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**AGGREGATE DEMAND,
UNCERTAINTY AND OIL PRICES:
THE 1990 OIL SHOCK IN
COMPARATIVE PERSPECTIVE**

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I.

Introduction

With the doubling of oil prices and the greater potential for a supply disruption following the outbreak of the crisis in the Persian Gulf the general economic picture deteriorated significantly in the second half of 1990 for most industrial economies. By the end of 1990 the rise in oil prices was associated with slowing output growth or deepening recession and somewhat higher inflation rates. The slowdown continued into 1991 despite the decline of oil prices to around their pre-crisis level. In some respects, this was not surprising. For the oil-importing countries, the rise in oil prices represented a terms-of-trade loss and an associated fall in real income, as well as an important negative "supply shock" reflecting the central role of oil as an intermediate input in the production process. Earlier dramatic increases in the price of oil, in 1973-74 and 1978-80, had been followed not only by higher inflation, higher interest rates and falling output in most industrial countries, but also by major restructuring in production and consumption.

In contrast to actual economic developments, however, most forecasts immediately following the outbreak of the Gulf crisis had predicted fairly moderate adverse effects from higher oil prices – much more moderate than direct analogies with previous oil shocks would have seemed to indicate.¹ Not only were the effects predicted

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¹ Both private and official economic predictions were generally more optimistic about the likely effects of the 1990 oil price shock compared with those in the 1970s. For example, this position is expressed in recent publications by the Japan Economic Institute (1990), Institut für Weltwirtschaft (1990), OECD (1990) and IMF (1990).

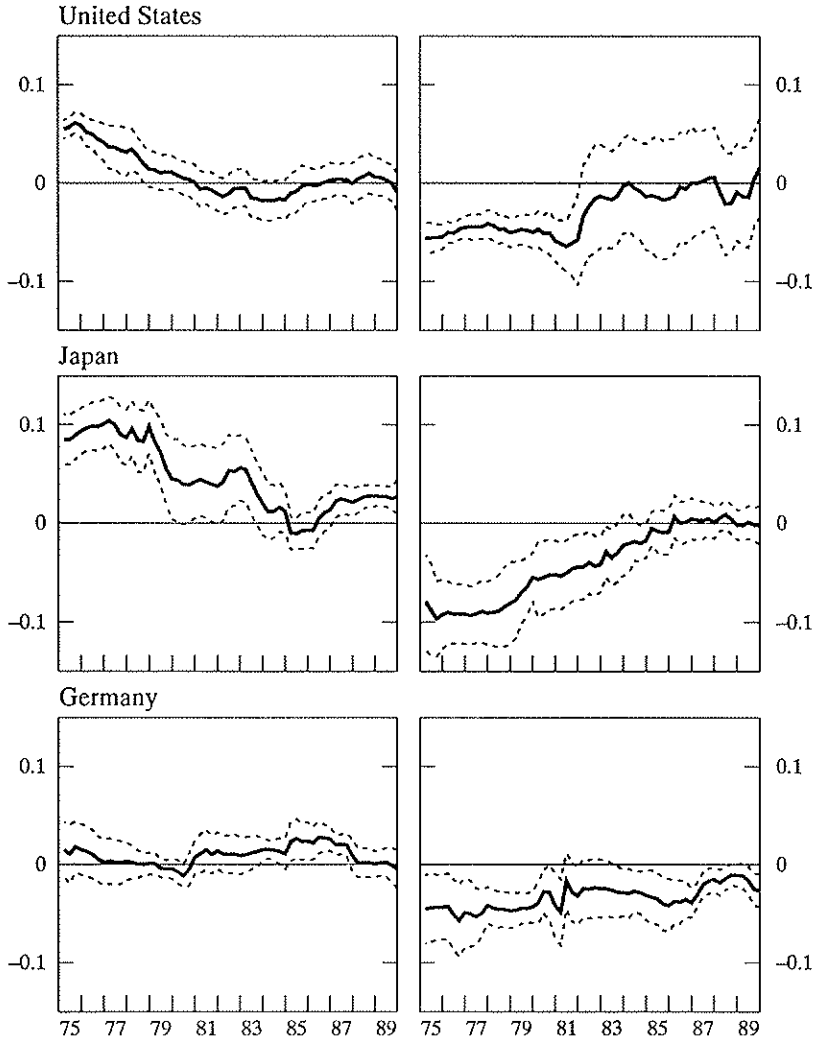
limited in magnitude, they were also short in duration. For example, Graph 1 presents estimates which are illustrative of the results typically found in more complex simulations of econometric models underlying published forecasts. The net cumulative effect on output and the price level (percentage change) one year after a 1% rise in the price of oil for the United States, Japan and Germany had been declining for a number of years prior to the oil shock last August. The graph shows the estimated net (reduced form) effect of an oil price shock on output and prices, together with 90% statistical confidence intervals, from the mid-1970s until 1990. Each data point on the solid line shows the estimated cumulative impact of an oil price rise evaluated at the date shown, and the broken lines show the statistical confidence intervals, holding constant the effects of monetary and fiscal policies.² The net effect of oil on both prices and output levels is seen to decrease over time in five of the six panels, i.e. the solid line moves closer to zero and the confidence boundaries tend to encompass zero (no significant effect) at the end of the sample period. This pattern suggests that the major industrial countries were in a better position to weather an oil shock in mid-1990 than had previously been the case.

Statistical results of this nature are also consistent with several empirical developments, which in turn had helped to underpin initially optimistic views about the limited effects of an oil price shock. More resilient supply-side features of economies are one

² These estimates are calculated from "rolling regressions" of reduced form equations. For example, the 1975.Q1 data point (solid line) of -0.055 in the upper right-hand panel of Graph 1 indicates that the net effect of a 1% oil price increase on US real GNP is -0.055% for the sample estimated up to 1975.Q1 (sample period 1964.Q1 to 1975.Q1 with 45 observations). The 1975.Q2 data point of -0.054 indicates a net effect of -0.054% for the sample estimated up to 1975.Q2 (sample period 1964.Q2 to 1975.Q2). This updating of the sample period or "rolling regressions" procedure allows the net effects to vary over time in line with changing economic structure or other factors. The regressors in the estimating equations are a constant, a time trend, and contemporaneous values and four lags of oil prices, broad money, and government expenditures (in logarithms). The Cochrane-Orcutt correction for first-order autocorrelation was employed.

Graph 1
**Price and output effects of oil shocks
 in the United States, Japan and Germany**

Effect on prices Effect on output
 90% confidence intervals 90% confidence intervals



aspect, as production profiles have become less energy intensive and presumably more flexible in adjusting to energy price changes.³ In addition, the development and deregulation of financial markets during the 1980s should in principle also have allowed economies more flexibility in responding to oil shocks without major output disruptions or inflationary consequences.⁴ Finally, the extent to which aggregate demand was affected by the oil shock – working through real income and wealth effects – should have been more limited because of the reduced share of imported oil in total production.

Why then did economic conditions deteriorate so quickly after the oil shock? In this paper we argue that three related aggregate demand factors led to weaker-than-expected output performance following the mid-1990 oil shock, all of which had also been evident at the time of the 1973–74 oil price hike. Specifically, the increase in uncertainty due to the Gulf crisis – over oil supplies, price hikes and regional conflict – led to a sharp fall in consumer and business confidence and related weakness in domestic demand in a number of countries. In some respects this is similar to the uncertainty in 1973 over the Yom Kippur war in the Middle East, the oil embargo and the rise in oil prices. In addition, we argue that the momentum and intensity of the business cycle downturn in mid-1990, much as in 1973, had reduced the resilience of many economies to an adverse oil shock. The oil price shock and associated economic uncertainty in 1990 came at a time when a downturn was already under way and greatly weakened

³ See Andersen and Bernard (1991) for a discussion of aggregate supply effects and empirical estimates by sector of the demand for energy.

⁴ See Bisignano (1991) for a discussion of how financial market structures and institutions are likely to affect the transmission of oil shocks to real economic activity and inflation. He finds that greater flexibility in interest rates and exchange rates, as well as fewer controls on channels of finance, should help to insulate economies from oil shocks. However, he also concludes that certain structural weaknesses in the financial systems of a number of countries, particularly the United States, could be exacerbated by oil shocks, potentially leading to undesirable feedback effects on real economic activity.

business conditions in several large industrial economies. Finally, we show that a very low level of business confidence existed in several large industrial economies even before the beginning of the Gulf crisis, which not only directly contributed to the subsequent weakness in investment and consumption expenditure, but may also have magnified the decline in confidence and fall in demand growth by the end of 1990.

Placing the 1990 oil shock in comparative perspective, this study investigates the role of aggregate demand factors in determining the response of the economy to oil shocks. We provide a non-technical and eclectic review of the demand-side issues involved, with particular attention devoted to contrasting the 1990 shock with the events and consequences associated with the oil price hikes of the 1970s in the major industrial economies. The objective is to gain an insight into the demand-side channels of oil shock transmission and how these factors have affected the output and price responses following an oil shock. In our review of past oil shocks we find that declines in output growth and increases in inflation around the time of previous oil shocks were in large measure related to demand factors.⁵ We also argue that a focus on demand factors provides the clearest insight into why the 1990 price swing had such adverse, and largely unanticipated, effects on the real economy.

The structure of this paper is based on the three basic channels through which aggregate demand factors may influence the response of the economy to an increase in oil prices. First, we identify factors which influence the magnitude of the direct aggregate demand effect of an oil shock. By this we mean factors such as the degree of dependence on imported oil and the ability to substitute other non-oil energy sources, which determine the ultimate terms-of-trade and wealth effects of an oil shock on aggregate demand. Secondly, we consider the initial (cyclical) demand conditions at the time of the oil shock and evaluate their likely effects on the transmission of oil

⁵ This view has also been expressed by Sachs (1982) in his analysis of the US experience.

shocks to real activity and inflation. In particular, we compare demand conditions prevailing in mid-1990 – factors such as capacity constraints, inflation and wage pressures and business conditions – with those prevailing prior to the two oil shocks in the 1970s and assess whether they tended to be more or less favourable. Finally, we consider the aggregate demand policy responses to previous oil shocks, in their fiscal and monetary dimensions, and evaluate the role they played in determining the ultimate pattern of output and inflation. Our concentration is on broad differences in policies between the periods and, for that purpose, we do not attempt a detailed country-specific analysis.

The analysis is organised as follows. Section II considers changes in the structural features of the major industrial economies which influence the real income and wealth effects of an oil price shock, and thereby directly affect the demand response. Section III examines cyclical conditions from the same perspective, and Section IV reviews previous policy responses to oil shocks and the state of policy immediately following the 1990 oil shock. Section V summarises the findings.

II.

