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THE EFFECTS OF FALLING OIL PRICES

by

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The two oil crises in 1973/74 and 1979/80 have provided adequate proof of the harmful effects of rising oil prices upon the world economy. Can we expect equivalent beneficial effects from the fall in oil prices which is now perceptible?

The quintupling of the oil price during the first oil crisis and an almost 200% increase during the second crisis caused current account deficits, devaluations and a deterioration in the terms of trade of the oil-importing countries. At the same time, inflation increased, part of the capital stock which was oriented towards low energy prices became obsolete, capacity income fell and real income was redistributed to the advantage of OPEC. Macroeconomic demand was reduced. Distribution problems also occurred because the lower real income – or the downward shift of the factor price frontier – required a reduction in real wages and real interest rates. Last but not least, the growth process was stemmed and, at least in the short term, unemployment rose. The harmful effects of the oil crises could be absorbed only by a long-term process of energy-saving measures, the threat or introduction of alternative technologies, the adjustment of real wages, replacement of the obsolete capital stock and also as a result of increased supplies of oil from the fringe nations of the cartel (Great Britain, Mexico) and the heterogeneity of OPEC's interests.

Surprisingly, this process of adjustment was assisted by the severely criticized high interest rates in addition to the downward world economic trend and the accompanying fall in the demand for oil. This is because high

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interest rates act as an incentive to make more oil available. This assertion is derived from the basic calculation of a supplier of resources. He can extract his resources now and invest the proceeds on the international capital market, where they generate interest at the existing rate, or leave the resources in the ground, where they generate the anticipated rate of price rises. From the supplier's point of view, a balanced portfolio requires that the rate of price rises for the resources is equal to the interest rate. If the interest rate increases, the supplier has a greater incentive for exploiting his resources but, in doing so, he also reduces the price of the resource. Consequently, high interest rates put pressure on the oil price.

Oil-Dependent Industrialized Nations

For an industrialized nation which is dependent upon oil, such as the Federal Republic of Germany or Japan, the lowering of the oil price signifies a reduction of the value of imports, because the imported quantity does not usually change over a short period and the price drops. When viewed from the import side, at any given rate of exchange an improvement of the trade balance is produced which results in the upward revaluation of the national currency. This is usually accompanied by an improvement in the terms of trade. Because oil prices are denominated in US dollars, the revaluation further reduces the oil price when expressed in national currencies.

If the argument is based on a macro-economic production function in which energy as an intermediary input is a production factor in addition to capital and labour, the capacity income increases; the long-term macro-economic supply curve moves downwards and to the right. If a short-term macro-economic supply curve is interpreted as the correlation between the supplies on offer and the factor costs plus profit margin, that short-term supply curve also moves downwards and the move (for any given price) signals larger supplies of goods. This can be expressed in practical terms by saying that the factor price frontier for real wages and real interest rates shifts outwards when the oil price is falling. Real wages and/or real interest rates may rise in the long term in the event of full employment.

An Economic Stimulus

The rise in the price level is restricted for a number of reasons. Firstly, the price of the "consumer good" oil or energy which is directly incorporated in the cost-of-living index falls. Secondly, the price of a major intermediate

product is lowered, and that reduction is passed on along the vertical production chain right up to the end-products. The upward revaluation of the national currency signifies a further trend towards price reduction because imported goods become cheaper. The downward movement of the short-term and long-term macro-economic supply curves has a price-curbing effect. Finally, this anti-inflationary tendency is further intensified if (with full employment) the scope for increasing real interest rates and real wages (as a result of the movement of the factor price frontier upwards and to the right) is exhausted only after some delay, just as only a long-term adjustment of real wages took place when the oil crises occurred.

The national income increases because the capacity income rises and the improvement of the terms of trade causes a real redistribution to the benefit of the oil-importing countries (and to the disadvantage of OPEC). At the same time, the margin available for paying for domestic production factors also expands. The macro-economic demand rises as a result of the increase in real income. In 1984 the OECD's oil imports totalled \$ 175 billion, and so a 30% reduction in price released some \$ 50 billion of purchasing power; in the case of the Federal Republic of Germany, which spent DM 88.5 billion (1984) on imports of mineral fuels, including gas (oil and oil products, DM 69.3 billion), this superficial calculation shows that DM 25 billion were released, which is quite a reputable sum when compared with an economic programme based on tax reduction in which private income will increase by DM 20 billion over two years. Yet these calculations do not allow for the fact that part of the additional income is directed towards the demand for imports and that the upward revaluation of the national currency reduces net exports (value of exports minus value of imports) and so, when considered in isolation, reduces the macro-economic demand.

