

# CIO View Special



## Black Gold?

The consequences of oil-market turbulence





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## CIO View Special

The full impact to countries and companies of the drop of the oil price will only become visible in the course of 2015. We show in what way.

### An entire industry enters uncharted territory

Oil prices have halved in 2014. It is all but impossible to forecast where the market will find its new equilibrium. Both the relatively new shale-oil sector as well as the strategically repositioned OPEC are the wild cards in 2015. The price slump leads to major shifts on a country and sector level producing winners and losers. We believe that by and large the new oil price will have a positive impact on global growth and stock markets.

### The oil-price slump didn't come out of nowhere

A barrel of Brent has gone from \$115 to \$46 within seven months. This, we believe, was the result of a number of factors, culminating in the Organization of the Petroleum Exporting Countries (OPEC) summit decision not to cut back on oil production levels. Additionally, as a consequence of changed Energy Information Agency (EIA) estimates for 2015 the threat of another supply surplus in the current year, just like in 2014, increased. Slower growth in demand was partly to blame on emerging markets, which are regarded as an important growth driver now that developed-economy consumption may be peaking. Moreover, oil prices fell in line with consensus estimates of global economic growth for 2015 – from 3.1% to 2.8%. On the supply side U.S. shale oil once again surprised with very rapid growth rates during 2014. Capital markets may also have spurred on this development. However, the decisive factor has been OPEC's strategic u-turn to focus on defending its market share instead of oil prices.

### Oil – a market like no other

Despite all internal quarrels, OPEC remains the driving force on the oil market. As a low-cost producer with the highest reserve capacities available, it can credibly make aggressive statements about its fight for market share. However, just like in the early 1980s, OPEC also has to blame itself for incentivizing new market entrants by its preceding high-price strategy. This is one more way OPEC's actions – and the response to them – encapsulate the absurdities of this market. The CEO of a U.S. oil company complained in October 2014 that "OPEC has declared war on the U.S. oil industry."<sup>1</sup> Basically, this means the following: By no longer using its cartel power to manipulate oil prices, OPEC exposes U.S. companies to the play of demand and supply. So it means "war" if OPEC does not reduce its output after U.S. firms have drowned the market with an additional 4 million barrels per day (b/d), built up over four years, through the aggressive expansion of shale oil production.

The peculiarities of the oil market are also underlined by the fact that lower prices that have put an additional \$5 billion in consumers' pockets every day have not been met with much enthusiasm.<sup>2</sup> Apart from worries about social unrest in countries depending on oil exports, this might suggest fears of capital market disruption.

<sup>1</sup> Scott Sheffield, CEO of the U.S. oil producer Pioneer Natural Resources. Source: Financial Times, „US shale industry faces endurance test after Opec rejects cuts“, 12/09/2014

<sup>2</sup> Calculated on the basis of a price difference of \$55 per barrel and a daily output of 92 million barrels

## Pricing with many unknowns

If demand growth does not accelerate unexpectedly, the market will have to adjust by reducing oil production capacity. The new equilibrium price in the long run will be close to the full costs and in the short run close to the marginal costs of the most expensive producers. The latter should be around \$35 to \$45 per barrel. We believe that the absence of follow-on investments will be the way to slash output. Due to its short investment cycle, North-American shale oil is in the focus here. After a choppy first quarter, with prices sliding to \$40 per barrel for West Texas Intermediate (WTI), we expect a recovery to \$65 by the end of 2015. Factors difficult to assess that could impact our scenario are: OPEC's behavior; the sort of price drop that producers can cope with under an extreme scenario; refinancing conditions of oil firms in this environment; the level of cost-deflation the sector will reach and the scale of unplanned production outages in countries facing potential political crisis. In the medium term, only a cut-back of expensive deep-sea production fields and Canadian oil-sand fields will ease the pressure on the market. Since the turn of the year, statements on investment cuts have become much more frequent and the speed at which the number of oil rigs in production is being cut back is gaining momentum.<sup>1</sup> Our forecast is for investment in U.S. shale oil to decline by 40% in 2015.

## What the new oil price has already changed

It might well take a couple of months before any more reliable forecast for the oil market can be made. This report aims to provide enough background information to allow everyone to assess the current situation and potential developments. It will describe the dynamics of the oil market and the profiles of its major protagonists – most notably shale oil. We will have a look at the winners and losers on a country, industry and capital-market level. Our oil-price scenario will have a positive effect on global economic growth and exert downward pressure on inflation – we expect headline Eurozone deflation to continue through 2015. Equity markets should benefit altogether, while expanding the gap between winners and losers. In fixed income the focus will be on high-yield bonds of U.S. oil companies as well as on investment-grade bonds of major oil companies from emerging markets. Both segments might witness further turbulences. These can also not be excluded for some oil-exporting countries. Many of these rely on oil exports for a big part of their gross domestic product (GDP). Next to an economic downturn these countries risk severe deteriorations of their trade balance should oil prices stay low. On the other side net energy-importing emerging markets will be even bigger winners from the new oil price than developed markets.

<sup>1</sup> According to Goldman Sachs figures, accumulated investment cuts of U.S. oil producers increased from \$0.5 billion in mid-December to \$4.5 billion in mid-January, as of 01/13/2015

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# 1. Oil market: review of 2014 and outlook for 2015

Both higher than expected supply and lower than expected demand contributed to the oil price drop. Furthermore, OPEC's new strategy shocked the market. In the short term, oil prices might drop below marginal costs, but in the long run it should reach levels around the full costs. But the cost structure of oil producers remains just as opaque as the behavior of shale oil firms in a stress scenario. Price volatility is likely to persist in 2015.

## Two-phased slump: Half pulled, half sinking

Within half a year, the oil prices have fallen in half – will one single factor do as an explanation? We doubt it. Let's divide this slide into two phases: From the middle of June, when WTI had reached an annual peak of \$107 per barrel (/b), to the OPEC meeting on November 27, 2014, the price fell by \$33/b or 30%. Since then it has lost another 40%, in its peak equivalent to \$30/b. Why is this important? It is important in order to get an idea of how strongly prices had already fallen before the frequently mentioned November 2014 OPEC meeting, meaning that the market was already worried about a supply and demand imbalance. After the meeting, disappointment on OPEC's inertia exacerbated the slide: it took only twelve days for WTI to then fall from \$73/b to \$55.9/b. Moreover, on the day after the OPEC decision, some of the smaller U.S. shale oil producers lost almost a third of their market value, and even a heavyweight like Halliburton lost almost 11%.

## Understanding the past to grasp the future

This section describes the individual factors which are, in our opinion, accountable for the slide and should, therefore, also play a major role in pricing in the current year. One must, however, be aware that extrapolating data from the past may not yield the right forecasts. The oil market is, more than any other market, affected by systemic failures and unpredictable factors such as economic, environmental and foreign politics, territorial crises, innovations and capital-market imbalances.

## The experts are not always right

Why, given the complexity of the oil markets, should one not simply adopt the forecasts of those institutions exclusively involved with this market? The simple answer is that they can get it wrong. In July, in its short-term market outlook for 2015, EIA still forecast an average price of \$95/b (for WTI). In its December Short-Term Energy Outlook, the EIA states: "The recent declines in oil price and associated increases in oil-price volatility have created a particularly uncertain forecasting environment."<sup>1</sup> Over the summer, OPEC had not seen any reason either to depart from its positive outlook for 2014 and 2015.

OPEC's decision not the sole responsible for price drop

The oil market's many mysteries

The energy agencies failed as well in predicting the price drop

<sup>1</sup> Source: EIA Short-Term Energy Outlook, December 2014

## OPEC leaves market to its own destiny

### Fundamental influences

#### OPEC: from model pupil to enfant terrible

OPEC's decision to leave its production quota of 30 million b/d unchanged triggered not only a slide of oil prices but also of oil companies' equities and bonds. What was behind its decision? Is it an admission of its own weakness in the face of its decreasing global market share, or will OPEC deliberately accept lower prices in order to squeeze more expensive extraction capacities out of the market? Some issues have to be borne in mind when trying to understand the strategy of the cartel which has always been difficult to grasp:

- The cartel finds it hard to enforce the production quota fixed by itself. Instead of the 30 million b/d agreed upon in 2011, an additional 0.5 to 1 million b/d are said to have been pumped. The monthly OPEC reports, based not only on direct notifications of its member states but also on third parties' input on oil production, clearly show that OPEC does not trust its own members.
- OPEC is, in every respect, a heterogeneous group with different political systems, production costs and state budgets. Relations between some member states, such as Saudi Arabia and Iran, are strained.
- The next regular OPEC meeting takes place in June 2015 – and another u-turn cannot be ruled out.
- OPEC's pre-dominant member, Saudi Arabia, remains the most potent producer. Saudi Arabia can immediately either curb production or increase it by 2 million b/d by using idle capacities.
- OPEC's basic dilemma remains that higher prices, caused by curbing its own output too strongly, make it more attractive for other producers to enter the market.
- The statement by the minister of energy of the United Arab Emirates (UAE), Suhail Al-Mazrouei, on December 15, 2014, that OPEC would not cut its output even if prices fell below \$40/b<sup>1</sup> sounds quite harmless compared with the declaration of the Saudi oil minister Ali al-Naimi on December 22, 2014: "Whatever the price is, whether it goes down to \$20, OPEC doesn't intend to cut its output." It is all about defending its market share against Russian, North American or Brazilian oil.<sup>2</sup>
- The EIA expects OPEC's market share to rise again from 2025 onwards, to roughly 50% by 2040. So there is no reason to write OPEC off, anyway.
- It cannot be ruled out that OPEC seizes the short-term oversupply caused by shale oil as an opportunity to use low prices to discourage development of alternative sources of oil, i.e., deep sea oil, Canadian sand oil, Chinese shale oil.

<sup>1</sup> Source: Bloomberg Finance LP, as of 12/15/2014

<sup>2</sup> Source: Financial Times LTD, as of 12/22/2014

## Oil is both commodity and asset class

### Procyclical speculation

In the summer of 2014, oil-price peak futures also reached a record high. Purchases increased again from mid-October after drastic sell-offs.

### No support from the U.S federal Reserve Bond

It is possible that slower growth in Fed-supplied liquidity also contributed to lower prices.

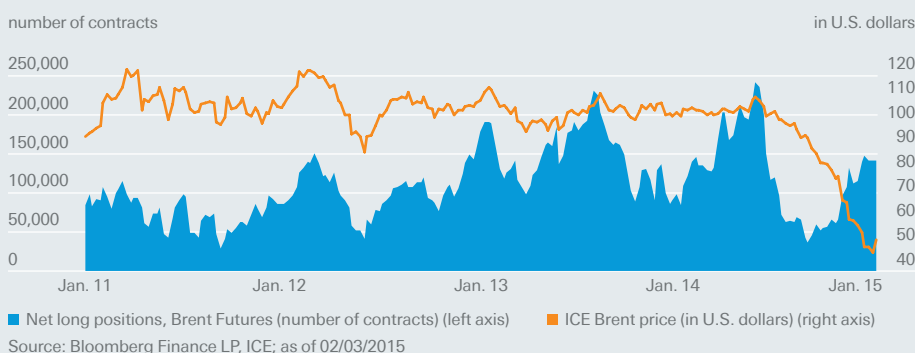
### Oil prices and stock markets usually move in line

Since 2009, the oil price and the S&P 500 Index have moved in similar directions before a gap opened up at the start of 2014.

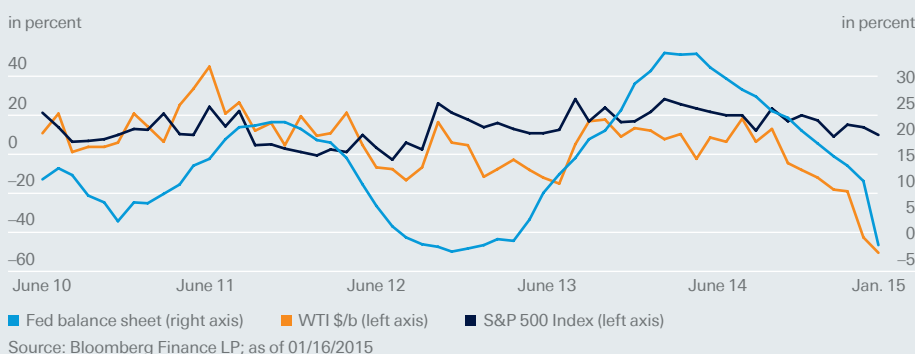
## Oil, capital markets, expectations and the real economy

Although the oil market is ultimately based on a balance of supply and demand, oil is also an investment instrument and thus exposed to the forces of the capital market. Sales on the futures and options market are more than four times higher than sales on the physical oil market. Moreover, capital-market trends also influence expectations on the supply and demand side.

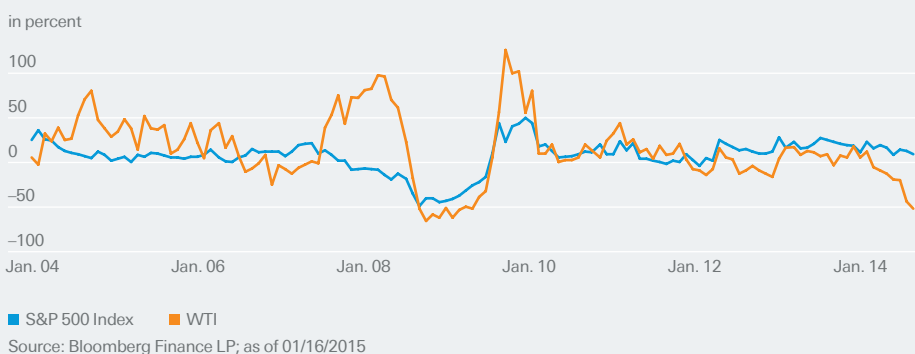
### Oil price and level of speculation



### Oil price, stock exchange and Fed balance sheet, year-on-year change



### Oil price and S&P 500 Index, year-on-year change



**Cheap oil, strong U.S. dollar**

At least since 2007 there has been an evident correlation between the U.S. dollar and oil prices. A currently strong U.S. dollar goes hand in hand with a weak oil price.