Structural features and aggregate demand

Increases in the price of energy directly slow the growth of aggregate demand in oil-importing countries. A net energy-importing country suffers a terms-of-trade loss with an energy price rise – each unit of imports costs more units of domestically produced export goods than previously. Terms-of-trade losses generated by external developments represent a decline in real income and wealth. In particular, an oil price hike reduces an oil-importing country's purchasing power because less of a given basket of imported goods can be purchased at the same domestic production level. The immediate loss in purchasing power, together with the expected loss in future purchasing power (depending on expected future prices of

energy and substitution possibilities in both production and consumption) lowers domestic wealth and depresses current aggregate demand. Wealth and aggregate demand effects are therefore influenced by the size and expected duration of the oil price hike, the share of net energy imports in total domestic production and the degree of energy substitutability in consumption and production.

Real income and wealth effects

Statistics on the energy exposure of the industrial economies indicated that the oil price rise in mid-1990 was likely to have smaller contractionary effects on aggregate demand than the shocks in 1973-74 or 1978-80. A number of recent studies have emphasised that energy conservation, measured by energy consumption per unit of output, has played an important role in reducing the dependence in real terms on imported energy for all major energy-importing industrial countries during the last decade (e.g. Andersen and Bernard (1991)). This trend, together with the sharp decline in energy prices in the mid-1980s, had greatly reduced the degree of energy exposure since the peak reached in the early 1980s. Net energy imports relative to total income in 1989 for the Group of Seven major industrial countries ranged from less than 1% (United States) to about 1½% (Japan, Germany, France and Italy). This stands in contrast to the 3 to 7% range prevailing in 1980-81. Reflecting these patterns, Table 1 shows that the sharp rise in net energy imports as a percentage of income during the 1970s was largely reversed in the 1980s.

Similarly, Table 2 provides some estimates of the direct real income effects of oil price changes over the periods 1972-74, 1978-81 and 1984-86. These are calculated on the basis of the changes in net import costs associated with energy price fluctuations (adjusted for exchange rate movements and changes in the GDP deflators) as a percentage of domestic GNP. The table demonstrates that the real income deterioration associated with the second oil shock was

Table I
Net imports of oil in major industrial countries*
 As a percentage of GDP

Period	United States	Japan	Germany	Canada	France	Italy	United Kingdom
1972	-0.3	-1.9	-1.0	0.6	-1.5	-1.5	-1.6
1973	-0.5	-2.0	-1.3	0.9	-1.5	-1.6	-1.8
1974	-1.5	-5.4	-2.7	1.1	-3.9	-4.5	-4.7
1975	-1.4	-5.1	-2.5	0.7	-3.2	-3.9	-3.4
1976	-1.7	-5.0	-3.0	0.6	-3.3	-4.3	-3.6
1977	-2.1	-4.5	-2.8	0.6	-3.4	-3.9	-2.2
1978	-1.7	-3.2	-2.3	0.6	-2.8	-3.4	-1.4
1979	-2.2	-4.4	-3.3	1.1	-3.3	-3.7	-0.5
1980	-2.8	-6.6	-4.3	0.8	-4.7	-5.1	-0.2
1981	-2.4	-6.2	-4.8	0.6	-5.1	-6.5	1.0
1982	-1.7	-6.0	-4.5	1.5	-4.9	-5.7	1.4
1983	-1.4	-5.0	-4.1	1.9	-4.2	-5.1	2.0
1984	-1.4	-4.8	-4.1	2.0	-4.3	-5.0	1.6
1985	-1.1	-4.2	-4.2	2.2	-3.8	-4.9	1.8
1986	-0.7	-1.9	-2.0	1.2	-1.7	-1.7	0.6
1987	-0.8	-1.6	-1.6	1.3	-1.6	-1.6	0.6
1988	-0.7	-1.3	-1.3	1.2	-1.2	-1.1	0.2
1989	-0.8	-1.5	-1.4	1.0	-1.4	-1.4	-0.1

* Exports minus imports of crude oil, petroleum and lubricants, SITC-3.
 Source: OECD Series A.

substantially greater than that following the first oil shock, despite a much smaller increase in the relative price of energy. This is attributable to the increased exposure to imported oil in the course of the decade. By contrast, estimates of the real income loss associated with the 1990 hike in oil prices are much smaller than those for either of the two previous experiences for most countries, in large part owing to reduced import exposure. Other estimates support this conclusion. For example, the IMF (1990) finds that the direct real income loss in the major seven industrial economies due to the 1990 oil price hike was less than 0.5% of GNP, compared with drops of 2.4% for the first oil shock and 3.4% for the second. Moreover, unlike the two shocks in the 1970s, the subsequent fall in oil prices translated into real income gains by early 1991, essentially reversing,

Table 2
Direct real output effects of changes in energy import prices
 As a percentage of GDP

Country	Period	Energy imports/GDP	Relative price change	Real output change/GDP	Memo item: Change in US dollar exchange rate
		in percentages			
United States .	1972-74	0.3	352	-1.1	-
	1978-81	1.7	152	-2.6	-
	1984-86	1.4	-53	0.6	-
	1989-90*	0.8	15	-0.1	-
Japan	1972-74	1.9	159	-3.0	- 3.6
	1978-81	3.2	129	-4.1	4.8
	1984-86	4.8	-58	2.7	-30.0
	1989-90*	1.5	24	-0.4	4.9
Germany . . .	1972-74	1.0	194	-1.9	-19.0
	1978-81	2.3	145	-3.3	12.4
	1984-86	4.1	-56	2.3	-24.0
	1989-90*	1.4	2	-0.0	-14.0
France	1972-74	1.5	146	-2.2	- 4.4
	1978-81	2.8	108	-3.0	20.8
	1984-86	4.3	-57	2.5	-20.0
	1989-90*	1.4	2	-0.0	-14.5
Italy	1972-74	1.5	214	-3.2	11.5
	1978-81	3.4	111	-3.8	34.0
	1984-86	5.5	-64	3.5	-15.2
	1989-90*	1.4	0	0.0	-12.7

* Estimated on the assumption that the recorded rise in US dollar oil import prices of 26.8% corresponds to a rise in the deflator for net energy imports (in US dollars) of 20%.

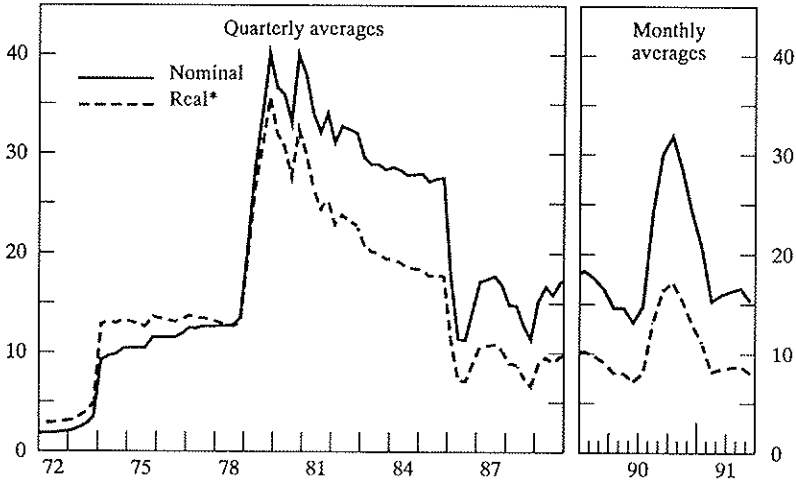
Sources: OECD/IEA: energy balances for OECD countries and OECD Trade Series C.

though not cancelling out (as average oil prices were higher during the period), the initially adverse terms-of-trade effect (Graph 2).

World demand effects

The decline in the terms of trade for oil-importing nations also represents a transfer of wealth to the oil exporters. This rise in wealth and real income associated with the oil price hike should lead to increased foreign demand for goods produced by the oil-importing

Graph 2
Spot crude oil prices
 Saudi Arabian light-34, in US\$/barrel



* In 1978 US\$; nominal oil price deflated by the US GNP deflator.

countries. However, the oil-exporting nations reaping the terms-of-trade windfall are not likely to immediately increase their purchases of industrial countries' exports to such an extent as to offset the overall decline in aggregate demand within the group of industrial countries. The short-term aggregate demand effects of an oil price rise, therefore, will depend on the relative speed with which the gainers and losers adjust their expenditures.

After the 1973-74 and 1978-80 oil price rises, OPEC members and oil producers among the OECD countries were much slower to adjust their expenditure than those countries which lost income. The "recycling" of the OPEC current-account surpluses in the years immediately following the first oil price hike demonstrated the limited capacity at that time to translate the windfall wealth gains into absorption in the short term. It took four years from 1973-74 for

the OPEC countries' current-account surplus to return to balance. Although the increase in absorption following the 1978–80 price hike was somewhat more rapid, it still took about two years for the OPEC current-account surplus to return to balance. In both cases the transfer of income from the oil-importing countries to OPEC and other oil producers raised global saving, reduced global demand and was a major cause of the ensuing global recession (Powell and Horton (1985)).

Demand for imports by oil-exporting nations following the 1990 oil price hike probably rose more quickly than previous experience would suggest, however. In particular, the largest contributors to the allied war effort and military build-up in the Persian Gulf were Saudi Arabia and Kuwait. In the former case, the rise in oil revenues from both higher prices and increased production was largely offset by military spending.

Finally, the degree of business cycle synchronisation among the major industrial economies will also influence aggregate demand responses in individual countries following an oil shock. To the extent that business cycles are co-ordinated, “boom and bust” cycles working through trade multiplier effects are more likely to develop. Quite simply, when most of the industrial economies are growing quickly and operating at full capacity, they are more susceptible to inflationary pressures. Under these conditions, a common external shock such as an oil price hike will show up more quickly in each country's domestic and export prices, and thereby be transmitted to its major trading partners. Domestic inflationary pressures are not only transmitted abroad, but may also be exacerbated. On the other hand, if countries are less synchronised in this respect a common oil shock will place less pressure on prices in some countries – the weaker economies are more likely to absorb the real income losses without significant wage and price hikes – and the international transmission effects are likely to be dampened.

As is discussed below, business conditions in the major industrial economies in mid-1990 were much less uniform than had been the case in 1978, when an upturn was in progress in most industrial

countries, or in 1973, when a downturn was evident in all of the five largest industrial countries. Relative to 1978, this helped to dampen the inflationary effects of the 1990 shock; relative to 1973, it helped to dampen the contractionary effects of the shock.

Internal demand effects

An additional consideration concerns the potential aggregate demand effects arising from the transfer of purchasing power between the household sector and the corporate sector or the government sector following energy price fluctuations. Profits in the petroleum industry will generally increase in the wake of an unanticipated oil price rise, potentially influencing future cash flows, dividend payments and investment decisions. Government revenue from the ownership of oil production facilities and energy taxes will also rise. For example, the full year effects on UK government receipts of each \$10 rise in the oil price is estimated at about £2 billion in 1990 (HM Treasury (1990)). If there are marked differences between the marginal propensities to spend in these sectors - consumers, producers, taxpayers and government - then income transfers could influence the pattern and rate of aggregate demand growth. These redistribution effects will be more pronounced in countries with substantial energy production or refining facilities, of course, and will also tend to show up in countries where the regional effects of energy price fluctuations are unevenly distributed.

