

## Axel A Weber: Oil price shocks and monetary policy in the euro area

Text of the Whitaker Lecture by Professor Axel A Weber, President of the Deutsche Bundesbank, at the Central Bank and Financial Services Authority of Ireland, Dublin, 11 May 2006.

*References to the speech can be found on the Deutsche Bundesbank's website.*

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### Introduction

Dear John Hurley, Dear Dr Ken Whitaker, Ladies and gentlemen,

Thank you very much for your kind invitation to Dublin. I am very pleased to have this opportunity to share my views with you. And I am honoured to give this year's Whitaker lecture. Ken Whitaker has been the intellectual mastermind behind the theoretical and practical sea change in Irish economic policies in general. Especially with his book on economic development in 1958. And let me mention that his rigorous arguments against protectionism and isolation and for macroeconomic stability are still relevant today despite all the achievements we have made in this respect in Europe over the past few decades.

Ken Whitaker has not only made a crucial contribution to the intellectual foundations of solid macroeconomic policies in Ireland, also he has not shied away from the more onerous challenge of implementing his views in day-to-day policy, not least during his term as Irish central bank governor from 1969 to 1976.

Ken Whitaker's tenure as central bank governor fell at the time of the first oil price shock. This is a subject that is once again high on the agenda of monetary policymakers all over the world and it is the topic I shall focus on in my following remarks.

The world is, indeed, once again facing a substantial rise in oil prices. Prices have nearly tripled since mid-2003 and have now reached nominal record levels (USD70 per barrel Brent crude on a monthly average in April 2006). Putting it even more starkly: Taking the low-point of oil prices at the end of 1998 (USD10 per barrel Brent) and thus interpreting the developments since then as a single prolonged oil price shock, the scale of the shock is greatly magnified. Moreover, the current oil price level is perceived to be persistent, as is reflected by Brent crude oil futures remaining at elevated levels.

These developments are creating imminent upside risks to price stability. Consequently oil prices figure prominently on the risk agenda of the ECB's Governing Council. This is documented by last week's assessment that inflationary risks persist and continue to lie on the upside. Upside risks for future price stability arise, amongst others, from additional increases in administered prices and indirect taxes, and from a situation with ample liquidity. But in particular they stem from possible further increases in oil prices, a stronger pass-through of higher oil prices into consumer prices due to stronger indirect effects or possible second-round effects. I will come back to these transmission channels later on.

As I have said before, the concern about oil prices will be familiar to Dr Whitaker. In his time as Governor of the Central Bank of Ireland, he had to manage the first oil price crisis of 1973-74, the textbook example of a supply shock. It caused a serious stagflation (in other words, a period characterised by both rising inflation and recession) in the oil-importing economies.

In my subsequent remarks, I should like to concentrate on the following three issues. How does the current oil price shock compare to previous ones? Why do supply shocks pose a challenge for the monetary policymaker? What are the implications of the current high oil prices for the Eurosystem's monetary policy stance?

### Comparison of current and previous oil price shocks

Taking the developments since mid-2003 as a single energy price shock, the current oil price hike is roughly comparable to its predecessors in the 1970s and 1980s. From December 1973 to January 1974, the dollar price of oil increased by over 250%. Taking the average oil price over the years 1974 and 1975, the price hike amounted to over 160%. Again, from November 1978 to June 1979, the price

increase was nearly 160%. Taking the oil price high in November 1979, the price jumped by roughly 180% within one year. And it also is comparable to the oil price increase in 1990 following the invasion of Kuwait (from June 1990 to October 1990: 140% in nominal US dollar terms). From the end of 1998 to the end of 2000, the oil price went up by more than 200%, stabilising thereafter for some years only to start rising again to unprecedented nominal levels since mid-2003.

The scale of current oil price developments is also comparable to its predecessors in real terms and after taking into account exchange rates -with the possible exception of the period from 1998 to 2000, when the depreciation of the euro amplified the dollar increase in energy prices. Here, however, due account should also be taken of the extremely low level of oil prices in 1998 at the onset of the price increases (under USD10 per barrel Brent).

In marked contrast to its predecessors in the 1970s and 1980s and in 1990, however, the impact of the latest oil price shocks on real GDP growth have been benign. Whereas the oil price shocks of the 1970s, 1980s and the shock in 1990 were accompanied by a severe slowdown in global growth and outright recessions in many oil-importing countries, the current oil price increases are coinciding with the most favourable scenario for the global economy in the past 35 years. Global GDP growth is estimated by the IMF at 4.8% in 2005, compared with 5.3% in 2004 (historical average: 3½%). And real growth in advanced economies in 2004/05 was above the long-term average and, according to the latest IMF outlook, is projected to stay at around 3% this year and next year. Although the euro area is lagging behind, there are clear signs of a more sustained recovery in the quarters ahead.

