

Outlook for the Global Oil Markets

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Statement of Adam E. Sieminski, Chief Energy Economist for Deutsche Bank, before the US House of Representatives Committee on Energy and Commerce, Subcommittee on Energy and Power. The opinions expressed in this testimony are those of the author and do not necessarily reflect the views of Deutsche Bank AG or its subsidiaries.

- The continuing rise in oil prices off the lows in early 2009 has raised concerns. The International Energy Agency (IEA) has expressed concern about economic “trouble ahead” from surging oil prices. The Energy Information Administration predicts that US gasoline prices will jump about 15% (37 cents) in 2011 to average \$3.15 per gallon, with a further rise to \$3.30 per gallon in 2012. The OPEC Secretariat says that fundamentals alone do not explain the rise in oil prices.
- Global oil demand tends to be driven primarily by economic activity. World GDP growth forecasts for 2011 and 2012 are being revised up by most of the major economic forecasters. After 4.5-5.0% worldwide GDP growth in 2010, the typical global GDP forecast for 2011 is now coming in at circa 4% - a slowdown from 2010, but still strong against the long-term historical average (1980-2010) of 3.3%.
- The IEA estimates global oil demand grew 2.7mmb/d last year and expects a 1.4-1.5mmb/d increment in 2011. In my view, demand is more likely to grow a bit faster than the IEA’s estimate, rather than slower. Most of the demand growth is coming from the non-OECD (emerging markets) region of the world.
- Non-OPEC supply estimates have been increasing as well. The IEA forecasts non-OPEC output will rise by about 0.6mmb/d in 2011, following a 1.1mmb/d increment in 2010. The IEA says “higher prices are encouraging investment and helping to sustain supply growth” and we agree with this view. Growth prospects are favorable in China, Brazil, the FSU, and Colombia, for example. Global biofuels output is rising. US production should hold relatively steady in 2011, assisted by the very interesting development of oil resources in North Dakota’s Bakken formation.
- OPEC natural gas liquids (NGL) production is expected to be up sharply again in 2011 after strong growth in 2010. The consensus points to growth of about 0.6mmb/d this year. Most forecasts for the total “call on OPEC crude oil” suggest modest growth in OPEC’s market share in 2011. Our numbers show stronger growth in 2012 and a continuing trend up in 2013-15. Depending on the timing of new production capacity projects in Iraq, OPEC spare capacity appears likely to shrink over the next five years.
- OECD total oil stocks appear to be on a down-trend that would take forward demand cover from 59 days now (relatively high) to 54 days (closer to the historical mid-range) by the end of 2012. Many oil price forecasting models use OPEC spare capacity and OECD inventories as key drivers. Lower inventories and lower spare capacity are associated with higher oil prices.
- Over the past few years, oil prices have moved in concert with financial factors such as exchange rates and equity indices. Evidence that index investing can impact prices is accumulating, but “speculation” continues to offer significantly less explanation for price movements than traditional “fundamentals” (supply, demand, inventories, etc.). By our calculations, oil prices are close to historic “equilibrium” levels.
- Oil prices also react to expectations about the future. This can play just as important a role in price formation as current conditions in the markets. Projections of future supply / demand balances, inventories, weather, logistics, and geopolitics can drive sentiment. Low elasticity of supply and demand for oil can lead to steep price movements.
- Events in the Middle East fall into this “geopolitical” category. As EIA data show, closure of the Suez Canal or the SuMed Pipeline in Egypt would constitute a significant event in the oil markets. Furthermore, some market participants worry that tensions in Tunisia and Egypt could spill over into countries with greater oil production profiles. A quick release of global Strategic Petroleum Reserves would help stem the fear that such a development could create in the markets.

