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## Capital Spending on Energy: The Downside to Lower Oil Prices

Since mid-summer, spot and forward oil prices have plunged. Lower energy costs will boost near-term U.S. GDP growth by raising real income, wealth, and hence consumer spending. Yet the recent rapid expansion of the domestic energy sector has created a new vulnerability.

- Capital spending on energy recently reached 1% of GDP, the highest in three decades, but is likely to fall sharply if current low oil prices persist.<sup>1</sup>
- A simple model of investment suggests that if oil prices remain as low as implied by current forward contracts, these capital expenditures could, by the end of 2015, drop 30% relative to the path consistent with forward prices last summer.
- This would shave 0.1 percentage point from U.S. GDP growth over 2014 and 0.2 percentage point over 2015.
- Nevertheless, the drop in oil prices is good for the U.S. economy because the boost to household spending from lower oil prices more than offsets the decline in capital spending in the energy sector.

### CAPITAL SPENDING ON ENERGY

By mid-2014 capital spending in the energy sector exceeded \$150 billion, or 1% of GDP, the highest in three decades (Chart 1). While this expansion helped propel the current economic recovery, a drop in investment spending in the energy sector could now be a sizable offset to the boost in consumer spending from lower energy costs.

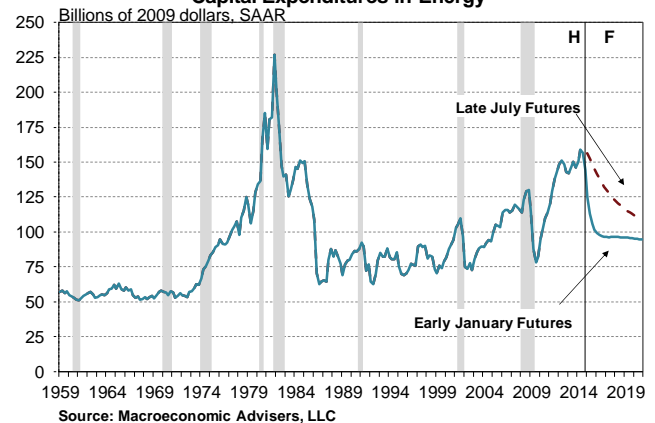
In theory, these capital expenditures should be positively correlated with the price of oil relative to the price of the capital goods in the industry. Chart 2 shows the history and, based on the early-January forward prices for WTI crude, a projection of this relative price. If today's forward prices are realized, the industry is facing a long period of sharply reduced, weak investment incentives.

We estimated a simple model in which capital expenditures in the energy sector react to the real price of oil with a lag while cumulating to a long-run unit-elastic response.<sup>2</sup> We used the model to estimate the impact on investment of the downward shift in the spot and forward prices of oil between late July and early January. The two cases are depicted quarterly in Chart 1, while annual average results are summarized in the nearby table. Under late-July price assumptions, investment falls to \$124 billion by the end of 2017. Under early-January price assumptions, investment falls to \$96 billion by the end of 2017, but the decline is concentrated in 2015.

<sup>1</sup> Capital spending on energy is defined here to include expenditures on the equipment and structures used in oil and gas extraction and supporting services.

<sup>2</sup> For more information on the model, please contact [Prakken@macroadvisers.com](mailto:Prakken@macroadvisers.com).

Chart 1  
 Capital Expenditures in Energy



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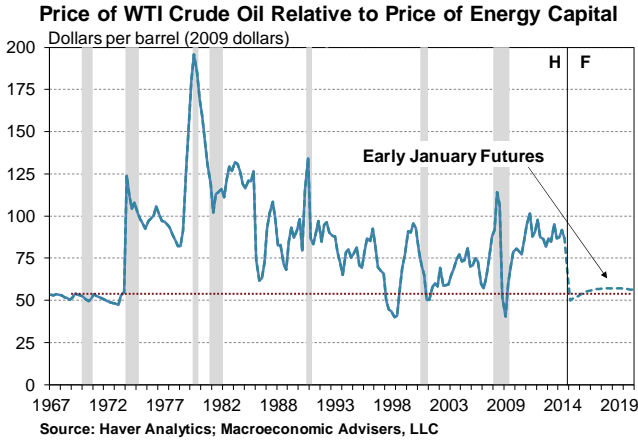
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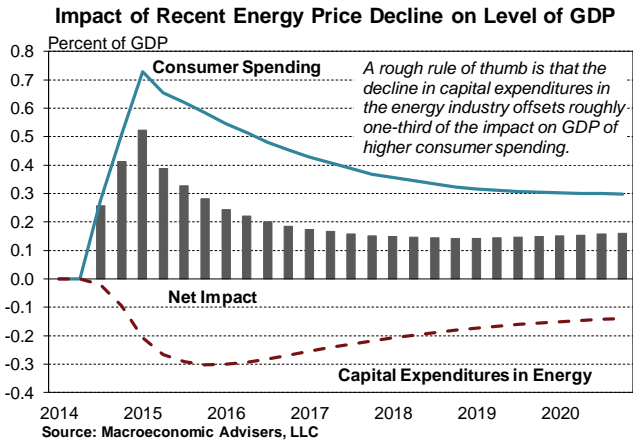
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**Chart 2**



**Chart 3**



The shift down in spot and forward oil prices since summer implies a decline in investment of \$51 billion (or 30%) by the end of this year. Given the quarterly pattern of the decline, it is enough to shave 0.1 percentage point from GDP growth over the four quarters of 2014 and 0.2 percentage point over the four quarters of 2015. The impact on *growth* after 2015 is minimal because the projected real price of oil stabilizes.

**LOWER OIL PRICES STILL A NET PLUS FOR THE US ECONOMY**

Capital spending in the energy industry is the downside to lower oil price. The upside is the increase in consumer spending that arises as lower energy prices free household income to be spent on non-energy goods and services. Chart 3 shows, in the solid blue line and measured as a percent of GDP, the boost to personal consumption expenditures from lower energy prices since the second quarter of 2014. The red dashed line shows the offset from the decline in capital spending, and the gray bars depict the net boost to the economy. The rise in consumer spending reaches 0.7 percent of GDP in 2015. The decline in capital spending offsets roughly one-third of that gain, leaving a peak net effect on GDP of 0.5 percent. This gradually dwindles as oil prices recover towards the early July projections.

**Energy Cap Ex under Alternative WTI Paths (Billions of 2009 dollars)**

WTI Price Path	2014	2015	2016	2017	2018	2019	2020
Early July Futures	157	151	137	127	120	114	111
Early January Futures	153	111	98	96	96	96	95
<i>Differences:</i>							
Billions 2009 Dollars	-4	-39	-39	-30	-23	-19	-16
Percent Difference	-3%	-26%	-29%	-24%	-19%	-16%	-14%
Percent of GDP	0.0%	-0.2%	-0.2%	-0.2%	-0.1%	-0.1%	-0.1%

<sup>3</sup> The impact on consumer spending is discussed in more detail in “Energy Price Declines Good for the U.S. Economy, but the Story Has Nuances” (Macroeconomic Advisers’ *Macro Focus*, forthcoming, January 2015).

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