This marked difference is also supported by simple correlation analysis: The contemporaneous correlation between the level of annual oil prices and annual global growth was -0.6 for the period 1970-1991. For the period 1992 -2005, however, the correlation coefficient has changed radically (+0.6). This admittedly crude line of reasoning is supported by more formal country-specific econometric analysis.<sup>1</sup>

Equally remarkable is the behaviour of consumer price inflation in the current energy-price-driven economic environment. Whereas the oil price shocks of the 1970s and 1980s went hand in hand globally with more or less a doubling of inflation rates, the latest oil price increases to date have not led to an escalation of consumer prices. On the contrary: The present global inflation rates are the lowest for 35 years. In the euro area, inflation rates in the aftermath of the oil price shocks edged up markedly in the 1970s and 1980s and went into double-digit figures. Euro area inflation rates since 1999 have been much more contained.

In light of such evidence: Is the expression ‘oil price shock’ old hat? Or, as David Walton of the Bank of England put it some weeks ago: “Has oil lost its capacity to shock?”<sup>2</sup>

There are several plausible explanations for the muted impact of oil price increases in recent times. To start with, the difference in today’s economic performance and that of earlier periods might, in part, be related to the different size and nature of the shock.

The more than doubling in oil prices – though comparable in scale to earlier oil price shocks – has taken more than two years to unfold, much longer than on previous occasions.

Moreover, unlike its predecessors, the present price hike is explained by substantially different factors. Shocks in the 1970s were caused mainly by sizeable disruptions to the oil supply, which seriously dampened the confidence of companies and households. Now, there is a variety of factors. As they are partly structural in nature, however, it is all the more likely that the present shock will prove to be permanent.

To a large extent, the current oil price shock has been driven by unexpectedly buoyant demand for oil, particularly in the US, and by rapidly growing emerging market countries – especially China. China’s share in global oil demand has more than doubled in the past 15 years (3.5% in 1990, estimated 8.2% in 2006). Despite higher oil prices, the demand from China is expected to persist, because its underlying growth development is still ongoing.

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<sup>1</sup> For example, Jimenez-Rodriguez and Sanchez (2004) for the main OECD members; Schmidt and Zimmermann (2005) or the German Council of Economic Experts (2004) for an analysis of oil price effects on the German economy. The declining economic impact of oil price increases over time has led some researchers to study these issues in a non-linear framework.

<sup>2</sup> Walton (2006).

The latest price hike, however, is being put down mainly to supply-side factors, namely, to heightened geopolitical concerns over the security of future supplies, especially in Iran, Iraq and Nigeria – or the recent events in Bolivia.

Both factors are aggravated by yet another supply-side argument: Spare capacities in both refining and production are limited, as the investments of oil producing countries have been responding too slowly to the unexpected pace of demand growth. Now, it is taking time to open up the bottlenecks. This view has been recently accentuated at the G7-meeting in Washington where, amongst others, a strengthening of the dialogue between oil producers and consumers and further investment in exploration, production, energy infrastructure, and refinery capacity has been demanded.

The fact that the bulk of the current oil price shock – unlike its predecessors – has been demand-driven is often said to alleviate its impact on economic growth. Oil price shocks lead to a negative domestic demand effect in oil-importing countries resulting from a loss in terms of trade. A demand-driven shock offsets this impact somewhat as foreign oil producers recycle part of their income by importing capital goods.<sup>3</sup> It should be noted, however, that this additional demand – owing to the oil-exporting countries' specific needs – might lead to sectoral shifts in the production pattern of the euro area economy.

Obviously, with oil prices being increasingly driven not only by demand-side concerns, the nature of the current shock might eventually become closer to that of its predecessors.

Apart from the size and nature of the shock, the resilience of advanced economies like the euro area stems from a structural change in their dependence on oil. Owing to the growing importance of the services sector, which now accounts for roughly 70% of GDP in the euro area, the relative weight of the energy-intensive industrial sector has declined since the 1970s. Accordingly (and also due to a growing ecological awareness), the oil intensity of industrial countries, defined as the total amount of oil consumed to produce one unit of GDP, has been halved during the past 30 years.