A reduction in oil prices causes an acceleration of the growth-rate of the gross national product because the macro-economic capacity frontier moves outwards and macro-economic demand rises. With a 30% drop in oil prices, this is calculated to increase the growth-rate by between 0.5¹ and 1 percentage point. Generally speaking, we can expect increased employment, especially when the potential increase in real wages in a situation of full employment is not exhausted in view of unemployment.

The marginal efficiency of capital increases as a result of falling oil prices. This is explained by the fact that more can be produced per unit of newly created capital. The higher marginal efficiency of capital means that via the investment opportunities the real interest rate must rise. Part of the old capital stock becomes obsolete in that it is directed towards higher energy prices. Yet the argument for increased marginal efficiency of capital is valid only in the long term because the existing fixed capital stock cannot be changed suddenly.

Nor is the capital stock adjusted to the new oil price if the oil-price reduction is not considered to be permanent and if excess capacities exist which do not incite new investment. Finally, the increase in real interest rates also depends upon other factors, such as the increase in real wages, crowding-out and the rate of inflation.

In the oil-dependent industrialized nations, a further consequence is the changes in relative prices which particularly affect the rôle of the national energy supply. Falling oil prices make coal relatively more expensive and thus less competitive. The competitiveness of coal-mining areas, such as the Ruhr, deteriorates. There will be increasing demands for subsidies for national energy. Alternative technologies lose their attraction. The private sector has long since cancelled tar-sand and oil-shale projects and we hear nothing more about Carter's \$ 80 billion "Synfuel Programme". The drop in the oil price will also cause expanded production of oil-intensive products, thus favouring chemicals and steel, for example. In conjunction with the rise in incomes, the revaluation stimulates the "non-tradeable" goods (services, including commerce).

Reactions of Economic Policy

The effects of oil-price reductions discussed have do, however, vary in accordance with the reactions of economic policy. All other things being equal, e.g. with the existing wage policy, the falling oil prices allow more latitude for manoeuvre for monetary policy because the objective of price stability can be achieved more easily. As a result of the tendency towards upward revaluation, the central bank no longer has to protect the national currency against the US dollar by means of higher interest rates. The money supply target can therefore be more liberal; interest rates may fall. This effect counters the increase in real interest rates caused by the improved marginal efficiency of capital. It is impossible to say which of the two effects predominates: whether, on balance, falling oil prices put pressure on the real interest rate. Nevertheless, real interest rates in the European Community fell during the two oil crises² and so an increase in real interest rates can be expected now that oil prices are dropping.

The wage policy also influences the effects discussed above. An extreme case occurs when (as the factor price frontier moves upwards and towards the right) the real wage remains unchanged. A comparatively strong rise may then occur in the real interest rate. In the other extreme case, the real interest rate remains unchanged and the reduction in oil prices is reflected entirely in an increase in the real wage. Realistically, we should expect both the real interest rate and the real wage to increase but, in some circumstances, the adjustment of the real

wage may be delayed. In the long term, the real wage determines the employment of the existing supply labour, while the real interest rate determines the degree of capital formation.

Finally, the effects discussed here are also influenced by an import tax or excise duty on oil and oil products. Any such tax or duty inevitably reduces the above-mentioned beneficial effects upon the general economy, employment and growth. If, however, the oil price is expected to rise again in the long term, those taxes and duties prevent a cyclical movement of the main macro-economic variables and thus misallocation.

Oil-Exporting Industrialized Nations

The effects take a different course in the industrialized nations which export oil and natural gas (Great Britain, The Netherlands, Canada and Norway). Falling oil prices generate a trend towards current account deficits since the value of exports drops; the currencies of those countries are devalued. This devaluation may be accompanied by a deterioration in the terms of trade; it causes a higher level of prices. Reductions in real income usually occur since net imports decrease; growth, the general economy and employment fall off. The central bank has to raise interest rates in order to restrain the inflationary trends generated by the devaluation. Since resources are drawn upon to fund public expenditure and the taxes on resources are dependent upon earnings, funding problems arise which are not mitigated by increasing interest rates. With falling incomes and higher prices, distribution problems, such as the wage policy, are bound to become more serious.

