Assuming the multiplier mainly affects similar industries, the $66 billion increase in total gross output in 2013 translates to about $48 billion in value added—which was close to 8% of growth in nominal GDP during the year, and about three times bigger than oil and gas extraction/mining support's share of value added.

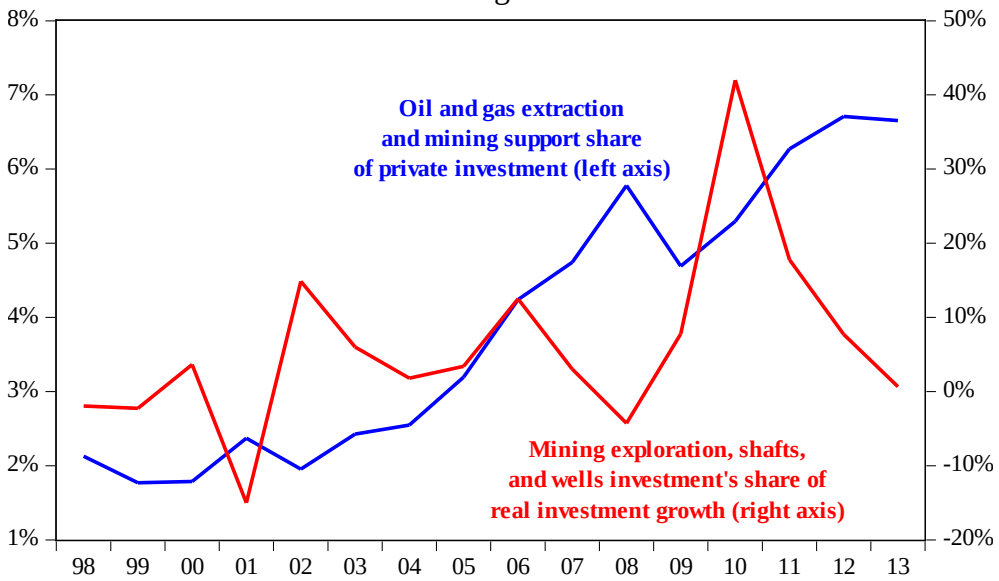
Investment and Consumption Related to the Oil Sector

The importance of oil and gas extraction also extends to the expenditure side of the U.S. national accounts. Because of the sector's capital intensive nature, this is most obvious in investment. The share of private investment due to oil and gas extraction and mining support has more than tripled since 1998, from just over 2% to nearly 7% [Figure 2, left axis]. This share does not take into account any additional investment outside of mining, which could be sizeable.

[8] This multiplier is modified in two ways from the industry by commodity value available for 2013 on BEA's website. First, it no longer includes increased production due to imports. This procedure, described in Streitwieser (2011: 6), requires converting the requirements tables to domestic only using the import matrix provided by the BEA. Additionally, the multiplier derived from the domestic requirements tables has been corrected for possible double-counting of economic impacts. Specifically, I have adjusted it so that the value represents the impacts of a change in production in oil and gas extraction, not a change in final demand for oil and gas extraction output. The conversion procedure is described in Steinbeck (2004: 63-67).

[9] For example, ICF (2013: 37) use a value added multiplier between 1.3 and 1.9.

Figure 2: Oil and gas extraction and mining support investment share and mining-related investment's share of real investment growth



Source: BEA (2015b)

At the same time, the contributions of mining-related investment to total real investment have steadily increased, although with large swings [Figure 2, right axis]. There was little that mining exploration, shafts, and wells investment contributed to total investment growth in 1998, but the value has fluctuated between -15% [2001] and 42% [2010] since that time.

Preliminary data for the first quarter of 2015 indicate this type of investment contributed 136% of real investment growth [real investment fell by 2.5%, and mining-related investment fell at a rate consistent with a decline of 3.4%]. As with the level of investment, these contributions are certainly an underestimate because they do not consider industries outside of mining.