There is some evidence to suggest that these income transfers could be important in influencing the pattern and rate of aggregate demand growth. Following the first and second oil shocks in the 1970s, there were surges in investment in the energy industry which helped to offset some of the contractionary effect on aggregate demand growth. This was the case in the United States, the United Kingdom, Norway, Canada and other oil-producing nations.

No investment boom in the energy sector occurred in late 1990, however, perhaps signalling a more cautious approach by the industry in the light of its experience of excess capacity and low prices

in the late 1980s. Moreover, the return of oil prices to their pre-shock level in early 1991, indications of plentiful oil supplies and the moderate tone of the March 1991 OPEC meeting afforded no additional incentive for investment in the oil sector. The implication, however, is that investment in the energy sector did not provide a partial offset to the contraction in aggregate demand growth as had been the case following the shocks in 1973–74 and 1978–80. In some industrial countries, such as Canada, or in particular regions, such as the South-West of the United States, this may be an important difference between the present circumstances and those following the oil shocks in the 1970s.

The pattern of demand may also be influenced by substitution effects. Following an oil price hike domestic residents attempt to conserve imported oil by switching to other products, thus helping to stimulate domestic demand. This would include market pressures to increase the production of oil-substitute intermediate goods. Nonetheless, for a net importer of intermediate goods with a low degree of short-term substitutability, these two effects on aggregate demand are likely to be moderate.

Expectations and wealth effects

Beyond the direct real income loss associated with a rise in oil prices, the wealth effect and consequent impact on aggregate demand will also be influenced by expectations of future price developments. These in turn are dependent on the longer-run supply and demand conditions in energy markets. If the oil price rise is expected to be a transitory phenomenon, the reduction in domestic wealth and consequent fall in aggregate demand is likely to be mitigated. This is because households tend to resist cutting consumption expenditures in response to a temporary decline in current income, “smoothing” their consumption over time by reducing saving. By contrast, if the terms-of-trade deterioration associated with the oil price rise is expected to be permanent, then the corresponding wealth and aggregate demand effects will generally be magnified.

Of course, it is difficult to predict whether an oil price hike will be transitory, or to determine the extent to which a rise in the price of oil was generally anticipated. The timing of energy price movements is particularly difficult to predict because the lion's share of world oil production is concentrated in the Middle East, a region where hostilities – either wars or revolutions – have contributed to the most dramatic oil price hikes.

Nonetheless, most longer-term energy forecasts had been predicting a gradual tightening of energy market conditions and a firming of prices before the Iraqi invasion of Kuwait and oil prices had risen somewhat following the OPEC meeting in July 1990. To the extent that oil price rises had been anticipated, and were already incorporated in expected wealth, the contractionary effect on demand growth in the autumn of 1990 should have been dampened. Moreover, most forecasters in the weeks following the Gulf crisis argued that an oil price of over \$30 a barrel would be unsustainable for an extended period in the absence a further major disruption of supply in the Middle East. Pointing to the increase in oil output by producers other than Iraq and Kuwait, which quickly made up for the initial supply shortfall, an equilibrium price somewhere around \$25 was typically predicted (OECD (1990)). Of course, the actual price decline, to below \$15 in early 1991 and then recovering somewhat, exceeded these expectations.

Aspects of private sector adjustment

Another important aspect of the impact of an oil price rise on aggregate demand concerns the ability of the private sector to perceive the shock and understand its economic consequences. This involves a “learning by doing” process based on previous experience, which for convenience we characterise as a structural feature of economic adjustment, and which is clearly evident in the different inventory cycles following the three oil shocks. In particular, the inventory cycle was more severe in some countries following the first oil shock than after the second and third, eventually contributing to

the more marked business cycle downturn. Sachs (1982), for example, argues that market signals in 1974 were completely misinterpreted, partly because the oil price hike preceding the slowdown was the first significant supply shock in thirty years. The rise in prices was perceived to reflect a general overstimulation of the economy rather than a one-off price level increase, and as a consequence many businesses in the United States stockpiled inventories as the economy slowed in 1974, leading to unprecedented inventory/sales ratios. When the nature of the slowdown became evident, however, a large inventory liquidation ensued in 1975 and sales far exceeded production, exacerbating the slump in aggregate demand and the slowdown in the economy.

By contrast, a much smaller rise in the inventory/sales ratio, and less subsequent destocking, were noted in 1979–80. Firms were cautious in their inventory plans prior to the second oil shock as forecasts of impending recession had become frequent by late 1978 (before the magnitude of the price hikes by OPEC could have been anticipated). The result was that a shift in inventory investment was not the major factor contributing to the recession in 1980 in the United States as had been the case in previous recessions.

Similarly, inventory overhang in the months immediately following the mid-1990 oil price hike was also largely avoided. Based on past experience, and with greater emphasis on “just in time” inventory planning, inventory/sales ratios did not rise significantly in most cases as economies slowed in the second half of 1990. This in turn helped to prevent a sharp inventory destocking in the economic downturn in the fourth quarter of 1990 and the first quarter of 1991.⁶

⁶ Another example of uncertainty playing an important role in the dynamics of adjustment to oil price shocks is provided by Blanchard and Fischer (1989). They show that when there is uncertainty over whether an observed oil price hike is temporary or permanent, economic adjustment to it will be slowed and the cycle prolonged even in the presence of rational expectations. The firmer expectation that the second oil price shock was permanent may have speeded the adjustment to that shock relative to the first.

Monetary factors and demand policy

Assuming no change in the supply of money in nominal terms, the upward pressure on the general price level arising from the supply-side effect of the oil shock would lead to lower real money balances and higher interest rates. In a modelling sense, this amounts to an upward movement along the economy's aggregate demand curve rather than a shift in demand, and is an important channel through which the effect of the adverse supply shock is transmitted to the economy. The size of the interest rate effect reflects the interest sensitivity of the demand for money, the interest sensitivity of investment and other components of aggregate demand. Recent estimates based on the assumption of unchanged monetary and fiscal policies, for example, found that short-term interest rates would be likely to rise by about 0.75% for the group of industrial countries following a 40% increase in the price of oil (IMF (1990)). The same study estimates rises of about 1% for short-term rates in the United States, Japan and Germany.

Typically, however, the more important factor influencing the short-term aggregate demand response to the oil price hike is the overall stance of monetary and fiscal policies. These policies, both prior to and following a shock, play a central role in the evolution of inflation, output, employment and other important variables. Differences in monetary and fiscal stances before and after the three oil shocks, as is explained in detail below, in large part account for the subsequent, widely divergent, patterns of adjustment to the first and the second oil shocks. More recently, the firmer stance of monetary policy prevailing in most industrial economies tended to limit the inflationary impact of the oil shock after mid-1990, but probably strengthened the contractionary effect on output. This will be discussed in the following two sections.

III.

Oil shocks and initial business cycle conditions

The short and medium-term effects of an oil shock depend not only on the structural characteristics of the economy, but also on the state of the business cycle. The actual evolution of output and prices following an oil price rise will obviously depend on the “initial” conditions preceding the shock – the state of aggregate demand as characterised by the level of capacity utilisation, inflationary pressure, monetary conditions and so on. But the net effect of the shock may also be dependent on business cycle conditions. For example, asymmetries in price and wage adjustment, in the formation of price expectations and in the responses of the monetary and fiscal authorities could make the net effects of a shock on inflation, output and unemployment vary with the state of the business cycle.

Graphs 3 to 10 below show the most important business cycle indicators for the major industrial countries before and after the oil price shocks of the 1970s, and contrast them with conditions prior to and immediately following the mid-1990 shock. The vertical line indicates the timing of each oil shock and points to the left (right) refer to variable values preceding (following) the shock. Indicators of economic activity, price pressures and monetary policy are shown. This comparison suggests that inflationary pressures and signs of “overheating” were much less prevalent in mid-1990 than had been the case prior to the two shocks in the 1970s. As in the case of the 1973–74 oil shock – though not to the same extent, and in contrast to the price hike starting in 1978 – monetary tightening had been imposed to stem overheating pressures in most countries more than a year prior to the oil shock in mid-1990. Also as in the 1973–74 episode, a distinct slowing in economic activity was well under way before the 1990 oil shock.

The 1973–74 oil shock

After moderate increases in the average price of oil from the beginning of 1972 until September 1973, the first oil price explosion in 1973–74 came in the wake of the Yom Kippur war in the Middle East. Following the outbreak of hostilities in October 1973, the oil-producing Arab states announced first a 10% cut in production, and later a 25% cut, accompanied by a partial embargo on oil shipments. Fears of massive shortages grew and most oil-importing nations took steps to conserve supplies and prepare emergency allocation procedures. Despite initial supply disruptions, the embargo eventually proved ineffective, and the sustained impact was not on the flow of oil, but on its price. As is shown in Graph 2, the price eventually quadrupled, with the increases being mainly concentrated in the last quarter of 1973 and early 1974.

The economic situation on the eve of the first oil shock in late 1973 was one of considerable uncertainty and a substantial build-up of inflationary pressures. In the latter part of the mild “growth recession” of 1970–71, monetary policies shifted to a highly stimulative stance in most industrial countries, leading to an outburst of worldwide inflation (Graph 3). The uncertainties and policy mistakes during the transition from the adjustable-peg exchange rate system to one of managed floating rates not only contributed significantly to this inflation, but also marked a watershed in the structure of the international monetary system. This shift greatly increased the degree of uncertainty in international business and trade arrangements, at least temporarily.⁷

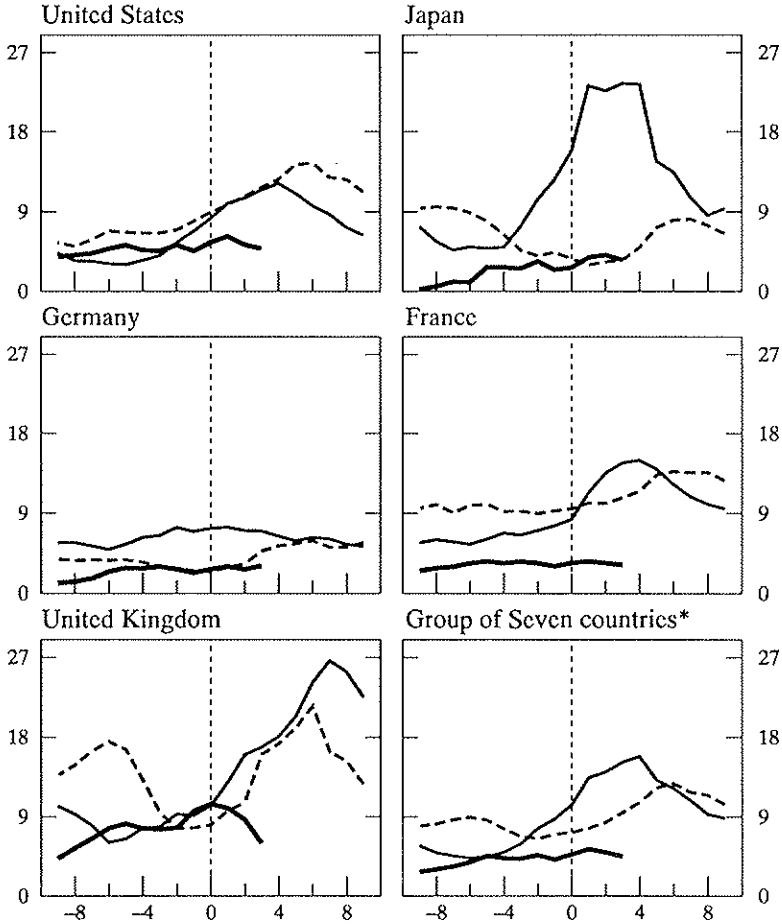
Pressures on the Bretton Woods adjustable-peg exchange rate system had been growing for some time, as was evidenced by more frequent parity adjustments and growing doubts about the “soundness of the dollar” and its role as the primary reserve currency. US official settlement deficits grew sharply in 1971,

⁷ The McCracken Report (OECD (1977)) contains an excellent comprehensive discussion of the business conditions and policy stances prevailing in the late 1960s and early 1970s.