Finally, the devaluation means that the traditional exporting sectors become more competitive. So, in the long term, a re-allocation occurs in favour of the industrial sector. Exports of agricultural produce may also be stimulated by the devaluation. The "Dutch disease" (de-industrialization) which accompanies an oil boom is countered. The non-tradeable goods sector is restrained since demand is reduced as a result of the lower income, and the expansion of the traditional exporting sectors attracts production factors away from the service sector. Oil-exporting industrialized nations also experience some effects in their oil-producing areas (Texas, Louisiana, Oklahoma and Alaska in the USA) and in the regions where substitute products are produced (coal-mining districts in England).

OPEC Countries and the Third World

The "low absorbers" no longer achieve export surpluses and must liquidate financial holdings in order to maintain their level of imports. It is estimated

that the OPEC's international financial investments were reduced from \$ 350 billion in 1981 to \$ 270 billion at the end of 1985. It is suspected that Saudi Arabia (with a current account deficit of \$ 25–30 billion in 1985) lost about half of those financial assets between 1982 and the end of 1985. In the longer term, those countries will have to adapt to the situation by changing the value of their imports. In other respects, the effects occurring in the OPEC countries are, in principle, analogous to the adjustments in the oil-exporting industrialized nations.

For the oil-producing countries with high levels of indebtedness, such as Mexico, Nigeria and Venezuela, falling interest rates do indeed provide some relief, but that relief is far from sufficient to offset the falling oil prices and export earnings. In the case of Mexico, whose oil exports totalled \$ 15.5 billion in 1983, a price reduction to \$ 20 per barrel represented a \$ 4.5 billion or so drop in foreign exchange earnings. Assuming that any such fall in oil prices reduces the nominal interest by one percentage point, with its present debt of \$ 97 billion the savings on interest payments are just on \$ 800 million. The net additional burden is estimated at \$ 3.6 billion. Similar problems arise for Venezuela (\$ 35 billion debt), Indonesia and Nigeria.

On the other hand, a ray of hope can be perceived for the oil-importing indebted developing countries. Falling interest rates provide some relief on the debt front and falling oil prices reduce the value of imports and alleviate the permanent balance of payments problems.

Consequences for the World Economy

Falling oil prices combined with falling nominal interest rates provide the world economy with economic stimuli and (in the case of longer-term low oil prices) growth stimuli. The primary effect of the reduction in oil prices is a redistribution of income between OPEC and the oil-importing countries. If this primary effect is to occur, the oil importers must employ the additional income for other purposes. If the Saudi Arabians and other oil-producing countries were immediately to reduce their consumption instead of liquidating financial assets, no stimulating primary effect would be perceptible in the world economy as a whole. This argument is valid by analogy with the two oil crises, when the redistribution in favour of the oil-producing countries increased the world's hoarding as a result of their smaller capacity for absorption at that time. In addition to this primary effect, however, the secondary effects of falling oil prices as discussed above, such as greater price stability, lower nominal interest rates, etc. must be mentioned.

Expansion, upward revaluation, greater price stability and positive effects

on employment are recorded in the oil-importing industrialized nations; the *oil-exporting industrialized nations experience adjustments in the opposite direction*. So the relative positions of the industrialized nations change according to whether the country is a net importer of oil. In the case of a net importer, the upward revaluation produces lower prices while the net exporter experiences devaluation. If the industrialized nations are classified in accordance with their decreasing degree of dependence on oil, the currencies of oil-dependent countries, such as Japan, France and the Federal Republic of Germany, are revalued upwards, while the currencies of oil-exporting countries (Great Britain, Norway) are devalued. So falling oil prices change the currency ratios. In principle, the USA, with oil imports of \$ 22 billion (1984), should also experience an easing of pressure and thus an upward revaluation. But the fact that oil prices are denominated in US dollars and falling oil prices reduce the demand for US dollars may counter (and more than offset) this trend.