Figure 1: Comparison of 2011 forecast assumptions

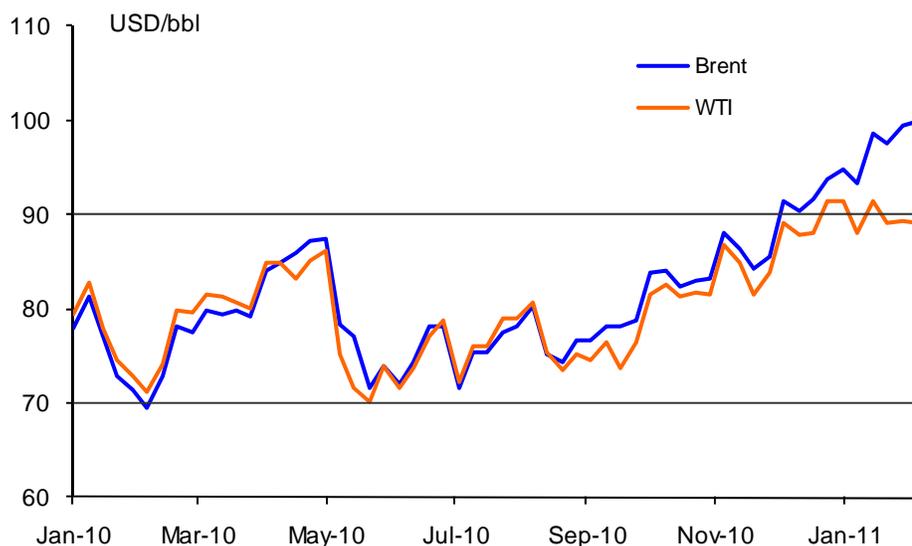
2011 vs. 2010 (mmb/d)	Demand Growth	Non-OPEC		Call on OPEC Crude	World GDP Growth	
		Supply Growth	OPEC NGLs		2010	2011
US DOE/ EIA	1.44	0.31	0.73	0.46	4.8%	4.4%
Int'l Energy Agency	1.41	0.59	0.55	0.40	5.0%	4.4%
OPEC Secretariat	1.23	0.41	0.46	0.35	4.5%	3.9%
Deutsche Bank	1.69	0.73	0.58	0.40	4.8%	4.1%
Average	1.44	0.51	0.58	0.40	4.8%	4.2%
Big 3 Agency Avg	1.36	0.44	0.58	0.40	4.8%	4.2%

Note: EIA GDP estimates adjusted upward by 0.5% to reflect fx to ppp

Source: US DOE/EIA, IEA, OPEC, Deutsche Bank

A few months ago it appeared that relative stability in global oil supply and forecasts for 2011 may have been responsible for the much-discussed USD70-90/bbl oil trading range. In our view, market sentiment surrounding the validity of this range has been shattered by a rising concern about how rapidly OPEC spare capacity could erode in the 2012-2015 timeframe. The influence of financial factors such as correlations to the S&P 500 index and the dollar/euro rate that have been important drivers, may be giving way to more traditional fundamentals that are tightening. Brent front month futures prices have pierced through the USD90/bbl top of the band, although interestingly, WTI still looks relatively range-bound.

Figure 2: Comparison of Brent and WTI oil prices



Source: Bloomberg LP, Deutsche Bank

Figure 3: Global GDP growth forecasts

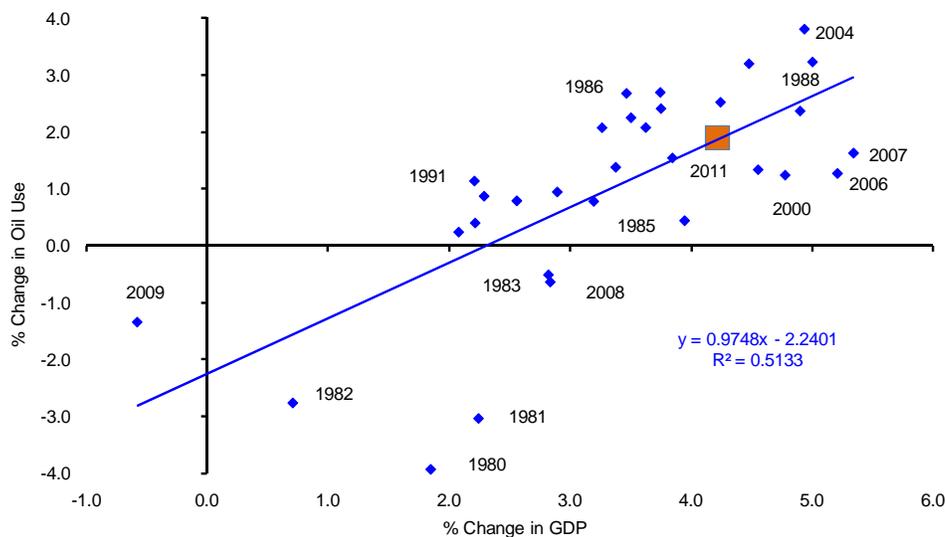
y-o-y % change	2008	2009	2010E	2011E	2012E
US	0.2	-3.2	2.9	3.8	3.9
Euro Area	0.0	-2.6	1.7	1.2	1.4
Japan	-1.2	-5.2	4.2	0.8	1.9
Other OECD	1.0	-2.3	3.5	3.5	3.8
OECD	0.1%	-3.1%	2.6%	2.4%	2.7%
China	9.6	9.1	10.0	8.7	8.4
Other Asia (1)	5.4	4.3	8.6	6.3	6.8
Latin America	4.3	-1.7	6.0	4.3	4.0
Other Non-OECD (2)	3.6	-4.5	4.5	4.2	4.5
Non-OECD	6.0%	2.5%	7.5%	6.2%	6.3%
World	2.8%	-0.6%	4.8%	4.1%	4.3%