Finally, the reaction of economic agents, namely trade unions, has contributed to the muted economic impact of the current oil price shock. Strong global competitive pressures, particularly in the manufacturing sector, as well as relatively high unemployment rates significantly weaken the bargaining power of today's trade unions. Inflationary pressures resulting from potential second-round effects and wage-price spirals have so far been much more contained than in the 1970s.

The credibility of low-inflation regimes has now been well established. Therefore, inflation expectations have so far remained well anchored at low levels. This has allowed central banks to maintain a more accommodative monetary policy stance, thereby providing ongoing support to overall demand.<sup>4</sup>

It should be clear by now that, for all these reasons, the oil price shocks of the 1970s differ strongly from those of today. The recently changing nature of the current oil shock with supply-side factors gaining more importance implies a certain risk, however, that this benign scenario may not extend into the future. Central banks therefore have to closely monitor ongoing developments and act appropriately if needed. But what is an appropriate response?

### **The trade-off faced by monetary policy**

Does the current benign environment mean that oil price shocks have lost their potentially damaging effects and are no longer a challenge for monetary policy? In my view, this is not the case. A stability-oriented monetary policy cannot afford to treat oil price shocks with benign neglect.

A natural starting point to discuss this topic is provided by current macroeconomic thinking on the determinants of inflation – which may be summarised under the heading of the New Keynesian Phillips Curve (NKPC). According to this – now mainstream – building block of modern macro models, current

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<sup>3</sup> The fact that the recycling of oil revenues plays a more supportive role for oil-importing countries today than during past oil price shocks has been confirmed for Germany by research undertaken at the Bundesbank (Bundesbank, 2005). Another channel of recycling oil revenues is provided by financial investment opportunities in the capital markets of oil importers. The latter effect is estimated to have contributed to the decline in the order of approximately 1/3 percentage point in long-term government yields in the US in 2005 (IMF, 2006).

<sup>4</sup> This point is especially important in light of the fact that some research has explained the dampening economic impact of earlier oil price shocks by the endogenous reaction of monetary policy (Bernanke, Gertler and Watson, 1997; Barsky and Kilian, 2004).

inflation is driven by expectations about future inflation, current and expected future demand and supply factors (both translated into the summary statistic of the output gap) and cost-push shocks.

Unlike demand shocks, which affect inflation and economic growth alike – that is, either both positively or both negatively – cost-push shocks are more of a challenge. A surge in oil prices will raise inflation (at least in the short term) while dampening economic growth, thereby constituting a trade-off if monetary policy tries to achieve price stability without compromising real economic developments in general. The trade-off between inflation and output stabilisation in the face of macroeconomic shocks is also influenced by real rigidities. Real wage rigidities, especially, are important in this context.<sup>5</sup>

From the aforementioned, it is clear that the possible trade-off for monetary policy is influenced by various transmission channels over and above the cost-push element alone.

Firstly, the better inflation expectations are anchored, the less a cost-push shock leads to higher future inflation.

Secondly, an oil price shock influences not only output but also potential output. The concrete relative factors are difficult to gauge for policy makers in real time. Notwithstanding this identification issue, it is clear that the popular notion of equating the observable dampening effect of higher oil prices on GDP with a corresponding decline in the output gap may be seriously misleading.

The problems are compounded by the fact that there is not the one all-encompassing concept to calculate potential output. In applied work potential is often modelled as a de-trended measure of real GDP or calculated within a production function approach. Taking the first concept, the dampening effects of oil price shocks on real GDP will translate into potential output depending on the concrete statistical filtering method being used. Using a production function approach, a persistent increase of oil prices can influence potential output directly via reduced energy inputs and indirectly via its effects on the capital stock: a higher equilibrium price of energy inputs slows down capital accumulation and scraps some part of the existing capital stock.

Last but not least, in the New-Keynesian framework, potential output is an even more complex concept and very different from the de-trended measures popular in current empirical work. Potential output here refers to the output level that would prevail when all distortions – be they static or dynamic – were absent.<sup>6</sup> Not going into the details it is clear that potential output is then influenced by a host of shocks hitting the economy. It is thus much less smooth over time than a figure calculated by applying a statistical filtering method.<sup>7</sup>

All in all, it should be clear that oil price shocks have also adverse effects on potential output, albeit difficult to quantify with any precision.

