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## The Economics of Lower Oil Prices

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**Abstract**

Since mid-2014, crude oil prices have dropped precipitously. After averaging more than \$100 per barrel in the first half of the year, West Texas Intermediate has plunged to less than \$55 per barrel at year's end, about a 50% drop. This ranks as one of the largest oil price declines in history. And though it will result in economic winners and losers, on net it will be a significant positive for the global economy.

# The Economics of Lower Oil Prices

BY CHRIS LAFAKIS, ADAM KAMINS, EDWARD FRIEDMAN AND DAN WHITE

Since mid-2014, crude oil prices have dropped precipitously. After averaging more than \$100 per barrel in the first half of the year, West Texas Intermediate has plunged to less than \$55 per barrel at year's end, about a 50% drop. This ranks as one of the largest oil price declines in history. And though it will result in economic winners and losers, on net it will be a significant positive for the global economy.

This article addresses four broad questions:

1. What is the baseline outlook for oil prices?
2. What are the links between oil and the rest of the economy in terms of demand, supply, inflation and monetary policy?
3. What is the effect of oil prices on global, U.S. and regional economies under the baseline outlook for oil prices?
4. What would be the impact if oil prices were to remain lower for longer?

The article begins by exploring the factors that explain why oil prices have fallen, including the unexpectedly large recent growth in supply, weakness in global demand growth, the rising value of the U.S. dollar, and the perception that political uncertainty in global oil-producing regions has diminished, even though it is not completely gone. The discussion of these factors will underpin the baseline outlook that oil prices will remain low in 2015 but rebound steadily to more than \$100 per barrel by 2018. The dynamics are that lower prices will slow the growth in oil supply at the same time that they lead to higher oil demand.

Next, the major linkages between oil and the overall economy are described. On the demand side, changes in oil prices result in significant changes in disposable income available for nonenergy consumer spending, qualitatively comparable to a tax cut or

increase. On the supply side, the oil industry has become a larger segment of overall business fixed investment in the past decade, and the pace of such investment is sensitive to the oil price.

This paper then reviews the intersection of oil prices and inflation. Oil prices directly affect the top-line CPI and consequently will affect monetary policy deliberations regarding the normalization of interest rates.

Finally, the effects of lower oil prices on the U.S. economy are evaluated under alternative assumptions that would keep the price of oil subdued for several years running. This projection utilizes the Moody's Analytics macro model, a large, multi-equation structural econometric model that links the various sectors of the U.S. economy. The regional pattern of impacts is projected using the Moody's Analytics regional econometric models, which use the macro model results as inputs to apportion the effects across the regions. Most parts of the country will benefit from a lower oil price, since they are net consumers of energy. However, producing regions are at risk to decline. The experience of Texas

in the 1986 oil price drop will be reviewed in this context.

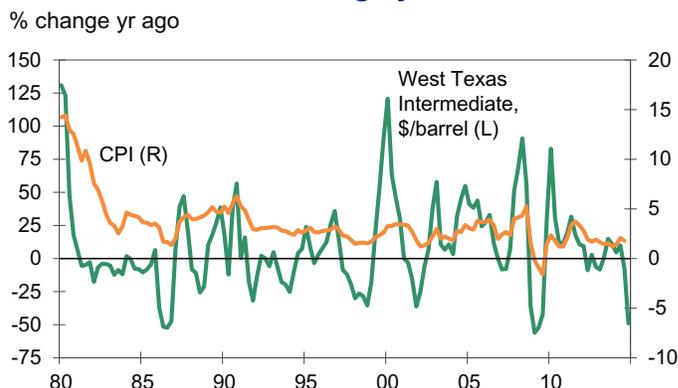
Finally, commentary is provided on the effects of lower oil prices in the rest of the world.

## Sharp declines in the past

The price of oil is especially volatile (see Chart 1). Three times during the past 35 years, the price of West Texas Intermediate crude has fallen by more than 40% (see Chart 2). The biggest decline was in the second half of 2008, when WTI fell from \$133 per barrel on a monthly average basis to \$40, a 70% drop. That was exclusively a demand-driven event associated with the rapid global contraction in the Great Recession.

An earlier large decline, starting in late 1985 and continuing through the first half of 1986, may compare more closely with

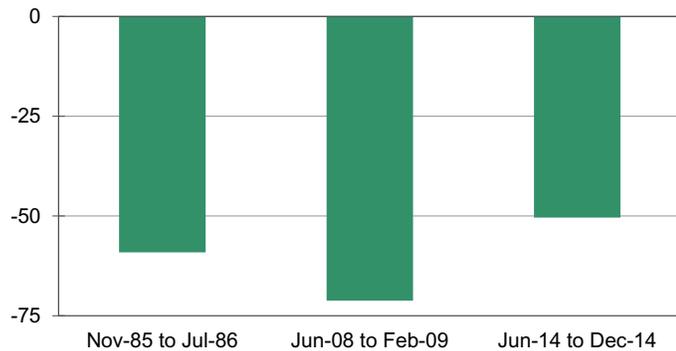
**Chart 1: Oil Prices Are Highly Volatile**



Sources: EIA, BLS, Moody's Analytics

**Chart 2: Not the First Time Oil Has Fallen So Far**

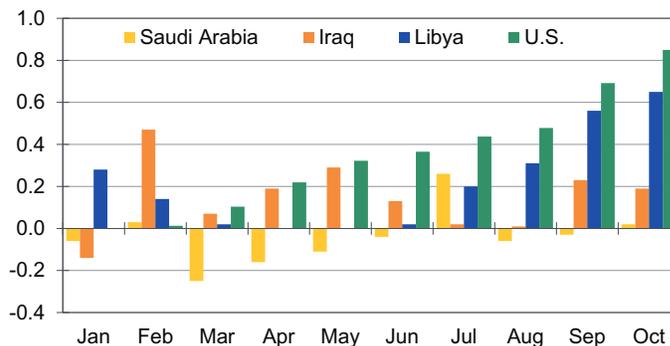
West Texas Intermediate, peak-to-trough % change



Sources: EIA, Moody's Analytics

**Chart 3: Primary Reason Is New Supplies...**

Cumulative change in oil production from Dec 2013, mil bpd



Sources: IEA, EIA, Moody's Analytics

current events. At that time, the per-barrel price fell from a bit higher than \$30 to less than \$12, a 62% decline. Then, as now, the U.S. economy had been recovering for several years from a deep recession, and supply-side rather than demand-side considerations were the major driver. In particular, the government of Saudi Arabia, the world's major swing producer at the time, found itself in deficit and needed to boost production to meet its fiscal needs.

**The supply side today**

Moody's Analytics estimates that approximately half of the recent decline in oil prices can be attributed to strong growth in global crude oil production concentrated in the U.S., Libya and Iraq (see Chart 3). U.S. oil production has risen by 677,000 barrels per day since June and 978,000 bpd since the beginning of the year, thanks to the continued development of oil-rich shale fields. The

Eagle Ford and Bakken shale formations in Texas and North Dakota have been the biggest sources of U.S. oil production growth.

Furthermore, Libyan oil production has surged. Because of political infighting, the nation's production in June was just 240,000 bpd, far below its level of 1.5 million before the 2011 revolution. But since June, the government has cut deals with rebels and protesters, allowing it to reopen oil fields and terminals. Libyan oil output briefly rose to 810,000 bpd before settling at 690,000 bpd. Libyan officials are expecting to boost production to 1.2 million bpd by early 2015.

Iraq's oil production has risen by 200,000 bpd since the start of 2014, a remarkable feat in the midst of the rise of ISIS. Combined, the U.S., Libya and Iraq added 1.7 million bpd to global oil supply in 2014.

**Perceived slowing global demand**

New supplies have emerged at a time when expectations for global oil demand growth have slowed. In recent months, the International Energy Agency has cut its forecast for global oil demand in 2015 by 700,000 bpd (see Chart 4). Moody's Analytics estimates that 30% of the decline in oil prices

can be attributed to weaker than expected global demand.

Specifically, concerns about the global economy have widened over the past few months. Although China is expected to be the foremost driver of global oil demand over the next five years, its property prices are falling, and recent economic indicators have imperiled its target real GDP growth rate of 7.5%.

Moreover, the widening rift between Russia and the West has created a crisis in Russia, which almost assuredly will fall into recession in 2015. Europe's growth is sluggish as well. The persistent focus on fiscal austerity, constrained credit flows, and a lack of structural reforms have kept alive fears of a triple-dip recession there.

Latin America is slumping as well, as both Brazil and Argentina have struggled to post any growth, and Mexico has not performed much better.

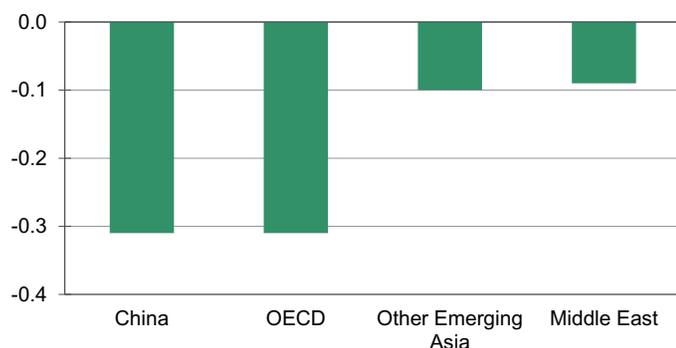
It is important to note that, up to this point, global oil demand continues to grow despite the dark clouds on the global economic horizon. But investors worried about future oil demand gains have flocked toward the exits.