(1) Non-OECD Asia ex-China, (2) E. Europe, Md-East, Africa, Fmr.Sov.Un.

Source: IMF, Deutsche Bank

Global output is forecast by the IMF to expand by 4.4% in 2011 and 4.5% in 2012 after growing by some 5.0% in 2010. According to the IMF, this reflects stronger-than-expected activity in the second half of 2010 as well as new policy initiatives in the US. The IMF is quick to point out that downside risks to the recovery remain elevated. The two biggest potential problems are sovereign debt and financial troubles in the euro area, along with overheating pressures and external rebalancing needs in key EM economies. Deutsche Bank forecasts for world and regional economic growth in 2011-12 are slightly more conservative than the IMF.

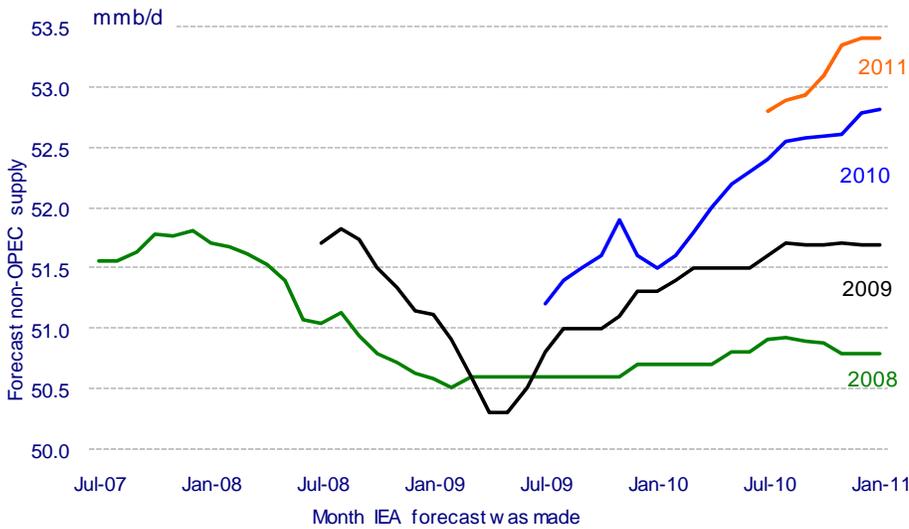
Figure 4: Global GDP growth vs global oil demand growth (1980-2010)



Source: IMF, IEA, Deutsche Bank

Assuming that the 1980-2010 historical relationship continues, world economic growth of 4.1% should translate into a 1.9% rise in oil demand. On a base of 87.7 mmb/d of demand in 2010, this amounts to circa 1.7 mmb/d of oil demand growth in 2011.