Graph 3
Consumer price inflation
 Changes over four quarters, in percentages

Date of oil shock (and period covered):

- 4th quarter 1973 (3rd quarter 1971-1st quarter 1976)
- - - 4th quarter 1978 (3rd quarter 1976-1st quarter 1981)
- 3rd quarter 1990 (2nd quarter 1988-2nd quarter 1991)



* Calculated using 1988 GDP weights and exchange rates.

creating an explosion in European and Japanese international reserves and contributing to the growth of liquidity in these countries. These imbalances led to speculative pressures and forced major realignments in currency parities and short periods of floating rates in the course of 1971. Although a major realignment of official parities was completed with the Smithsonian agreement in December 1971, the system nonetheless came under almost immediate pressure as a result of continuing large US international payments imbalances and speculative pressures in the foreign exchange markets, culminating in the floating of the Japanese yen against the dollar in February 1973 and the adoption of joint floating arrangements by the EC member countries against the dollar a month later.

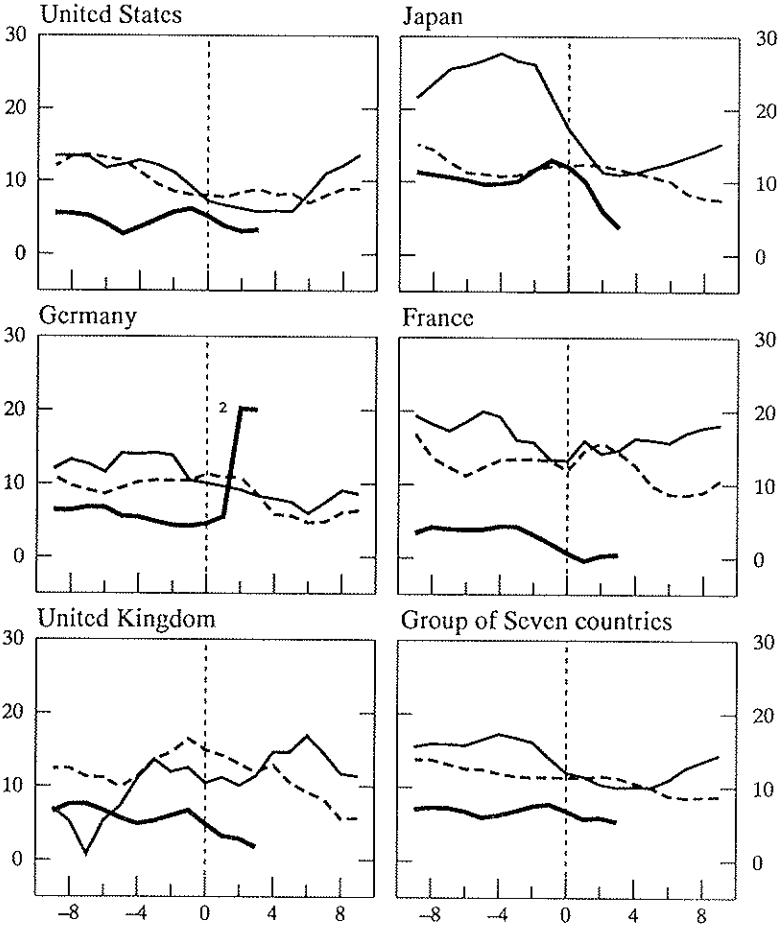
The increase in international reserves during this period, together with the willingness to move towards a more expansionary stance so as to offset the economic slowdown in 1970-71, led to a rapid acceleration in money growth synchronised across most of the industrial countries (OECD (1977)). Average money growth in the major industrial countries started to quicken at the beginning of 1970, and in 1971 broad money growth amounted to about 16% (Graph 4, seven quarters prior to the oil price hike); the rate of increase in 1972 was even higher, at over 17%. Average short-term interest rates declined from 8% in early 1970 to 4% by early 1972 (Graph 5). These policies contributed to booming business conditions; over the eighteen-month period following the Smithsonian agreement the industrialised world experienced the most rapid upswing since the 1950s. Average real GNP growth for the industrial countries in 1972 was almost 7% (Graph 6). Although the level of resource utilisation had been higher in 1968, the exceptional speed of the 1972-73 expansion combined with the "liquidity overhang" contributed to significant inflationary pressures and surges in raw materials and food prices, partly fuelled by speculative forces.⁸

⁸ For example, the Economist spot index of industrial materials prices doubled between mid-1972 and the autumn of 1973 (OECD (1977)).

Graph 4
Money supply¹
 Changes over four quarters, in percentages

Date of oil shock (and period covered):

- 4th quarter 1973 (3rd quarter 1971-1st quarter 1976)
- - - 4th quarter 1978 (3rd quarter 1976-1st quarter 1981)
- 3rd quarter 1990 (2nd quarter 1988-2nd quarter 1991)



¹ For the United States and France, M2; for Japan, M2+CDs; for Germany, M3; for the United Kingdom, M0. ² From 1991, including eastern Germany.

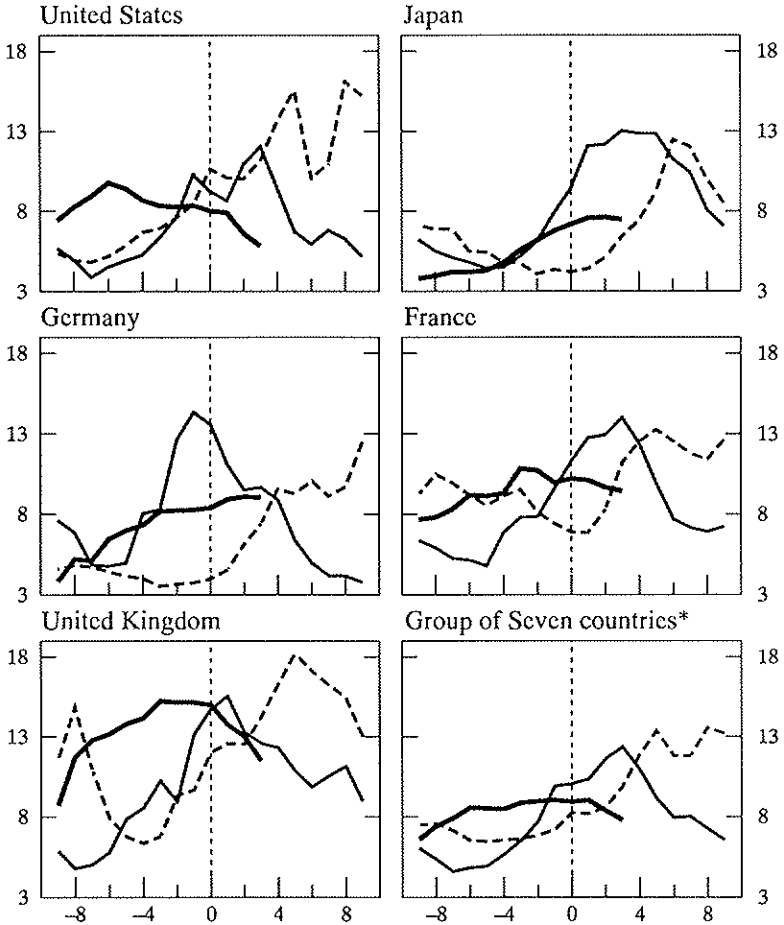
Graph 5
Short-term interest rate
 Quarterly averages, in percentage points

Date of oil shock (and period covered):

———— 4th quarter 1973 (3rd quarter 1971-1st quarter 1976)

- - - - - 4th quarter 1978 (3rd quarter 1976-1st quarter 1981)

———— 3rd quarter 1990 (2nd quarter 1988-2nd quarter 1991)

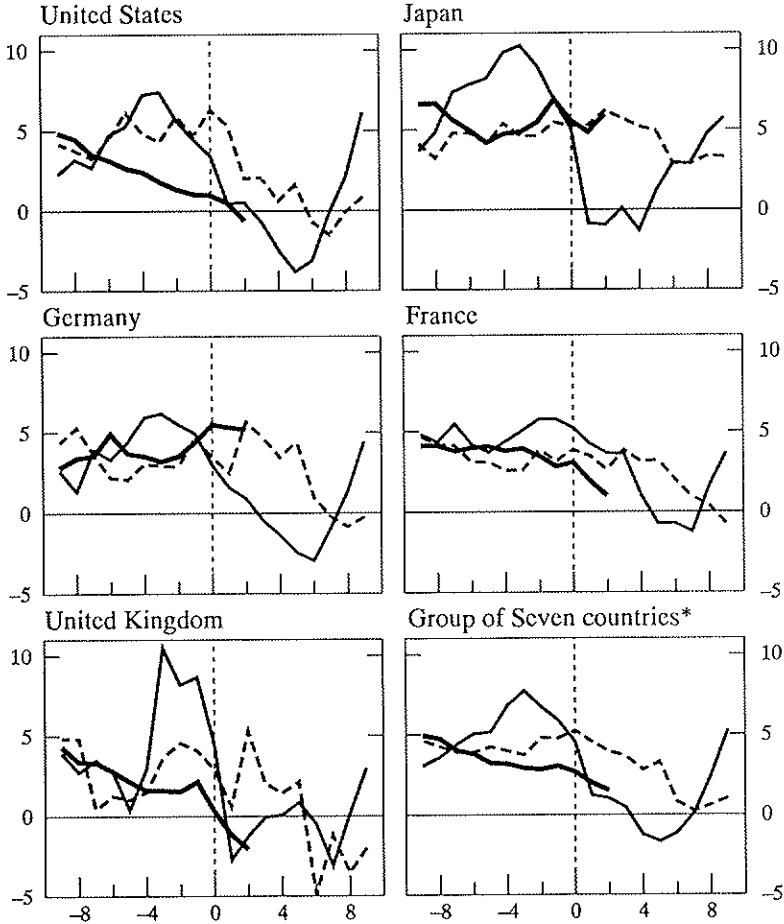


* Calculated using 1988 GDP weights and exchange rates.