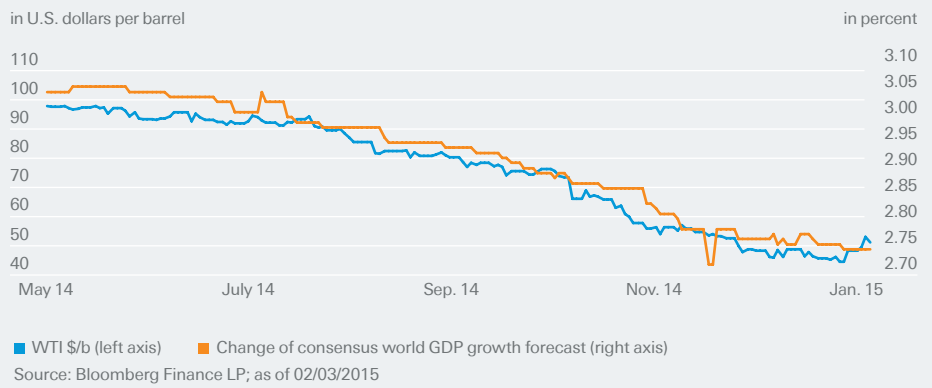
**Oil price and U.S. dollar strength, year-on-year change**



**Worsening concerns about growth**

In the summer, analysts started to revise their 2015 growth forecasts for the global economy downwards. Oil prices neatly followed suit.

**Oil price and growth expectations**



**Most production outages occur in OPEC countries**

**Output – not all positive**

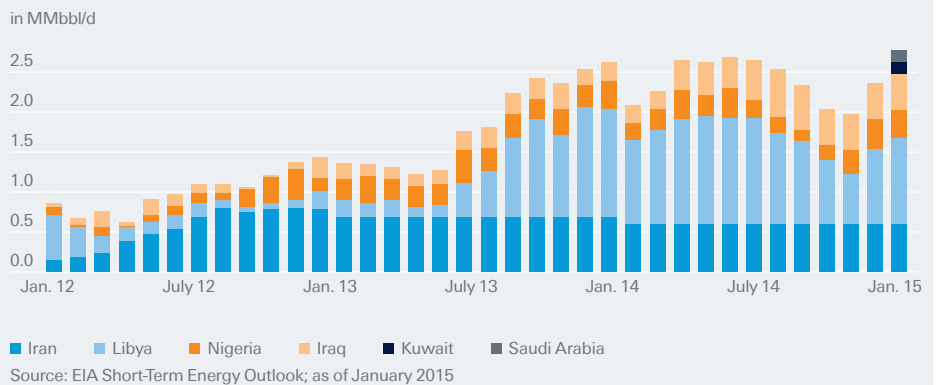
**More shale oil and more risks**

Two issues have been in focus on the supply side in the past few years: North American shale oil and gas, and supply disruptions within OPEC. The latter are primarily due to the repercussions of the Arab Spring, the Iran embargo and, in 2014, also due to Islamic State advances. Non-OPEC output disruptions totaling roughly 0.6 million b/d

**Oil glut despite outages**

After a brief easing in the autumn of 2014, unplanned production outages increased again. Libya and Iran alone accounted for 75% of outages. An easing of the situation there would increase the oil glut.

**Estimated historical unplanned OPEC crude oil productions outages**





Growth stems exclusively from shale oil

Production volume is still increasing

More output and less demand than forecast

were rather modest last year. The EIA estimates idle OPEC capacity at 2.1 million b/d (without shutdowns caused by sanctions in Iran), just half the 2010 volume. This figure should climb to 2.3 million b/d in 2015.<sup>1</sup>

On the other side, particularly output of U.S. shale oil is growing. The United States accounts for 3.78 million b/d of the accumulated global output growth of 3.44 million b/d from 2013 to 2015 (some countries are reporting falling outputs). According to EIA estimates, U.S. output peaked in 2014 at roughly 1.6 million b/d. For the current year, estimates have been revised downwards to only 0.6 million b/d.

However, this shale-oil revolution did not come by surprise. According to Rystad Energy figures, current spending and investment of the U.S. oil sector increased fivefold between 2004 and 2014 – from \$34.5 billion to \$184.3 billion. But OPEC as well as the EIA were both taken by surprise by the huge output growth in 2014 alone.

### Little price elasticity on the oil market

Oil shows little price elasticity – neither on the supply nor on the demand side. This is the reason why production was not cut back in the second half of 2014. The sector-specific reasons – first of all low variable costs – will be described in more detail in the following section.

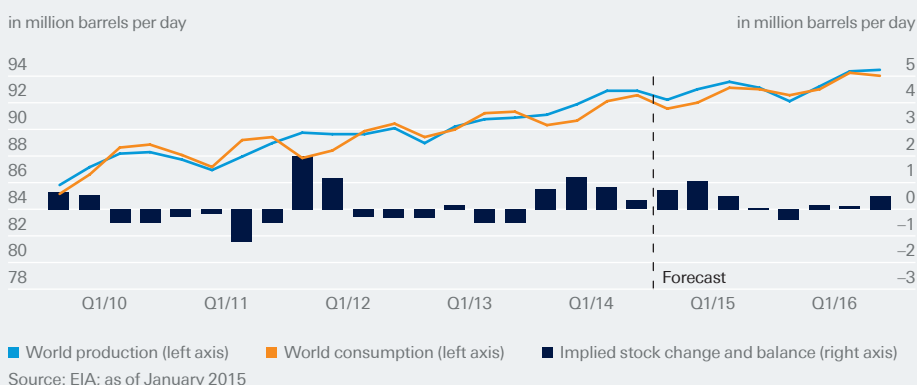
## Demand: modest but critical forecast downgrades

At first sight, the forecast revisions by the EIA in the course of 2014 appear to be harmless: Compared with July, the demand estimate for 2014 was revised downwards by 0.2% and by 0.8% for 2015. The supply estimate for 2014 was revised downwards by 0.2% and upwards by 0.2% for 2015. However, compared with January, the supply estimate for 2014 went up by 0.5% or 0.44 million b/d. Though small, these changes proved critical since they turned an estimated 2015 supply shortage of 0.14 million b/d into an oversupply of 0.43 million b/d. The prospect of another year with oil inventories building up might have weighed on the oil price in 2014.

### Oil oversupply in the first half of 2015

There has been an excess of supply over demand since the first quarter of 2014, which should continue in 2015.

### World liquid fuels production and consumption balance



<sup>1</sup> Source: EIA Short-Term Energy Outlook, January 2015

Change in stock hardly provides pricing signals.

### Change in stock and the oil price

In order to recognize a correlation between an excess of supply or demand and the oil price, the oil price must be compared with changes in stock in six months' time, which is shown in the chart quarter by quarter until end of 2012 and month by month afterwards. A stock value above zero implies de-stocking. Although a correlation is clearly visible, it does not explain the extent of the recent plunge.

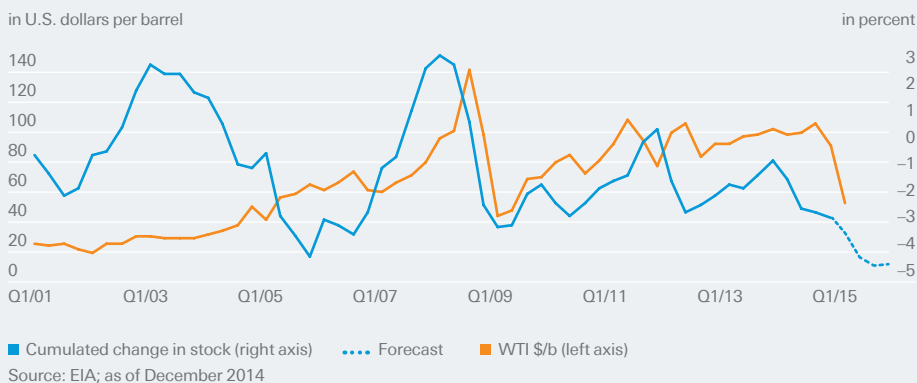
### Inventory change and oil price



### Inventories and oil prices

The following chart also shows that the erosion of oil prices cannot be blamed on the imbalance of supply and demand alone. In order to get a better long-term overview, changes in stock were cumulated since 2001. The chart shows that up to now, the cumulated inventory build-up (negative values) has been far from unusual from a historic perspective. Only if EIA forecasts really materialized, would stocks peak at the end of 2015.

### Cumulated change in global oil inventories



Price could drop below \$40/b in first quarter

300,000 b/d have to be replaced in shale oil every month just to compensate for well depletion

## 2015 and further

### Deutsche AWM scenario: a focus first on marginal, then full costs

We assume that the WTI price will slide to \$40/b in the first quarter before recovering by \$10/b per quarter until finally reaching \$65 at the end of this year. This is equivalent to an average price of \$50 to \$55/b in 2015, compared with the EIA estimate from January of \$58/b and consensus estimates of \$70/b<sup>1</sup>. The latter comprises, however, many old estimates that are likely to be revised further downwards.

This forecast is based on the assumption that oversupply will peak in the first half of 2015. During this period the oil price might well move down towards marginal costs, which we see below \$40 per barrel for WTI. Production growth should already start to decelerate in the second half of 2015, particularly due to capacity reductions in North America. We expect investment in shale oil to fall by 40% year over year. Even if existing production sites prove to be longer-lived than expected, follow-on investment will be cut back. Every month, 300,000 b/d have to be replaced due to the well decline rate. New investments will be evaluated on full and not marginal costs. In the medium term, investments into other expensive exploration sites such as sand and deep-sea oil will also be delayed. This kind of capacity reduction should have a longer-term effect since these projects follow long preparation and development periods.

<sup>1</sup> Source: Bloomberg Finance LP, as of 01/16/2015

Production costs are a moving target

Break-even costs often misinterpreted

Only at prices below \$40/b significant part of capacity would be produced unprofitably

Unknown behavior of shale oil firms in stress scenario

OPEC has the means to flood the market

Should the oil price, however, climb back to \$60 to \$90/b, U.S. shale oil will return to the market as swiftly as it might leave it this year. This is also the price range within which the full costs of the most expensive producers are likely to stabilize over the medium run.

Despite the significance of production costs in a market characterized by price competition, investor uncertainty on this issue is particularly high. It is caused by widely differing production costs and an incomplete database which has also been complicated by falling production costs.

Moreover, essential terms are interpreted in different ways. For a long time, the market focused on break-even costs and the related break-even oil price. This is, however, in its widest definition, a full-cost concept, in most cases even implying capital returns of 10% to 15%. It took quite some time for marginal costs (or, in a broader sense, variable costs), which are in the short run more important with a view to capacity adjustments, to come to the fore.

A study published by industry specialist Wood Mackenzie in early January 2015 provided some clarity.<sup>1</sup> Based on 2,222 oil fields, it found that at a price of \$50/b (for Brent), only 190,000 b/d of oil production would be cash-negative. At \$45/b, 400,000 b/d would be cash-negative, and only \$40/b would leave the more significant figure of 1.5 million b/d as cash-negative (equivalent to 1.6% of world production). Many producers might of course decide to continue production even if variable costs were no longer covered. The absence of replacement investment should, however, be the decisive factor for output adjustments in the current year. Recently, investment cuts in the oil industry and the decline of U.S. rigs have accelerated.

#### Capacity adjustment could take longer

Our scenario of sharp supply cutbacks around mid-year could be further delayed if the following factors develop as outlined below:

- Cost relief with a view to variable and fixed costs, based on progress in productivity and price cuts for materials and services purchased, clearly exceeds the average forecast of 10%.
- Investment inflows seeking to gain from a price turnaround delay supply adjustments. In December 2014 alone, \$1.7 billion of fresh money went into oil-related exchange-traded products (ETPs) – more than double the sum of the two previous months.
- Unplanned output or delivery suspensions provide short-term relief. The war-torn countries of Nigeria, Libya and Iraq account for 8 million b/d or roughly 9% of world production. An additional 14 million b/d (16% of global output) comes from countries hit by economic sanctions – Russia and Iran.
- Finally, accelerating demand – either due to lower oil prices or a global economic recovery – would reduce the need for supply adjustments.

The decrease in non-OPEC capacities could, however, be accelerated if OPEC outages of 2.8 million b/d<sup>2</sup> were significantly reduced or if OPEC flooded the market even more. According to the narrow EIA definition, there are idle capacities of 2.1 million b/d.<sup>3</sup> According to the broader Bloomberg definition, OPEC capacities of 7 million b/d are lying idle.<sup>4</sup>

<sup>1</sup> Wood Mackenzie: "Oil Prices – When Do Production Shut-Ins Start?", January 2015

<sup>2</sup> Source: EIA Short-Term Energy Outlook, December 2014

<sup>3</sup> EIA definition: within 30 days and for at least 90 days ready for production

<sup>4</sup> Source: Bloomberg Finance LP, as of 01/16/2015; definition: within 90 days and for six months able to produce

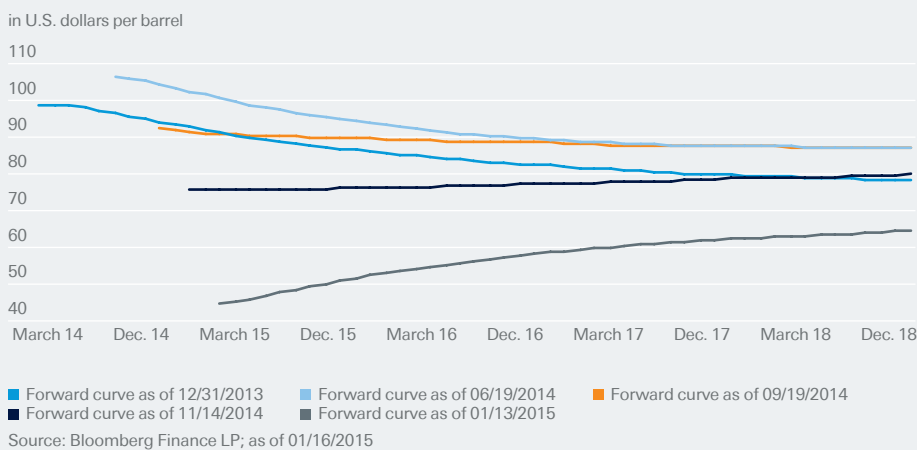
## Futures market has reacted

The oil futures curve clearly shows that market expectations have meanwhile fallen significantly below the Deutsche AWM forecast – the December contract is trading at \$52/b for WTI (as of January 13, 2015). Market participants doubt the validity of the futures curve – i.e., the prices of future deliveries implied in futures contracts, since opportunity costs (interest rates and storage costs) are not considered. But there is no other more reliable market barometer.