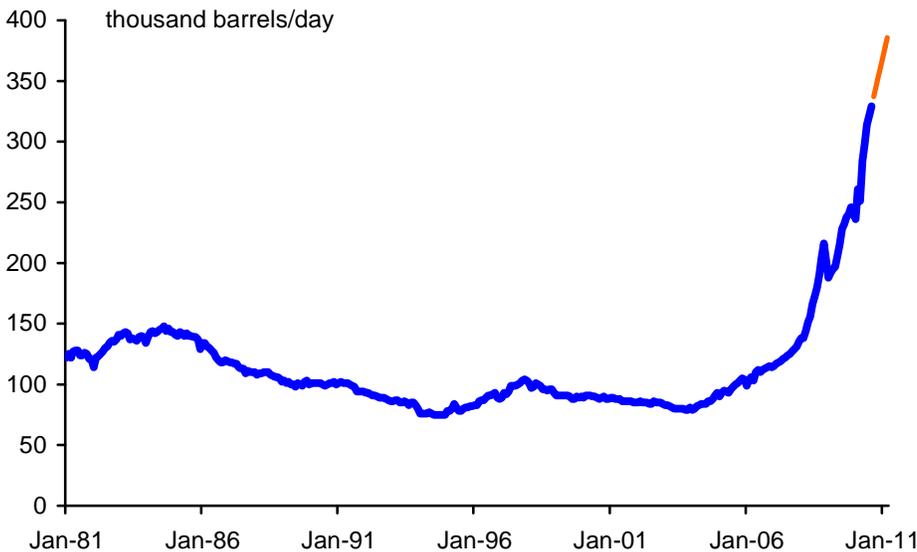
Figure 5: IEA Non-OPEC supply forecast projections



Source: IEA, Deutsche Bank

Since mid-2009, non-OPEC supply estimates have tended to be revised up over time. EIA currently expects a growth of 310kb/d in 2011, followed by a slight decline in 2012. The IEA estimates 0.6mmb/d growth in 2011 following a 1.1mmb/d increment in 2010. The IEA says “higher prices are encouraging investment and helping to sustain supply growth.”