Lower oil prices also reduce employment in oil and gas extraction and related sectors, putting downward pressure on consumption from those unemployed workers and their families. It is unclear how large such impacts are, but reports of layoffs in and related to the oil industry have been substantial in 2014-15. A rough estimate for employment, based on BEA input-output data, implies that a one billion dollar change in the value of oil and gas production leads to the addition or destruction of roughly 2000 jobs throughout the U.S. economy.[10]

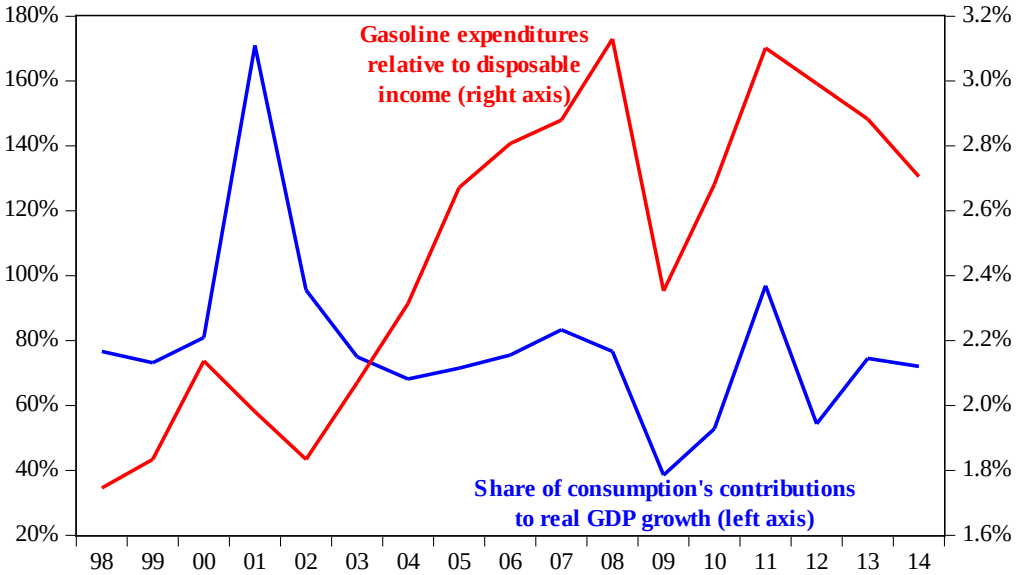
Total Consumption

Consumption expenditures are where conventional wisdom holds that lower oil prices have their largest impact. But this does not seem to be the case in recent years: since oil prices began to fall in mid-2014, consumption's share of real GDP growth has declined slightly [Figure 3, left axis], from about 74% to 72%. There are many factors behind this decline, but it is not something that

[10] I calculate this value by following the procedure described in Streitwieser (2011: 7). First I derive the ratio of full and part-time employees to gross output for 2013 in various industries. Next, I multiply these ratios by the domestic total requirements table that gave the multiplier for oil and gas extraction above. The sum of the oil and gas extraction column then gives a multiplier for employment which has units of thousands of employees per million dollars of gross output.

most forecasters would have predicted given the reductions in gasoline prices over 2014 and 2015.[11]

Figure 3: Consumption's share of real GDP growth and gasoline expenditures as a share of disposable income



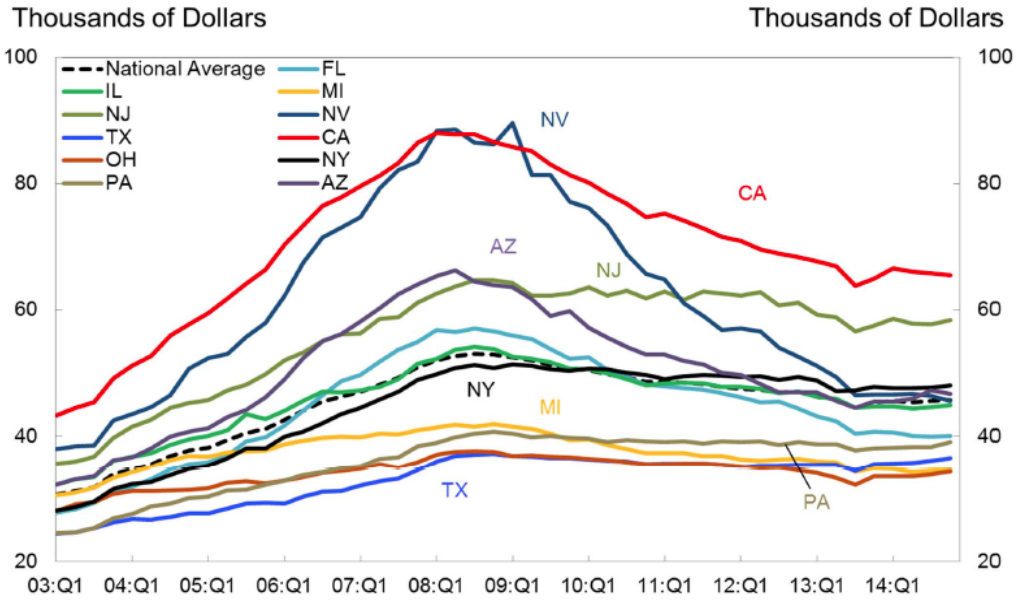
Source: BEA (2015b)