Graph 6
Real GNP/GDP
 Changes over four quarters, in percentages

Date of oil shock (and period covered):

- 4th quarter 1973 (3rd quarter 1971-1st quarter 1976)
- - - 4th quarter 1978 (3rd quarter 1976-1st quarter 1981)
- 3rd quarter 1990 (2nd quarter 1988-1st quarter 1991)



* Calculated using 1988 GDP weights and exchange rates.

Table 3
**Central government fiscal balances and impulses
in major industrial countries**
As a percentage of GDP

	First oil shock ¹				Second oil shock ²				Third oil shock ³	
	1973	1974	1975	1976	1978	1979	1980	1981	1989	1990
Fiscal balance (+ = surplus/- = deficit)										
Canada	0.3	0.8	- 2.3	-1.8	- 4.6	- 3.5	- 3.5	- 2.2	- 3.5	- 3.4
United States	-0.4	-0.7	- 4.9	-3.4	- 2.0	- 1.1	- 2.3	- 2.4	- 2.6	- 2.8
Japan	-5.2	-5.8	- 8.9	-8.3	- 5.2	- 6.1	- 6.2	- 5.9	- 0.8	- 0.7
France	0.6	0.3	- 3.0	-1.1	- 6.1	- 1.5	- 1.1	- 2.6	- 1.6	- 1.4
Germany	0.5	-0.7	- 3.6	-2.7	- 2.1	- 1.8	- 1.6	- 2.1	- 0.9	- 1.8
Italy	-8.3	-7.5	-10.7	-9.1	-13.1	-10.8	-10.8	-12.8	-11.2	-10.9
United Kingdom	-3.2	-4.4	- 8.0	-5.5	- 3.3	- 2.2	- 2.5	- 2.9	0.7	0.6
Fiscal impulse (- = contractionary)										
Canada	-0.2	-0.6	2.0	1.7	1.2	- 0.5	- 0.2	- 1.1	0.1	- 0.6
United States	-0.7	-1.3	2.0	1.1	0.1	- 0.8	0.4	-	- 0.4	- 0.2
Japan	0.9	0.4	2.9	2.5	0.2	1.1	0.1	- 0.5	- 0.3	-
France	-0.3	-0.4	2.3	0.6	0.9	0.1	- 0.8	1.1	- 0.2	- 0.3
Germany	-0.5	0.1	1.8	1.4	0.1	-	- 0.7	- 0.8	- 0.6	... ⁴
Italy	1.5	0.8	2.2	1.2	3.8	- 1.7	0.1	0.7	- 0.3	- 0.6
United Kingdom	2.3	2.1	4.7	2.5	2.1	- 0.8	- 1.6	- 1.5	0.4	0.1

¹ Source: IMF (1990). The fiscal impulse measure is the cyclically adjusted neutral fiscal balance minus the actual balance for the years 1973-76.

² Source: IMF (1986), April.

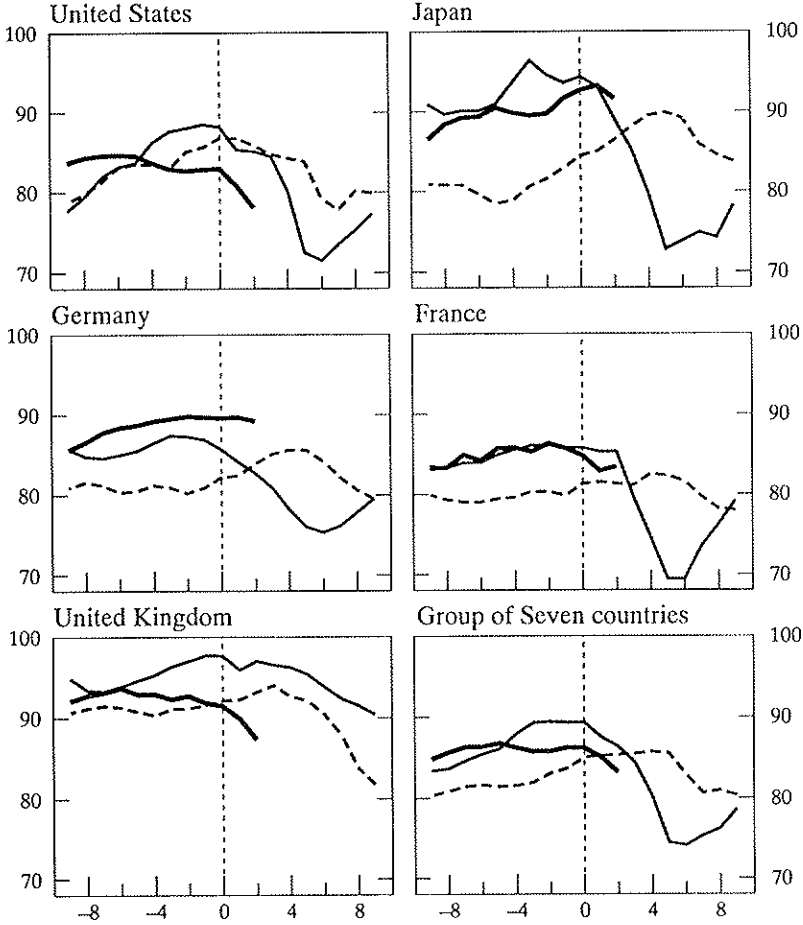
³ Source: IMF (1991), May.

⁴ No estimate due to break in series.

In response to the rapid expansion of demand, policies shifted to a restrictive stance in 1973. The growth of broad money in the major countries was reduced from 17% at end-1972 to 12% at end-1973, and short-term interest rates more than doubled in all of the major industrial countries between the first quarter of 1972 and the third quarter of 1973. The fiscal impact indicator, measured by "fiscal impulse" in Table 3, also pointed to a general move to restraint in 1973.

Graph 7
Capacity utilisation*

Date of oil shock (and period covered):
 ——— 4th quarter 1973 (3rd quarter 1971-1st quarter 1976)
 - - - - 4th quarter 1978 (3rd quarter 1976-1st quarter 1981)
 ——— 3rd quarter 1990 (2nd quarter 1988-1st quarter 1991)



* For Japan, 1968 peak=100 of operating rates; for the United Kingdom, BIS estimate based on survey data; for the G-7 countries, calculated using 1988 GDP weights and exchange rates.

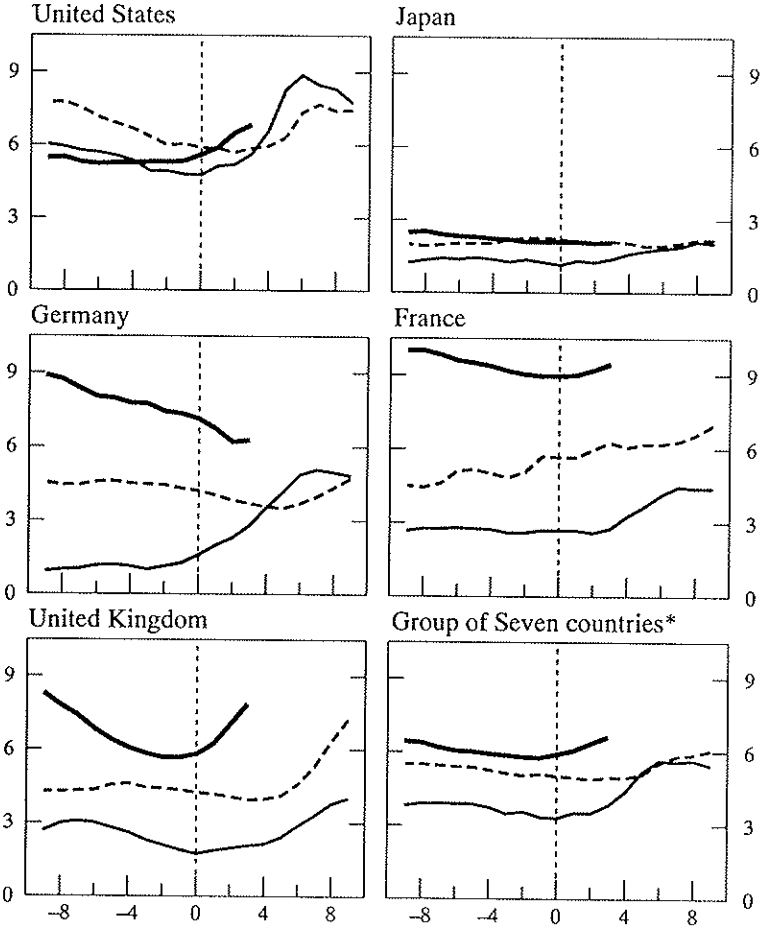
Graph 8
Unemployment rate
 Quarterly averages, as a percentage of the labour force

Date of oil shock (and period covered):

—— 4th quarter 1973 (3rd quarter 1971-1st quarter 1976)

- - - 4th quarter 1978 (3rd quarter 1976-1st quarter 1981)

—— 3rd quarter 1990 (2nd quarter 1988-2nd quarter 1991)



* Total number of unemployed as a percentage of the total labour force.

In terms of real growth rates, business conditions peaked for most large industrial countries in the first quarter of 1973, three quarters before the major part of the oil price hike. By the end of the year growth in real activity had dropped to 4.5% in the G-7 countries on average and a recession occurred in 1974 (with real output declining by 1.3% on average) and the first half of 1975. Reflecting the drop in activity, capacity utilisation fell back from the peak registered in the first quarter of 1973 (Graph 7), with a particularly sharp drop being recorded in Japan. Average unemployment had been gradually declining during the two-year period prior to the first oil shock, and stood at 3.3% in the fourth quarter of 1973 (Graph 8).

The move to restrictive policies proved too little and came too late to stem the cumulative build-up of inflationary pressures, however. Inflation continued to rise in most industrial countries throughout 1973. Double-digit rates were reached in Japan as early as the second quarter of the year. The average G-7 inflation rate, as measured by the consumer price index, rose from 5% in fourth quarter of 1972 to 8.8% in the third quarter of 1973 and jumped to over 10% in the fourth quarter of that year. Moreover, measured inflation understated the true inflationary pressures owing to the mandatory prices and incomes controls in the United States, initially imposed in 1971. This partly shifted the timing of price pressures to coincide with the aftermath of the oil shock and contributed to measured inflation at that time. Moreover, during 1973 the pressures emanating from goods markets began to flow over into labour markets. A price-wage spiral had already been set in motion before the oil shock as workers demanded "catch-up" wage increases (Graph 9) to compensate for the inflation-eroded purchasing power of nominal wages.