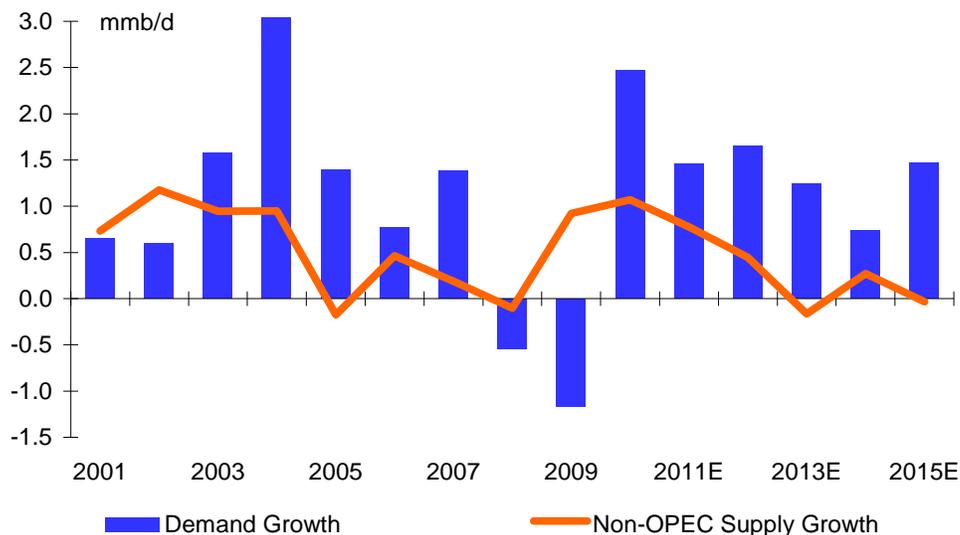
Figure 6: North Dakota oil production



Source: US DOE/EIA, Deutsche Bank

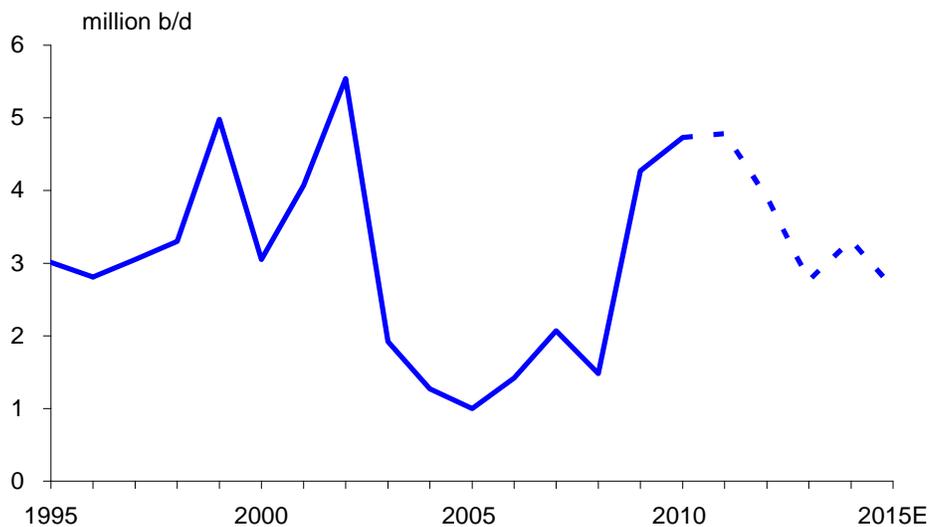
Production in ND languished at 100kb/d for a decade from 1995-2005. Starting around 2006, however, producers in the region began to use multi-stage fracturing of horizontal wells. This allows drillers to stimulate oil flow along numerous “stages” of the well bore and to do so without raising water-cuts significantly. An intensive search for other formations where this technique will work is underway- the Niobrara in Colorado, the Monterey in California, and the Wolfcamp shales in West Texas- and we expect there will be more.

Figure 7: Need for OPEC oil grows over time



Source: IMF, Deutsche Bank

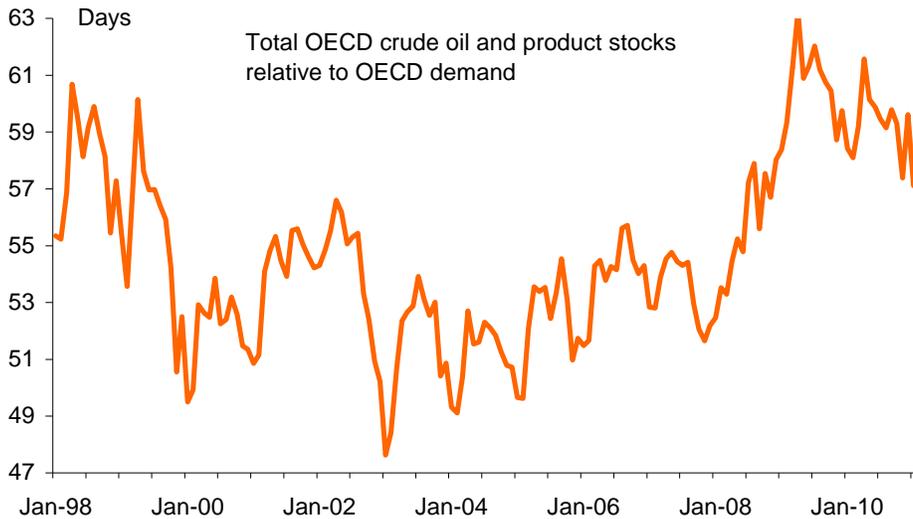
Figure 8: OPEC spare capacity to 2015



Source: US DOE/EIA, Deutsche Bank

We estimate that overall OPEC capacity will average about the same in 2011 as the 4.7-4.8mmb/d estimate from 2010, and then decline as the “call on OPEC” grows faster than capacity additions. We are assuming that Iraq’s total capacity will grow from circa 2.5mmb/d in 2010 to circa 4.3mmb/d in 2015. Absent this improvement, spare capacity in OPEC in 2015 could be closer to the 1.0mmb/d low hit in 2005.