Despite the inhibiting effects for the oil-exporting industrialized nations, increased trade should be expected between the group of industrialized nations as a whole. Higher incomes in the oil-importing industrialized nations will cause a rise in the demand for imports; more active trading can be expected, especially between the industrialized nations. This trend is also encouraged by the depreciation of the currencies of the oil-exporting countries. On the other hand, foreign trade is inhibited by the lower incomes in the oil-exporting countries, the upward revaluation of the net oil importers' currencies and the long-term reduction of OPEC's absorption capacity.

The increased economic activity in the industrialized nations also has beneficial consequences for the developing countries. The oil-importing developing countries can also expect some alleviation of their debt and balance-of-payments problems.

The OPEC bears the strain of this short-term worldwide upheaval. It is impossible in this paper to examine how individual nations, such as Nigeria, are adjusting internally to this loss of foreign exchange earnings – possibly by reducing public expenditure – and how they are handling those adjustments in terms of policy. In particular, the debt problems of the oil-producing countries Mexico, Nigeria and Venezuela could prove to be a disruptive factor for the international monetary system, because the easing of pressure on the debt front for the oil-importing developing and semi-industrialized nations contrasts with the reduced solvency of the indebted oil-producing countries. It is hardly possible to determine whether, overall, the debt problem will be easier to solve as a result of falling oil prices in the world economy.

The crucial question is whether the general bright picture of international economic development will be clouded by the indebtedness of the oil-

exporting countries. The political argument advocating "burden sharing" will also play a part in this context. The annual interest payable by Mexico, Nigeria and Venezuela, the three oil-producing countries with a particularly high level of indebtedness, is around \$ 15 billion. This sum contrasts with the \$ 50 billion of income released in the indebted nations. The industrialized nations are also faced with the question of whether, in view of lower oil prices, it may not be worthwhile to reduce the risk of a financial débâcle.

Can this Continue?

Are falling oil prices a short-term phenomenon or are they a longer-term general condition of the world economy?

Arguments in favour of a longer-term trend of relatively low oil prices are suggested by the technical progress in energy production, e.g. a larger proportion of nuclear power, and the need to find new, energy-saving or oil-replacing solutions (in cars, for example) because of pollution problems and despite the lower oil prices.

Yet there are a number of adjustment processes which indicate that the present situation may not last long. If the oil price remains low in the longer term, the demand for oil will increase again. Although some energy-saving measures, such as thermal insulation for houses, cannot be retracted because existing stocks (e.g. the capital stock) are not so quickly adjusted, the incentive for saving energy in new buildings, new technical solutions and new plants is reduced. In the long term, domestic energy supplies such as coal would also be more seriously threatened; the search for alternative technologies will become less intensive and the opportunity costs for implementing alternative technologies are valued at a higher level in the political process when oil prices are falling, so that the chances of the alternative technologies diminish. Worldwide, replacement energies, such as coal, become less competitive and the development of new coal deposits less attractive.

In the case of oil itself, falling interest rates do in principle reduce supplies – a trend which does not work through to the actual oil recovery sector in the short term, owing to the surplus capacities. In addition, when oil prices are falling, the exploration and development of new deposits are reduced (such as the Beaufort oil find in Canada and the Hibernia Field in the offshore area of Newfoundland) because exploration and development are worthwhile only when the exploration costs (development costs) for an extra unit of oil are exactly equal to the implicit valuation of an oil unit – the "user costs". But the user costs are reduced when oil prices are falling.

Finally, the regional distribution of production and reserves varies. Whilst

in 1985 OPEC accounted for only 29.7% of the world's oil production (state-trading countries 27.7%; western non-OPEC countries 42.6%), it possesses 67.9% of the world's oil reserves, compared with only 20.5% for the non-socialist non-OPEC countries (state-trading countries 11.6%). And there has been hardly any increase in the oil reserves since 1982. The regional distribution and relatively unchanged level of stocks have repercussions upon future expectations and prices. Low energy prices may persuade the industrialized nations not to adopt adjustment measures since they visualize abundant energy supplies. We shall then be on course for the third oil crisis.

NOTES

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¹ Cf / Ifo-Studien 6/86, p. 3.

² Cf. OECD: Economic Outlook, December 1985, p. 33.