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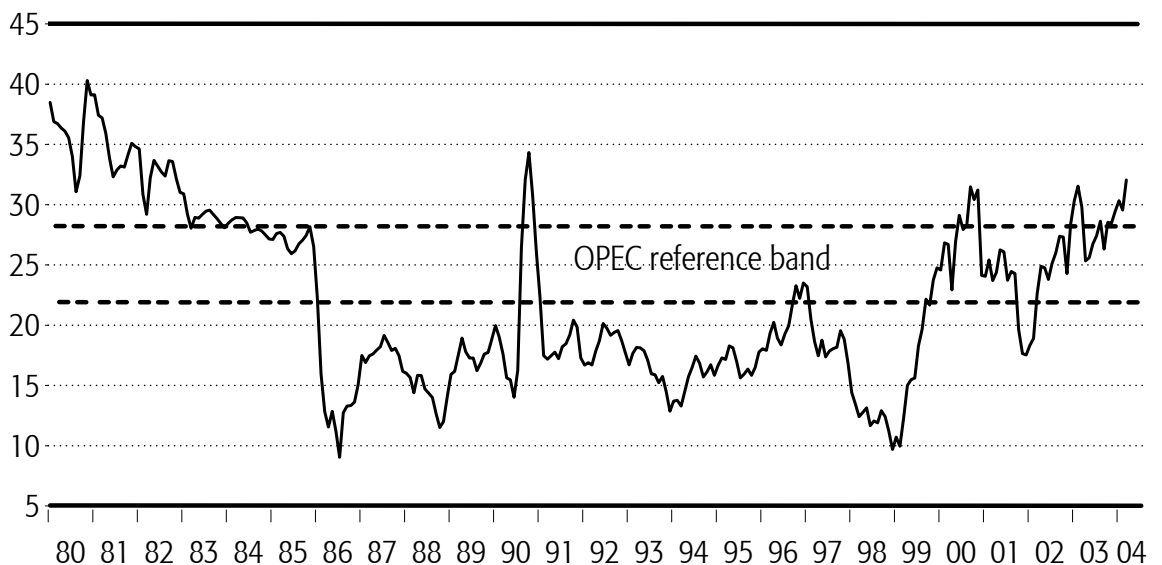
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Oil prices and the business cycle: What has or has not changed

Introduction

Oil prices have become something of a hot topic in the economic debate of late. The price of crude oil has been mired well above OPEC's originally declared price band* of 22 to 28 USD/barrel since September 2003. OPEC members have been at odds about how to respond to this development. On the one hand, some member countries have toyed with the idea of readjusting the top end of

Oil prices are above OPEC's reference band
price in USD/barrel



* The OPEC Reference Basket averages prices of seven crudes: Algeria Saharan Blend, Indonesia Minas, Nigeria Bonny Light, Saudi Arabia Arab Light, UAE Dubai, Venezuela Tijuana Light and (non-OPEC) Mexico Isthmus.

the band to 35 USD/barrel in order to compensate for the lower purchasing power of the US-dollar. While that may sound strange at first, the motive becomes plain when you consider that while almost all exports of the Gulf states are denominated in USD, between 60 to 80 % of imports originate from Europe. The 50 % devaluation of the USD vis-à-vis the euro therefore translates directly into a loss in welfare. On the other hand, OPEC countries such as Saudi-Arabia have been pressing for a significant increase of production quotas, even threatening unilateral action. On June 3 this dispute was finally resolved with an agreement to increase production quotas by 2 million barrels per day (bpd), to be followed by another increase of 0.5 million bpd in August should the price not be back within the band by then. It is currently disputed whether this increase is sufficient to send the oil price down – especially since it is not only fundamentals but also a major risk premium for terrorist attacks that has kept the oil price up for so long.

In this paper we focus on the transmission mechanism between oil prices and the business cycle in industrial countries in order to highlight what differentiates (or not as the case may be) the current episode of high oil prices from the oil price shocks of the 1970s. Furthermore, we provide an economic scenario for an oil price that remains stuck at 40 USD/Barrel (Brent).

The historical perspective

As any change in the oil price is so acutely registered by a majority of people, strong rises tend to grab the headlines early on. It therefore seems reasonable to put the most recent rise in a historical perspective. To do this we have identified four distinct periods of rapid increases in the oil price. What matters is not only the rise itself but also the duration over which oil prices remained high. The results are shown in the table below.