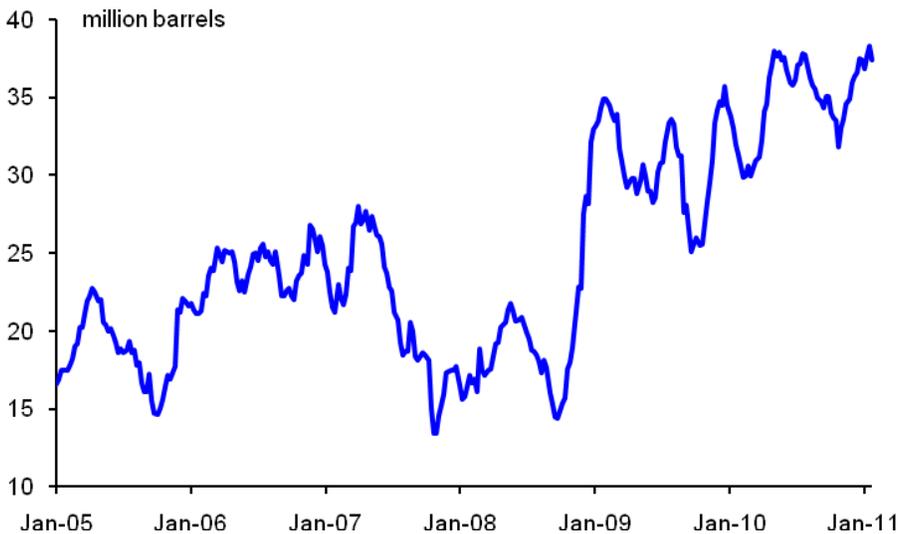
Figure 9: OECD inventory cover of demand



Source: IEA, Deutsche Bank

Most analysts expect that oil inventories will decline over the course of 2011 and 2012 so that by the end of 2012, stocks will be closer to the middle of the normal range. The recent trend is volatile, but seems to be clearly on a general downward course. Our supply/demand model suggests that OECD forward demand cover could be at 54 days by the end of 2012. This is consistent with the US DOE/EIA view.

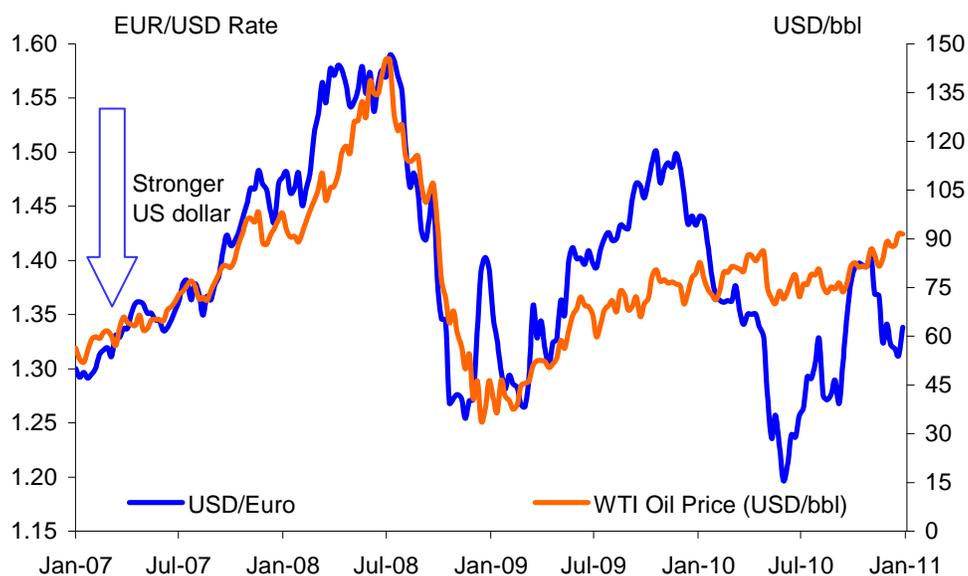
Figure 10: Crude oil stocks at Cushing, Oklahoma



Source: US DOE/EIA, Bloomberg Finance LP, Deutsche Bank

Crude oil stocks in Cushing (the delivery point for the Nymex WIT contract) are very full. Canadian and Bakken crude oil currently has no good transportation options out of Cushing to the US Gulf Coast.