**Other factors**

Moody's Analytics estimates that appreciation of the U.S. dollar accounts for about 15% of the decline in crude oil prices (see Chart 5). The dollar has been strong because global weakness has led to yet another flight to the safe haven of U.S. Treasury securities. Since oil is priced in dollars, a stronger

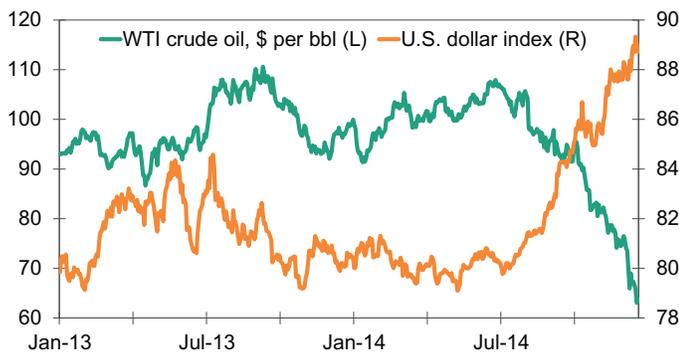
**Chart 4: ...But Weaker Growth Also Plays Role...**

IEA forecast for 2015 oil demand, change from peak, mil bpd



Sources: IEA, Moody's Analytics

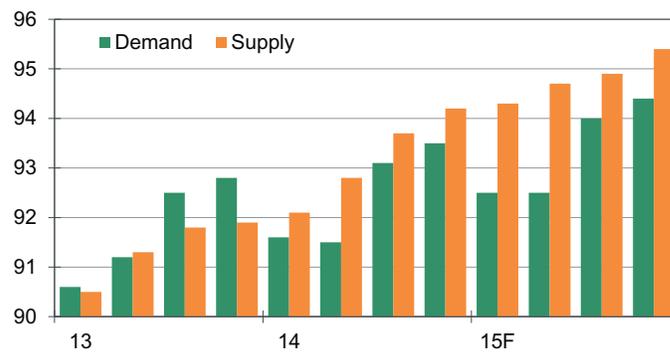
**Chart 5: ...As Does Surging Dollar**



Sources: Bloomberg, ICE, Moody's Analytics

**Chart 6: IEA Expects Ongoing Oil Glut**

Global oil market, IEA forecast, mil bpd



Sources: IEA, Moody's Analytics

U.S. dollar means that a lower oil price is needed to bring global supply in line with global demand.

Further, a small proportion of the decline in oil prices can be explained by the easing, or at least stabilization, of geopolitical tensions. In late June and early July, there was a legitimate concern that ISIS would topple Iraq's government and throw the country's oil production into disarray. But many countries have come to the aid of Iraq under the leadership of the U.S., extinguishing the imminent threat to Iraqi oil production. Moreover, the constructive and ongoing negotiations between the U.S. and Iran on its nuclear program have turned geopolitics into a downside risk for oil prices. An Iran-U.S. rapprochement would enable Iran's investment-starved oil industry to ramp up production over time.

**OPEC shifts strategy**

OPEC has responded to falling oil prices by standing pat on production. Moreover, Saudi Arabian oil minister Ali al-Naimi vowed that OPEC would not cut production even if global prices fell to as low as \$20 per barrel. This marks a stark departure from the aftermath of the 2008-2009 global recession, during which the cartel slashed production to prop up prices.

The difference this time around is the proliferation of U.S. shale drillers. Saudi Arabia rightly assumes that cutting its output not only would mean a loss of market share but also would keep global oil prices above the breakeven extraction costs for many upstart

U.S. shale drillers. By letting oil prices plunge, the Saudis hope to wring out less efficient oil producers. This strategy was not effective when oil prices fell to \$80, but it became effective at \$60 a barrel. Barclays estimates that 25 North American companies have already cut their capital spending budgets for 2015 by \$12 billion.

The consequence of Saudi Arabia's strategy is that the OPEC cartel has effectively ceased to play its familiar role of restraining production to buoy prices. A cartel cannot be effective without cooperation, and there is a gulf between the positions of fiscally unstable countries such as Venezuela and secure, efficient producers such as Saudi Arabia. OPEC cooperation has always ebbed and flowed, but the advent of U.S. shale production could mark a new chapter in OPEC's willingness to support falling oil prices.

**Recalibrating expectations**

Moody's Analytics has revised its 2015 outlook for the price of oil to reflect swift and appreciable deterioration in the balance between global supply and demand and OPEC's unexpected response in an environment of sharply declining oil prices. The current baseline forecast projects WTI crude

oil will cost \$80 per barrel by this time next year, down from \$114 in June 2014.

**Is the IEA right?**

In 2013, global oil demand outpaced supply by 400,000 bpd, but in 2014 supply was on track to outpace demand by 525,000 bpd. In the fourth quarter of 2014, according to IEA estimates, supply outpaced demand by 700,000 bpd, and its expectation is that the gap will widen in 2015 (see Chart 6). If it does, it will be difficult to envision a scenario in which oil prices rebound significantly from their current levels, especially because the U.S. dollar is expected to continue appreciating in 2015 (see Chart 7).

Since the IEA is the arbiter of the global oil market, its projections carry a great deal of weight. Market participants expect WTI crude oil will average \$56 per barrel one year from now, implicitly assuming that the glut will not disappear soon. However, supply has

**Chart 7: Dollar Should Rise Further**

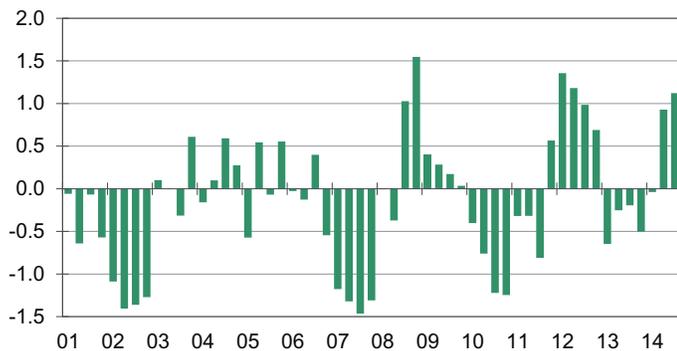
Weighted avg U.S. dollar index, Mar 1973=100



Sources: Federal Reserve, Moody's Analytics

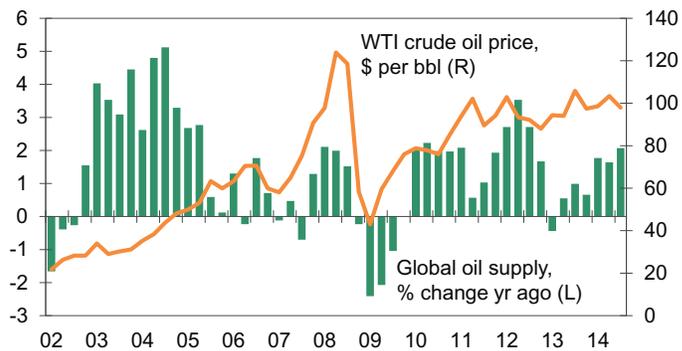
**Chart 8: Oil Market Is Self-Correcting...**

Global supply less demand, mil bpd, SA



Sources: IEA, Moody's Analytics

**Chart 9: ...As Oil Price Declines Rein in Supply**



Sources: EIA, IEA, Moody's Analytics

outstripped demand for a maximum of only six consecutive quarters dating back to 2001, even during the Great Recession (see Chart 8). If the IEA's forecast came to pass, supply would be outpacing demand in at least eight consecutive quarters. The supply/demand balance will likely adjust more quickly.

**Not a normal market**

The oil industry adjusts whenever supply becomes out of sync with demand, but not in the same fashion as other industries because of differences in demand elasticities, resource constraints and input costs. Industries such as fast food and retail operate at razor-thin profit margins and have minimal pricing power, since any wholesale attempt to raise prices appreciably would drive away customers. In contrast, demand for gasoline, diesel, and other petroleum products is inelastic, allowing marginal revenues for crude oil production for many producers to be well above marginal costs. Whereas additional supply would come on line to compete away the profit margin for most other industries, the scarcity of crude oil reserves has long limited supply growth.

Thus, for the oil industry it does not make sense to cut production when prices decline so long as prices are still above breakeven extraction costs. Moreover, even when prices are below breakeven costs, many energy companies will still continue pumping from established wells to generate the cash flow needed to finance the debt that they took on to create the well. Lower oil prices do reduce oil exploration and production investment,

however, to the extent that the capital costs of a project exceed its expected returns.

Historically, sharp oil price declines have drained investment and caused global oil supply to contract (see Chart 9). This occurred in each of the last two recessions, when prices fell below their breakeven costs. Reduced investment translated into lower production, typically with a three-quarter lag.

**Production growth will slow...**

It remains to be seen whether the \$50 decline in prices will cause global oil supply to decrease, but it is certain to slow production growth. Drillers reduced their capital spending by about 20% in the price decline of 2008 and 2009. During that episode, prices fell by \$115 to their daily trough from their \$145 daily peak. Capital spending might have fallen even more, but oil companies were not making investments that were predicated on oil averaging \$145 because oil prices had previously ramped up dramatically from \$100 at the beginning of 2008. This limited the decline in investment. Moreover, profit margins were a lot wider.