Given the jump in inflation, the level of nominal interest rates was not always an accurate indicator of the stance of policy. Real short-term interest rates, as measured by the nominal rate less CPI inflation (Graph 10), were less than 1% on average for the industrial economies throughout much of 1973 and were frequently negative in many countries despite the rise in nominal rates. A wide range between the major countries was evident, however, with Japan

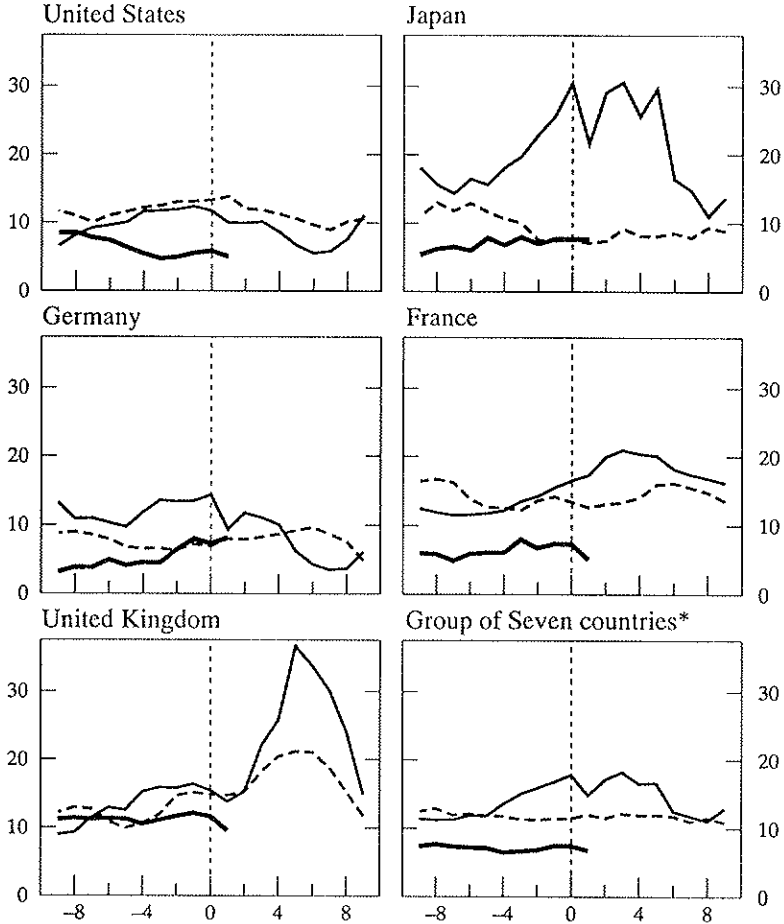
Graph 9
Compensation of employees
 Changes over four quarters, in percentages

Date of oil shock (and period covered):

—— 4th quarter 1973 (3rd quarter 1971-1st quarter 1976)

- - - 4th quarter 1978 (3rd quarter 1976-1st quarter 1981)

—— 3rd quarter 1990 (2nd quarter 1988-4th quarter 1990)



* Calculated using 1988 GDP weights and exchange rates.

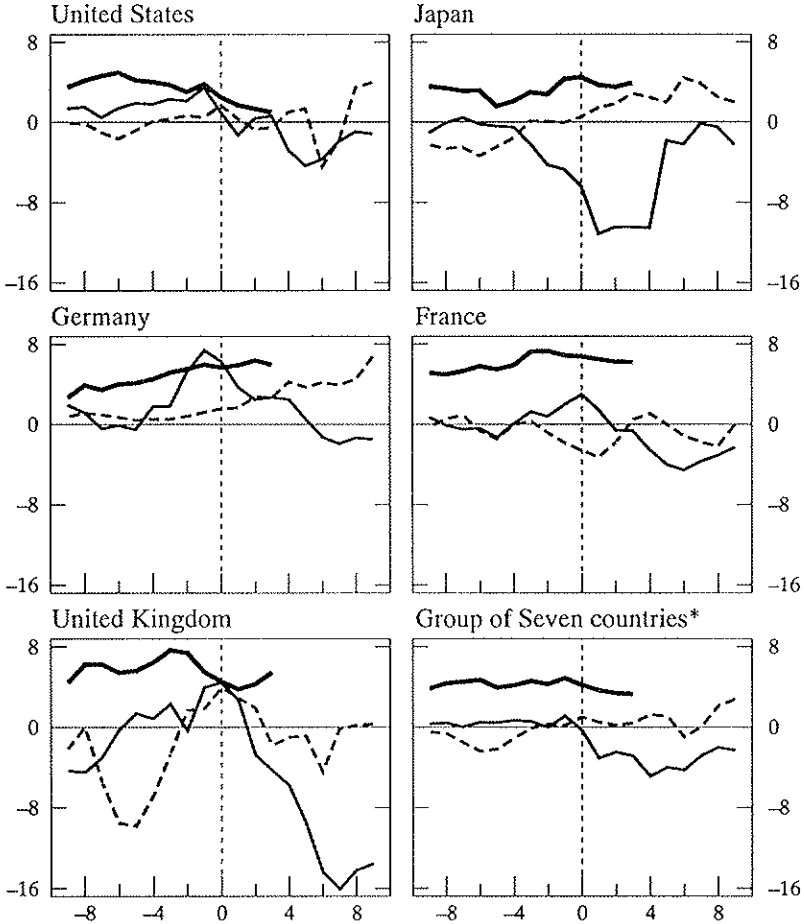
Graph 10
Real short-term interest rate
 Quarterly averages, in percentage points

Date of oil shock (and period covered):

— 4th quarter 1973 (3rd quarter 1971-1st quarter 1976)

- - - 4th quarter 1978 (3rd quarter 1976-1st quarter 1981)

— 3rd quarter 1990 (2nd quarter 1988-2nd quarter 1991)



* Calculated using 1988 GDP weights and exchange rates.

experiencing significant negative and Germany very high positive short-term real rates of about 6% on the eve of the oil shock. Real rates in the United States, France and the United Kingdom were also significantly positive.

The 1978–80 oil shock

The second oil price explosion began at the end of 1978, with OPEC's decision to raise the price of oil by a total of 15% in several stages within one year against the backdrop of improved demand conditions. Oil prices began to firm in the final quarter of the year on this announcement, and more than doubled during the course of 1979 following the supply disruption and uncertainties caused in part by the Iranian revolution. Unlike the 1973 experience in which a downturn had already begun, the oil price shock at the end of 1978 cut short the growth cycle in most of the major industrial economies. Average real GNP growth for the G-7 countries reached 5.2% in the fourth quarter of 1978, followed by a gradual decline in most countries. US, Japanese and French growth rates peaked in the fourth quarter, while Germany and the United Kingdom reached high points one or two quarters earlier.

The extent of "overheating" in the industrial economies preceding the second oil price shock was much less than in 1973–74, whether measured by rates of capacity utilisation, unemployment levels or observed inflation rates. Unemployment rates at the time of the second shock were much higher, and average capacity utilisation rates somewhat less on average. Inflation (consumer prices) at the end of 1978 was about 7% on a year-on-year basis for the G-7 countries, compared with over 10% prior to the 1973–74 oil price hike.

Considerable diversity in inflation performance was evident, however, and the synchronised overheating conditions prevailing on the eve of the first oil shock in almost all industrial economies were absent at the end of 1978. Japan and Germany had managed to significantly reduce their inflation rates to around 4% by the end of

1978, far below the rates prevailing prior to the first oil shock, particularly in the case of Japan. Inflation in the United States, at 8%, was roughly similar prior to both shocks, and equally worrying was the rise in inflation since the mid-1970s. With double-digit rates at the end of 1978, the United Kingdom and France were both experiencing somewhat higher inflation than that recorded just prior to the first oil price hike.

Given divergent business cycle conditions, policy stances also varied significantly among the industrial economies prior to the second oil shock. Monetary policy in Japan and Germany was generally stimulative in 1978, with broad money growth rates of about 12 and 11% respectively, and by year-end short-term interest rates were roughly unchanged from 1977 year-end levels (quarterly averages). By contrast, the United States and the United Kingdom had begun to tighten policies by the second quarter of 1978, so that their respective short-term nominal interest rates in the fourth quarter of 1978 stood about 400 and 550 basis points above the levels of the previous year. Although higher inflation in the United States made monetary conditions somewhat less restrictive than nominal interest rate levels would suggest, rates in real terms nonetheless rose by about 150 basis points. With the exception of France and Italy, real interest rates in the major industrial countries were significantly positive at the end of 1978 and considerably higher in the United States and, especially, Japan than had been the case at the end of 1973.

With respect to fiscal positions, the Governments of Germany and Japan committed themselves to following more expansionary policies at the Bonn Economic Summit in the summer of 1978, providing an "engine of growth" to sustain the economic expansion.⁹ According to cyclically adjusted impulse measures, fiscal policies were generally expansionary in 1978, providing an average net stimulus of about 0.5% of GNP for the G-7 countries (IMF (1986), p. 192). Among individual countries, fiscal stimulus in 1978

Footnote see page 34.

amounted to about 0.2% in Japan and 0.1% in Germany and the United States. (The figures for 1979 are 1.1% for Japan, no change for Germany and -0.8% for the United States.)

The 1990 oil shock

The oil market was quite weak during the first half of 1990, with prices declining throughout June. The market firmed somewhat in mid-summer, and spot prices subsequently doubled, from below \$15 a barrel in July to about \$30 in August (monthly average), immediately following the outbreak of the Gulf crisis. By contrast with the earlier oil price shocks, however, oil prices began to fall after several months and soon approached their pre-shock levels. By March 1991, following the allied military victory, average spot prices were again around \$15 a barrel. In percentage terms the 1990 oil price hike, measured from trough to peak, was also less dramatic than either of the oil shocks in the 1970s. Moreover, owing to the weakness in the oil market in the second half of the 1980s, the doubling of oil prices in mid-1990 was from a very low base in real terms.

The oil shock in August 1990 came amidst signs of slowing activity in most industrial countries. Year-on-year average real GNP growth in the major industrial economies had gradually decelerated from about 5% in mid-1988 to about 2³/₄% by the third quarter of 1990,

⁹ For example, with respect to Germany the 1978 Bonn communiqué stated that the government would propose to the legislative bodies additional and quantitatively substantive stimulative economic measures up to 1% of GNP. Analysis by Holtham (1989, p. 156) indicates that additional government expenditures amounted to about 0.25% of GNP in 1979, while tax cuts amounted to about 0.6% of GNP, for a total budgetary effect of about 0.85% of GNP in 1979. With respect to Japan, the communiqué states that the "... government is striving for the attainment of the real growth target for fiscal year 1978, which is about 1.5 percentage points higher than the performance for the previous year, ...". Fiscal year (1st April to 31st March) 1978 growth in Japan was about 0.14% higher than in 1977. See von Furstenberg and Daniels, "Policy undertaking by the seven 'summit' countries: ascertaining the degree of compliance" (1990).

led by a clear weakening of activity in the United States, the United Kingdom and Canada. Although robust conditions continued to prevail in Japan and Germany, signs of spreading weakness were evident in several other countries, including Australia and Sweden. Some slowing of real GNP growth was evident in France and there were signs of weakness in the industrial sector in Italy, where production had peaked in December 1989.