The decreases in oil prices have also lowered consumer expenditures on gasoline relative to disposable income [Figure 3, right axis]. These fell below 2.5% by the end of 2014, and were below 2% in the first quarter of 2015 according to preliminary data. By some estimates the lower prices could save households $68-$92 billion in 2015 alone.[12]

So why has consumer spending not grown as much as might be expected? There are probably as many reasons as there are consumers, but a few stand out. One of the most important is that consumers are still carrying elevated levels of debt, especially in the most populous states [Figure 4].[13]

[11] See for example http://econbrowser.com/archives/2015/05/energy-prices-and-consumer-spending.
[12] See http://www.eia.gov/todayinenergy/detail.cfm?id=19211 and http://blogs.wsj.com/economics/2014/12/10/lower-gas-prices-like-huge-tax-cut-for-middle-class/. The estimates peg household savings in 2015 at $550 and $750, respectively. Multiplying each by the 123.2 million U.S. households in 2014 yields the range of $68-$92 billion.
[13] These are the only states with debt balance per capita available from the Federal Reserve Bank of New York (2015).

Figure 4: Total debt balance per capita by state



Source: Federal Reserve Bank of New York (2015)

Although these levels have come down since their peaks, many are still above pre-2008 levels in the states shown in Figure 4. For example, the average person in California holds roughly $65 thousand in debt, up from an average of about $40 thousand in 2003. Still, they don't appear to be that much higher than before the recent U.S. recession, so why do they matter more now?

It appears that in the face of these debt levels consumers are increasingly paying down non-mortgage debt—consumer debt payments as a share of disposable income are up since the end of 2012 [Figure 5].[14] The level at the end of 2014 [5.3%] was nearly the same as that at the beginning of 2010, after the last U.S. recession ended, but very close to the point where unemployment reached its peak [October 2009].

This rise in consumer debt services payments is consistent with recent increases in personal savings as a share of disposable income [Figure 5]. This steady increase since the end of 2013 confirms that households are paying down debt in lieu of making new purchases. One reason for this is the well documented lack of growth in real wages for most workers.[15]

These explanations are consistent with households and firms improving their so-called balance sheets—the difference between what they own and earn and what they owe and spend. In fact, a sizeable number of U.S. households have recently used additional income from fiscal policies to

[14] Federal Reserve statistics show that total debt service payments relative to disposable income have declined during this period [https://research.stlouisfed.org/fred2/series/TDSP]. These falls have been driven by reductions in mortgage debt service [https://research.stlouisfed.org/fred2/series/MDSP].

[15] Real compensation, which includes all benefits, has grown more. See for example http://www.pewresearch.org/fact-tank/2014/10/09/for-most-workers-real-wages-have-barely-budged-for-decades/.

pay down debt, and then save even more once that additional income is no longer available (Sahm, et. al., 2015: 2-10). They may choose to do the same with savings on gasoline.

The employment situation certainly matters as well, and the share of the population in the labor force since 2010 has hovered at levels unseen since the 1970s. Some of this is structural, related to the ageing of the U.S. population, but there is a component of this decline related to potential workers leaving the labor force altogether [discouraged workers]. And the numbers of workers who are in part-time jobs for economic reasons, though declining in 2014-2015, is at levels similar to those in the late-1970s.