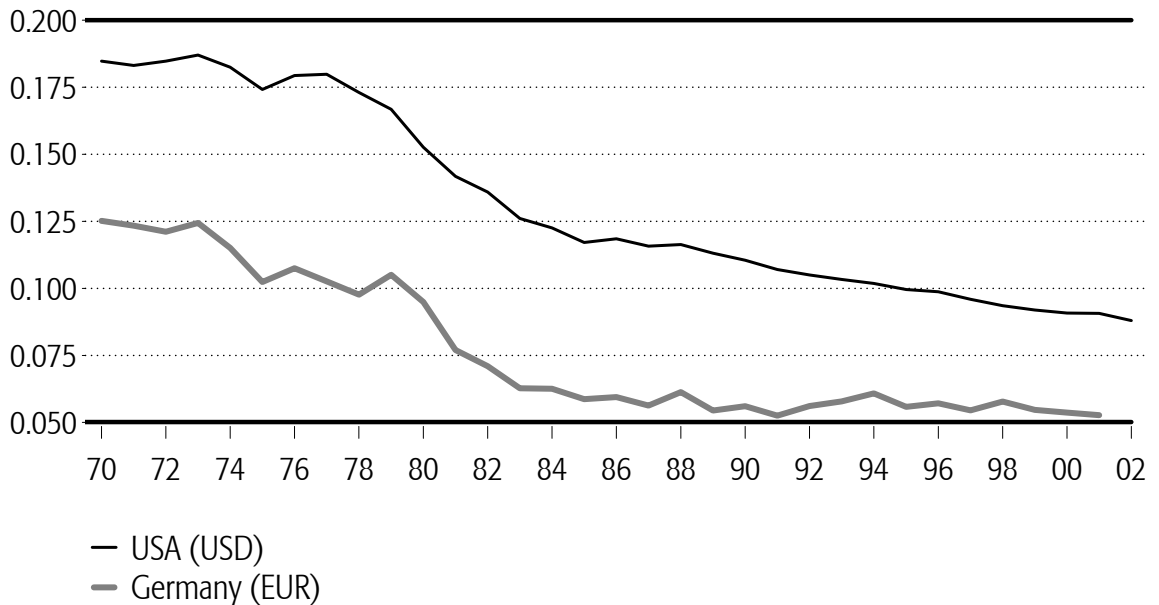
	Trough (USD/Barrel)	Peak USD/Barrel)	Nominal rise percent	Real rise percent	Duration (months)
1974	4.6	15.5	336	340	6
1978	10.0	42.0	300	275	32
1990	15.1	38.9	257	254	4
2003 to May 2004	23.9	38.7	161	141	13

Given this comparison, the latest episode of rising oil prices scores only very moderately though the duration argues that we cannot discount it as a mere blip in oil prices without any more serious implications for the economy.

OPEC still matters

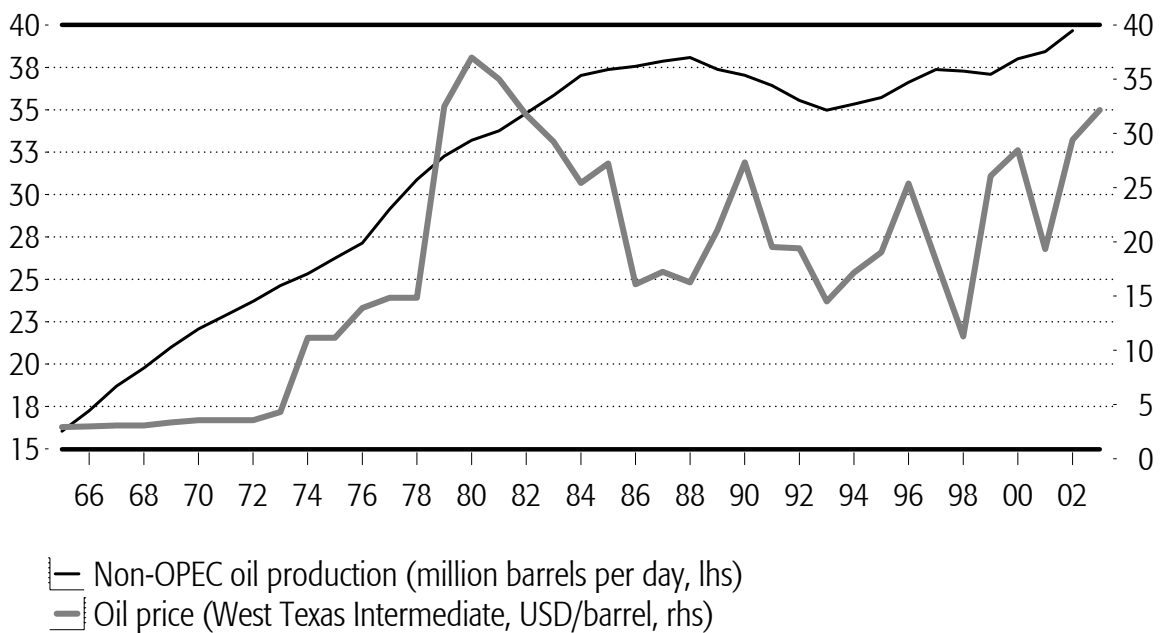
The two oil shocks of the 1970s encouraged the industrial countries to wean themselves off their dependence on oil imports from the Middle East. This has taken three distinct forms: an increase in energy efficiency, a broadening of the energy mix used and the build-up of own production facilities.