## The derivative market bets on recovery

The forward curve has turned from backwardation (prices for future deliveries are lower than prices for immediate deliveries) into contango, and its curve has further steepened.

## WTI term structure today and historically



## Emerging markets are the demand's growth drivers

## Factors determining market equilibrium medium-term

Despite the low price elasticity mentioned before, an oil price around \$50/b will leave its mark particularly on the supply side in 2015.

### Demand – always wanting a bit more

The demand for oil has risen every year since 1985, except for 2008 and 2009. According to major energy agencies, this growth should continue, fueled by demand from emerging markets. For Organisation for Economic Co-operation and Development (OECD) countries, the EIA expects an average decline in demand of 0.1% while the rest of the world will keep growing by 2%, summing up to a plus of 1.1%. But beware of taking these figures too seriously at the long end since the oil market could suffer from various disruptions – e.g., alternative energies, more efficient energy use, geopolitics.

### Production: usually a long-term issue ...

Against the background of low fluctuations in global oil demand over the medium term, the output side bears the brunt of adjusting market imbalances. There are two ways of adjusting output: no new investments or shutting down existing sites. The latter should rather remain an exception in view of low variable costs whereas the increase in search and exploration costs in the past ten years might at least delay many investment decisions at current oil prices.

### ... which also needs to counter well decline

Of course, also the decline of existing wells reduces supply in a natural way, which has to be compensated for by the commission of new wells each year. Estimates on this natural output decline run at 4% to 5% per year. This means the development of new wells with roughly 4 million b/d every year to keep output on the current level – roughly equivalent to total current Canadian production. Due to the long forward planning and long-term nature of such large-scale projects, which are initiated to compensate for well decline, hardly any reaction should be visible here. Although ConocoPhillips

## Capacity adjustments done via absence of follow-on investments

Yearly well depletion estimated to equal some 4% to 5% of global production

**Ambiguous extraction costs**

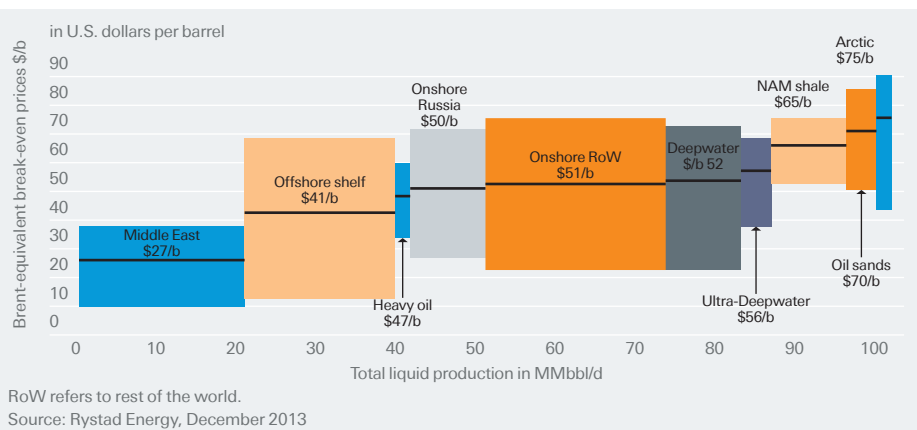
This chart illustrates the range of costs for different extraction methods and regions. Currently, a cost reduction is under way.

announced on December 8, 2014, that it would slash its 2015 investments by 20% to \$13.5 billion vs. 2014, it also said that output volumes would, at the same time, rise by 3% due to newly launched projects.

**No two oil fields have the same cost profile**

The following chart not only shows the average cost of different exploration methods and sites but also the variety of cost estimates. There are not only huge differences between individual companies as regards full and marginal costs – sometimes even two directly adjacent oil rigs show different cost profiles.

**Costs of different exploration methods**



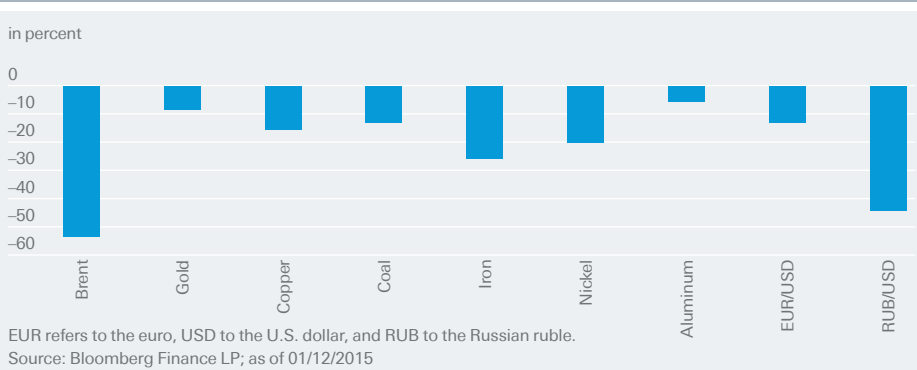
**Not only oil suffers**

Oil has not been the only victim of massive price slides in the past six months. Commodities and some currencies have also suffered.

**Deflation worries? Relevant for commodities**

Another aspect is that production costs are currently caught in a deflationary spiral. It is not only that the prices of many other commodities, which are partly directly used for the extraction of oil, have plunged since mid-2014. Oil companies also report that prices

**6-month price change**



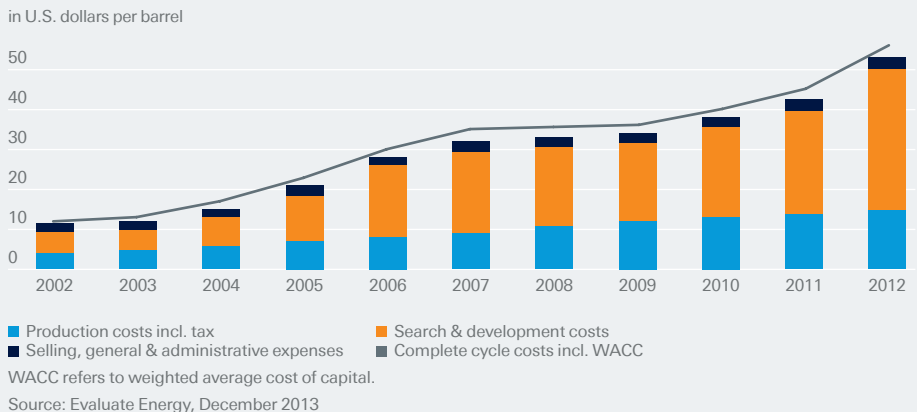
**Oil producers' cost base benefits from deflation**

demanded by oil-service industries have plummeted. According to a Repsol Board member, a drilling vessel that cost \$600,000 a day two years ago now costs just \$400,000. At an investors' conference organized by Wells Fargo on December 10, 2014, Midstates Petroleum, a U.S. shale-oil producer, reported that servicers granted rebates between 10% and 15% but that he expected even more in 2015. Another example of the pressure exerted on oil servicers was provided by Precision Drilling, Canada's major service provider in oil and gas drillings. It announced in December 2014 that it would slash its investments for 2015 by 44%. A look at the cost explosion of the past few years gives a good impression of how far costs can be reduced.

## Rapid cost increases

This chart shows, on the one hand, the relation between (variable) production costs, (fixed) investment costs and semi-fixed overhead expenses and, on the other hand, the big increase in search and exploration costs.

## Break-even price for oil majors



## Past cost explosion triggered by price inflation and unconventional oil exploration

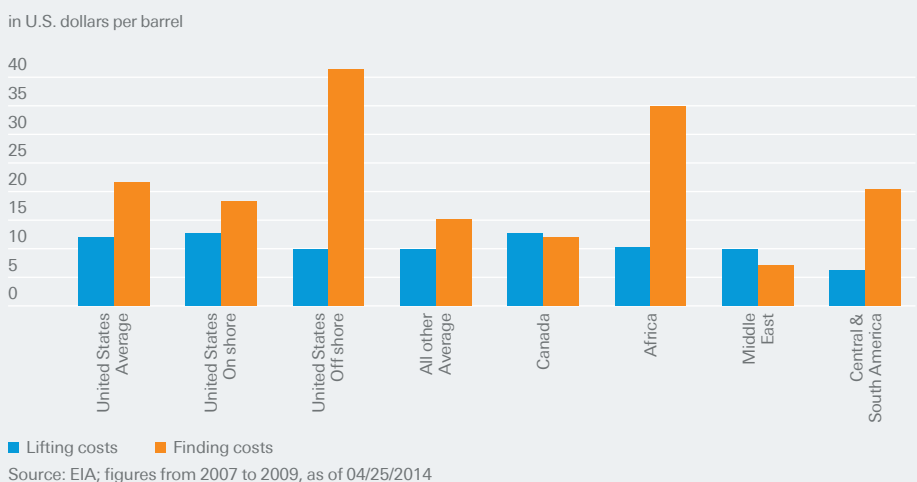
## Production ever more expensive, production ever cheaper

Previous cost hikes have been the result not only of higher prices for material and services but also of the fact that major oil companies had finally started to look and drill for oil in ever more difficult and therefore expensive regions of the world – in the Arctic, in Canadian oil sand, in the deep sea off the Brazilian coast, or in Kazakhstan. These projects will be the first to be cut back. The volume of cost savings – estimates vary from 10% to 25% per year – will probably not be revealed before the start of the reporting season on companies' 2014 financial years. According to Goldman Sachs estimates, with an oil price of \$70/b (for WTI), investment projects of roughly \$1 trillion will become unprofitable (without U.S. shale gas) reducing output capacity by 7.5 million b/d by 2025.<sup>1</sup> However, the static approach of these calculations leaves room for doubt in this uncertain environment. For Rystad Energy, a Norwegian consultancy, investments to the tune of \$150 billion are jeopardized by an oil price of \$70/b.<sup>2</sup> But first of all, all break-even costs in circulation need updating.

## Low variable costs

This chart does not so much intend to show the absolute values of variable and fixed costs (approximated here with production and exploration and development costs) but rather their relationship. Even if a doubling of costs until 2014 is assumed, it shows that oil could even be produced at \$40/b or less.

## Variable and fix costs



<sup>1</sup> Source: Goldman Sachs Research, December 2014

<sup>2</sup> Source: Morgan Stanley Research, Rystad Energy, December 2014

Big cost differences for searching and exploring

Shale oil – new sector as a blessing or a curse?

Rapid improvements in productivity

Constant cost deflation

Most shale-oil producers hedged for 2015

Search-and-exploration costs vary widely within the sector whereas variable costs remain in a much narrower band. Before going into more detail on our 2015 outlook, let's have a closer look at U.S. shale oil. It is the most flexible non-OPEC player on the market – but since its history is rather short, its behavior in a longer-lasting stress scenario is difficult to assess.

## Shale oil – a mixed blessing?

Attention should currently be focused on U.S. shale oil, which accounts for 56% of U.S. oil production.<sup>1</sup> Firstly, its rapid growth has contributed significantly to the current oversupply. Secondly, it is generally regarded as a swing producer. This segment could adjust its capacities most rapidly, due both to relatively high full costs and also its market structure consisting of a large number of smaller and financially more fragile producers.

### Production has become ever cheaper

The U.S. shale oil and gas industry has proven to be very innovative and resilient up to now. Five years after its début with gas fracking in Texas in 2003 it still enjoyed record prices before gas lost 85% of its value within four years. Since then fracking has become ever more efficient. A couple of years ago it took 70 to 90 days to explore a well, yielding 150 b/d – now this work can be done in a couple of weeks, for wells pumping 550 b/d from the soil. Furthermore, one rig is today not only used for extracting oil from one well but from up to four wells. All this has led to a near halving of shale production's full costs to roughly \$35 to \$45/b in oil fields such as Bakken or Eagle Ford.

### Does OPEC really know what it is up to?

The warning of Abdalla El-Badri, OPEC's secretary-general, that half of U.S. fracking production would disappear when the WTI price fell to \$85/b<sup>2</sup> therefore now seems wrong to most industry observers. Marianne Kah, chief economist of ConocoPhillips, stated in an interview with Wall Street Journal on October 30, 2014, that 80% of the sector could generate profits as long as WTI prices ranged between \$40 and 80/b.

### Shale production could prove short-term resilient ...

A decision to shut capacities down will, however, be based on variable costs. Although data are vague due to the large number (over 200) of mostly non-listed oil producers, industrial analysts assume that the variable costs of the majority of the sector are below \$30/b, if not \$20/b.<sup>3</sup> And there are further reasons why, at least in the next six to nine months, it is unlikely that a large number of fracking companies will leave the market: Many of them hedge their production against falling oil prices via derivatives, particularly the highly leveraged ones (as they are urged to by their banks). According to J.P. Morgan, in 2014 61% of output was on average hedged at \$96.20 per barrel WTI, and for 2015 over 36% was hedged at an average of \$90/b.<sup>4</sup> Furthermore, only \$3 billion worth of oil high-yields will mature in 2015 and 2016, another \$12 billion in the two following years.<sup>5</sup>

<sup>1</sup> Source: EIA Short-Term Energy Outlook, December 2014

<sup>2</sup> Oil & Money Conference in London, 10/30/2014

<sup>3</sup> Source: Petrie Partners in a Bloomberg interview on 12/18/2014 (\$20 plus/minus \$5), or Fadel Gheit, Oppenheimer Senior Energy Analyst, in a CNBC interview on 12/03/2014 (cash costs are \$15 to \$25)

<sup>4</sup> Source: JPMorgan Chase & Co.: "US Mid- and Small-Cap Banks Energy Lending Spotlight", 12/02/2014

<sup>5</sup> Source: Citi Research: "What does \$65 Oil Mean for Energy Bonds?", 12/07/2014

Higher leverage amongst smaller players

Producing wells will not be abandoned

More output with less oil rigs

Although many companies in this segment are highly leveraged, the balance sheets of the major producers are generally sound. In the J.P. Morgan universe, large companies' debts equal their earnings before interest, taxes, depreciation and amortization (EBITDA), medium-sized firms are leveraged by a factor of 1.9, and smaller firms by an average factor of 2.4.<sup>1</sup> But there are also firms with a leverage factor above 5.