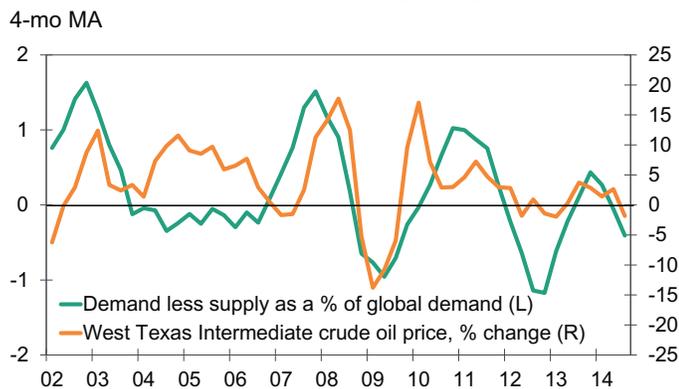
The U.S. shale revolution has contributed to the thinning of industry-wide profit margins. Small and midsize drillers have greatly accelerated their operations over the past few years, driving up the costs of land, labor, fracking resources, drilling equipment and energy services. Meanwhile, infrastructure bottlenecks force shale operators to sell their oil at a discount to global benchmarks such as Brent crude oil, further compressing profit

margins. As a result, some investment decisions were made that are uneconomical at today's oil prices. It typically takes two to three quarters for declines in investment to result in lower oil prices.

In addition, depletion rates of shale oil wells in the U.S. are three times faster than for conventional oil wells. This means that new wells must be continually brought on line to compensate for the depletion of old wells and boost net production, and new wells require financing. However, financial intermediaries are far less willing to provide drillers credit when WTI is trading below \$60 than when it is trading above \$100. To complicate matters, a nontrivial number of small and medium-size drillers that have contributed to the breakneck pace of U.S. oil production growth leveraged their balance sheets to expand oil production. But yields in leveraged energy finance have doubled, and the share prices of many small, leveraged drillers have been cut by half. Moreover, the Federal Reserve has ceased its quantitative easing program, and robust macroeconomic data have pulled forward expectations of a funds rate increase, further exacerbating leveraged energy finance conditions.

To manage their substantial debt burdens, leveraged energy drillers are being forced to deleverage their balance sheets. The only way to do so is to cut capital spending, lay off workers, or sell assets. Companies are more likely to cut spending because they do not want to sell their assets into a buyer's market. A number of small and midsize companies have already slashed their capital

**Chart 10: Lower Supply Brings Higher Prices**



Sources: Bloomberg, Moody's Analytics

**Chart 11: Emerging Markets Still Growing**



Sources: Bloomberg, China Assn. of Auto Manufacturers, Moody's Analytics

expenditure plans for 2015, some by more than 40%.

Large multinational oil companies will also trim their capital spending in response to lower prices. Conoco Phillips and Marathon Oil will cut their 2015 capital budgets by 20%; BP and Total also are trimming capital spending. Chevron and Shell have backed out of shale drilling in Ukraine, and Goldman Sachs estimates that almost \$1 trillion of spending on future oil projects is at risk because of the oil price drop, with the most sensitive areas being high-cost areas such as Canada's oil sands, the North Sea, and the Arctic Sea. Lower oil prices also complicate Mexico's task of opening its energy sector to investment next year.

Big projects with poor economics, such as the \$16 billion project that Total and Exxon are working on in Angola that will be profitable only at \$70 per barrel, are difficult to stop. But the appetite for new large-scale

projects has diminished. And smaller projects by leveraged companies will likely be the first to go. Weaker supply gains are the principal case for higher oil prices in the coming year (see Chart 10). Reduced investment will manifest itself in weaker production growth in the second half of 2015.

**...And demand will rise**

Although most of the adjustment needed to bring the oil market back into balance will come from the supply side, lower oil prices will also boost global oil demand. Even though gasoline demand is fairly inelastic, it is not completely so. In the U.S., a 10% decline in gasoline prices boosts gasoline consumption by 1%. Since prices have fallen by 33% from their peak, this rule of thumb suggests that the nation's gasoline demand will rise by 3.3% on account of lower gasoline prices. Lower gasoline prices are the main channel through which lower oil prices benefit the U.S. economy.

Globally, it takes a 15% decrease in crude oil prices to cause oil consumption to rise by 1%. The global economy's price elasticity of oil demand is lower than that of the U.S. because many emerging-economy governments

manipulate energy prices by fixing them or offering subsidies. These actions in many cases decouple global oil prices from petroleum product prices in emerging economies.

Indeed, just in the last few months, India moved to halt diesel subsidies and raise taxes on gasoline and diesel. In China, gasoline and diesel prices cease to closely track oil prices at around \$80 per barrel. Actions such as these will dampen the degree to which lower oil prices flow through to consumers. Nonetheless, oil demand will rise because of lower oil prices in emerging and developed economies.

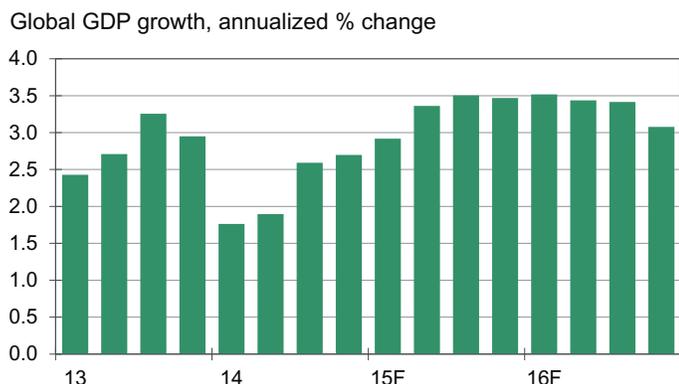
Independent of lower oil prices, emerging-economy industrialization will continue to be the primary catalyst for rising global oil demand. China's passenger car sales have risen from 500,000 per month in January 2006 to 1.7 million units, achieving a rise of 340%, far above the 111% growth rate of China's overall economy over the past eight years (see Chart 11).

Moreover, the global economy is expected to firm up in 2015. Moody's Analytics estimates that it expanded at 1.8% in the first half of 2014, but growth is expected to accelerate to 3% in 2015 (see Chart 12). The combination of lower oil prices, industrializing emerging economies, and stronger economic gains will ensure that global oil demand rises in 2015.

**The baseline outlook: Oil prices rebound in 2015**

Moody's Analytics expects the price of WTI crude oil to rise throughout 2015, reach-

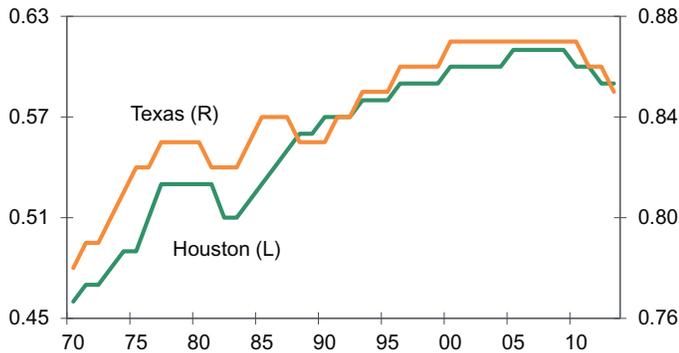
**Chart 12: Global Growth Will Revive Oil Demand**



Source: Moody's Analytics

**Chart 13: Diversity Reduces Texas Volatility**

Industrial diversity index, U.S.=1



Source: Moody's Analytics

ing \$80 per barrel by this time next year. The risks to this price forecast are weighted to the downside, since it is difficult to project the timing of reductions in exploration and production and increases in oil product consumption that Moody's Analytics assumes will bring the oil market into balance. However, supply and demand dynamics serve to explain the logic behind the forecast.

**Links between oil and the economy**

Numerous crosscurrents must be considered when calculating the effect of oil price declines on the prospects of the U.S. economy. Oil price declines act as a tax cut, enabling consumers to spend a greater percentage of their incomes on nonenergy goods and services. Every 1-cent decline per gallon in gasoline prices frees up \$1.1 billion in spending over the course of a year. If the \$60 decline in oil prices is sustained over the course of a year, lower oil prices would free up \$165 billion for nongasoline expenditures. Households would also benefit from lower heating oil and diesel prices, freeing up an additional \$50 billion. Furthermore, since the U.S. is still a net oil importer, lower oil prices reduce the nation's trade deficit.

Compelling as they are, these two factors have no bearing on the rate of real U.S. GDP growth. When it comes to national income and product accounting, the Bureau of Economic Analysis counts every real dollar of spending the same, regardless of whether that dollar is spent on gasoline or healthcare. Moreover, the nominal trade deficit is irrelevant to real GDP growth, which strips out

price fluctuations by definition. Instead, the extent to which lower oil prices help the economy to expand depends on the decline in inflation, which amplifies real spending and creates jobs, and the increase in corporate profits. Higher real spending prompts businesses to increase investment and hire more workers. Businesses also benefit from lower input costs and thus higher profit margins, especially those for which oil is a major input cost. These include transportation, agriculture and manufacturing companies.

On the downside, lower oil prices are a stark negative for U.S. drillers, which have historically responded by cutting capital expenditure and laying off workers. The oil and gas sector had been adding jobs at a rate of 35,000 per year, but it could shift to a similarly sized drag this year. Moreover, some oil rigs will be idled in 2015. And rig rates, which are the amount of money that drillers pay to lease rigs so that they can establish new wells, have already fallen by 10%. Nominal capital expenditure on oil exploration and production fell by 20% during the Great Recession, and it is on pace to fall by a similar amount this time around. Lower oil prices also curb tax revenue collections for state governments, which will have to respond by cutting spending or raising taxes.

On net, though, lower oil prices are an unambiguous positive for the U.S. economy. Even when accounting for the indirect jobs tied to the energy industry, two jobs will be created in nonenergy industries for every energy-linked job that is lost. Corporate profits also get a net boost, although the positives are diffused among a greater number of businesses than the negatives. Because of the preeminent effect of lower inflation in the lower oil price equation, each \$10 decline in oil prices boosts U.S. real GDP

growth by 0.15 to 0.2 percentage point per year. If oil prices come in as expected this year, real GDP growth would be boosted by 0.5 percentage point.