Oil consumption per unit of real GDP million tons/billions of real GDP



The results of these efforts are indeed quite impressive. For example, US oil consumption plummeted from 0.17 million tons per billion US-dollars of real GDP in the early-1970s to some 0.08 in 2002. For Germany the corresponding figures are 0.12 million tons per billion euros of real GDP to 0.05 by 2001. Reliance on oil as a primary source of energy has therefore roughly halved over the past three decades.

Oil price and non-OPEC production



Moreover, exploration of oil in non-OPEC countries has significantly helped in reducing the dependence on these sources. In 1973 somewhat over 55 % of the global oil supply originated from the OPEC countries. By 1985, that share was down to an all-time low of 29 % but has since bounced back to somewhat over 40 %. But this does not mean that OPEC's power in the market has been broken. The Gulf states still maintain a huge natural advantage over other suppliers: Extraction costs for oil are a fraction of what they are in other regions where more sophisticated equipment is required to bring the liquid to the surface. Some simple econometrics shows that the oil price has to stay above 20 USD/barrel (West Texas Intermediate) for more than a year before non-OPEC producers start to significantly bring new capacity online. Moreover, production increases seem to be limited to some two to three million barrels per day. By contrast, OPEC seems to be able to swing production by some 5 million barrels per day within a year. That means that OPEC in general, and the Gulf states in particular, are set to remain the most important players in the market for some time to come.

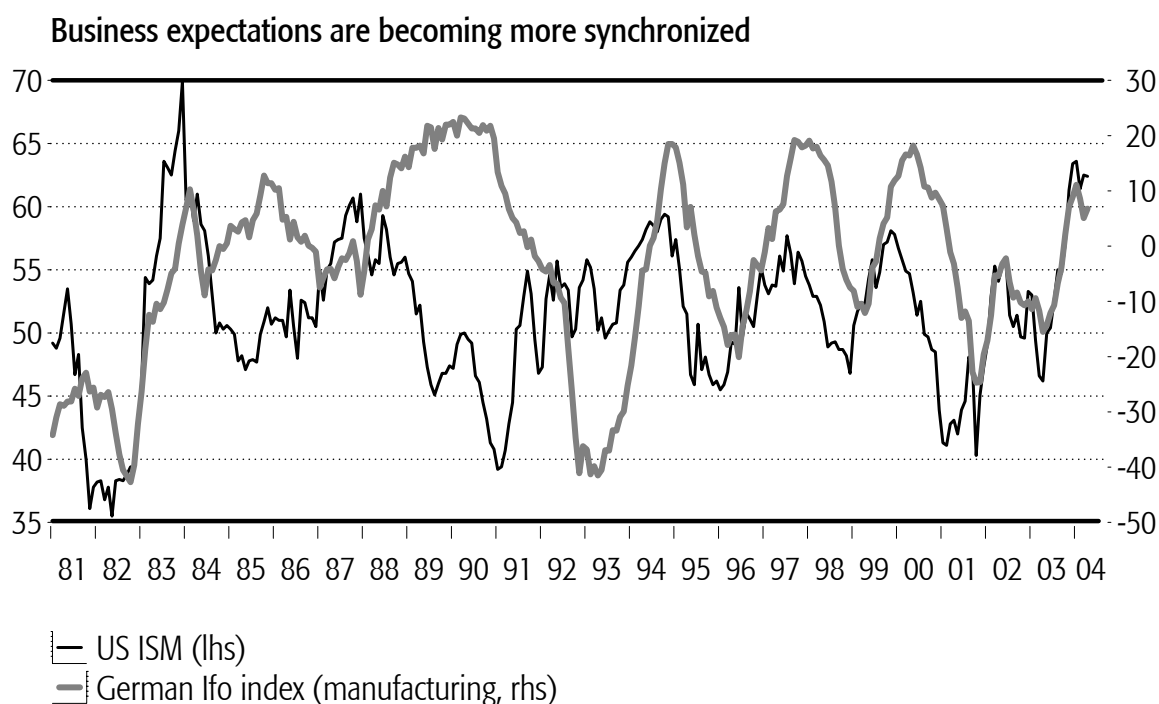
The changing transmission mechanism of oil prices on the business cycle