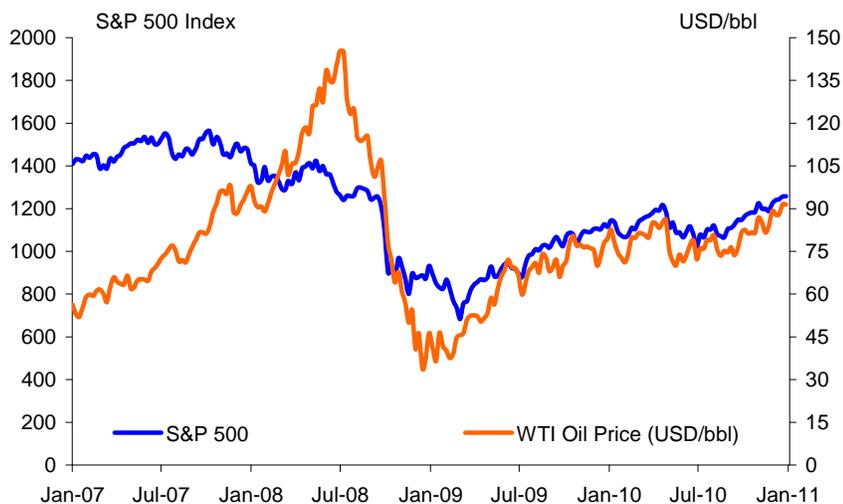
Figure 11: Oil price and the US dollar



Source: Bloomberg Finance LP, Deutsche Bank

According to the IMF, in the long run, a 1% depreciation in the US dollar is associated with increases for gold and oil prices of more than 1%. In the short run, the elasticity is close to 1, but higher for gold than for crude oil, says the IMF. We believe the relationship between oil prices and the US dollar is highly unstable.

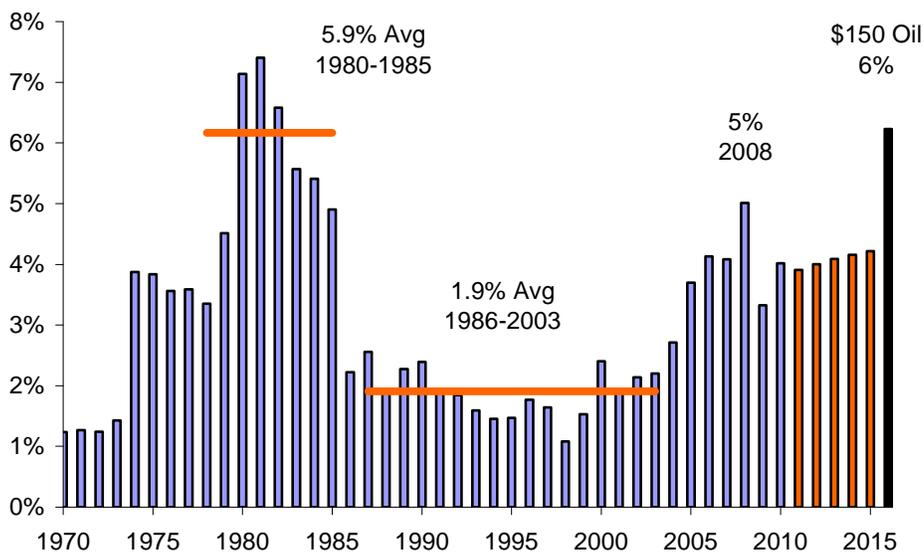
Figure 12: Oil prices and the S&P 500 stock market index



Source: Bloomberg Finance LP, Deutsche Bank

The relationship between the S&P 500 and oil is usually inverse. From July 2008 to the start of March 2009, the two moved in parallel down. From April 2009, the relationship appears to be positively correlated. The 2010 regression implies the S&P500 at 1260 equates to USD90/bbl oil. A rise of 10% from this level of the S&P500 would take oil to USD100/bbl.

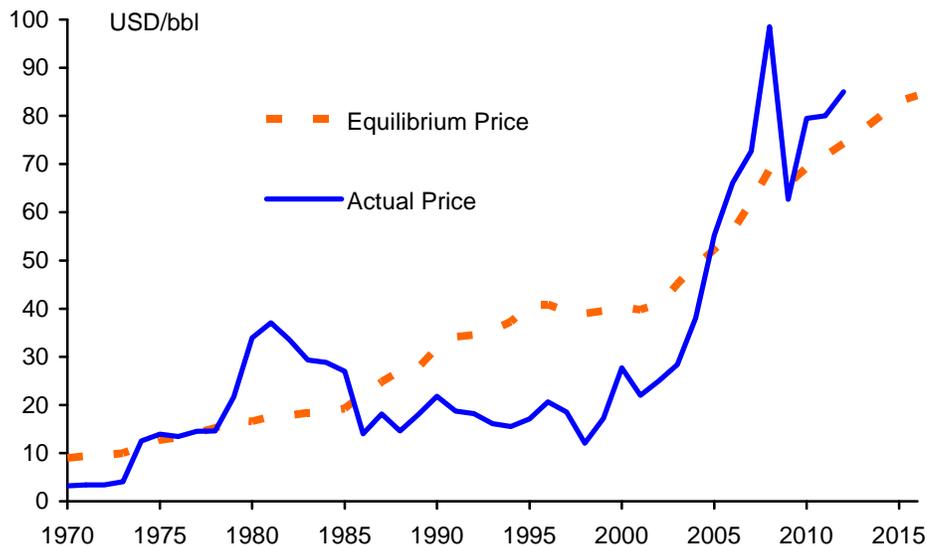
Figure 13: Oil as a percent of global GDP