Lower oil prices also carry implications for monetary policy. The stronger growth they generate would argue for tighter monetary policy, but the reductions in inflation would argue for looser monetary policy. In an environment in which annual growth in the personal consumption expenditures deflator could fall to 0.6% by midyear, far below the Federal Reserve's preferred level of 2%, lower oil prices are more likely to result in a more accommodative monetary policy rather than tighter policy.

**Oil and the baseline outlook**

The U.S. economy was already projected to accelerate in 2015 prior to recent events. Some sectors will now get an added boost while oil prices are low. Specifically, the increase in disposable income will support additional consumer spending. However, any net impact on real GDP growth will be tempered by the higher value of the U.S. dollar, which will limit growth in exports.

Gains will be slower in oil-producing areas of the country, but they should avoid recession.

There are four reasons for the relatively sanguine forecast. First, the baseline presumes that global demand for oil will firm as the gap between supply and demand closes, leading to the rebound in prices. As a consequence, production and exploration will stabilize.

Second, major producing regions such as Texas—and Houston in particular—are more industrially diversified than in the past. The Moody's Analytics diversity index for Houston has trended up since the mid-1980s. The current reading for Houston of 0.6 means that the metro area is about 60% as diverse as the U.S. economy (see Chart 13). For reference, well-diversified metro areas such as Dallas and Chicago are at about 0.8, financially concentrated San Francisco and New York are at about 0.6, and Seattle is much lower at 0.38 because of the high concentration of the aerospace industry. The additional diversity in Houston is reflected in the

**Table 1: U.S. Macro S8 Scenario—Forecast Summary**

|                                  | Units     | 14Q4     | 15Q1     | 15Q2     | 15Q3     | 2014     | 2015     | 2016     | 2017     | 2018     |
|----------------------------------|-----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| Gross domestic product           | bcw\$     | 16,236.1 | 16,379.9 | 16,577.8 | 16,760.6 | 16,060.6 | 16,668.5 | 17,395.7 | 17,972.3 | 18,421.0 |
| Change                           | %AR       | 1.8      | 3.6      | 4.9      | 4.5      | 2.2      | 3.8      | 4.4      | 3.3      | 2.5      |
| Federal budget                   | \$ bil    | -297.2   | -251.3   | 68.4     | -77.1    | -608.3   | -509.2   | -383.9   | -313.7   | -276.3   |
| Total employment                 | mil       | 140.0    | 140.9    | 142.1    | 143.2    | 138.9    | 142.7    | 147.2    | 150.1    | 151.4    |
| Change                           | %AR       | 2.4      | 2.4      | 3.4      | 3.3      | 1.9      | 2.7      | 3.2      | 1.9      | 0.9      |
| Unemployment rate                | %         | 5.8      | 5.6      | 5.3      | 5.1      | 6.2      | 5.2      | 4.5      | 3.9      | 3.8      |
| Light vehicle sales              | mil, SAAR | 16.7     | 16.7     | 17.5     | 17.8     | 16.4     | 17.5     | 18.0     | 17.7     | 17.4     |
| Residential housing starts       | mil, SAAR | 1.15     | 1.23     | 1.39     | 1.53     | 1.02     | 1.46     | 1.92     | 2.06     | 1.95     |
| Median existing-home price       | \$ ths    | 212.1    | 216.7    | 219.1    | 221.6    | 207.3    | 220.3    | 228.3    | 235.2    | 241.4    |
| Change                           | %YA       | 6.3      | 6.7      | 7.0      | 6.0      | 5.9      | 6.3      | 3.6      | 3.0      | 2.6      |
| Consumer price index             | %AR       | 0.4      | -1.6     | 1.6      | 1.4      | 1.7      | 0.6      | 2.0      | 2.6      | 3.1      |
| Federal funds rate               | %         | 0.1      | 0.1      | 0.1      | 0.3      | 0.1      | 0.3      | 2.3      | 3.9      | 4.7      |
| Treasury yield: 10-yr bond       | %         | 2.45     | 2.65     | 2.95     | 3.24     | 2.58     | 3.06     | 4.07     | 4.69     | 4.65     |
| Baa corp. - 10-yr Treasury       | DIFF      | 2.8      | 3.0      | 2.7      | 2.5      | 2.4      | 2.6      | 2.3      | 2.4      | 2.5      |
| Corporate profits with IVA & CCA | \$ bil    | 2,179.6  | 2,290.7  | 2,445.3  | 2,586.7  | 2,094.5  | 2,513.9  | 2,882.4  | 3,019.4  | 3,074.0  |
| Change                           | %YA       | 1.7      | 18.0     | 16.1     | 20.3     | -0.6     | 20.0     | 14.7     | 4.8      | 1.8      |
| S&P 500                          | 1941=10   | 2,012.2  | 2,058.2  | 2,111.5  | 2,144.8  | 1,930.7  | 2,120.5  | 2,212.0  | 2,282.6  | 2,405.8  |
| Change                           | %YA       | 13.7     | 12.2     | 11.1     | 8.5      | 17.5     | 9.8      | 4.3      | 3.2      | 5.4      |

Source: Moody's Analytics

growth of its downstream petrochemicals businesses, healthcare, and research, transportation and professional services.

The implication is that a decline in any one industry is less likely to cause the entire metro area economy to decline. In the case of Texas and Houston, although mining employment is likely to decrease significantly, the state and metro area should continue to grow overall. The Moody's Analytics baseline forecast for 2015 employment and output growth in Houston, while positive, is now

half of what was projected early in the fourth quarter of 2014. The risks are even greater for smaller energy-focused metro areas such as Midland and Odessa, whose diversity indexes remain below 0.2.

Third, the housing markets of the Texas and Houston economies are in better shape than those of many areas around the country. House prices rose at an above-average pace in 2014, and the inventory of homes for sale is the lowest in more than 25 years (see Chart 14). Population growth that is well

above the national average in Texas and Houston alike implies that demographic demand for housing will continue to grow. Further, as in the past, affordability is comparable to the national average in Texas and Houston.

Fourth, the breakeven cost of

drilling in Eagle Ford has been estimated at \$50 to \$57 per barrel.<sup>1</sup> Further, the breakeven cost itself can decline as productivity improvements in drilling disseminate and oil-field services businesses compromise on fees in the climate of lower oil prices.

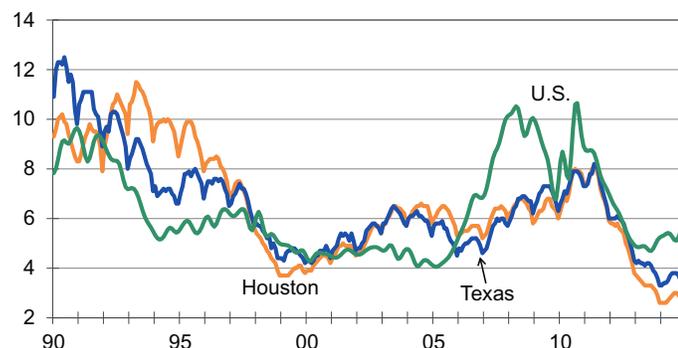
### What if the price of oil stays low?

The Moody's Analytics baseline outlook projects a steady rebound in the price of oil, based on the assumption that strengthening global demand will outpace growth in supply. But what if this assumption does not play out as projected?

An alternative scenario has been created using the Moody's Analytics macro model to assess what would happen if oil prices were to stay in the current general range for the next several years. This scenario assumes that oil prices would stay at around \$60 per barrel continuously through the end of 2017. The fundamental basis of this low-oil-price scenario is that recent and prospective increases in supply are greater than previously

### Chart 14: Texas Housing Is Not Overbuilt

Housing inventory, mo of sales



Sources: Census Bureau, Texas A&M Real Estate Center, Moody's Analytics

<sup>1</sup> See <http://www.mysanantonio.com/business/article/Eagle-Ford-economics-makes-lots-of-sense-4314324.php>