Finally, a sluggish adjustment of real wages adds a further complication to the policy trade-off in the face of an oil price shock: a higher price of oil increases real marginal costs and thus inflation as long as the necessary decline in real wages is not brought about. With flexible real wages this poses no problem, with only gradually adjusting real wages the time profile of inflation and output also depends on the way monetary policy reacts. A non-accommodating monetary policy can achieve the necessary decline in real marginal costs in the face of sluggish real wages by further reducing output through a tighter response. An accommodating monetary policy temporarily allows for some increases in inflation and thus real marginal costs thereby stretching the effects over time. Which policy is optimal can not be decided without a deeper analysis of the causes of wage rigidities and the possible strategic interactions between monetary policy and wage setting parties.

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<sup>5</sup> See for example Blanchard and Gali (2005) or Krause and Lemke (2005). Real wage rigidities have the potential to create inertia in inflation rates. Inflation then is not only determined by future macroeconomic conditions but also influenced by past developments. Moreover, real wage rigidities have the consequence that for a wide variety of shocks – not only cost-push shocks – policymakers are confronted with a trade-off between inflation and output stabilisation. The reason for this is that real wage rigidities introduce another dynamic distortion in addition to nominal rigidities. The latter can be corrected by a monetary policy directed towards price stability. Such a policy, however, would not eliminate the distorting effects of the former, that is sluggish real wage adjustments, and therefore be sub-optimal from a welfare point of view.

<sup>6</sup> In the base-line NK-model without real rigidities the statistic distortion is given by monopolistic competition on goods markets, the dynamic distortion by nominal rigidities in the price-setting process.

<sup>7</sup> Cost-push shocks and real wage rigidities introduce another complexity in the NK-framework as they create a wedge between the output level that would stabilise inflation and the output level that would be optimal to stabilise from a welfare maximising perspective. With other words, the inflation stabilising output gap is different than the welfare relevant output gap.

In general: The more flexibly the real wage reacts to an oil price shock, the sooner the necessary decline in real marginal costs can be achieved and the faster the output gap will be closed. A more flexible labour market is therefore conducive to alleviating the conflict between price stability and output stabilisation.

Admittedly, these more theoretical considerations do not provide us with a mechanical formula for responding to oil price shocks. But they make clear that the appropriate monetary policy response in the face of a persistent increase in the level of oil prices is more complex than the often popular “transitory blip theory” assumes. And they highlight several important insights which are also relevant in the present context.

Firstly, the New-Keynesian framework strongly emphasises the advantages of price stability. Monetary policy in keeping inflation low corrects for the distorting effects of nominal price rigidities.

Secondly, in the light of the above mentioned policy trade-offs monetary policy should not strike the balance by responding in a discretionary fashion to shocks. Rather, it should adopt a systematic framework for decision-making and explicitly apply it to the prevailing conditions.

By committing itself to a systematic monetary policy approach, the central bank is best able to anchor inflation expectations at a low level. This should ultimately lead to a containment of inflation at the lowest possible cost.<sup>8</sup> And, as a by-product it will also lead to a better track record in stabilising real output close to potential.

Moreover, in that respect a credible and systematic monetary policy may lead wage setting parties to a swifter acceptance of necessary real wage adjustments.

The presence of labour market rigidities significantly complicates the task of a stability-oriented monetary policy. It is therefore in the natural own interests of a central bank to insist on making excessively rigid labour market structures more flexible and not an overstretching of central bank competences, as it is sometimes portrayed in the public debate.

Summing up: Monetary policy is well-advised to follow these guiding principles even in the more complex oil price shock environment. Focusing on price stability to anchor inflation expectations, acting in a systematic strategy compatible fashion, and not trying to fine-tune the policy trade-off discretionary is the best way to confront the limitations of monetary policy in real-time and to limit the danger of becoming overburdened with tasks it can not fulfil.

### **The Eurosystem's economic and monetary analysis**

In order to maintain price stability for the euro area over the medium term, the Eurosystem has provided itself with such a systematic framework: its monetary policy strategy. Two key elements are a quantitative definition of price stability by the Governing Council (a year-on-year increase in the HICP for the euro area of below, but close to, 2% over the medium term) and an analytical framework for the assessment of all relevant information and analysis based on two pillars: economic and monetary analysis.

The economic analysis assesses the short to medium-term determinants of price developments with a focus on real activity and financial conditions. The monetary analysis concentrates on a longer-term horizon. It exploits the long-run link between money and prices and serves as a means of cross-checking, from a medium to long-term perspective, the short to medium-term indications for monetary policy resulting from the economic analysis.