Inflationary pressures were relatively moderate in most industrial countries in mid-1990 considering the length of the business cycle upturn up to that time. Whether measured by the GNP deflator, the consumer price index or consumer prices excluding energy, average inflation in the G-7 industrial countries in mid-1990 was about 4%. The average inflation rate for the G-7 countries was also roughly unchanged during the year prior to the oil shock. However, high inflation rates in the United Kingdom, Canada and Sweden were serious policy concerns, and some acceleration in inflation was evident in the United States and Japan.

The slowing of real output growth was partly related to the pre-emptive tightening of monetary policy by most central banks in the spring of 1988. As the graph on short-term interest rates (Graph 5) indicates, steps to tighten monetary stances were taken more than two years prior to the oil price shock in August 1990. As signs of overheating became evident at the beginning of 1988 – firming labour markets, higher rates of capacity utilisation and continuing strong growth – central banks began to raise short-term interest rates and continued to push them up or keep them at high levels over the course of the next two years. Reflecting these measures, monetary growth was moderate in most industrial countries, averaging about 7½% for the G-7 in mid-1990, and real interest rates were high. The average real short-term interest rate in the second quarter of 1990, for example, was about 5% for the G-7 countries and well above 4% in most industrial countries. Among the major industrial countries, the noteworthy exception was the United States, where the Federal Reserve eased short-term money market rates from spring 1989 to the end of the year in response to early signs

of weakness in the economy; in the first three quarters of 1990 US policy remained roughly unchanged and short-term rates held steady.

The generally restrictive orientation of budgetary policies in the first half of 1990 was also a factor in the slowing of aggregate demand growth (Table 3). Fiscal stances in most industrial countries prior to the 1990 oil shock were generally contractionary, as governments continued to pursue the objective of budget consolidation following a decade of rapidly growing public debt. Using the IMF fiscal impulse measure, i.e. central government budgets adjusted for cyclical conditions in the economy, the contraction for the G-7 industrial countries amounted to about 0.3% of GNP in 1989 (IMF (1990)). With the exceptions of the United Kingdom and Canada, contractionary policies were pursued by central governments in the G-7 countries in 1989, with variations ranging from 0.2% of GNP in France (least contractionary) to 0.6% in Germany (most contractionary). US budgetary policy amounted to a contraction of about 0.4% of GNP, sufficient to lower the fiscal deficit somewhat despite a marked deceleration in economic growth. Although the average central government budget deficit in the G-7 countries rose somewhat in 1990 for the year as a whole, to 2.5 from 2.4% of GNP, this mainly reflected the slowdown in economic activity rather than a shift towards fiscal expansion. Excluding Germany, the average aggregate demand "impulse" of fiscal policy in the industrial countries in 1990 was distinctly contractionary. The fiscal stimulus and sharp increase in the budget deficit in Germany, by contrast, were mainly attributable to the transfers to the former GDR in connection with unification and were unrelated to the oil shock.

Although more difficult to quantify, a climate of considerable uncertainty had developed by mid-1990 regarding several aspects of the economy and economic policy in the United States. In particular, the wide extent and the scale of the collapse in the savings and loan industry were becoming clearer, with ever higher estimates of the eventual cost to taxpayers. Concern over the health of other financial institutions, particularly banks, was also widespread, in part because of their exposures in the overbuilt commercial property market and

weak real estate markets generally (Bisignano (1991)). The heated political debate over the appropriate tax and spending measures to reduce the large US federal budget deficit also reached a climax in mid-1990, which, together with large upward revisions in deficit forecasts, further heightened uncertainty over the economic outlook.

In several important respects, economic conditions in mid-1990 were similar to those at the beginning of the first oil shock in 1973. At that time an even sharper deceleration in GNP growth had been under way for several quarters, albeit from a higher overall level of activity so that average growth was greater at the time of the oil shock in 1973 than in 1990. But the downward momentum of the business cycle was clearly evident in both cases, related in part to more restrictive monetary conditions – a similarity not fully reflected in the more optimistic growth forecasts immediately following the 1990 oil price hike. One reason for this was that the momentum, intensity and widespread nature of the downturn was not entirely clear from the available data in mid-1990. Initial post-shock forecasts also tended to emphasise generally favourable inflation trends compared with previous oil shocks rather than the slowdown which was under way as in 1973. In addition, the contractionary demand effect of high real interest rates prior to the oil price hike in 1990, contrasting sharply with an average real short-term rate of about 1% or less before the two shocks in the 1970s, was probably not fully taken into account in many of the more optimistic growth projections.

Another similar feature was the climate of uncertainty. In 1990 there was widespread concern over the stability of domestic financial systems, particularly in the United States, as well as the problem of ongoing US budget deficits. In 1973, there was widespread concern over the stability of the international monetary system and whether the move to flexible exchange rates would help redress the international imbalances which had led to a breakdown of the Bretton Woods System. Concern over war and oil supply disruptions, either through the destruction of facilities or embargoes, was also an element common to both 1973 and 1990 which led to greater uncertainty.

The similarities between the economic conditions surrounding the oil shocks should not be exaggerated, however. Clearly, inflation was a much greater problem prior to the 1973 and 1978 shocks than it was in mid-1990. The cumulative inflationary pressures and monetary overhang prior to the 1973 shock were especially large. Similarly, the deceleration of output growth immediately preceding the 1973 oil shock was also much sharper and more general than that in mid-1990.

IV. Responses to the oil shocks

The policy responses in the industrial countries following each of the three oil shocks were influenced not only by explicit policy reactions to the shocks themselves, but also by other factors influencing the overall policy stance. As described in the previous section, business cycle conditions and policy stances preceding the oil shocks were quite different in some respects and varied from country to country. This played an important role in determining the timing, magnitude and duration of the monetary policy response immediately following the shocks.

The institutional environment in which monetary and fiscal policies operated also changed markedly in the mid to late 1970s, contributing to generally less accommodating stances in response to the oil shocks in 1978-80 and 1990. During the mid and late 1970s central banks in most industrial countries changed their operating procedures to focus more on the growth of money and credit aggregates. This allowed a more definitive and clearly articulated monetary policy stance in the wake of the second shock, which proved effective in many cases in stabilising inflation expectations and influencing the wage and price-setting process. Although by the late 1980s central banks were focusing less on a single monetary aggregate – often using a variety of indicators in formulating policy – a much higher priority was given to holding the line against inflation than had been the case in the early 1970s. Moreover, the fiscal focus

following the 1978–80 and, especially, 1990 oil shocks was more conservative in most countries, as governments were concerned with consolidating public finances, which had grown increasingly lax in many countries during the mid to late 1970s.

One difficulty in precisely identifying and comparing the policy responses following the oil price hikes is that the shocks themselves differed widely in timing, magnitude and duration. In some respects the first shock may be viewed as a one-off event, with most of the almost fivefold price rise between the first quarter of 1973 and the fourth quarter of 1974 (from \$2.10 to \$10.40 a barrel) being concentrated between September and March when the monthly average price climbed from \$2.80 to \$9.60 a barrel. The second shock, by contrast, was more clearly a sequence of several price increases, gradually leading to more than a tripling of the price from \$12.80 in the third quarter of 1978 to \$40 in the fourth quarter of 1979. Finally, the third oil price hike in 1990 was also a one-off event which, unlike the previous shocks, was quickly reversed – spot market oil prices more than doubled between July and September, from \$15 to over \$30 a barrel, but declined subsequently to approach their pre-shock level in early 1991. Moreover, the weakness in the oil market in the mid and late 1980s resulted in a significant decline in real oil prices over this period, so that oil prices at their peak following the 1990 shock were still lower than those prevailing in the early 1980s.

Despite differences in the timing, magnitude and duration of the shocks, however, the general responses may nonetheless be identified and fairly clear contrasts drawn between the three episodes.

Monetary policy

First oil shock

In the aftermath of the first oil shock, most central banks increased short-term interest rates in an attempt to ward off additional inflationary pressures. Average short-term interest rates for the major industrial countries climbed more than 300 basis points

between the fourth quarter of 1973 and the third quarter of 1974. However, owing to the uninterrupted climb in inflation, monetary tightening did not prove sufficient to stop real interest rates from declining. The oil price hike further fuelled the build-up of existing inflationary pressures, and led to a sharp fall in ex post real interest rates.¹⁰ All of the major industrial countries experienced declines in short-term real interest rates following the first oil shock, and only Germany consistently maintained positive ex post short-term real rates of interest in the course of 1974. Japanese inflation rates exceeded short-term nominal interest rates by more than 10% during 1974. Moreover, as the depth of the recession in 1974–75 became evident, monetary policy in many industrial countries was eased, further contributing to downward pressure on real rates in 1975.

There was considerable diversity among countries in the timing and precise nature of the monetary policy response to the first oil shock. Short-term interest rates in the United States rose about 500 basis points over the first three quarters of 1973 in line with the attempt to control rising inflation, but dropped at the time of the oil price increase between the fourth quarter of 1973 and the first quarter of 1974 by about 150 basis points.¹¹ Minutes of Federal Reserve policy deliberations in the Federal Open Market Committee (FOMC) reveal that several Committee members argued that the rise in oil prices should be accommodated, and that real money balances should not be allowed to shrink (Mayer (1982)). Real interest rates (ex post) declined in response both to the initial ease in policy and to accelerating inflation.

With the lifting of wage and price controls in April 1974, however, it became clear that inflation was out of control, and by June the

¹⁰ However, caution must be exercised in interpreting ex post real interest rates as an indicator of ex ante (expected) real interest rates, particularly when movements in inflation are in part attributable to unexpected supply shocks such as oil price fluctuations with one-off effects on the price level.

¹¹ See Trehan (1990) and Sachs (1982) for comparisons of the monetary policy responses in the United States to the first and second oil shocks.

Federal Reserve had moved to tighten policy, pushing up short-term interest rates by about 300 basis points over the next two quarters. This policy stance was reversed in the later part of the year and into 1975, however, when the general severity of the ensuing recession became evident. The net result was that real short-term interest rates were negative for most of 1974 and 1975, with slightly positive rates only during the period of temporary tightening by the Federal Reserve in mid-1974.