#### ... but supply will be adjusted via investment cuts

U.S. shale-oil companies have been awarded the status of "swing producer," more with a view to their investment needs than their current operations. No other wells can be as quickly tapped and depleted as shale oil: Already three months after tapping output starts to decrease. In a typical field of the U.S. Eagle Ford Formation, 75% of the well will be depleted after one year and 87% after approximately two years.<sup>2</sup> Due to ongoing technological progress, however, these figures are continuously changing and differ from field to field. But hardly any firm will stop pumping oil in the first year of production. Their reaction to low oil prices will instead be to suspend further investments. To summarize: Contrary to conventional oil projects, the time gap between capital expenditure and operational expenditure (capex and opex) of shale-oil producers is very narrow. The consequences of investment cuts will be immediately felt since output decreases every month by 300,000 b/d due to well-decline alone.

#### Growth in the face of shrinkage

Shale-oil companies have already started to react to the price slide by reducing the number of oil rigs by 24.0% to 1,223 since September.<sup>3</sup> Horizontal rigs<sup>4</sup>, which are more telling here, have been reduced by 14.9% since the end of November. Additionally, many companies have announced capital-expenditure cuts for 2015. According to Bloomberg Intelligence, capital expenditure of independent oil producers has stabilized around \$140 billion since 2012 anyway: the November estimate for 2015 still amounted to \$132 billion.<sup>5</sup> Paradoxically, investment cuts must not necessarily lead to output cuts since companies will focus on the richer and more easily accessible oil wells and strive to increase productivity by other means. Laredo Petroleum Inc. will, for example, cut 2015 capital expenditure by half but nevertheless expects output to increase by 12%.<sup>6</sup> And Concho Resources, one of the major producers with an estimated turnover of almost \$3 billion for 2014,<sup>7</sup> announced at the beginning of January to curb its 2015 investments from \$3 to only \$2 billion (2014: \$2.6 billion) but to increase production by 18%. The charts illustrate how U.S. shale-oil output grows rather independently of the number of rigs – a sign of increased productivity.

<sup>1</sup> Source: JPMorgan Chase & Co.: "US Mid- and Small-Cap Banks Energy Lending Spotlight", 12/02/2014

<sup>2</sup> Source: Uppsala University, master thesis in Energy Systems Engineering, Linnea Lund, October 2014

<sup>3</sup> Source: Baker Hughes, as of 01/30/2015

<sup>4</sup> Shale-oil production takes place mainly through horizontal drilling. As they can cover a larger area, new horizontal rigs have improved the productivity significantly.

<sup>5</sup> Source: Bloomberg Intelligence, November 2014. 2015 estimates might have been further downsized meanwhile; Deutsche Asset & Wealth Management Investment GmbH expects shale-oil producers to cut investments by 40% in 2015.

<sup>6</sup> Source: Laredo Petroleum press release, as of 12/16/2014

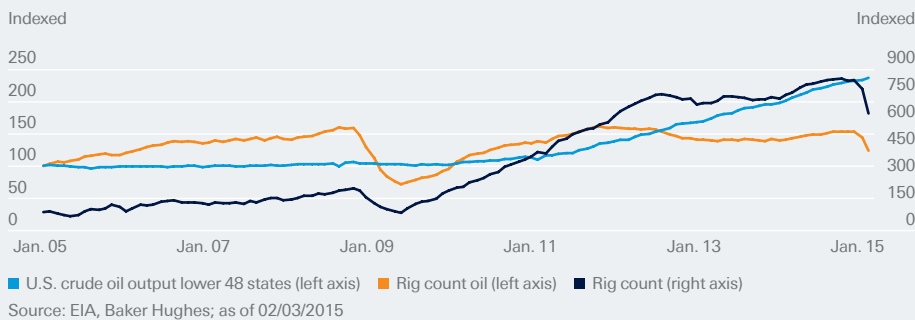
<sup>7</sup> Source: Bloomberg Finance LP, consensus estimate, as of 01/12/2015



## Rigs produce constantly more oil

Looking just at the total number of rigs alone is not sufficient.

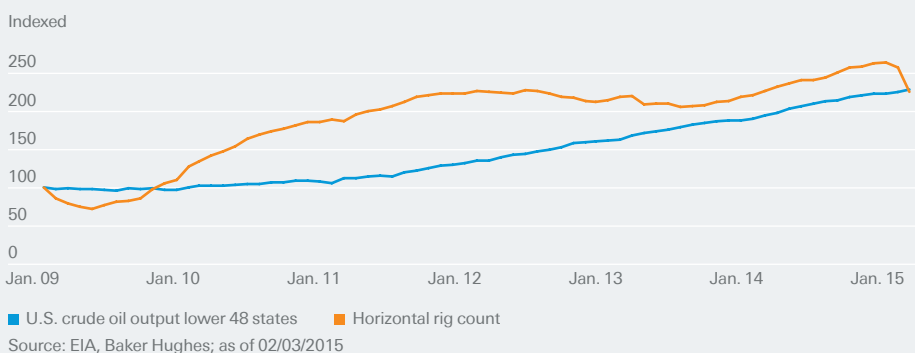
## Oil rigs and oil production in the United States



## Horizontal rigs more telling

At least over a five-year horizon, some correlation between rig numbers and output seems to be visible. However, short-term, even the number of horizontal rigs does not indicate output.

## Horizontal rigs and oil production in the United States



## First fire sales taking place

## Fracking is also controversial in the United States

## OPEC's short term victim

### Shale-oil producers will face a hard year

Even if the sector seems, at first sight, to be well positioned for 2015 regarding balance sheets, some companies might experience financial distress. That Talisman, one of the major names in U.S. fracking, agreed to the sale to Repsol at a price "only" 24% above the previous three-month average<sup>1</sup> shows how serious the current situation is. Repsol also wanted to close the deal quickly to spare Talisman from having to sell its most valuable assets. With a leverage ratio below three times EBITDA (in the current year),<sup>2</sup> Talisman is not even among the most highly leveraged firms.

Political headwinds are another issue. Even in the United States, frackers and their extraction method increasingly face opposition. New York was the second state after Vermont to ban fracking at the end of December, alongside the communities of Denton (Texas) and Athens (Ohio). This is quite remarkable since New York state, adjacent to the major Marcellus Shale, thus potentially foregoes a huge amount of tax revenues and jobs. And it is also very telling that real estate close to fracking projects is not found in the premium segment of real-estate brokers.

Finally, not all debt-ridden frackers will shrug off the words of the Saudi oil minister on December 22, 2014 as saber-rattling. According to Ali I. Naimi, the most efficient producers deserved a higher market share; others might be hit hard whereas they – with production costs of \$4/b to \$5/b – could bear any price slide.<sup>3</sup> He did not say whether these were full or variable costs.

<sup>1</sup> Thus the offer price is still 30% below the 12-month high of Talisman's share

<sup>2</sup> Source: Repsol press release, as of 12/22/2014

<sup>3</sup> Source: Financial Times, as of 12/22/2014

## 2. OPEC's power and powerlessness

OPEC has decided to maintain its production ceiling. Its intention is to protect OPEC market share and not the oil price. Oil supply therefore remains high. Steadily increasing demand should nevertheless help the oil price to recover over the medium term.

### Lessons from history

#### OPEC's strategic u-turn in November 2014

At its annual meeting in November 2014, the OPEC members (Saudi Arabia, United Arab Emirates, Kuwait, Qatar, Iran, Iraq, Nigeria, Libya, Angola, Algeria, Ecuador and Venezuela) decided to maintain a production level of 30 million b/d. This decision may have been influenced by the cartel's experience during the 1980s. This time around Saudi Arabia, which has successfully stabilized prices by short-term supply management in the past, was obviously not prepared to support any production cutbacks.

#### Previous successes in raising prices ...

A look back to the 1980s might have prompted Saudi Arabia into taking this decision. During the 1970s, the cartel had still controlled roughly 50% of global oil supplies. OPEC used its predominant market position to increase the oil price tenfold to roughly \$30/b in the decade from 1970 to 1980. In the 1980s this prompted oil consumers to look for energy-saving measures, and states and companies into searching for other sources of oil, gas and coal.

#### ... backfired as demand and supply reacted

Energy savings were achieved. Based on BP figures, global daily oil consumption decreased from 63.9 million barrels in 1979 to 57.6 million barrels in 1983. At the same time, the United States expanded its production by 1.3 million b/d. In the Eurasian area, production increased by 1.7 million b/d – mostly thanks to the newly explored oil fields in the North Sea.<sup>1</sup> As a reaction to this, OPEC, and in particular its most important member Saudi Arabia, tried to stabilize oil prices by cutting production during the 1980s.

OPEC decided not to cut output in November 2014

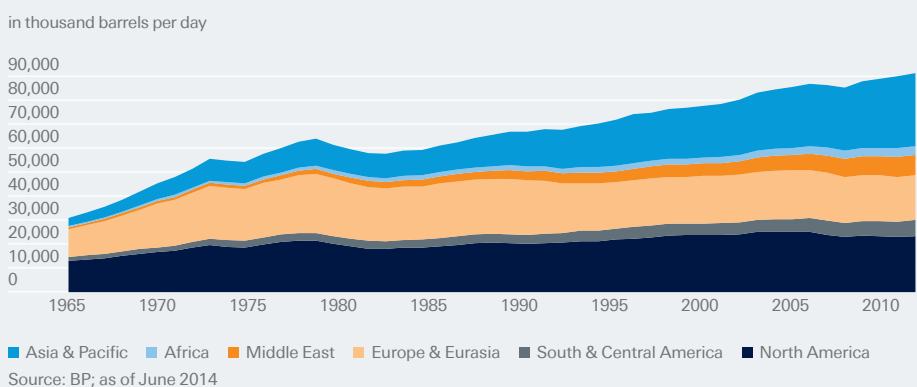
Higher oil prices had encouraged energy saving efforts and the development of new oil fields

OPEC in the past tried to stabilize the price by cutting output

#### Rising demand

Soaring oil prices led to massive energy-saving efforts at the beginning of the 1980s. A similar development could be observed in the industrialized countries from 2005 onwards. It was, however, more than offset by an increasing oil consumption in the emerging markets.

Oil: global consumption (cumulated)



<sup>1</sup> Source: BP Statistical Review of World Energy, as of June 2014

OPEC lost market share as a result of its production cuts

OPEC has a market share of 39% and 73% of all proven oil reserves

### Rising supply

Rising oil demand from emerging markets has been offset by an expansion of oil production in North America and the Middle East. This has increased the significance of U.S. and Canadian corporations hydraulically fracturing oil from oil sand and shale.

### OPEC's power

At its last meeting, OPEC maintained its daily production level of 30 million barrels of oil. The United States and Canada have significantly expanded their production in the previous years, thus gaining market shares. Russia has been overtaken by the U.S. but has defended its market share.

### Prices slide as market share declines

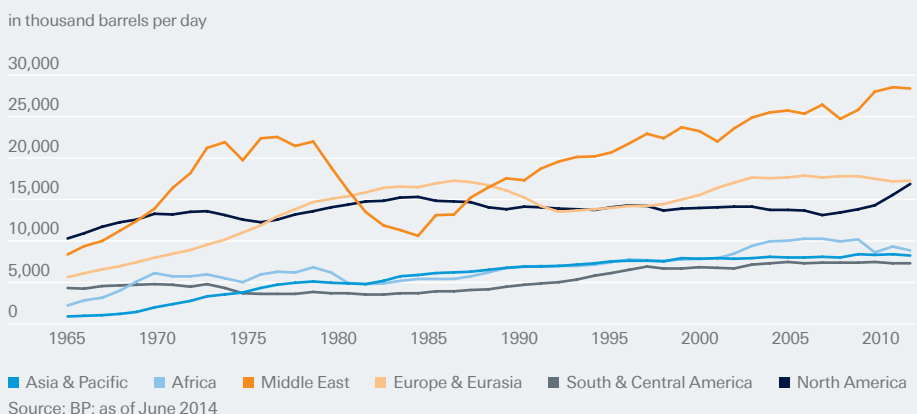
During the 1980s, OPEC successfully prevented a price slide by slashing production. The trade-off was, however, a painful loss of market share for the cartel. Its share of global production shrank from 40.8% in 1980 to 27.5% in 1985. OPEC responded by defining the safeguarding of a fair market share as its objective in December 1985. As early as in 1986, OPEC's production share rose again to over 30%. In exchange, the oil price fell back from over \$30/b to, temporarily, under \$10/b. These experiences during the 1980s certainly contributed to OPEC's recent decision not to cut back production.

### OPEC is still powerful

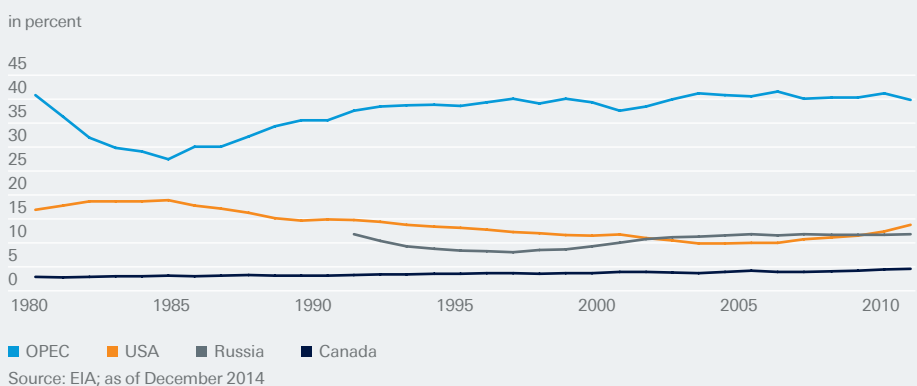
#### OPEC dominates global oil reserves

Based on EIA estimates, OPEC currently has a market share of roughly 39%.<sup>1</sup> At an oil price of roughly \$50/b, this means annual revenues of \$661 billion. Moreover, according to EIA estimates, OPEC members have roughly 73% of all proven global oil reserves, amounting to 1.6 trillion barrels.