**Table 2: U.S. Macro S8 Scenario—Difference From Baseline**

|                                  | Units     | 18Q2  | 18Q3  | 18Q4  | 19Q1  | 2017  | 2018  | 2019  | 2020  | 2021  |
|----------------------------------|-----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Gross domestic product           | bcw\$     | 298.0 | 289.2 | 277.3 | 261.8 | 278.2 | 290.8 | 228.1 | 121.8 | 11.9  |
| Change                           | %AR       | -0.1  | -0.2  | -0.3  | -0.4  | 0.4   | 0.0   | -0.4  | -0.6  | -0.6  |
| Federal budget                   | \$ bil    | 81.9  | 84.2  | 85.5  | 85.8  | 261.1 | 329.8 | 333.4 | 274.5 | 178.9 |
| Total employment                 | mil       | 2.4   | 2.3   | 2.3   | 2.1   | 2.2   | 2.3   | 1.9   | 1.0   | 0.1   |
| Change                           | %AR       | 0.0   | -0.1  | -0.2  | -0.3  | 0.4   | 0.1   | -0.3  | -0.6  | -0.6  |
| Unemployment rate                | %         | -1.1  | -1.1  | -1.0  | -1.0  | -1.0  | -1.1  | -0.9  | -0.5  | -0.1  |
| Light vehicle sales              | mil, SAAR | 1.3   | 1.0   | 0.8   | 0.6   | 1.6   | 1.1   | 0.2   | -0.6  | -1.2  |
| Residential housing starts       | mil, SAAR | 0.05  | 0.04  | 0.03  | 0.02  | 0.07  | 0.05  | -0.01 | -0.08 | -0.15 |
| Median existing-home price       | \$ ths    | 4.9   | 5.3   | 5.6   | 5.8   | 3.3   | 5.1   | 5.8   | 5.0   | 2.7   |
| Change                           | %YA       | 0.8   | 0.7   | 0.6   | 0.5   | 0.8   | 0.7   | 0.3   | -0.5  | -1.0  |
| Consumer price index             | %AR       | 0.5   | 0.6   | 0.5   | 0.5   | -0.2  | 0.3   | 0.5   | 0.5   | 0.4   |
| Federal funds rate               | %         | 0.7   | 0.8   | 0.9   | 1.0   | 0.4   | 0.7   | 1.1   | 1.5   | 1.7   |
| Treasury yield: 10-yr bond       | %         | 0.12  | 0.16  | 0.21  | 0.26  | 0.03  | 0.15  | 0.34  | 0.59  | 0.76  |
| Baa corp. - 10-yr Treasury       | DIFF      | -9.1  | -9.0  | -9.0  | -9.0  | -9.4  | -9.0  | -8.9  | -8.9  | -8.9  |
| Corporate profits with IVA & CCA | \$ bil    | 515.3 | 511.0 | 500.2 | 485.4 | 442.0 | 508.3 | 453.7 | 347.1 | 214.3 |
| Change                           | %YA       | 3.0   | 1.9   | 0.4   | -0.9  | 4.2   | 2.3   | -2.1  | -4.2  | -4.9  |
| S&P 500                          | 1941=10   | 158.6 | 152.8 | 142.6 | 130.4 | 142.7 | 153.2 | 106.3 | 36.6  | -33.0 |
| Change                           | %YA       | 0.7   | -0.1  | -0.9  | -1.6  | 1.0   | 0.1   | -2.3  | -3.1  | -2.8  |

Source: Moody's Analytics

anticipated, demand growth will be weaker than expected, and new supply will more than offset the rise in demand. The results are summarized in Tables 1 and 2.

Although its oil industry is larger than those of most other nations, the U.S. is a net importer of oil, and the nonoil share of its economy is far greater than in major petroleum producers such as Saudi Arabia, Canada, Russia, Mexico and Venezuela. Consequently, although lower oil prices cause a decline in oil exploration and production, the effect on the rest of the economy is positive.

One factor resulting from the model-based result is that inflation, as measured by the top-line CPI, would be 1 percentage point lower than in the baseline outlook over the course of 2015.

In terms of real economic activity, the extended lower oil prices of the scenario also extend the boost to consumer spending on nonoil goods and services and further reduce energy costs overall for industrial production. As a result, on an annual average basis, real GDP growth in 2015 is 0.5 percentage point greater than in the baseline forecast; in

2016, GDP growth exceeds the baseline rate by 0.8 percentage point. By the end of 2017, the level of real GDP is 1.7% higher than in the baseline.

However, the energy industry itself contracts, with oil exploration and related employment declining over the course of 2015 and 2016. Oil production also falls somewhat during this time.

The scenario assumes that oil prices would ultimately begin to rise again in 2018, and as a result, overall real GDP growth would decelerate back to the baseline path over the ensuing several years. Specifically, the assumption is that oil prices rise at a rate close to the CPI and ultimately return to the baseline level by the end of 2024. The basis for this assumption is the long-run historical observation that although oil prices are volatile, since the end of the 1970s the inflation-adjusted price of oil has trended neither up nor down.

### A benefit to most U.S. regions...

Most regions of the country would benefit if oil prices were to stay persistently low,

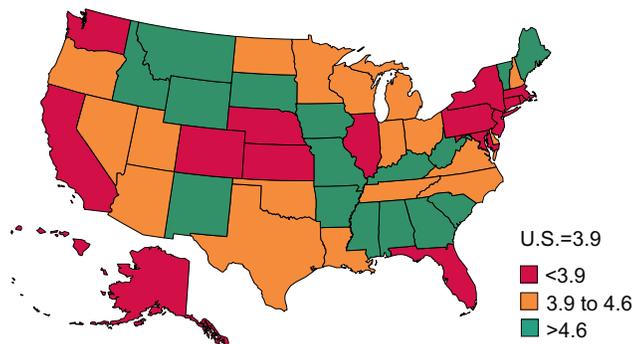
because less disposable income needs to be spent on gasoline and other forms of energy. In particular, regions with an above-average proportion of disposable income spent on gasoline would benefit the most. These include South states outside of the Oil Patch, and the Mountain West (see Chart 15).

Additionally, regions that engage in energy-intensive manufacturing would also be buoyed (see Chart 16). The industrial Midwest is the prime example, but so are automakers in the mid-South. Besides lower costs of production, automakers could expect additional growth in demand for new vehicles. Moreover, even in the Oil Patch, downstream producers of refined products and petrochemicals should see rising profit margins.

Ultimately, the Northeast and Midwest would benefit most from a sustained dip in oil prices (see Chart 17). Only about 0.1% of output in those regions is tied directly to oil and gas extraction, compared with nearly 3% in the South and more than 1% in the West. Given the Midwest's reliance on energy as a manufacturing input and the large energy cost disadvantage that plagues the

### Chart 15: Nonoil South, Mountain Would Gain

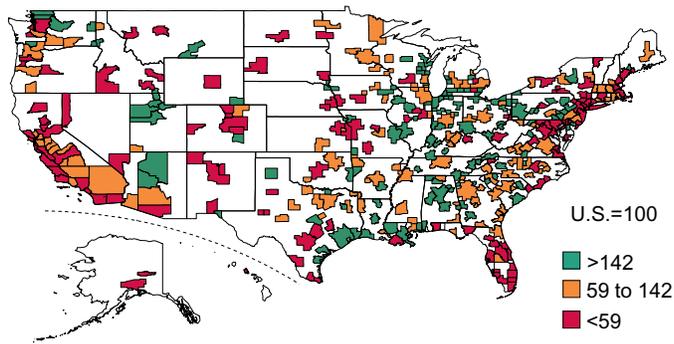
Gasoline expenditure share of disposable income, %, 2012



Sources: BEA, EIA, Moody's Analytics

### Chart 16: Also Manufacturers in Midwest, South

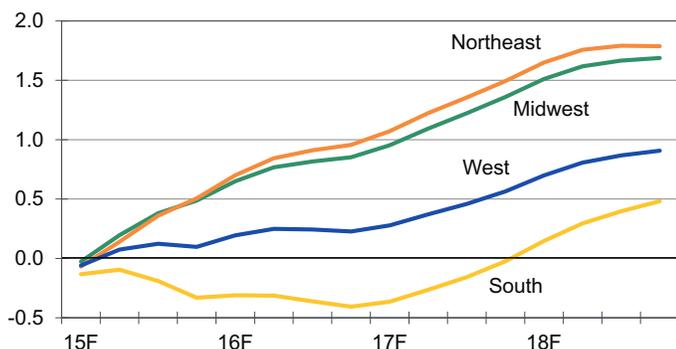
Petroleum used by manufacturing sector per \$ of output, 2013



Sources: Census Bureau, EIA, Moody's Analytics

### Chart 17: Northeast, Midwest Benefit

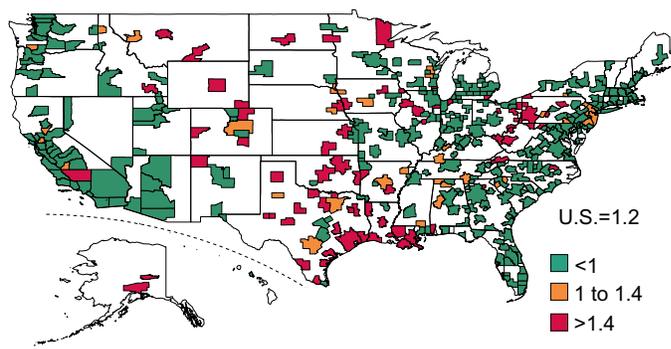
Gross regional product, % difference between S8 and baseline



Sources: BEA, Moody's Analytics

### Chart 18: Oil Patch Would Be Hurt

Energy-related jobs as % of total employment, Oct 2014



Sources: BLS, Moody's Analytics

Northeast, both regions are well-positioned to capitalize on inexpensive oil. The sustained low-oil-price scenario would lead to an additional \$75 billion of overall output in each of those regions over the next three years.

#### ...But energy regions would be hurt

The regions of the country that depend most heavily on energy exploration and production are at the greatest risk of decline if oil prices stay low (see Chart 18). Typically, these are in the states with the largest numbers of active drill rigs (see Table 3). But there are only six states for which the ratio of energy production to gross state product is 8% or more (see Table 4), with three of them in the South.

In crafting the low-oil-price scenario, Moody's Analytics examined the extent to which oil production rose in states during the shale oil revolution. Because of the faster

depletion of shale oil wells, investment must be constantly replenished, leaving shale-exposed segments of the country more susceptible to declines in investment resulting from lower oil prices. Moody's Analytics also considered the economics of oil extraction among the major shale players. Investment declines will be more pronounced in places where extraction costs have fallen below producer prices.

Since the beginning of 2005, the increase in U.S. crude oil production can be attributed to six states: Texas,<sup>2</sup> North Dakota, Oklahoma, Colorado, New Mexico and Wyoming. They bear the brunt of the declines in energy extraction employment in the low-oil-price scenario. Texas and North Dakota were assumed to have the lowest average extraction costs, at around

\$65 per barrel,<sup>3</sup> and Colorado and Wyoming were assumed to have the highest costs, at around \$75 per barrel.