Add to the debt issues the fact that the oil industry is taking a hit due to lower prices, pushing down consumption because of job losses and less revenue for producers.[16] EIA's Short Term Energy Outlook (STEO) in May 2015 forecasts the value of U.S. oil and natural gas production to fall about $150 billion from 2014 (EIA, 2015: Table 1). Applying the employment multiplier from above gives an estimate of around 300,000 job losses. This number is only a small fraction of total U.S. employment—but large enough to slightly depress consumption expenditures.

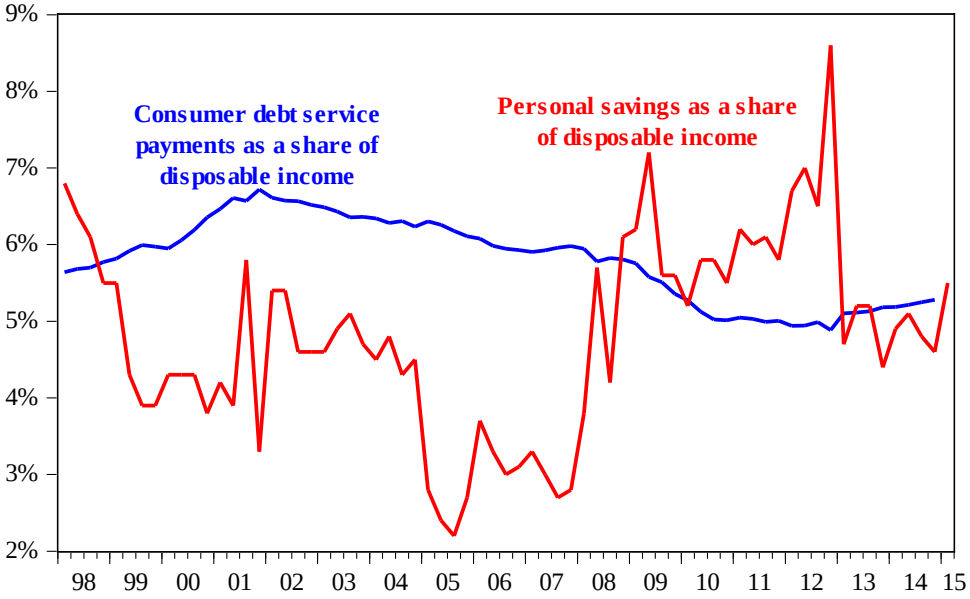
The manner in which savings on gasoline are realized, over time as opposed to lump sum, also has an effect, in that increases in consumption are likely spread out over time and hard to identify. Finally, there is evidence that consumers expect lower gasoline prices to be temporary, resulting in more savings than if prices were expected to stay at such levels permanently.[17]

There is also a distributional component to the relatively lackluster response of consumption to lower gasoline prices. Low income consumers are the biggest beneficiaries of falling prices because purchases of gasoline make up a larger share of their income. And because such households have relatively higher propensities to consume, they tend to spend more of these savings than others on goods and services. But it appears there are currently some mitigating circumstances.

[16] There is no double-counting here of oil and gas extraction, because most workers in this and related industries purchases consumer goods in the majority of their expenditures.

[17] http://blogs.wsj.com/economics/2015/05/07/for-shoppers-its-not-what-gas-costs-now-its-what-it-will-cost-tomorrow/.

Figure 5: Consumer debt and personal savings as a share of disposable income



Source: BEA (2015b), Federal Reserve Board (2015)

The first is also related to debt. Data from the Federal Reserve Bank of Philadelphia indicates that almost a quarter of families in the lowest 20th income percentile had debt payments over 40% of their income in 2013 (Federal Reserve Bank of Philadelphia, 2015). While this is a little below the historical average, for families with incomes in the 20-40th percentile, the number was above the historical average [18.4%]; and it was 11.1% in the 40-60th percentile. What this all means is that even with ultra-low interest rates, 6 out of 10 U.S. households in 2013 used almost half of their income to pay back debt.[18]

Again, these values are not that far above historical averages, so why do they matter more now? In addition to the reasons given above, the supply of credit to poorer households may also have declined (Gropp et. al, 2014). These people may not be able to borrow to pay off existing debt and increase purchases at the same time, as can be done with home equity loans for example.[19]

Additionally, many of the poorest households rely on transfer payments for day-to-day purchases. These fell relative to disposable income after 2010 [18.5%], bottoming out in 2012 [16.6%], and stayed relatively flat after that. As a result, the ability of lower income individuals to consume additional goods and services after debt payments has not increased in five years. Lower gasoline prices may add a bit to income, but seem unlikely to spur consumption substantially given the circumstances.