### Regional production of crude oil



### Market shares of global oil production



<sup>1</sup> Source: EIA Short-Term Energy Outlook, November 2014

Asia's economic rise continues to be the major driver of oil demand

OPEC wants to maintain its market share and deter new market entrants

### Historic price threshold

In the 1970s, OPEC tried to push oil prices beyond the threshold of \$100 (adjusted to 2013 prices), but failed. Oil has again missed this threshold now (based on average prices). The main reason should be that the higher the price level, the more profitable it is to develop new extraction technologies and explore new oil deposits, thereby increasing production and depressing prices.

Moreover, there are a number of differences between the current situation and that in the 1980s, all suggesting that OPEC's influence should not be underestimated. In the 1980s, high oil prices prompted consumers to try and save energy. Similar efforts could be observed in the industrialized countries in the years following 2005 when oil prices started soaring again. But they were more than offset by increasing oil consumption in emerging markets. Particularly in the Asia-Pacific (APAC) economies, oil consumption rose by 5.8 million b/d from 2005 to 2013.<sup>1</sup>

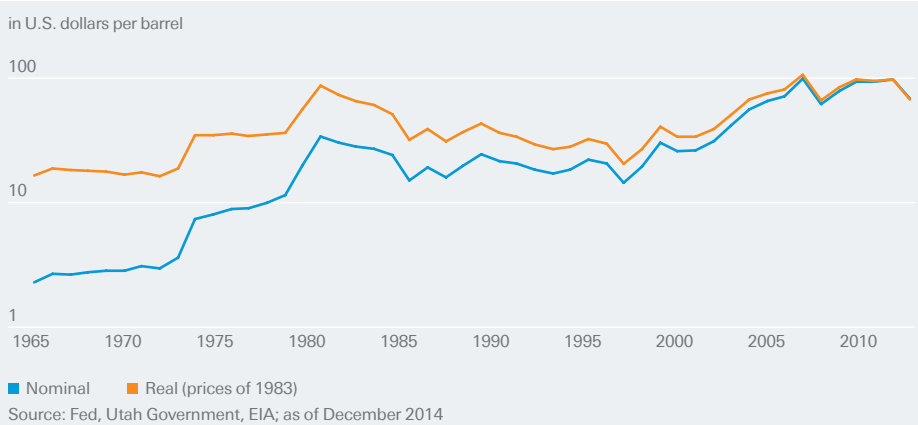
### Emerging markets are boosting global demand

Unlike in the 1980s, global demand for oil is rising today so that production must rise as well. The United States, Canada and OPEC members were at the forefront of production expansion, raising production from 2005 to 2013 by 4.04 million barrels, 1.03 million barrels and 0.97 million b/d, respectively.<sup>2</sup> The United States thus made an essential contribution towards preventing a rapid increase of oil prices triggered by higher oil consumption. The existence of large oil-sand and shale-oil deposits made it possible to increase production. This development had, in turn, been facilitated by an oil price by far topping the threshold of \$80/b which allows the majority of oil producers to operate in a profitable way.<sup>3</sup>

### OPEC wants to make expensive oil production unattractive

Maintaining market share might therefore not be the only objective of OPEC's strategy. Maintaining its production level is meant to keep the oil price below the level which makes extraction of oil from shale and sand a profitable business. OPEC is afraid of additional competitors. This strategy might work at first. In the long run, however, oil consumption from emerging markets continues to rise. Also, the EIA states that idle oil production capacity is currently no higher than 2.04 million b/d. Oil prices should therefore, in the long run, gradually rise above \$80/b, and oil production from shale and sand should expand further.

### Development of crude oil price



<sup>1</sup> Source: BP Statistical Review of World Energy, as of June 2014

<sup>2</sup> Source: EIA Short-Term Energy Outlook, December 2014

<sup>3</sup> Based on data from the International Energy Agency, currently 4% of U.S. shale oil producers will only make profits if the oil price is above \$80/b

We expect the oil price to recover until the end of the year\*

### 3. Macroeconomic implications

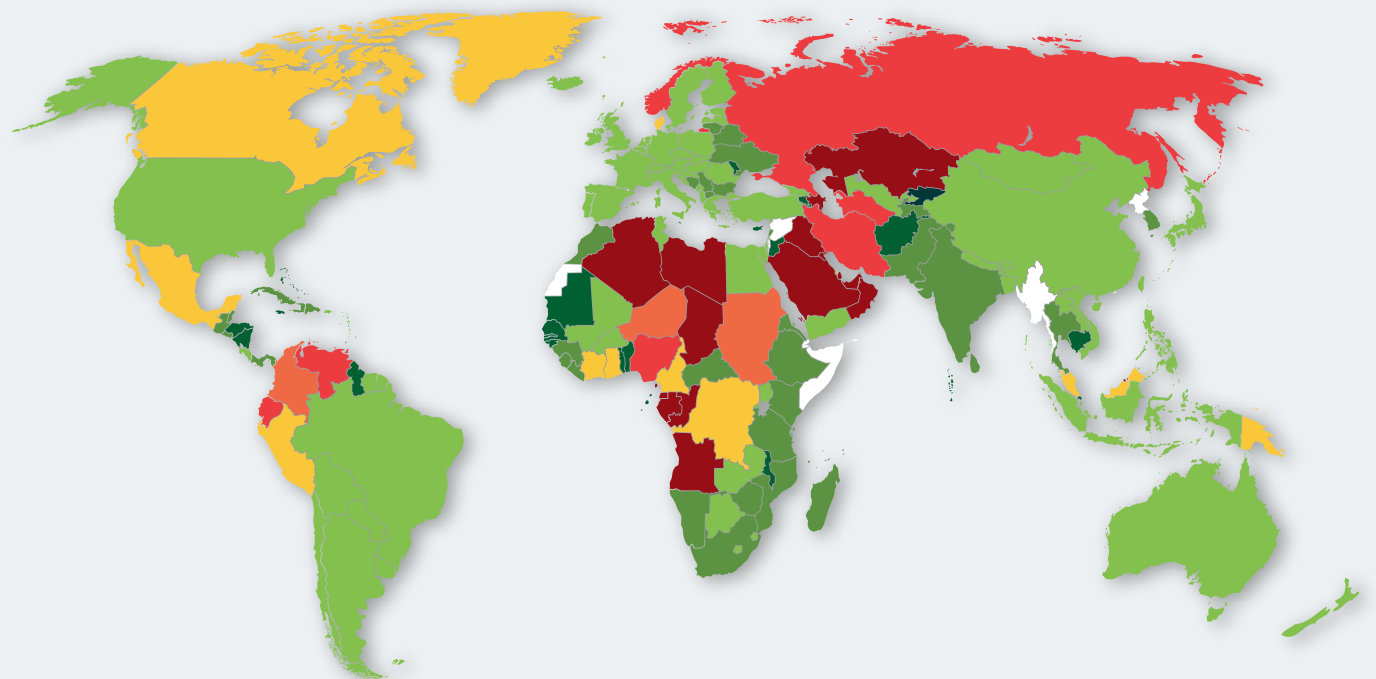
The oil-price fall can lead to a redistribution of real income amongst countries and regions. While net oil exporters will have to draw on their currency reserves, cheaper oil will positively affect GDP growth in net oil-importing countries.

#### How current accounts are affected

In 2014, a barrel of WTI oil was on average still priced at \$95. By the end of the first quarter of 2015, we expect an oil price of \$40/b, in the second quarter a price of \$50/b, in the third quarter a rise up to \$60/b, and in the fourth quarter one of \$65/b. This would mean an average price of \$50 to \$55/b for WTI in 2015. This would represent an average price decline of 42% over 2014.

Lower oil prices have an immediate effect on current-account balances and on economic growth. Countries where oil production exceeds oil consumption should be adversely affected by oil-price developments in 2015. Countries with higher consumption than production should be among the winners. Changes in the net external position on oil converted into local currencies illustrate the extent to which the growth of a country is affected by oil-price changes.

#### Oil price: winners and losers by countries



GDP change given an oil-price decline of 42 percent

■ less than -10%   ■ -10% to -5%   ■ -5% to -2,5%   ■ -2,5% to 0%   ■ 0% to 2,5%   ■ 2,5% to 5%   ■ 5% to 10%   ■ above 10%

Basis of calculation: real income gains and losses due to the oil-price drop will cause domestic demand to adapt. Oil-price changes will also shift international demand patterns. <sup>1,2</sup>

<sup>1</sup> Calculations are based on an oil price which is on average by 42% lower than in 2014. GDP changes caused by changing oil prices are expressed in U.S. dollars, exchange rate fluctuations are not considered. For reasons of availability, data on the individual countries' oil production, oil consumption and GDP are based on figures from 2013.

<sup>2</sup> Sources: EIA, World Bank, IMF, as of December 2014

## Changes in the oil price and exchange rates affect trade balances and GDP

A look at the world map shows that a large number of industrialized states should be among the winners. A decline in import prices for fuel, which means improved terms of trade<sup>1</sup>, leads to an improving current-account balance. The expansion of shale-oil production in the United States has greatly contributed to a significant reduction in U.S. oil imports in the last few years. This is the reason why the expected 0.4% boost to the U.S. growth rate is rather modest. Since only little oil is produced in the Eurozone, the growth effect is much bigger here than in the United States (see chart).

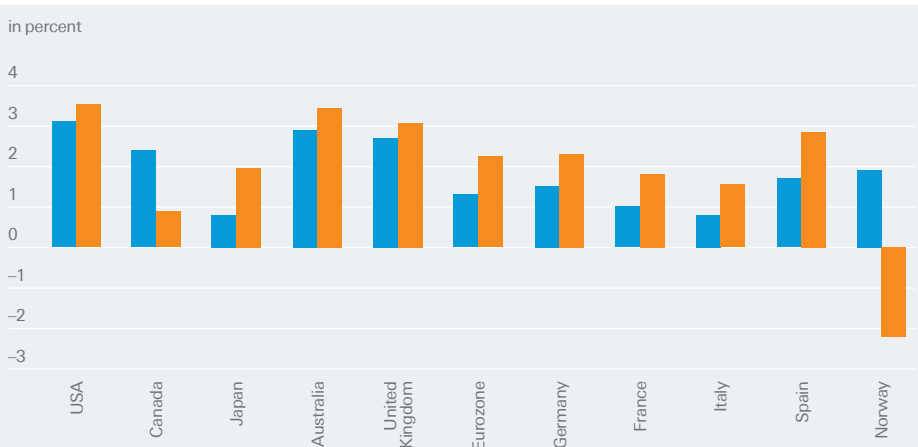
### Oil prices and the U.S. dollar

Oil is traded in U.S. dollars. The fact that the euro might devalue further against the U.S. dollar in the course of 2015 must, therefore, be considered when estimating the growth effect from low oil prices. Deutsche AWM expects the euro to weaken even further against the U.S. dollar this year than it already has. Energy sources which are imported in U.S. dollar will thus become more expensive when converted into euro. Declining oil prices should – adjusted for exchange-rate changes – lead to a recovery of Eurozone real growth by 1% in the current year. This and the following calculations in this chapter show the hypothetical effect of the oil price fall on the International Monetary Fund's (IMF's) GDP growth forecasts for 2015. We assume an average year-over-year drop of the oil price of 42% and that the resulting (currency adjusted) income gains and losses will feed entirely through to changes in spending, with nothing diverted into additional saving. Countries such as Canada and Norway, where oil production contributes significantly to GDP, will be an exception among industrialized countries. Canada's economy might grow at a slower pace in 2015 than expected. Norway is even threatened by recession this year due to declining oil prices.

### Numerous winners

Due to their high oil consumption, industrialized countries tend to be among the winners. Among industrialized countries, only Canada and Norway will be outright losers.

Industrial economies: hypothetical effect of the oil-price change on IMF forecasts



The chart shows the hypothetical effect of the oil price fall on the IMF's GDP growth forecasts for 2015. We assume an average year-over-year drop of the oil price of 42% and that the resulting (currency adjusted) income gains and losses will feed entirely through to changes in spending, with no additional saving.

■ GDP growth without oil price change    ■ GDP growth with oil price change

Sources: IMF, EIA, Morgan Stanley, Deutsche Bank, Deutsche Asset & Wealth Management Investment GmbH; as of January 2015

## Impact on emerging-market economies varies due to their differing natural resources

### Main winners among emerging markets

The big Asian emerging markets are among the winners. The lower oil price should boost growth rates in India and South Korea by an estimated 2% and 1.6% respectively in 2015. China and Indonesia will benefit from declining oil prices, too. Singapore should as well experience a significant growth impetus since it is – also due to its big petrochemical sector – a high energy consumer.

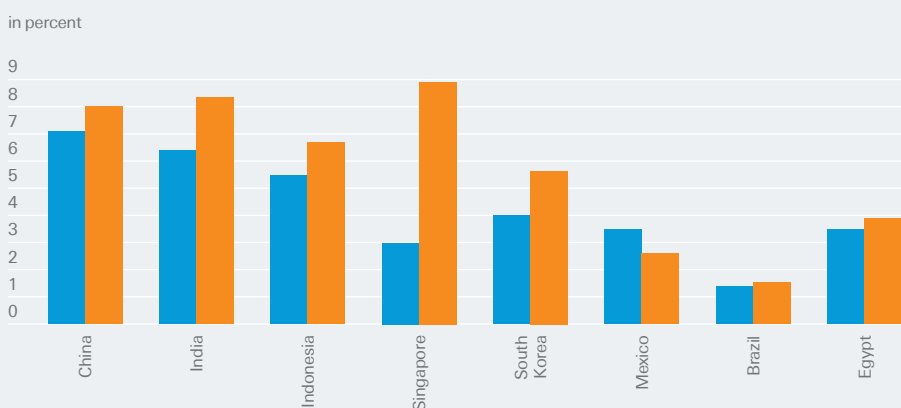
<sup>1</sup> "Terms of trade" is an economic coefficient for the real exchange ratio of exported and imported goods of a country. When a country can buy more imported goods for its exported goods, the terms of trade are said to "improve."