The primary transmission of oil prices onto the business cycle remains the immediate effect on costs. In this respect, an increase in the oil price acts like a tax: it squeezes real disposable income of households and firms' profit margins, thereby dampening economic activity through lower consumption and investment spending. All told, purchasing power is drained from any economy that is a net importer of oil to the benefit of net exporters. In addition to this, second round effects will occur if either firms, workers or both try to pass on those rising costs by raising output prices or wage claims. The ensuing wage-price spiral would then ultimately lead to rising inflation which, by distorting market price signals, dampens economic potential. Whether or not such a spiral ensues, depends on the starting position of the economy and the monetary policy reaction to it. The higher an economy's capacity utilization and the more accommodative the monetary policy reaction to the oil price hike is, the higher are the chances that a wage-inflation spiral kicks in. Given the reduced dependence of the industrial world on oil, as highlighted above, the primary transmission mechanism should have weakened considerably over the past three decades.

There is, however, a secondary transmission mechanism that has gained in importance: asset prices and corresponding wealth effects from their fluctuation. Over the two decades between 1980 and 2000 the share of corporate equities in US household assets rose from 10 to 26 %, before falling back to 16 % during the stock market slump. Moreover, while economic theory has always held that net worth influences consumption behavior, the amount of wealth in the industrial economies has now grown so large that its fluctuations might well be overriding other factors such as growth in disposable income in determining the direction of consumption dynamics. Something very similar can also be observed in the corporate sector. The present market value of US companies is currently as large as all other liabilities - up from 50 % at the beginning of the 1980s. There are several channels through which equity market valuation influences investment behavior (cf. Manh Ha Duong: Aktienkurse beeinflussen Investitionstätigkeit, DIW Wochenbericht 41/2003).

Not only do equities serve as a direct channel to finance investment but they also affect the general access to credit and the expectations of other firms.

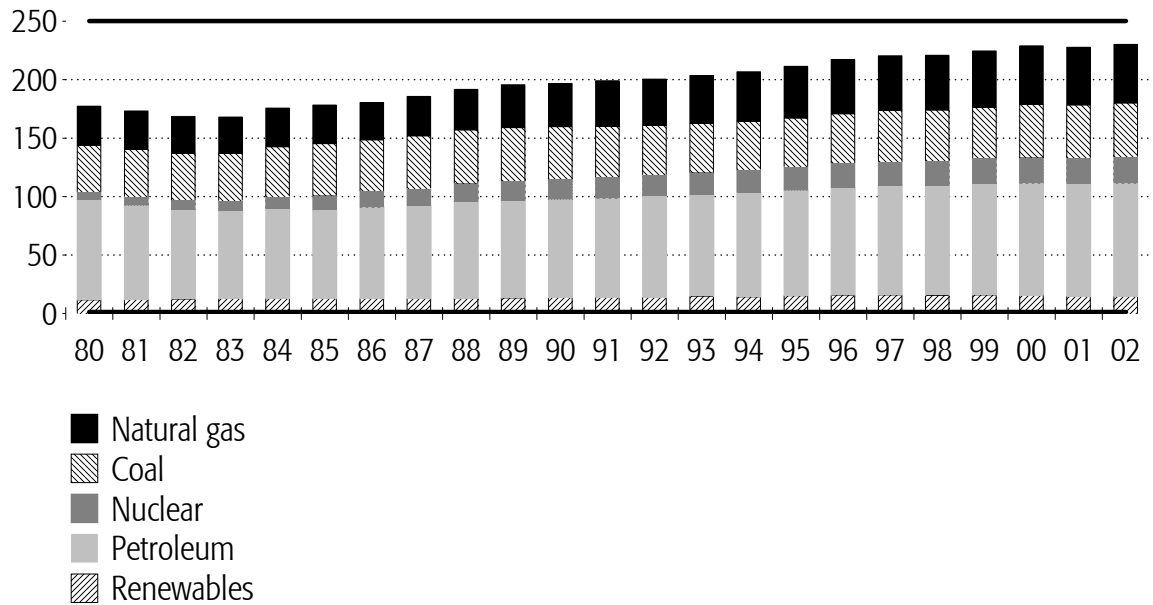
The increased macroeconomic importance of the stock market is also reflected by the fact that business cycles, and business expectations in particular, have become much more synchronized of late. While in the 1980s business expectations still showed quite divergent patterns across the Atlantic, they have been falling ever more into lockstep over the past decade.