After all of these factors are taken into consideration, Texas is hit far harder in the low-oil-price scenario than any other state. Just more than half of the decline in national extraction employment would be in Texas, with all other states below 10%. Most of the states behind the shale boom lose around 20% of their employment in natural resources and mining in the low-oil-price scenario, which is quite harsh considering that national industry employment fell by 15% during the Great Recession.

The energy patch's reliance on energy production would cause output to slip by more than \$40 billion relative to the baseline from 2015 to 2017. Reduced oil prices would

<sup>2</sup> Texas accounts for two-thirds of the increase in U.S. crude oil production growth since 2005.

<sup>3</sup> Extraction costs vary tremendously in states, and even within the same metro area, depending on the idiosyncrasies of the geology in question.

**Table 3: Active Drill Rigs in Major Energy-Producing States**
*# of rigs*

|      | Texas | Oklahoma | North Dakota | Louisiana | Colorado | Pennsylvania | Wyoming | California | Ohio | Montana | Alaska |
|------|-------|----------|--------------|-----------|----------|--------------|---------|------------|------|---------|--------|
| 2000 | 343   | 99       | 13           | 194       | 18       | 9            | 41      | 24         | 9    | 6       | 8      |
| 2001 | 462   | 130      | 14           | 214       | 32       | 11           | 55      | 36         | 10   | 10      | 13     |
| 2002 | 336   | 91       | 10           | 162       | 28       | 10           | 40      | 22         | 8    | 8       | 11     |
| 2003 | 449   | 128      | 14           | 157       | 39       | 10           | 54      | 21         | 7    | 14      | 10     |
| 2004 | 506   | 159      | 15           | 167       | 54       | 9            | 74      | 24         | 7    | 20      | 10     |
| 2005 | 614   | 153      | 20           | 182       | 74       | 13           | 78      | 27         | 9    | 24      | 9      |
| 2006 | 746   | 179      | 32           | 188       | 89       | 16           | 99      | 33         | 8    | 21      | 8      |
| 2007 | 834   | 188      | 39           | 177       | 107      | 16           | 74      | 35         | 13   | 17      | 8      |
| 2008 | 898   | 200      | 68           | 167       | 114      | 23           | 74      | 41         | 12   | 11      | 8      |
| 2009 | 432   | 94       | 50           | 150       | 50       | 42           | 40      | 23         | 8    | 3       | 8      |
| 2010 | 659   | 128      | 114          | 192       | 58       | 85           | 40      | 32         | 7    | 7       | 8      |
| 2011 | 838   | 180      | 168          | 165       | 72       | 110          | 48      | 45         | 11   | 9       | 7      |
| 2012 | 899   | 196      | 188          | 124       | 65       | 84           | 47      | 44         | 18   | 20      | 7      |
| 2013 | 834   | 179      | 173          | 108       | 63       | 59           | 48      | 38         | 32   | 11      | 9      |
| 2014 | 882   | 199      | 176          | 110       | 68       | 55           | 54      | 42         | 41   | 8       | 10     |

Sources: Baker Hughes, Moody's Analytics

**Table 4: Share of Energy Output to Total Real Gross State Output in Major Energy-Producing States**
*% of gross state product*

|      | Texas | Oklahoma | North Dakota | Louisiana | Colorado | Pennsylvania | Wyoming | California | Ohio | Montana | Alaska |
|------|-------|----------|--------------|-----------|----------|--------------|---------|------------|------|---------|--------|
| 2000 | 8.3   | 7.0      | 2.7          | 14.4      | 2.1      | 1.0          | 26.1    | 0.7        | 0.7  | 5.8     | 23.0   |
| 2001 | 10.2  | 9.2      | 2.8          | 17.5      | 2.4      | 1.0          | 29.1    | 0.7        | 0.7  | 6.0     | 20.8   |
| 2002 | 10.5  | 9.4      | 2.6          | 12.9      | 2.5      | 0.9          | 28.7    | 0.7        | 0.7  | 5.3     | 25.7   |
| 2003 | 9.0   | 9.1      | 2.4          | 9.7       | 3.0      | 0.9          | 28.3    | 0.6        | 0.6  | 4.9     | 19.9   |
| 2004 | 8.2   | 9.6      | 2.5          | 8.5       | 3.2      | 0.9          | 29.1    | 0.6        | 0.6  | 5.1     | 21.5   |
| 2005 | 7.9   | 9.6      | 2.6          | 6.8       | 3.7      | 0.9          | 29.6    | 0.6        | 0.5  | 5.4     | 21.7   |
| 2006 | 8.1   | 10.3     | 3.1          | 7.8       | 3.9      | 0.9          | 31.5    | 0.7        | 0.5  | 5.7     | 25.2   |
| 2007 | 8.5   | 10.9     | 3.4          | 7.8       | 3.6      | 1.0          | 30.7    | 0.8        | 0.6  | 5.8     | 26.6   |
| 2008 | 8.7   | 10.7     | 4.1          | 7.6       | 4.1      | 1.0          | 31.3    | 0.8        | 0.5  | 5.5     | 24.9   |
| 2009 | 10.3  | 11.8     | 4.9          | 10.0      | 4.6      | 1.1          | 34.8    | 1.1        | 0.7  | 5.3     | 28.7   |
| 2010 | 8.9   | 10.9     | 6.7          | 9.0       | 4.2      | 1.4          | 33.0    | 0.9        | 0.6  | 5.3     | 25.3   |
| 2011 | 9.6   | 11.1     | 9.4          | 9.6       | 4.4      | 1.7          | 33.1    | 1.0        | 0.6  | 5.7     | 25.8   |
| 2012 | 11.1  | 10.8     | 12.0         | 10.3      | 4.5      | 2.0          | 31.3    | 1.2        | 0.6  | 5.9     | 27.3   |
| 2013 | 11.1  | 12.4     | 13.9         | 8.0       | 5.6      | 2.1          | 34.3    | 0.8        | 0.5  | 5.8     | 25.7   |
| 2014 | 11.4  | 12.9     | 16.6         | 8.1       | 6.5      | 2.1          | 36.2    | 0.8        | 0.6  | 5.8     | 26.3   |

Sources: BEA, Moody's Analytics

be a net positive for the West, but the magnitude of the increase in output would pale in comparison with that in the Northeast and Midwest, given the West's significant drilling presence.

### All eyes on Texas

Driving the South's vulnerability to a protracted oil price decline is the severe impact of such a scenario on Texas. The state accounts for nearly 60% of oil and gas drilling GDP, nearly 10 times more than the

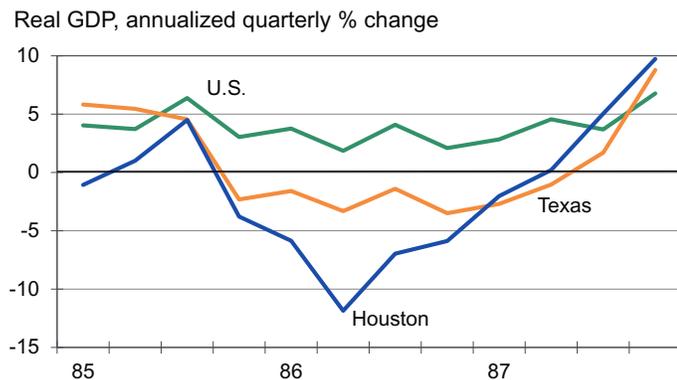
next highest state. Over the past five years, output has risen from about 1 million bpd, or 20% of the national total, to 3.4 million bpd, the highest in 30 years and more than 35% of the national total. The strong growth reflects the striking success of shale drilling in Eagle Ford and the Permian Basin.

Furthermore, during the late-1980s supply-side shock the Texas economy went into recession even as the U.S. economy continued to grow steadily (see Chart 19). The recession in Houston, the epicenter of

the Texas energy industry, was especially deep. The unemployment rates of both Houston and Texas rose by 2 percentage points even as the national rate declined. Moreover, the decline in Texas' energy industry spread to the rest of the economy (see Chart 20).

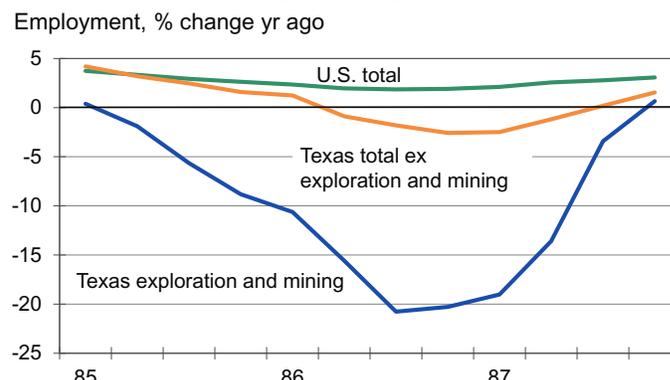
For Texas, as for the nation, exploration, rather than production, is the factor most sensitive to the price of oil (see Chart 21). During the 2008-2009 oil price cycle, when the price declined 70%, the number of ac-

**Chart 19: Texas Entered Recession in Late 1985**



Sources: BLS, Moody's Analytics

**Chart 20: Nonmining Employment Also Fell**



Sources: BLS, Moody's Analytics

tive Texas drill rigs fell by 66%. In contrast, the inflation-adjusted value of Texas mining production fell 21%. Likewise, when the oil price fell 62% in 1986, production declined by 12% (see Chart 22). Production is more likely to continue even when oil prices have declined because of sunk costs. On the other hand, production declined a lot more than employment, reflecting its capital-intensive nature.