Egypt and Brazil will be hardly affected by oil-price developments. Both countries are able to cover their domestic oil consumption by local production. Mexico will, however, be negatively affected by the low oil price as it is a net oil exporter. Assuming an 8% decline in the peso against the U.S. dollar in 2015, lower oil prices will entail a negative growth effect of 0.9%.

## Asia as the oil-price winner

Industrialization boosted oil consumption in many emerging markets. As net importers of oil, China, India, Indonesia and South Korea will benefit from plummeting oil prices. Mexico will be among the losers, but the impact on growth here is likely to be moderate.

Emerging economies: hypothetical effect of the oil-price change on IMF forecasts



The chart shows the hypothetical effect of the oil price fall on the IMF's GDP growth forecasts for 2015. We assume an average year-over-year drop of the oil price of 42% and that the resulting (currency adjusted) income gains and losses will feed entirely through to changes in spending, with no additional saving.

■ GDP growth without oil price change ■ GDP growth with oil price change

Sources: IMF, Morgan Stanley, Deutsche Bank, Deutsche Asset & Wealth Management Investment GmbH; as of January 2015

## Winners and losers among developed and emerging economies

As this all shows, a traditional classification of countries into industrialized states and emerging markets seems increasingly outdated. Instead, we may need to classify countries by their export share of commodities in relation to their GDP. The big economic winners from the slump in oil prices are emerging markets with few energy resources. Most of them are in Asia or Africa.

## Some oil-exporting countries could face a recession in 2015

### Emerging-market losers

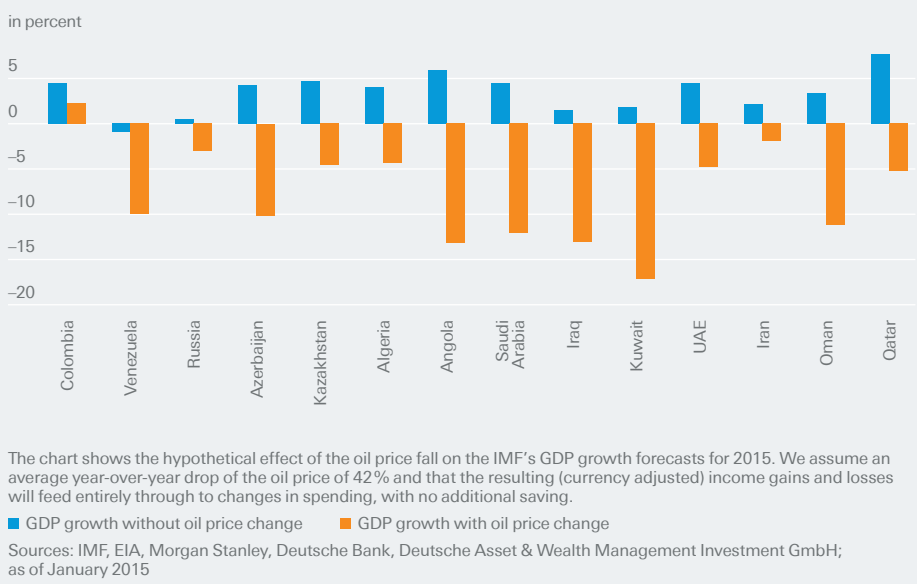
The big losers are emerging markets that export energy, in the Middle East, South America or Eurasia. The economies of these countries are heavily dependent on a product which is priced by the world market and is extremely volatile. Growth in these countries should suffer significantly. Almost all big oil-producing countries (with the United States as a major exception) are likely to slide into recession this year if oil prices develop along the lines of Deutsche AWM estimates. This may reinforce investors' existing perceptions that oil dependence adds to risk.

## High dependence on oil prices

Deutsche AWM expects a 2015 oil price around 42% below the 2014 level. Many oil-exporting countries could slide into recession. Developments in Libya are difficult to assess. The economy has collapsed in the wake of civil war. It is an open question whether the country manages to stabilize in 2015.<sup>1</sup>

## Attention shifting to external debt in 2015

Oil exporting countries: hypothetical effect of the oil-price change on IMF forecasts



Since the start of this millennium, oil exporters' terms of trade, i.e., the relation of export and import prices, have improved due to rising oil prices. As a consequence, oil-exporting countries have boosted public and personal consumption, leading to higher imports. These countries are now faced with rapidly changing terms of trade caused by the volatility of commodity prices last year. It may be very difficult for commodity-exporting countries in the Middle East, in Africa and in South America to react swiftly to declining commodity prices by tightening their belts fast enough.

### External debt threats

Since part of these economies' oil revenues has already disappeared, while consumption expenditure is only slowly being curbed, many oil-exporting countries are threatened by a significant expansion of public debt in 2015. Another threat is posed by worsening current-account deficits, which are the precursor of increasing external debt. The rising external debt of commodity-exporting countries increases the risk of credit defaults for foreign investors.

In 2015, Colombia, Venezuela, Kazakhstan, Algeria, Angola, Saudi Arabia, Iraq and Oman could be faced with large current-account deficits of more than 4% of GDP caused by the oil-price slide. Substantial foreign-exchange reserves, which are, in some cases, far higher than external debt, will for some act as a stabilizing factor. These reserves should help most countries to survive this low-oil-price phase unscathed. Exceptions include Venezuela and Kazakhstan. The current accounts of both countries are expected to deteriorate sharply in 2015. Their situation is aggravated by the high ratio of their external debt to gross domestic product.

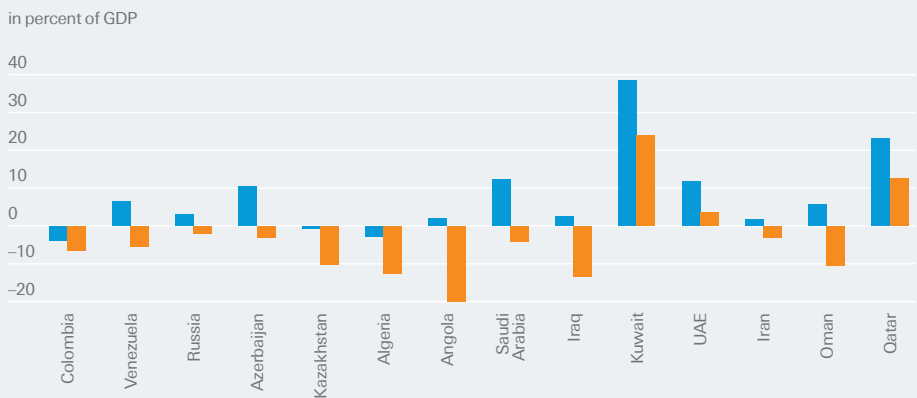
<sup>1</sup> This analysis does not include Libya since its GDP has collapsed in the wake of civil war. It is too early to tell whether the country will stabilize in the course of this year. The country is receiving international assistance. Its oil production dropped massively last year.



## Mixed picture

Adjustment of consumption to changed terms of trade requires time. The current-account balance of many of the oil-dependent countries might therefore turn negative this year.

## Change in current account balance in 2015



Calculations based on the following assumption: A changing oil price affects the value of oil exports and imports in the trade balance. All other income and expenses are unchanged.

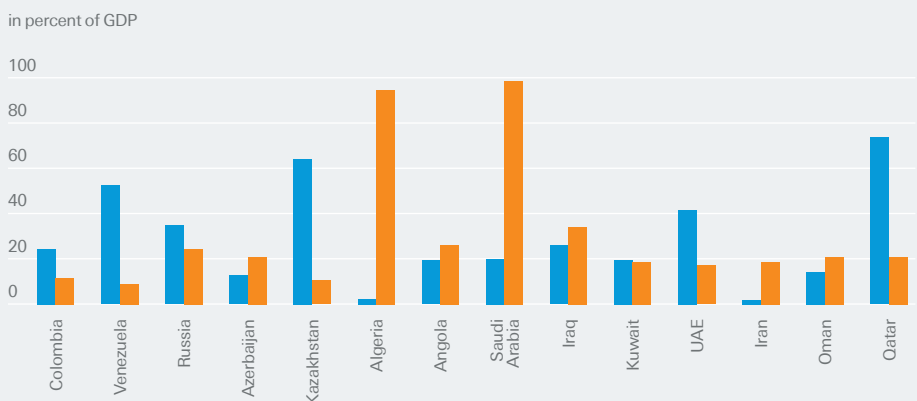
■ Without oil price change ■ With oil price change

Sources: IMF, EIA, Deutsche Asset & Wealth Management Investment GmbH; as of January 2015

## Important reserves

High foreign-exchange reserves should support many countries in their efforts to stabilize their economies while they adjust to the new oil-price level. Should oil prices, however, continue to fall, some of these countries will face serious problems.

## External debt and central bank reserves



■ External debt ■ Currency & gold reserves

Sources: CIA, FactSet Research Systems Inc., World Bank, IMF, Deutsche Asset & Wealth Management Investment GmbH; as of December 2014

All data as of end of 2013; for Saudi Arabia, Iraq, Kuwait, UAE, Iran, Oman and Qatar only estimates are available.

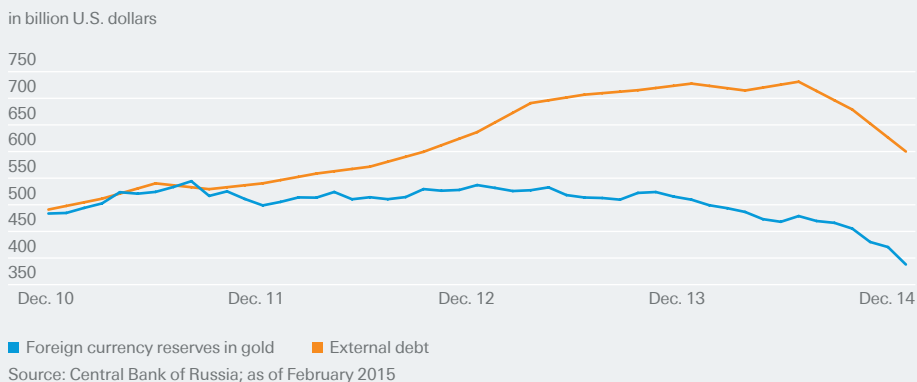
Russia's economy has not only been hit by slumping oil prices but also by political stresses and the economic embargo. The country has tried to defend its currency by using its foreign-exchange reserves. Its international reserves thus dwindled from \$509.6 billion at the end of 2013 to \$385.5 billion (end of 2014).<sup>1</sup> According to IMF estimates, this is equivalent to 20.4% of last year's GDP. Total external debt however decreased from \$728.9 billion at the end of 2013 to \$599.5 billion in December 2014 (preliminary figures), as reported by the Central Bank of Russia.

<sup>1</sup> Central Bank of Russia, as of 02/02/2014

## Russia's Achilles heel

The Central Bank of Russia's interventions to stabilize the ruble led to a meltdown of its foreign-exchange reserves in 2014. External debt was, however, only slightly reduced in the third quarter of 2014. S&P downgraded Russia's rating to BB+ in January 2015, maintaining the negative outlook in autumn due to the structural weakness of the economy.

## Russia's international currencies reserves and external debt

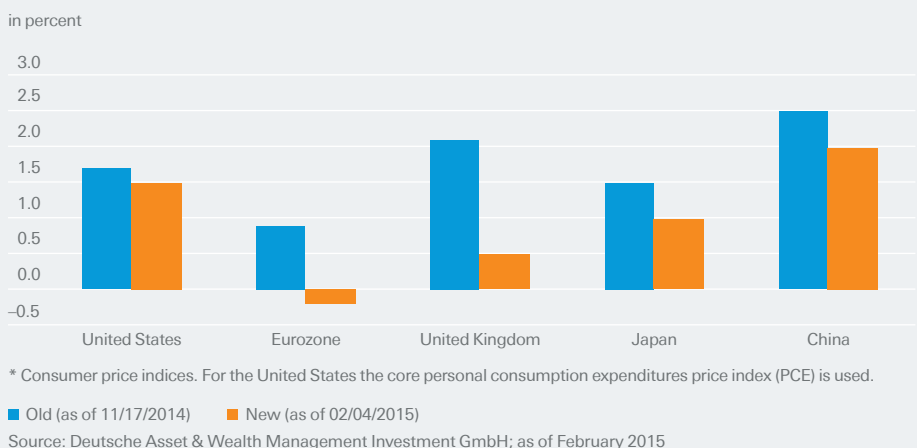


Our base scenario is a gradual recovery of the oil price to \$65/b by year-end 2015. This would offer some relief for many oil-dependent countries in this year.<sup>1</sup> However, the risk of oil prices remaining very low throughout 2015 remains. Should this risk scenario materialize countries such as Colombia, Venezuela, Angola, Iraq and Oman would be faced with serious economic problems.

## No deflation fears

According to Eurostat, energy has a weight of 10.9% of the Eurozone's Harmonised Index of Consumer Prices (HICP). Due largely to the sharp drop in oil prices, we believe that Eurozone HICP inflation will fall to an annual average of -0.2% in 2015. This will hold down nominal GDP growth. However, the increased purchasing power resulting from cheaper energy prices should be beneficial to demand and increase real GDP growth. The bottom line is that the positive effect from increased growth is likely to more than compensate for the fall in consumer prices. In the United States, United Kingdom, Japan and China the oil price drop will also lead to lower inflation. The positive effects on purchasing power should enhance these countries' real GDP growth as well.

## Inflation\* expectations 2015



<sup>1</sup> Our base scenario assumes an oil price of roughly \$40/b at the end of the first quarter. The price for WTI oil should continuously increase by \$10/b in each of the forthcoming quarters. For the end of the fourth quarter, we expect the oil price to be \$65/b. The annual average would run at \$50 to \$55/b.

Lower oil price, but increased volatility. More consumption, less investment.

#### Different degrees of nervousness

When looking at the five-year average, only oil-price volatility (OVX) has reached its peak whereas volatility measures for equities (VIX), bonds (MOVE) and currencies (CVIX) have increased from their all-time lows of summer 2014 but are still low.