How does the Eurosystem's strategy translate into day-to-day decision-making? Given the vigour and perseverance of the current oil price shock, its impact on the euro area economy has to be analysed carefully. The transmission of oil prices can analytically be separated into direct, indirect and second-round effects. Direct effects focus on the increase of energy components in consumer and producer prices in the short-term. Indirect effects refer to medium-term transmission to non-energy components. Finally, second round effects describe the inflation impulses due to endogenous reactions to direct

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<sup>8</sup> This point plays a prominent role in the current New Keynesian framework. There, discretionary monetary policy, even in a completely forward-looking environment, is inferior to a systematic response pattern under a timeless perspective from a welfare point of view (Woodford, 2003). And it is precisely the better anchoring of inflation expectations that is responsible for these results.

and indirect price effects by wage-setting parties. They create the danger of a wage-price spiral with subsequently accelerating inflation.

So far, only the direct effects of higher oil prices have been noticeable, although they have been less inflationary than in the 1970s. Headline inflation is still being driven mainly by energy prices. With core inflation remaining subdued, indirect effects of the oil price shock have remained contained.

The pick-up of the euro area economy is, however, expected to cause a gradual acceleration of core inflation. This view is supported by the March Eurosystem staff macroeconomic projections. And it demonstrates that blindly relying on core inflation as the major benchmark for monetary policy would be too short-sighted at the current juncture.

At the same time, second-round effects have not yet materialised on a noticeable scale. Wage dynamics in the euro area have remained moderate in the recent past, though the risks to this benign scenario have clearly risen over the past couple of weeks with oil prices accelerating once again. To prevent second-round effects from materializing it is crucial that the social partners continue to meet their responsibilities in this regard, also in the context of a more favourable economic environment.

Turning to monetary analysis, upside risks to price stability over the medium to long term are evidenced by strong monetary trend growth in an environment of already ample liquidity in the euro area. The growth in monetary aggregates is mirrored by dynamic developments in credit to the private sector, especially in the real estate sector. These monetary developments constitute strong upside risks to future price stability and they are stimulated by the low level of interest rates. They warrant particular vigilance and close monitoring.

Summing up: Whilst headline inflation clearly exceeds our definition of price stability and has recently edged up to 2.4 % under the impact of renewed oil price increases, underlying inflationary pressures have, to date, remained more contained. In the medium term, however, these pressures might gain in strength, as an improvement in the euro area economy is assumed for the quarters ahead, and oil prices may be passed-through faster in an economic upturn, raising the risk of indirect and second-round effects. Indirect effects are in the pipe-line and will most likely materialize. Additional increases in administered prices and indirect taxes will also contribute to inflationary pressures. In particular, the expected VAT increase in Germany (+3 pp) next year is expected to keep euro area headline inflation at a higher level (+0.3 pp in 2007). Finally, monetary and credit aggregates are growing at rates much higher than is compatible with non-inflationary real growth.

So, oil price developments are just one, albeit important factor contributing to inflationary risks in the current environment.

The materialisation of these risks to price stability would be most undesirable as the HICP inflation rate has already been exceeding the level that is consistent with the Eurosystem's definition of price stability for a considerable time now and is projected to do so on average this year and next year.

In the current environment, perhaps the single most important transmission channel of oil-price-induced risks into higher future inflation consists in longer-term inflation expectations becoming unanchored. And while it is true that current long-term inflation expectations are compatible with the Eurosystem's definition of price stability this argument cannot be used to justify a monetary policy of "wait and see". As inflation expectations incorporate the expected future path of monetary policy, and markets have priced in increasing short-term rates in the quarters ahead, the "wait and see" argument would run into inconsistencies.

The current low level of inflation expectations is predominantly the successful outcome of the stability-oriented monetary policy framework itself. This has been inherited partly from past achievements, but these achievements have to be secured by our current and future decisions. These considerations are highly relevant in the current situation, too.

## Concluding remarks

In general: An important way an oil price shock can lead to permanently higher inflation rates is through monetary policy accommodation. The most important explanation for fact that the current economic impact of the oil price increase has been so benign lies in the achievements of monetary policy having become transparent, systematic and well aware of the problem of time inconsistency. It would be an irony of history if we were to sacrifice the credibility we have earned by gambling on possible short-term gains in neglecting current risks to price stability. How easily such a gamble can

end in prolonged economic problems is demonstrated by the aftermath of the earlier oil price shocks – a period that became popular as “the great inflation”.