[18] McKinsey (2012: 3-5) predicts that even after debt levels in the U.S. are reduced to past amounts, strong consumer spending is unlikely. This is because households will not be able to borrow against the equity in their homes as much as in the past for purchases.

[19] Home equity loans to individuals living in poorer zip codes contracted more than in other zip codes after the last recession. See Amromin and McGranahan (2015: 149-152).

In fact, both the transfer payment and disposable income series include all consumers—low, high, and middle income. This means that the simple ratios likely overestimate the value of transfer payments relative to disposable income for poorer families.

Back-of-the-Envelope Calculations

These broad overviews can approximate differences in the economic impacts of recent gasoline price declines—mainly production falls versus consumption increases. What follows are rough estimates based on simple multipliers, meant to be informative about general magnitudes; they purposefully do not attempt to account for every economic response. For ease of comparison I will use inflation-adjusted dollar values ($2009) from this point forward unless otherwise noted.[20]

As outlined above, total U.S. savings to households because of the lower gasoline prices may be around $100 billion in 2015, or about $92 billion in inflation adjusted dollars ($2009). Because the lower prices free up billions of additional dollars for consumption that otherwise would not have been available, they are similar to a lump-sum tax cut of the same amount.[21]

A range of multipliers for such tax cuts are available from the U.S. Congressional Budget Office (CBO) which estimate the magnitude of economy-wide economic effects. These so-called fiscal multipliers estimate the change in U.S. GDP generated by each dollar worth of tax relief.[22] The CBO estimates that a two year tax cut for lower and middle income Americans can have a multiplier that ranges from 0.3 to 1.5 (Whalen and Reichling, Forthcoming: Table 1). The lower range of multiplier values, which I do not consider here, implies that consumers save most of the income they get back.

Assuming multipliers of 1, 1.25, and 1.5 for the savings from gasoline purchases gives potential additions to real U.S. GDP of $92 billion, $115 billion, and $139 billion [Table 1].[23]

Table 1: Approximated changes in U.S. real GDP due to lower gasoline prices

Consumption Multiplier	Addition to U.S. GDP ($2009)	Decline in Oil and Gas Extraction Gross Output to Match This Amount; O&G multiplier = 1.3; ($2009)	Decline in Oil and Gas Extraction Gross Output to Match This Amount; O&G multiplier = 1.0; ($2009)
1	92	95	123
1.25	115	118	154
1.5	139	142	185

[20] The nominal values are first calculated using the steps outlined. These are converted to $2009 by deflating using the GDP deflator from the BEA.

[21] The savings are more like an incremental tax cut realized over time, but this assumption makes the calculation simpler.

[22] Such multipliers can be derived from a range of macroeconomic models, including those with so-called "Keynesian" features, and those based on the neoclassical model of growth, as long as there is no assumption of full Ricardian equivalence in the latter.

[23] According to a December 2014 Goldman Sachs research note, lower gasoline prices are equivalent to a tax cut of $100-$125 billion in nominal terms, $92-$115 in $2009. See: http://blogs.wsj.com/economics/2014/12/10/lower-gas-prices-like-huge-tax-cut-for-middle-class/.

In the language of input-output analysis the second column of Table 1 is the value of additions to final demand because of lower gasoline prices over one year. The third column of Table 1 lists the corresponding reduction in the value of production from the oil and gas extraction sector which would offset those additions to final demand, assuming that the multiplier for this sector is 1.3 as calculated above. For example, if the consumption multiplier is 1 then changes in gasoline prices add about $92 billion to U.S. GDP in 2015. But a fall in the value of oil and gas extraction output (gross output) of around $95 billion takes the multiplier to zero.

This calculation has a few steps. I first take the values in column 2 of Table 1 and convert them to equivalent gross output numbers for the entire economy. In doing so, I assume that value-added is 75% of the value of production across the economy, which is representative of the services sector. Then to isolate the oil and gas sector I divide gross output effects for the entire economy by the multiplier for oil and gas extraction (1.3), and these numbers are reported in the third column of Table 1. The net result is that the value of oil and gas extraction gross output needs to fall between $95 and $142 billion to completely offset the estimated gains in consumption from lower gasoline prices based on the CBO multipliers.