Due to the rise of wealth effects, the relationship between oil prices and the business cycle has weakened by much less than the reduced dependency on oil would initially suggest. An econometric analysis for the US economy and a time sample of the 1970s vis-à-vis a sample for the 1990s - adjusting for the state of the business cycle (deviation of capacity utilization from the long-run mean) and underlying inflation - shows a meager reduction in the order of 25 % in the reaction of economic growth to an exogenous increase in the oil price by 10 USD/barrel, i.e. far less than the reduced oil-dependence would indicate.

We should, however, beware of attributing the less-than-proportional reduction in the effects of the oil price on macroeconomic variables relative to the reduced dependency on oil entirely to the increased importance of asset markets. Partly they also reflect the broadening of the energy mix, e.g. natural gas, nuclear power or renewable energy. Roughly 6 percentage points of the reduction in oil dependence of OECD countries can be tracked down to this substitution process. But as prices in energy markets are interrelated, changes in the oil price will spill over into price increases for other sources of energy. Due to the absence of consistent and long-run data we were not able to incorporate this fully into our analysis.

OECD energy consumption by type quadrillion British thermal units (Btu)



An economic scenario: Oil permanently at 40 USD/barrel

For our risk case we have assumed that the oil price (measured as Brent crude oil) would reach 40 USD/barrel over the coming months and stay there for the remainder of this year and entire 2005. Relative to our baseline scenario that corresponds to a rise in the oil price by 10 USD/barrel. All told this would increase the industrial countries' "oil bill" by some USD 40 to 60bn, eating into the real purchasing power of consumers, squeezing profit margins and sparking sizeable negative wealth effects. As the economy in industrial countries is still in the early stages of the recovery and output gaps are quite large, we deem it unlikely that major pass-throughs from the oil price into wages or other product prices will occur. Hence, second round effects should be muted.

Our econometric estimates for such a shock indicate that while consumer price inflation will move up relatively soon after the shock has occurred (by 0.7 percentage points in the US and 0.5 percentage points in Germany), the impact on economic activity lags some 3 to 4 quarters. The dampening effect on real GDP is estimated to be 0.6 percentage points in the US and 0.5 percentage points in Germany. Results are shown in a more detailed breakdown in the table below.

GDP Growth		
	2004	2005
US Baseline	4.0	3.3
US Oil Price	3.7	2.7
Germany Baseline	1.4	1.6
Germany Oil Price	1.2	1.1
Inflation		
US Baseline	2.3	2.9
US Oil Price	2.8	3.3
Germany Baseline	1.5	1.5
Germany Oil Price	1.9	1.9

These results are very much in line with other econometric estimates such as the OECD's interlink model (cf. Thomas Dalsgaard/ Christophe André/ Pete Richardson (2001): Standard Shocks in the OECD Interlink Model, OECD Economics Department Working Paper No. 306) or the Oxford Economic Forecasting Model. In contrast to both models, however, we reckon that the impact on the US economy is stronger than on Germany. This can be tracked to two factors: First, the higher energy intensity of the US economy. Second, the Gulf states import more from Europe than from America.

We should also note that our risk scenario could err on the optimistic side as the most recent rise in oil prices has come at a time when the world economy has just begun to rid itself of the massive global imbalances that are expressed in the US current account deficit. I.e. it hits the industrial countries just when the business cycle is making its way towards sustainable economic growth and is therefore susceptible to shocks to economic confidence.

As for financial markets, a lot depends on the reaction of monetary policy to the recent rise in oil prices. Most obviously, the concurrent rise in headline inflation together with faltering economic momentum puts central banks between a rock and a hard place. We reckon that while the Fed is likely to move key interest rates upwards in June or August by at least 25 basis points but could abort the hiking cycle as the negative effects on growth become apparent, the European Central Bank is likely to stay put. Indeed, the ECB might even lower the minimum bid rate in 2005 should the global economy stall due to the still prevalent global economic imbalances.

Due to rising inflation fears longer-term bond yields are likely to overshoot in the very short term to 5.5 % in the US and almost 5 % in Germany but subsequently fall back again to or even below the 5 % mark as the dampening effects on economic activity become apparent.

Equity markets have already begun to discount the squeeze on profit margins caused by higher input prices. Given index levels for Germany's DAX of 4,000 and for the US S&P 500 of 1,100 in late-April/early-May we think that a fall of up to 10 % by end-2004 cannot be ruled out.

All told, while the industrial world is clearly less dependent on oil than it used to be, the recent rise in oil prices definitely cannot be shrugged off as a mere nuisance. The implications are serious even if the experience of the oil shocks of the 1970s is unlikely to repeat itself.