The concentration of exploration varies greatly across Texas' metro areas and has shifted only slightly since 1986 (see Chart 23). The concentration has risen in Midland and Odessa because of the success of shale drilling in the Permian Basin, and in Corpus Christi and Victoria because of similar success in Eagle Ford. Among the larger metro areas, Houston, Corpus Christi and, to a lesser extent, Fort Worth have the highest concentrations. Fort Worth's is because of the prominence over the past decade of the

Barnett Shale, a natural gas deposit that will not be much affected by changes in the price of oil. Dallas, Austin, San Antonio and El Paso have concentrations no higher than the national average. It is noteworthy, however, that San Antonio's concentration has increased somewhat because of its proximity to oil-rich Eagle Ford.

Because so much of the state economy revolves around oil, most Texas metro areas would suffer in the face of a prolonged oil price slump. Houston would lose the largest volume of output of any metro area because of its size and its exposure to the energy industry. Its gross metro product would fall by up to 7% relative to the baseline and the metro area would fall into recession this year. This can be traced not only to reduced oil production but also to a decline in the metro area's professional services, which rely heavily on demand from the energy industry. The Dallas and Fort Worth economies would

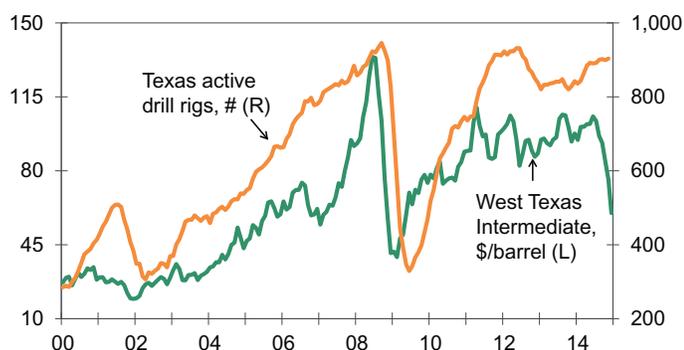
also suffer, but the impact would be mild in comparison with Houston's.

Because of relatively high industrial diversity and strength in other industries, Texas' large metro areas would avoid falling into recession. Some of the smaller ones, however, would not be so lucky. In Midland and Odessa, which are more energy-dependent than anywhere else in the country, output would decline by double digits relative to the baseline, plunging both into recession.

**Other energy states feel the effects**

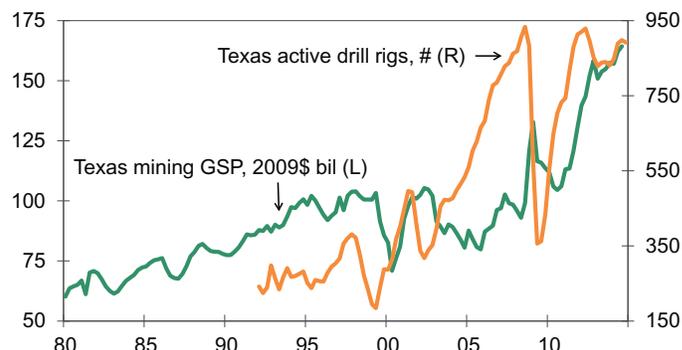
Although Texas is most vulnerable to an oil price slump, the impact on drillers would by no means be isolated to that state. The boom in North Dakota would slow further, with nearly \$10 billion of overall output shaved from the state's baseline forecast over the next three years (see Chart 24). This would push the state into recession by the second half of 2015, shifting it from

**Chart 21: Exploration Highly Sensitive to Prices**



Sources: EIA, Baker Hughes, Moody's Analytics

**Chart 22: Production Fell Less Than Exploration**



Sources: BEA, Baker Hughes, Moody's Analytics

**Table 5: Growth of Gross State Product Under Baseline and Low-Oil-Price Scenario**

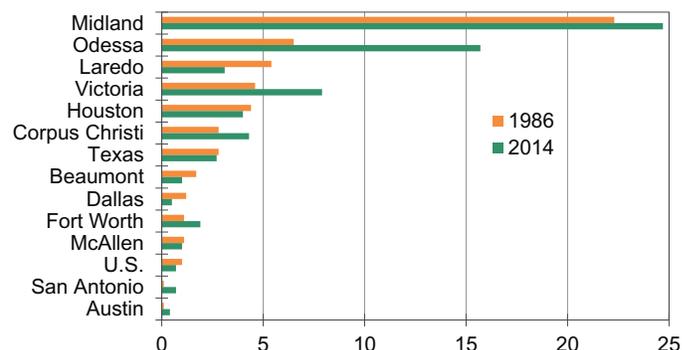
Gross state product, annualized 2-yr growth, %, 2014-2016

|                      | Baseline | Low-Oil-Price Scenario | Difference, ppts |
|----------------------|----------|------------------------|------------------|
| Alaska               | 4.9      | 2.5                    | -2.4             |
| Alabama              | 3.5      | 3.8                    | 0.4              |
| Arkansas             | 3.7      | 3.8                    | 0.1              |
| Arizona              | 4.7      | 4.8                    | 0.1              |
| California           | 3.0      | 3.2                    | 0.3              |
| Colorado             | 3.4      | 3.3                    | -0.2             |
| Connecticut          | 3.6      | 4.1                    | 0.5              |
| District of Columbia | 2.5      | 2.7                    | 0.2              |
| Delaware             | 2.7      | 3.4                    | 0.6              |
| Florida              | 3.5      | 3.9                    | 0.4              |
| Georgia              | 3.2      | 3.5                    | 0.4              |
| Hawaii               | 3.1      | 3.7                    | 0.5              |
| Iowa                 | 2.5      | 2.9                    | 0.4              |
| Idaho                | 2.7      | 2.8                    | 0.1              |
| Illinois             | 2.6      | 3.1                    | 0.4              |
| Indiana              | 3.7      | 4.3                    | 0.6              |
| Kansas               | 2.6      | 3.0                    | 0.4              |
| Kentucky             | 3.5      | 3.7                    | 0.2              |
| Louisiana            | 3.4      | 3.2                    | -0.3             |
| Massachusetts        | 3.1      | 3.4                    | 0.3              |
| Maryland             | 2.9      | 3.3                    | 0.3              |
| Maine                | 2.0      | 2.6                    | 0.6              |
| Michigan             | 3.5      | 4.3                    | 0.8              |
| Minnesota            | 3.0      | 3.3                    | 0.3              |
| Missouri             | 2.8      | 3.3                    | 0.5              |
| Mississippi          | 2.6      | 3.0                    | 0.4              |
| Montana              | 4.2      | 4.0                    | -0.3             |
| North Carolina       | 3.7      | 4.1                    | 0.4              |
| North Dakota         | 4.5      | 1.0                    | -3.4             |
| Nebraska             | 2.5      | 2.6                    | 0.1              |
| New Hampshire        | 3.3      | 3.6                    | 0.4              |
| New Jersey           | 3.0      | 3.5                    | 0.5              |
| New Mexico           | 2.3      | 0.5                    | -1.8             |
| Nevada               | 4.2      | 4.1                    | -0.1             |
| New York             | 3.1      | 3.5                    | 0.4              |
| Ohio                 | 3.0      | 3.6                    | 0.6              |
| Oklahoma             | 3.2      | 1.9                    | -1.4             |
| Oregon               | 3.1      | 3.3                    | 0.2              |
| Pennsylvania         | 2.9      | 3.2                    | 0.3              |
| Rhode Island         | 3.0      | 3.5                    | 0.5              |
| South Carolina       | 3.6      | 4.2                    | 0.6              |
| South Dakota         | 1.9      | 2.1                    | 0.2              |
| Tennessee            | 3.1      | 3.5                    | 0.4              |
| Texas                | 4.8      | 3.4                    | -1.3             |
| Utah                 | 3.5      | 3.5                    | 0.0              |
| Virginia             | 2.6      | 2.8                    | 0.2              |
| Vermont              | 2.6      | 3.0                    | 0.4              |
| Washington           | 3.3      | 3.8                    | 0.4              |
| Wisconsin            | 3.4      | 3.9                    | 0.5              |
| West Virginia        | 1.9      | 0.7                    | -1.2             |
| Wyoming              | 4.0      | 2.5                    | -1.6             |

Sources: BEA, Moody's Analytics

**Chart 23: Midland and Odessa Most Exposed**

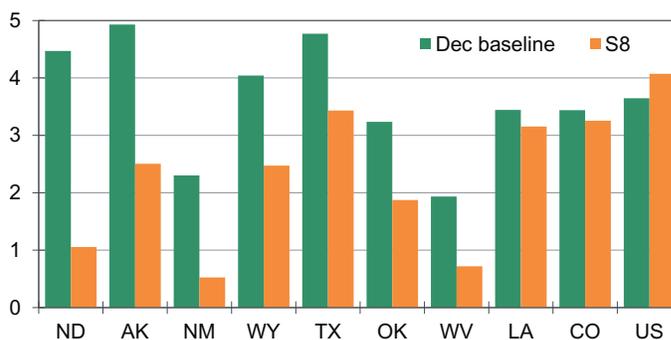
Mining employment, Texas, % share of total



Sources: BLS, Moody's Analytics

**Chart 24: North Dakota Has the Most to Lose**

Real output growth, 2014 to 2016, 2-yr annualized growth rate, %



Sources: BEA, Moody's Analytics

one of the nation's fastest-growing economies to one of its slowest.

Other states projected to suffer a steep decline in this scenario include Alaska, New Mexico, Oklahoma and Wyoming (see Table 5). West Virginia, although not a major player in oil drilling, would also suffer as coal and gas become less attractive as substitutes. Some large energy states such as Colorado and Louisiana will be insulated by the resilience of their large metro areas. Denver benefits from relatively high industrial diversity, while mining plays only a small role in the New Orleans

economy. Among the most vulnerable non-Texas metro areas are Oklahoma City, which is highly dependent on the energy industry, and Farmington NM, which would likely slide into recession if oil prices remain low for an extended period.