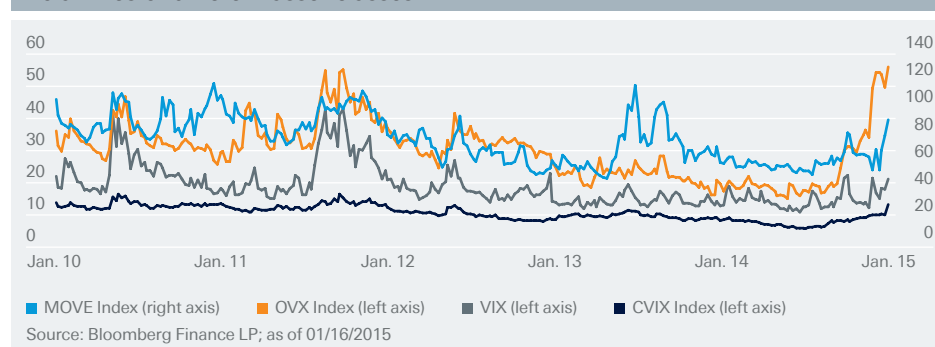
Consensus has turned in an astonishing pace

Big parts of stock markets profit in various ways

## 4. Implications for capital markets

The drop of the oil price has spurred the volatility of capital markets. The impact on countries and their stock markets might differ as energy often has a relatively high weighting in stock indices. Stock prices and earnings estimates have yet to fully encompass the change of the oil price. In fixed income all eyes are on high-yield bonds of the U.S. energy sector.

Volatilities of different asset classes



The shift of wealth – an oil price of \$48/b deprives producers of roughly \$5.7 billion a day, making consumers richer by the same amount compared to July 2014<sup>1</sup> – is tremendous. We expect the positive effects (higher consumption) to materialize far faster than the negative effects (lower investment<sup>2</sup>) so that the overall effect in 2015 will be positive for the global economy. An oil-price level too low could, however, result in disruptive events, particularly in politically more fragile oil-exporting countries or in the market for energy-sector bonds.

Whether lower prices experienced over the last few months and the market reactions seen since mid-December are warranted and to what extent sliding oil prices are discounted is hard to assess as long as the oil price continues to search for a new equilibrium price. Moreover, oil-price changes can have opposite effects on different sectors, making correct pricing more difficult. However, the capital market has once again shown one typical reaction: right after the oil-price slide, extensive explanatory models have been offered in various trade and broker reports as to why the price will never return to its old peak and why its current level should be a fairly appropriate reference for future prices. Such a conformist market opinion regularly attracts anti-cyclical investors.

### Equities

#### More turnover, higher margins, better valuation – on the winning side

Lower oil prices are generally boosting stock markets: Higher global economic growth tends to fuel company sales, and lower inflation favors higher multiples. European

<sup>1</sup> According to Deutsche Asset & Wealth Management Investment GmbH calculations

<sup>2</sup> Globally and in the United States, the energy sector accounted for 30% of investments of all listed companies.

**But troubles in some areas likely**

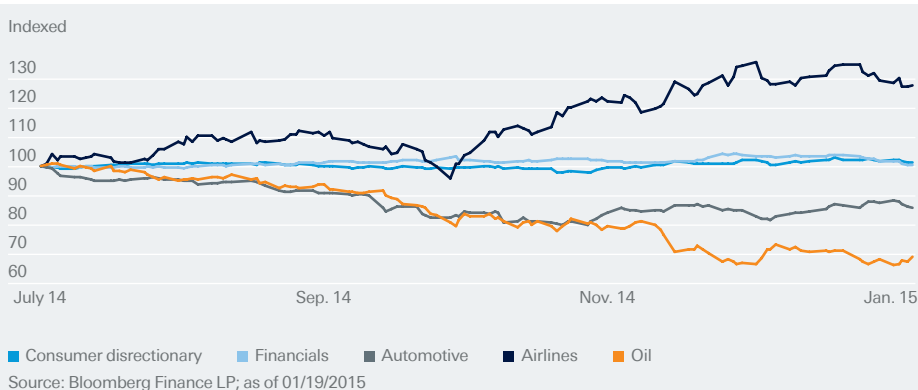
stocks have additionally been supported by the unconventional European Central Bank (ECB) measures that were launched on January 22, 2015 and that took the low inflation, triggered by the oil-price decline, into account. Moreover, lower oil prices reduce the cost of energy-intensive industries. We favor the stock markets of industrialized countries and of those emerging markets with high net energy imports (Asia). One important factor to be considered in stock picking is the share of turnover with net oil-exporting countries. The stock markets of the latter should be avoided for the time being.

Should the oil price hover around \$50/b longer than expected in our scenario, the overall effect on stock markets should still be a positive one. However, oil corporations in financial distress, higher interest rates and default rates on high-yield bonds as well as geopolitical tensions could require an adjustment of our global economic scenario and lead to rising market volatility.

**Sector reactions in the United States**

Whereas immediate winners (airlines) and losers (oil) reacted in line with expectations, reactions of other industries were rather ambiguous.

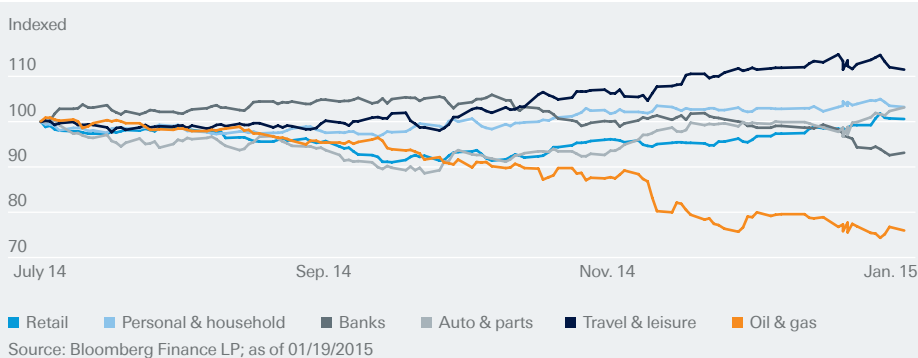
**S&P sector performance relative to S&P 500 Index**



**Sector reactions in Europe**

The oil sector was also hit in Europe whereas travel and leisure as well as consumer goods outperformed the market.

**STOXX Europe 600 Index sector performance relative to STOXX Europe 600 Index**

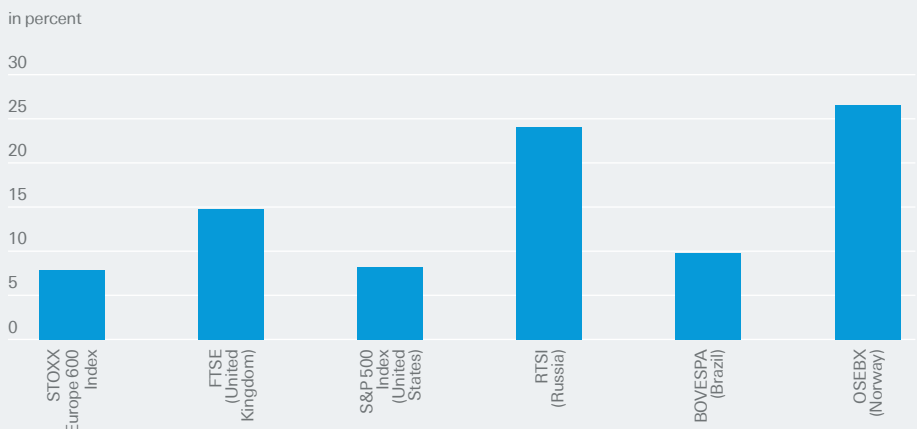


The two charts show the relative performance of the sectors which are typically regarded as oil-price sensitive in the United States and in Europe. Even if sectors such as oil stocks themselves or airlines have already shown clear reactions, sustained low oil prices will only have a gradual impact on earnings estimates.

## Energy sector's weight in equity markets

Investors favoring regional stock-market indices in 2015 must bear their sensitivity to the energy sector in mind.

## Energy sector's share of local stock index



Source: Bloomberg Finance LP, Deutsche Asset & Wealth Management Investment GmbH calculations; as of 01/07/2015

While oil majors can better weather the storm, their dividend capacity might be impaired

Since the major stock indices overweigh the energy sector compared to its economic significance, a lower oil price can result in lower aggregate index gains, even in an environment of GDP growth. Every oil-price decline by \$10/b is likely to lower S&P 500 Index and STOXX Europe 600 Index gains by 1%.

### The individual sectors:

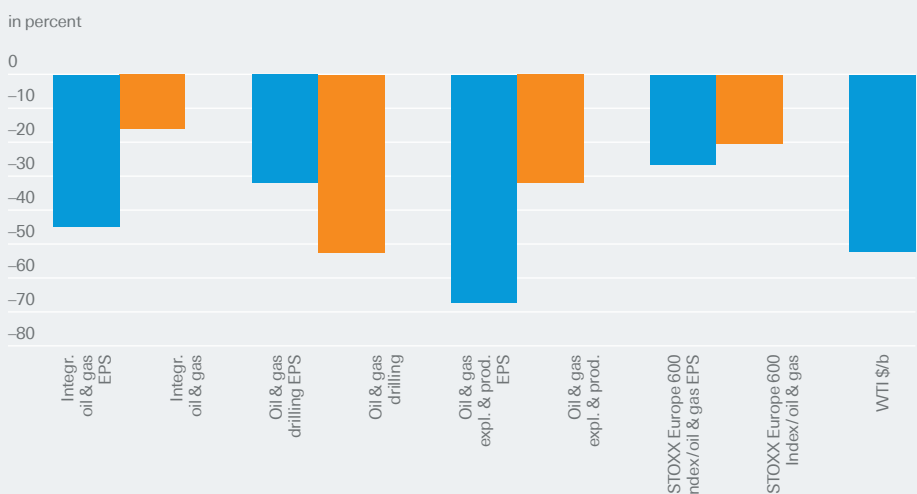
#### Oil

Every investment in an oil company remains a bet on future oil prices. The strongest reactions to oil-price changes are reported by independent explorers and servicers while integrated majors can cushion price fluctuations by their midstream and downstream business. According to model calculations by Deutsche AWM, oil-company stocks currently (as of January 22, 2015) imply an oil price of \$75/b WTI. For oil majors, generally considered to be more defensive, the dividend capacity<sup>1</sup>, a focus of investors, might be put into doubt. When oil prices start to fall below \$70/b, oil majors tend to have difficulties to cover their dividend payments from operating cash flow. While they

## Oil does not equal oil

Widely differing price losses and expected individual oil index gains underline the heterogeneity of this sector.

## 6-month change



Source: FactSet Research Systems Inc.; as of 01/15/2015

<sup>1</sup> Deutsche Asset & Wealth Management Investment GmbH calculations, as of 01/22/2015

Financially sound companies might buy the weaker ones

Consumer sector one of the winners

Reduced fuel costs have different impact on single airlines

Industrial sector loses a good customer

Direct repercussions mainly for U.S. banks

are expected to go out of their way to maintain dividend levels (one of them has never cut dividend payments since World War II), share buybacks could be the first victim of lower cash flows. According to Dealogic, U.S. corporations authorized \$35.4 billion for buybacks in 2014.<sup>1</sup>

If oil prices do not start to recover in the first half of 2015, mergers & acquisitions (M&A) activity within the sector should be spurred on. But whereas the oil-price decline at the turn of the year 1998/1999 (to roughly \$10/b for WTI) led to mergers among oil majors, consolidation will this time focus instead on financially strong oil companies buying smaller oil producers – presumably mostly within the U.S. shale-oil sector. This would be a way to improve the cost structure of their oil reserves. Since the third quarter of 2014 had been the most active M&A quarter of the past decade, in terms of the value of announced acquisitions,<sup>2</sup> the prevailing high uncertainty on the further development of oil prices might explain declining activity in the fourth quarter. M&A activities are set to increase significantly in the second half of 2015.

#### Consumption

According to J.P. Morgan figures from January 2015, an average U.S. household will have to spend \$940 less on gasoline this year compared to 2014.<sup>3</sup> Eurozone households will benefit somewhat less since they drive less, tax on oil is higher and the euro is weaker. Short-term higher disposable incomes are, however, particularly in the United States offset by the medium-term risk of layoffs in the energy sector due to fewer jobs and investment cuts. In the short run, cyclical consumption, particularly brand names, automobiles as well as leisure and travel, should benefit more than consumer staples. Since these companies are rather underweighted on stock exchanges, the effects should be stronger on the economy than on stock prices.

#### Airlines

Airlines are the natural gainers from falling oil prices. There are, however, huge differences between traditional airlines and no-frills carriers where fuel costs have a much higher percentage share of total costs – for Ryanair, an Irish low-cost airline, they account for 40% according to the 2013 annual accounts, for Lufthansa, a German carrier, for only 23.7% in 2013. Lufthansa has, however, hedged only 65% of its fuel required for 2015, Ryanair 90%<sup>4</sup> so that this cost relief will be reduced or delayed. And the additional question – not only for airlines – is to what extent the reduction in oil prices, which their customers are well aware of, must be passed on in the form of lower selling prices.

#### Industrial goods

The European industrial sector earns about 7% to 10% of its sales in the energy sector, which has always been a very profitable and strongly growing end-market. This will no longer be the case in 2015. Big corporations have always made good business with oil-exporting countries such as Saudi Arabia, Russia, etc. But as a result of the falling oil price there is less capital available now for capital expenditures in bigger projects such as power plants or infrastructure. U.S. industrial corporations are hit even harder since their sales to the energy sector amounted to up to 30%.