Because there is uncertainty in this value—it could be higher or lower—the final column of Table 1 shows these same values if the multiplier for oil and gas production were 1. In this case the value of oil and gas extraction gross output needs to fall between $123 and $185 billion to completely offset the estimated gains in consumption from lower gasoline prices based on the CBO multipliers.

These are large reductions for the sector, but not unheard of—the value of oil and gas production fell a little less than $170 billion between 2008 and 2009 ($2009). Oxford Economics forecasts that real gross output in the oil and gas extraction sector will fall nearly $148 billion in 2015 ($2009), and IHS Global Insight is in this range as well (Oxford Economics, May 2015). Similar approximations, with the oil and natural gas production and price forecasts from EIA's Short Term Energy Outlook (May 2015), imply falls in gross output for this sector of around $137 billion in 2015.

To reiterate, the main purpose of these calculations is not precision, but to demonstrate that a larger U.S. oil and gas extraction sector can offset at least some of the benefit from lower oil/gasoline prices.

The key uncertainty in this analysis lies in the consumption multiplier—how much of the additional income to households will be consumed versus saved? The calculations look much different for a multiplier of 2.5 versus 1. The multiplier's size is likely to be different at different times, but as argued above, depends crucially on consumer debt levels, transfer payments, and the general state of the economy.

One might counter that the benefits to consumers are underestimated in these calculations. Mainly this is because there are supply-side effects due to falling prices of intermediate goods and transport.[24] This is valid point, but I have kept it out of the analysis because research

[24] See Citi Research (May 2015: 6-7), "Commodities Inflation Strategy: Re-examining the Energy-Inflation Relationship."

indicates it is small, and because it is hard to incorporate into the simple calculations above.[25] But keep in mind I have also ignored any reductions in consumption due to negative prospects in the oil sector, where there have been substantial layoffs in 2014-15.

If nothing else these calculations make a case for reevaluating oil price/GDP elasticities in standard macroeconomic models. As mentioned above, standard models show a range of 0.015-0.025; that is, real U.S. GDP increases between 0.15% and 0.25% for every 10% decrease in the real oil price.

How might this change given the re-emergence of the U.S. as a major oil producer? Suppose that there is no offset from the oil and gas extraction sector and the elasticity value is 0.025 for some given price change. Assuming a multiplier for savings from gasoline prices of 1.5, real U.S. GDP will be about $139 billion ($2009) higher than it otherwise would have been (bottom of column 2 in Table 1).

But the May 2015 STEO forecasts that the value of oil and gas production will fall by around $137 billion in 2015. This means the benefits to consumers would be almost completely offset by declines in oil and gas extraction, for an elasticity of zero. In fact, if the Oxford Economics forecast is more accurate, then the elasticity will be negative—lower oil prices will lead to small declines in real U.S. GDP in 2015.

Because these numbers are such approximations there is probably a large range of point estimates for the elasticity. But there is little doubt that it is smaller now than it was 5-10 years ago. My best estimate is that it is close to zero, if not negative.

Conclusion

Overviews of oil and gas production and consumption paint a consistent picture of why recent falls in the price of oil have not led to substantial gains in economic activity. The oil and gas sector is more important than in the past—both its share of nominal GDP and contributions to real GDP growth has increased in recent years. And domestic output and employment multipliers from the oil and gas extraction sector are not insubstantial, meaning that this larger size has more than proportionately affected the U.S. economy. Finally, consumption growth is lower than might be expected because of debt levels, especially those of lower income consumers.

There are large caveats to my analysis. The most important is that I have used static point estimate multipliers, some from the CBO and others which I calculated based on one year of BEA data. There are also large uncertainties around the how and why of consumption expenditures, and for the most part I have neglected credit in the analysis. Still, the calculations provide a rough approximation that can be used for comparison.

[25] See Kilian (2008: 879-881). Any additional investment or employment that results from the greater consumption is already included in the multiplier value.