**Global impacts**

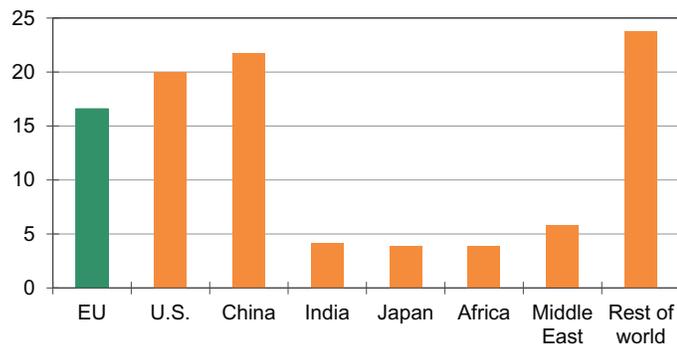
Just as in the U.S., the global winners from lower oil prices will be oil-consuming nations and the losers will be oil producers.

Europe, in particular, stands to benefit, as it is one of the largest global regional consumers of energy (see Chart 25). Oil accounts for about a third of total European energy demand (see Chart 26). Moreover, outside of Norway, the U.K. and Russia, the region is a net oil importer.

However, Europe will receive less of a stimulus from lower oil prices than the U.S. for four primary reasons. First, taxes or duties on gasoline in Europe are more than half the

**Chart 25: Energy Demand Still High in Europe**

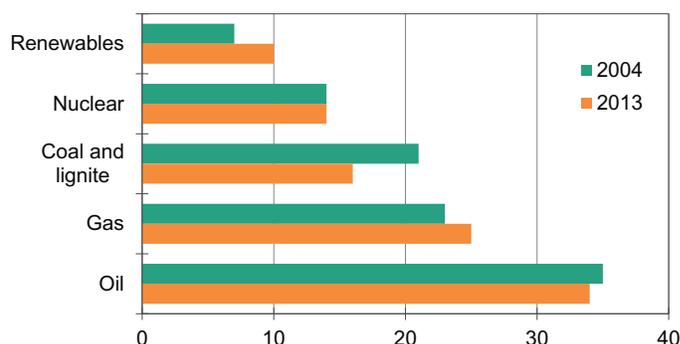
% of global demand, 2013



Sources: EIA, Moody's Analytics

**Chart 26: Oil Is Most Important Source in Europe**

% shares of total energy consumption



Sources: EIA, Moody's Analytics

total price of gasoline (see Chart 27). Consequently, the 50% decline in the price of oil will result in a far smaller percentage decline in the price of gasoline in Europe than in the U.S., where the price has fallen by about one-third.

Second, crude oil is priced in dollars in international markets, and the euro has fallen sharply against the dollar in recent months. Hence, the decline in the price of oil in euros has been much less.

Third, lower oil prices will have a negative effect on overall actually occurring inflation in Europe, as measured by the CPI (see Chart 28). As a result, inflation expectations would also be lower. Under other circumstances, that might not be a problem, but over the past year the risk has risen for a deflationary spiral in the context of weak aggregate demand (see Chart 29). Consumers could misinterpret an outright decline in the CPI that was caused by lower energy prices as a

reflection of such a spiral and then hold back their spending as a result.

Fourth, the decline in oil prices will harm the economy of Russia—a major energy producer—and may worsen the political uncertainty already in place because of the conflict with Ukraine. The combination of the conflict and lower oil prices has resulted in a sharp depreciation of the ruble, and that has contributed to an abrupt increase in inflation. The Russian central bank has responded by hiking its policy rate to 17%. Russia is expected to go into recession in 2015, and if it is deeper than expected, the contraction could limit the pace of Europe's rebound.

In general, the countries that will benefit the most from lower oil prices are big oil importers that have minimal oil-producing sectors. At the top of the list are Singapore, Taiwan, South Korea, India and Japan, whose net oil imports as a share of real GDP are the highest among countries. China is not too far

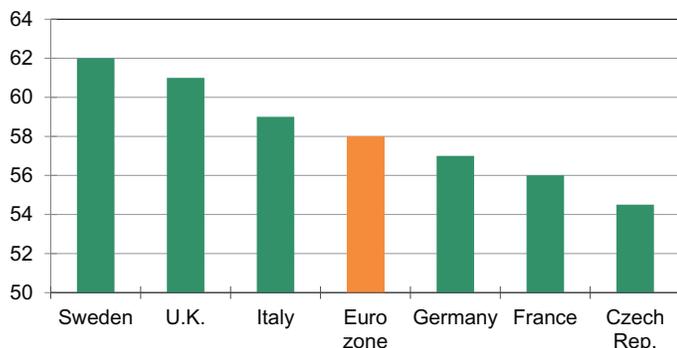
behind. Even though it produces more crude oil than Iraq, Iran or Canada, it is the world's top oil importer.

In some emerging economies, however, government policies are dampening the economic benefit of lower oil prices. Asian governments, including Indonesia, Malaysia and India, are cutting subsidies to energy prices, which is a long-term positive for the countries' economies, but it prevents the full stimulus of lower oil prices from flowing through to consumers. Moreover, gasoline and diesel prices in China are set by the government, and they stop closely tracking oil prices at around \$80 per barrel, essentially providing a price floor.

As a whole, Asia will benefit from lower oil prices. All Asian countries except for Malaysia are net oil importers. Heavy manufacturers, which require a great deal of energy, will benefit even more from lower input costs. This will especially benefit countries

**Chart 27: High Fuel Duties in Europe**

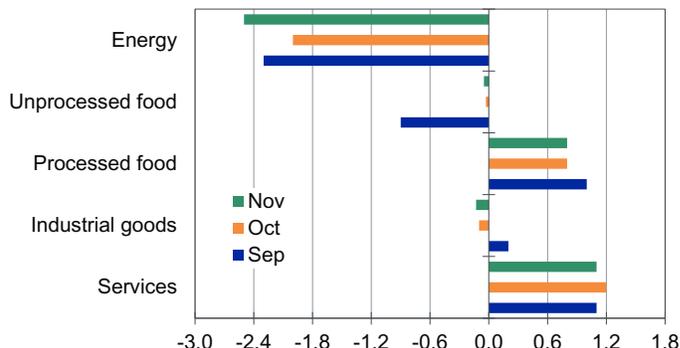
Total gasoline taxes, % of price of 1 litre



Sources: Eurostat, Moody's Analytics

**Chart 28: Lower Prices Reduce European CPIs**

Euro zone HCPI components, % change yr ago, 2014



Sources: ECB, Moody's Analytics

such as Thailand, South Korea and the Philippines. Moreover, Asia's exporters will receive an indirect boost from increased consumption in the U.S. and Europe. Almost half of the contribution to real GDP growth in emerging economies will result from stronger external demand.

Latin America is a net loser when oil prices fall. Venezuela, Mexico, Colombia and Ecuador are large net oil exporters. If prices remain low, these countries will lose about \$50 billion in export revenues over the next year. Venezuela, the hardest hit, stands to lose the equivalent of 10% of its GDP in oil revenue exports if prices stay near current levels, according to recent reports. About 97% of Venezuela's export revenue comes from oil.

Ecuador's loss could equal 3.9% of GDP, while Colombia will suffer a 2.6% loss and Mexico 0.9%. The decline in income

will slow GDP growth in 2015 as governments are forced to cut spending and currencies depreciate.

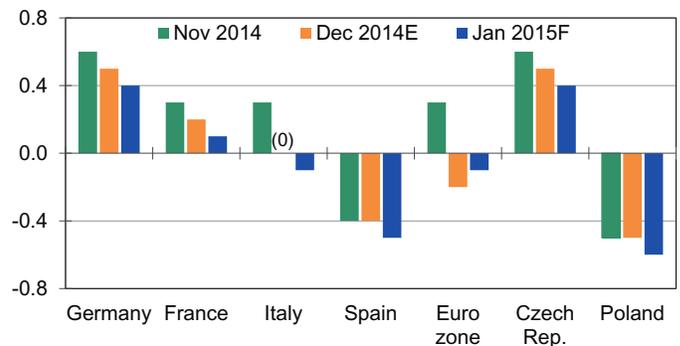
The net impact of cheaper oil will not be significant in Peru, Argentina and Brazil, which are largely self-sufficient. Brazil could suffer from the same decline in capital expenditure that will burden the U.S., however. Net oil importers such as Chile, Uruguay, Honduras and Nicaragua are winners.

Far and away the biggest losers are OPEC countries and Algeria, Kazakhstan and Russia. Angola's net oil exports are

close to 70% of GDP, topping that of any other country. Kuwait, Saudi Arabia, Iraq and Qatar are not far behind. On average, a 20% decline in oil prices reduces real GDP growth in emerging-market oil-exporting countries by 1 percentage point.

**Chart 29: European Inflation Already Slowing**

CPI, % change yr ago



Sources: Eurostat, Moody's Analytics

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Our web periodicals and special publications cover every U.S. state and metropolitan area; countries throughout Europe, Asia and the Americas; the world's major cities; and the U.S. housing market and other industries. From our offices in the U.S., the United Kingdom, the Czech Republic and Australia, we provide up-to-the-minute reporting and analysis on the world's major economies.

Moody's Analytics added Economy.com to its portfolio in 2005. Now called Economic & Consumer Credit Analytics, this arm is based in West Chester PA, a suburb of Philadelphia, with offices in London, Prague and Sydney. More information is available at [www.economy.com](http://www.economy.com).

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