#### Banks

Asian banks will benefit most from the economic consequences of the oil-price decline. Net oil imports have the highest relation to GDP here so that the local economy will get a new impetus and state budgets will be relieved. At the same time, inflation rates will come down granting more monetary leeway to central banks to cut interest rates (par-

<sup>1</sup> Source: Dealogic, quoted in Financial Times LTD, 12/16/2014: "The Squeeze on Oil Sector's 'Supertankers'"

<sup>2</sup> Source: IHS Herold, quoted from Financial Times LTD, 12/17/2014

<sup>3</sup> Calculations based on a price difference of \$1 per gallon. Source: J.P. Morgan Daily Economic Briefing, 12/02/2014

<sup>4</sup> Source: MainFirst Bank AG, as of 01/10/2015

ticularly in India). U.S. banks are hardest hit by the direct consequences of the oil-price slide since they are most deeply involved in the U.S. shale-oil business. They are threatened by several setbacks: 1) loss of revenues in lending but even more so in their capital-market business. Some big banks received up to 15% of their revenues from the energy sector; 2) write-downs on directly held trade investments; and 3) rising bad-debt provisioning. Of course, consumers ready to spend more and potentially thriving capital-market and advisory businesses in the second half of 2015 would be positive factors, should a wave of restructuring and consolidation among shale-oil producers materialize. But the negative effects, particularly in case of a further deteriorating high-yield market, should, however, outweigh any benefits.

### Bonds

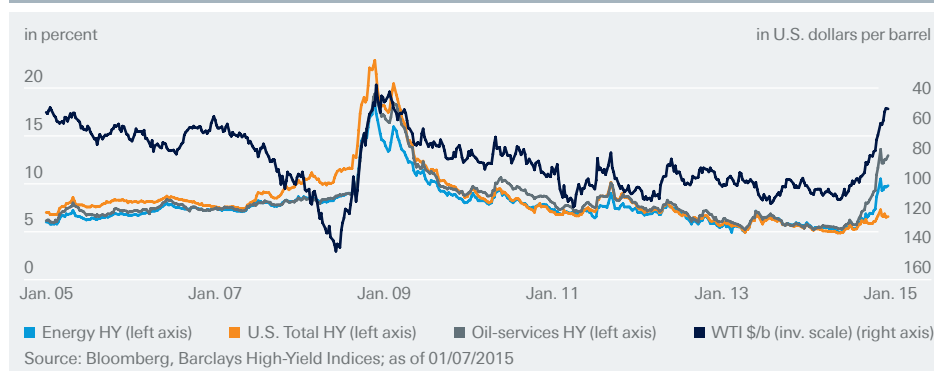
Low oil prices put downward pressure on inflation with generally positive effects on bond prices. Even if central banks decide to focus on core inflation and to wait for second-round effects, markets could start speculating on the Fed postponing its turn in the rate cycle – while the price decline has certainly given the ECB a much welcomed additional reason for its recently launched quantitative easing (QE) program.

#### High-yield bonds suffer

Within six months, the yield on oil-servicer bonds has more than doubled (from 5.4% to 12.4%). The total oil sector has not reacted as strongly yet (from 5.1% to 9.6%) but clearly exceeds the average high-yield market (where bond yields have risen from 5.0% to 6.8%). This corresponds with an implied default rate of roughly one fifth (assumptions: medium duration of five years and a recovery rate of 40%).

#### \$210 billion in the U.S. HY market stem from energy firms

U.S. high-yield bonds and oil price



10.65% of the BofA Merrill Lynch Global Corporate Index is accounted for by energy (equivalent to a market value of \$919 billion). Out of this, BBB3 bonds (rated by Moody's) account for \$127 billion, with \$27 billion already on negative outlook (figures from December, in January the \$127 billion of BBB3 bonds had already increased to \$186 billion). Should these bonds really be downgraded to high yield, they would have to be added to the already existing high-yield energy bonds of \$210 billion. With a total volume of \$1.3 trillion, energy thus accounts for 16% of the high-yield market. Most of these bonds are issued by U.S. shale-oil producers. On the one hand, their leverage ratio is generally high – between 1.5 and 5.5 times net debt to EBITDA. On the other hand, most of them are hedged against declining oil prices for the current year, on average for roughly half of their production. Moreover, in 2015 and 2016, only \$3 billion of energy high-yield bonds will mature.

Should the low oil price be sustained over a longer period and should rating agencies downgrade further bonds or bonds even default, the negative effects could spill over to the overall high-yield market. This is, however, for the reasons mentioned above, not what we do expect this year.

Other bonds which will be closely scrutinized by the market are oil-major bonds from emerging markets of which some are highly leveraged.

## 5. Conclusion

We draw the following conclusions from the oil-price slide:

1. The oil market will follow a steep learning curve in 2015 since U.S. high-production-cost shale oil is a relatively new player on the market and nobody knows its behavior under stress. OPEC's strategic u-turn will increase volatility on the oil market. Oil-market forecasts may be needed to be treated with some caution.
2. All in all, this price slide should support global economic growth. While positive effects in the form of higher consumer spending will materialize rather quickly, negative effects of investment cuts will come with a time lag.
3. Since the energy sector's weight is higher in the major stock indices than in the real economy, declining oil prices will at first lead to falling profits but, in aggregate, stock exchanges will benefit.
4. The oil-price slide should provide central banks with more leeway. The Fed might postpone the turn of its rate cycle, the ECB has received a further reason for its QE measures.
5. Short-term capacity adjustment should be primarily achieved via a reduction of follow-on investments in the U.S. shale-oil sector. Due to short project cycles, this sector can, however, quickly return to the market. In the medium term, only capacity cut-backs of high-price producers such as Canadian sand oil or deep-sea oil will bring about permanent relief on the supply side.
6. In the short term, the price floor will be marginal costs, and in the medium to long term, the full costs of the most expensive producer. Estimates of these figures are vague and constantly changing. Marginal costs could run at \$20/b to \$40/b, full costs at \$60/b to \$80/b.
7. Oil-dependent but financially and politically more fragile states are faced with the highest risk on a social level.
8. Arguments for a rapid price recovery within our forecast are: Investments are further cut as sharply as at the beginning of 2015; shale oil will suffer from major refinancing problems; shale oil is faced with political headwinds; there are major unplanned production outages, particularly in countries in crisis; demand rises faster due to lower prices or higher global economic growth; OPEC decides in June to cut production; investors start investing in oil again long before the market shake-out.
9. Arguments for a slower price recovery are: The U.S. shale-oil sector shows more resilience than expected thanks to higher productivity and cost deflation; financially distressed oil producers are taken over by strategic or financial investors; Saudi Arabia uses its reserve capacities to continue flooding the market; the currently very high unplanned OPEC outages decline; record oil inventories hamper the market for a longer time; less capacity than expected exits the market since companies bet on an imminent price recovery.
10. The available data set on investment cuts, production plans, cost deflation and margin pressure will not improve significantly before the start of the reporting season on the first quarter of 2015.



## 6. Glossary

### Explanations

**Asia Pacific (APAC)** is a term used to describe the economic region Asia-Pacific.

**Backwardation** describes the shape of a futures or forward curve where the price of a contract is trading below the expected spot price at contract maturity.

The **Bank of America Merrill Lynch Global Corporate Index** tracks the performance of investment-grade corporate debt securities issued in the U.S. domestic market with at least one year remaining to final maturity.

The **Barclays High Yield Indices** capture the performance of high-yield debt securities.

A **barrel (b)** is the commonly used unit to measure crude oil. One barrel is about 159 liters.

**Barrels per day (b/d)** is a measure of oil output, represented by the number of barrels of oil produced in a single day.

**Break-even costs** are the costs which have to be covered in order to maintain the sustainability of a business. Break-even costs include fixed and variable costs and the exact definition of them can vary for different companies.

**Break-even price** is the price that needs to be paid (here: for a barrel of oil) to cover all fixed and variable costs in the production and distribution process.

**Brent** crude is a grade of crude oil dominant in the European market.

The **BM&F BOVESPA** is a stock exchange located in São Paulo, Brazil.

**Capital expenditures (capex)** are undertaken by a company to acquire or upgrade physical assets.

A company's **cash flow** is comprised of its inflows and outflows which arise from financing, operational or investing activities.

The **Chicago Board Options Exchange (CBOE) Crude Oil ETF Volatility Index (OVX)** measures the market's expectation of crude oil price volatility over the next 30 days.

The **Chicago Board Options Exchange (CBOE) Market Volatility Index (VIX)** measures the market's expectation of S&P 500 volatility over the next 30 days.

**Contango** describes the shape of a futures or forward curve where contracts are higher priced than the expected future spot price.

**Core inflation** excludes items which can be susceptible to volatile price movements, e.g., food and energy.

The **current account** includes trade in goods and services, a net factor income balance (e.g., earnings on foreign investments and cash transfers from individuals working abroad) and transfers (e.g., foreign aid). It is a part of the balance of payments.

The **DB Currency Volatility Index (CVIX)** is designed to represent investors' expectation of future volatility, and is calculated as the arithmetic average of the three-month level of implied volatility for all the major currency pairs.

**Deflation** describes a sustained decline in an economy's overall price level.

A **derivative** is a security whose price is dependent upon or derived from one or more underlying assets. The derivative itself is merely a contract between two or more parties.

The **derivatives market** is the financial market for derivatives.

A **dividend** is a payment made to a company's shareholders distributing a portion of its earnings.

The **Dow Jones Industrial Average (DJIA)** is an equity index that aims to track the development of the U.S. equity market.

**Duration**, which is expressed in years, measures the sensitivity of the price of a bond or bond fund to a change in interest rates.

**EBITDA** is net income before interest, taxes, depreciation and amortization are deducted from it.

**Emerging markets (EM)** are those economies which are not yet fully developed in terms of market efficiency, liquidity, and other factors.

The U.S. **Energy Information Administration (EIA)** is a principal agency of the U.S. Federal Statistical System responsible for collecting, analyzing, and disseminating energy information.

**Enfant terrible** is a French expression also used in English describing a person who acts unconventionally and disruptively.

The **euro (EUR)** is the official currency of the Eurozone.

**Europe, the Middle East and Africa (EMEA)** is a regional designation used for government, marketing and business purposes.

The **European Central Bank (ECB)** is the central bank for the euro. It administers the monetary policy of the Eurozone, which consists of 19 European Union member states.

The **Eurozone** is formed of 19 European Union member states that have adopted the euro as their common currency and sole legal tender.

An **exchange-traded product (ETP)** is a derivatively priced security which trades during the day on a national stock exchange.

An **exploration and production (E&P) company** in the upstream part of the oil and gas sector is focused on finding, extracting and selling oil or gas.

**Extrapolation** is a forecasting method using historically observed relationships between variables.

The **U.S. Federal Reserve Board (Fed)** is the board of governors of the Federal Reserve; it implements U.S. monetary policy.

**Fixed costs** are those costs which do not change with a variation in production output.

A **forward curve** pictures the spot prices of forward contracts with different maturities.

**Fracking** (hydraulic fracturing) is an oil and gas production method. Fractures are created in rock formations by injecting fluid into cracks to force them further open which allows more oil and gas to flow out.

The **FTSE 100 Index** tracks the 100 companies listed on the London Stock Exchange with the highest market capitalization.

A **futures contract** is a contractual agreement to trade a financial instrument or commodities at a pre-determined price in the future.

**Gross domestic product (GDP)** is the value of all goods and services produced by a country's economy.

The **Harmonised Index of Consumer Prices (HICP)** is an index measuring the purchasing costs for consumers buying a certain basket of common goods harmonised across EU countries. It serves as an indicator of inflation for the European Central Bank (ECB).

**High yield (HY)** describes bonds which are sub-investment grade, see below.

**Inflation** describes the increase in an economy's overall price level.

The **Intercontinental Exchange (ICE)** is a major futures exchange in the U.S.

The **International Monetary Fund (IMF)** is an international organization which fosters global monetary cooperation and monitors economic and financial developments.

**Investment grade (IG)** describes bonds judged by rating agencies to be of at least medium quality (usually BBB or above).

The **marginal cost** reflects the change in total cost that comes from producing one additional unit.

**Mergers & Acquisitions (M&A)** are the two key methods of corporate consolidation. A merger is a combination of two companies to form a new company, while an acquisition is the purchase of one company by another in which no new company is formed.

The **Merrill Lynch Option Volatility Estimate (MOVE) Index** reflects a market estimate of future U.S. Treasury bond yield volatility.

**Nominal GDP** is the value of all goods and services produced by a country's economy, not adjusted for inflation or deflation.

**Operational expenditures (OPEX)** are the costs within a company incurred as a result of performing its normal business operations.

The **Organisation for Economic Co-operation and Development (OECD)** is an international economic organization of 34 countries founded in 1961 to stimulate economic progress and world trade.

The **Organization of Petroleum Exporting Countries (OPEC)** is an organization consisting of some of the world's major oil-exporting nations, created for the purpose of coordinating the petroleum policies of its members and providing member states with technical and economic aid.

The **OSEBX** is a stock exchange located in Oslo, Norway.

**Personal consumption expenditures (PCE)** measures price changes in consumer goods and services.

**Price elasticity** describes the relationship between a change in a good's demanded quantity and a change in its price.

**Quantitative easing (QE)** refers to broad-based asset-purchase programs conducted by central banks; these assets can be government bonds, but also other assets like asset-backed securities.

The **recovery rate** is the percentage of the face value of a debt instrument which can be recovered in default.

The **RTS Index (RTSI)** tracks 50 Russian stocks traded on the Moscow Exchange.

The **Russian ruble (RUB)** is the official currency of the Russian Federation.

The **S&P 500 Index** tracks the performance of 500 leading U.S. stocks and is widely considered representative of the U.S. equity market.

A **second-round effect** is an indirect effect from a change in economic policy or the economic environment. Higher prices, for example, can encourage trade unions to demand higher wages.

**Spread** refers to the excess yield various bond sectors offer over other financial instruments with similar maturities (e.g., government bonds). When spreads widen, yield differences are increasing between bonds in the two sectors being compared. When spreads narrow, the opposite is true.

The **STOXX Europe 600 Index** tracks the performance of 600 companies across 18 countries of the European region.

**Terms of trade** describe the real exchange ratio of a country's exported and imported goods. A country's terms of trade improve if it's receiving more imported for its exported goods.

**Variable costs** are costs which vary with the production output.

The **weighted average cost of capital (WACC)** is the rate that a company is expected to pay on average to all its security holders to finance its assets.

**West Texas Intermediate (WTI)** is a grade of crude oil which is used as a benchmark in oil pricing.

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