References

Amromin, Gene and Leslie McGranahan (2015). The Great Recession and Credit Trends Across Income Groups, *American Economic Review: Papers and Proceedings*, 105(5), p. 147-153. URL: https://www.aeaweb.org/articles.php?doi=10.1257/aer.p20151054.

BEA (2015a). GDP-by-Industry, Q42014.
URL: http://www.bea.gov/iTable/index_industry_gdpIndy.cfm.

BEA (2015b). National Income and Product Accounts, Q12015.
URL: http://www.bea.gov/iTable/index_nipa.cfm.

Citi Research (May 2015). "Commodities Inflation Strategy: Re-examining the Energy-Inflation Relationship."

Edelstein, Paul and Lutz Kilian (2009). "How Sensitive are Consumer Expenditures to Retail Energy Prices?" *Journal of Monetary Economics*, 56(6), p. 766-779. URL: http://www-personal.umich.edu/~lkilian/jme2r1.pdf.

EIA (May 2015). Short-term Energy Outlook. URL: http://www.eia.gov/forecasts/steo/.

Federal Reserve Bank of New York (2015). Household Debt and Credit Report, Q42014.
URL: http://www.newyorkfed.org/microeconomics/hhdc.html#/2014/q4.

Federal Reserve Bank of Philadelphia (2015). Consumer Credit & Payments Statistics, Credit at the Family Level. URL: https://www.philadelphiafed.org/consumer-credit-and-payments/statistics/.

Federal Reserve Board (2015). Household Debt Service and Financial Obligations Ratios, Q42014. URL: https://research.stlouisfed.org/fred2/series/CDSP.

Gropp, Reint, John Krainer, and Elizabeth Laderman (2014). "Did Consumers Want Less Debt? Consumer Credit Demand Versus Supply in the Wake of the 2008-2009 Financial Crisis," Federal Reserve Bank of San Francisco Working Paper 2014-08.
URL: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2402086.

ICF (2013). "U.S. LNG Exports: Impacts on Energy Markets and the Economy."
URL: http://www.api.org/~/media/files/policy/lng-exports/api-lng-export-report-by-icf.pdf.

Kilian, Lutz (2008). "The Economic Effects of Energy Price Shocks." *Journal of Economic Literature* 46 (4): 871-909.
URL: https://www.aeaweb.org/articles.php?doi=10.1257/jel.46.4.871.

McKinsey Global Institute (2012). "Debt and Deleveraging: Uneven Progress on the Path to Growth."
URL: http://www.mckinsey.com/insights/global_capital_markets/uneven_progress_on_the_path_to_growth.

Oxford Economics (May 2015). May 2015 Macroeconomic Database.

Ramey, Valerie A. and David J. Vine (2011). "Oil, Automobiles, and the US Economy: How Much Have Things Really Changed?" In *NBER Macroeconomics Annual 2010*, Vol. 25, 333–67. Chicago: University of Chicago Press. URL: http://www.nber.org/chapters/c12036.

Sahm, Claudia R., Matthew D. Shapiro, and Joel Slemrod (2015). "Balance-Sheet Households and Fiscal Stimulus: Lessons from the Payroll Tax Cut and its Expiration," NBER Working Paper 21220. URL: http://www.nber.org/papers/w21220.

Steinbeck Scott R. (2004). "Using Ready-Made Input-Output Models to Estimate Backward-Linkage Effects of Exogenous Output Shocks," *The Review of Regional Studies*, 34(1), p. 57-71. URL: https://ideas.repec.org/a/rre/publsh/v34y2004i1p57-71.html.

Streitwieser, Mary L. (2011). "A Primer on BEA's Industry Accounts." URL: http://www.bea.gov/industry/pdf/industry_primer.pdf.

Whalen, Charles J. and Felix Reichling (Forthcoming). "The Fiscal Multiplier and Economic Policy Analysis in the United States," *Contemporary Economic Policy*. URL: https://www.cbo.gov/publication/49925.

Economics
The Open-Access, Open-Assessment E-Journal

Please note:

You are most sincerely encouraged to participate in the open assessment of this discussion paper. You can do so by either recommending the paper or by posting your comments.

Please go to:

http://www.economics-ejournal.org/economics/discussionpapers/2015-48

The Editor

© Author(s) 2015. Licensed under the Creative Commons Attribution 3.0.