Source: IMF, IEA, Deutsche Bank

At 5-6% of global GDP, oil absorbs too much of disposable income -- and provides too much incentive for substitutes. At 1-2% of global GDP, oil demand grows rapidly and upstream investment does not. Company cash flow is insufficient to expand. The “sweet-spot” appears to be near 3-4% (not often achieved).

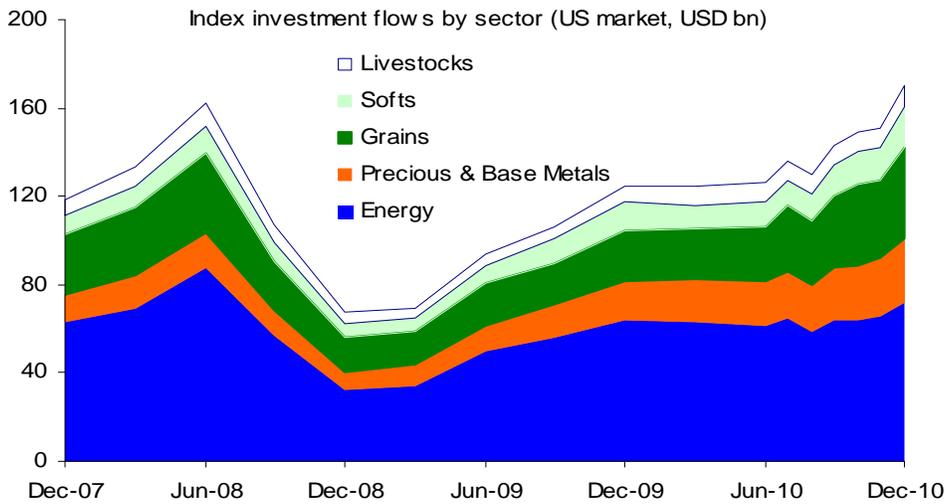
Figure 14: A simple (too simple) model of equilibrium oil prices



Source: IMF, IEA, Deutsche Bank

Oil’s average share of global GDP over the period from 1975 to 2010 is 3.3%. A 3.5% sweet spot translates into a current WTI price near \$70/bbl in 2010, \$75 in 2012m and about \$85/bbl in 2015. Note that actual prices can remain both above and below this definition of “equilibrium” for long periods of time.

Figure 15: What role is being played by index investors?



Source: CFTC, Deutsche Bank

Grains and precious metals were the engine rooms of commodity price performance in 2010. Oil index flows are picking up, but other commodity sectors grew faster in 2010. Energy flows were up 13%, precious & base metals 65%, grains 83%, softs 32%, and livestock 45%. Evidence that index investing can impact prices is accumulating, but “speculation” continues to offer significantly less explanation for price movements than traditional “fundamentals” (supply, demand, inventories, etc.).

Figure 16: Factors affecting crude oil prices



Source: Talisman Energy, Deutsche Bank

The formation of oil prices is very complicated thing. In addition to the factors cited in Figure 16, energy economist Philip Verleger notes that product prices determine crude oil prices and crude oil prices determine product prices in a bi-directional process. Verleger points out that volume and characteristics of alternative crude oil types offered for sale are not all the same. Neither is the capability and capacity of the world refining industry to process these crudes. Government-mandated specifications for oil products marketed by refiners can create pricing anomalies. Characteristics and volumes of global petroleum demand varies over time. Available storage capacity for crude oil and petroleum products plays an important role. The flexibility of the world transportation system for getting petroleum from the point of production to the point of sale can be critical. This last observation is very important in considering the recent events in Egypt.

Adam Sieminski +1 202 662-1624 adam.sieminski@db.com