Money growth in the United States during this entire period decelerated sharply, from over 12% in 1972 to below 6% in 1974 as measured by a broad aggregate, owing initially to the rise in interest rates during the first three quarters of 1973 and later in large part to the sharp drop in income associated with the recession. However, research into this episode shows a sharp structural fall in the demand for money in the United States at the time, making it difficult to use money growth per se as an indicator of policy stance.¹² In particular, starting in 1974 money forecasts of standard money demand equations as well as the Federal Reserve Board's FMP Model began to seriously overpredict the demand for real money balances in the United States (Judd and Scadding (1982)).

Monetary policy in Germany was similar to that in the United States in that the first part of 1973 saw monetary tightening, a slowdown in money growth and increases in short-term rates, followed by an immediate relaxation of policy at the time of the oil shock, with short-term rates declining about 300 basis points on average between the third quarter of 1973 and the first quarter of 1974. German policy differed, however, in that rates continued to decline over the next two years. This gradual relaxation of the policy stance may be attributable to the fact that the Bundesbank had embarked on a much more restrictive policy stance than that

¹² This has been termed "the case of the missing money". See Judd and Scadding (1982) for a comprehensive survey of issues regarding the stability of the money demand function in the United States during the 1970s.

prevailing in the United States and most other industrial countries following the collapse of the Bretton Woods system of exchange rates, resulting in nominal short-term rates in the third quarter of 1973 reaching an average of over 14% and ex post real rates over 7%. The monetary correction was seen in some quarters as largely completed by the time the oil shock occurred (Lehment (1982)).

The uninterrupted decline in nominal rates also brought down real rates in Germany, but unlike US rates they remained significantly positive through 1974. Broad money growth declined from over 14% in early 1973 to around 10% at the time of the shock and to below 8% by the end of 1974. As in the United States, however, as the depth of the recession became evident monetary policy continued to ease, pushing real rates down further to negative levels during most of 1975. It is difficult to assess whether monetary ease at that time may be regarded as a "response" to the oil shock as opposed to worsening economic conditions. The Bundesbank's Annual Report of 1974, in fact, made it quite clear that it was unwilling to accommodate a domestic wage push following the oil price increase, and it may be argued that the monetary policy response to the first oil shock may be regarded as "neutral" in Germany (Lehment (1982)).

Japan's monetary experience around the time of the first oil shock was the most dramatic among the major industrial economies and provides a sharp contrast to the United States and Germany. First, the degree of overheating in the Japanese economy during this episode far surpassed that in any other major industrial country. Secondly, the gradual monetary tightening as from the spring of 1973 to combat inflation, six months before the oil crisis, was not relaxed even temporarily at the time of the oil shock. The discount rate was raised in five steps between March and December to a record level of 9%. Reserve requirements were also raised and the Bank of Japan's "window guidance" on bank lending was tightened (Shigehara (1982)). Broad money growth declined from over 25% in early 1973 to about 11% in mid-1974, and short-term nominal rates during this period more than doubled from about 6 to 13%.

Despite the consistently restrictive stance of policy, monetary

tightening in Japan came too late to ward off the earlier build-up of “monetary overhang” and demand pressures. Consumer price inflation reached double-digit levels in mid-1973 and rose above 20% by early 1974 – more than twice the rates experienced in the United States and Germany. Tight monetary conditions did indeed slow the economy, contributing to the sharpest growth slowdown and the only true recession (in terms of a decline in the level of real GNP) in the post-war period. In the latter part of 1974 inflation began to decelerate rapidly and by the end of 1975 was below 5%.

Second oil shock

The economic expansion in most industrial countries was in full swing at the end of 1978 when the oil price shock began. Many countries were following broadly neutral or somewhat expansionary monetary policies and a widespread acceleration in inflationary pressures was not evident. The average inflation rate in the G-7 countries was roughly stable before and after the second oil shock and interest rates were declining in many industrial countries. Reflecting this pattern, the average rate of money growth in the industrial countries was also relatively stable in 1978. Notable exceptions were the United States, and to a lesser extent France, with rising inflation trends prior to the second oil price shock. Moreover, monetary conditions in the United States and the United Kingdom had been tightened earlier in 1978.

Monetary authorities in most industrial countries generally responded faster and more decisively to the second oil shock. Interest rates rose rapidly in virtually all of the industrial countries. Moreover, central banks generally maintained interest rates at high levels for a much longer period than had been the case after the first shock, despite the fact that the build-up of inflationary pressures and the magnitude of the oil price hike (in percentage terms) were much less. An important change in the institutional setting was also evident at the time of, or immediately following, the second oil shock. Most industrial countries implemented new monetary control procedures focusing on targeting money aggregates in the mid or late 1970s,

providing a more systematic institutional framework for implementing anti-inflation policies.

Following the disastrous inflation experience at the time of the first oil shock, Japan had implemented a “money-focused” policy stance in the mid-1970s, with publicly announced money supply/stock projections as from 1978. The explicit intent was to reduce core inflation through a gradual decline in the rate of money growth and to provide a more stable nominal anchor to stabilise expectations in the event of future shocks to the economy (Hutchison (1988)). Thus, at the time of the second oil shock the Bank of Japan broadly maintained existing nominal money growth rates, allowing growth in real balances to decline as the impact of the oil price hike fed into the general price level.

In sharp contrast to the first oil shock, short-term real interest rates were positive and gradually increasing during and after the oil price hike. Inflation continued to decelerate in 1978 and 1979 and only began to rise again in mid-1980. Also in contrast to the adverse experience in 1973–75, the effect of the second shock was limited to a one-off rise in the Japanese price level, temporarily raising consumer price inflation in 1980 by about 200 basis points and contributing to a 100 basis point rise in employee compensation, as is shown in Graph 9. Japan alone among the major industrial economies was able to absorb the second shock with only a brief and modest decline in real GNP growth during the entire adjustment period, while at the same time maintaining a good inflation record.

Like Japan, Germany also introduced new operating procedures focusing on the growth of money aggregates in the early 1970s. The Bundesbank was the first central bank to announce monetary targets, beginning with the “central bank money” aggregate at the end of 1974. Prior to the oil shock, however, the 1978 target was exceeded by more than 3%, and an expansionary policy stance was in place. The policy response to the second oil shock, which occurred in the middle of a strong upswing in economic activity, was to raise nominal and real interest rates quite sharply. Again, the Bundesbank made it clear in its Annual Report that it would refuse to accommodate a

wage/price spiral, and its overall response to the oil shock was very restrictive. Central bank money growth declined from over 11% in 1978 to about 6.5% in 1979, 4.8% in 1980 and 3.5% in 1981. While before the oil shock the central bank money target had been exceeded, during the following three years money growth was only slightly above (1979) or even below (1980-81) the lower limit of the target range. Broad money growth reflected this policy stance and decelerated sharply, from around 11% in 1978 to about 6% in 1979-80. By contrast, the Bundesbank had already begun to tighten its policy stance several quarters before the first oil shock in 1973 in response to the high inflation rate and widespread symptoms of overheating prevailing at that time.

The Bundesbank maintained a non-accommodating stance for a prolonged period following the oil shock in an attempt to lower core inflation in the economy to a level even below that prevailing in 1978, as well as to strengthen the Deutsche Mark in the foreign exchange markets. In response to the continuation of strong economic activity and falling unemployment into 1980, nominal and real interest rates were raised further. The economy began to slow later in the year and into 1981. From a level of around 3¹/₂% in early 1980, unemployment kept increasing and rose above 8% three years later. However, it would not appear that the oil shock itself played a major part in causing the slowdown in Germany; the main factor would appear to be a confluence of rigidity in the wage and price-setting process and the pursuit of the policy of price stability (Fischer (1987)).

The significant change in operating procedures in the United States, however, was not introduced until after the oil price shock had already begun. In October 1979 the Federal Reserve began to target money aggregates as a primary policy objective in an attempt to further reduce money growth and stem the steady rise in inflation during 1977-79. The concern over inflation which prompted the change in monetary control procedures was not only that it was increasing, but that it was already at a high level, about 9% (consumer prices) in 1978 and over 10% in mid-1979. Following the move to monetary targeting, short-term interest rates in the United

States rose above 15% in 1980, fell temporarily, and then rose again to average nearly 18% in mid-1982.¹³ However, the change in monetary policy operating procedures came too late to stop inflation rates from continuing to rise in the later part of 1979 and early 1980, which in turn led to the imposition of credit controls in March 1980. This intensified a short, sharp recession in the first half of 1980.¹⁴ Moreover, the jump in inflation kept real short-term rates at very low or even negative levels in 1979–80. When the commitment to a restrictive policy was maintained as the economy again moved into recession in 1981–82, supported by the shift in operating procedures, low money growth and high nominal interest rates, inflation pressures finally broke, with sharp declines noted in the latter part of 1982 and early 1983.

Third oil shock

Quite divergent monetary policy positions were adopted in the months immediately following the oil shock in 1990. To a large extent, however, these policies were not direct responses to the oil shock per se as such, but reflected divergent business cycle conditions. The Federal Reserve in the United States clearly eased monetary conditions in the second half of 1990, initially in July before the oil shock and later in October following the adoption by Congress of the multi-year deficit reduction package. In view of the deepening recession, however, the federal funds rate was aggressively lowered after that point, falling from 7³/₄% in November to around 5³/₄% by early May 1991 (in contrast to a modest 1/2 percentage point

¹³ Trehan (1990) emphasises that in real terms the federal funds rate was negative for a time following the second oil shock, despite the rise in nominal rates. CPI inflation averaged 11.8% over the four quarters ending in the third quarter of 1979, the highest rate since the first oil shock, while the short-term interest rate averaged below 11%. He argues that the temporary reduction in the federal funds rate in mid-1980 relaxed policy and “accommodated” the oil shock.

¹⁴ See Fischer (1987) for an interesting international comparison of the monetary responses to the two oil shocks and the role played by monetary targeting and central bank credibility.

decline between January and November 1990). The discount rate was lowered from 7 to 5½% in three stages between December 1990 and April 1991. However, reflecting the weakness of the economy, and perhaps also elements of a “credit crunch” (where banks may have been overly cautious in lending even to creditworthy borrowers), monetary growth was quite slow during this period.

In contrast to the United States, Japan tightened monetary policy throughout 1990, essentially continuing to pursue its existing policy after the oil shock because of the rapid pace of economic activity and tight labour and goods market conditions. The Bank of Japan raised the discount rate twice during 1990, in March and at the end of August (following the start of the oil shock), and maintained it unchanged through the early months of 1991. Call-money rates in Japan rose steadily during 1990 as well, a pace not seemingly affected by the oil price hike. Monetary conditions were also tightened somewhat in Germany following the oil shock, with the Bundesbank raising its lombard rate in November 1990 and February 1991. However, monetary policy was complicated not so much by the oil shock itself, but rather by the introduction of the Deutsche Mark into eastern Germany a month earlier and by the rapid rise in government budget deficits and the upswing in aggregate demand associated with unification. The United Kingdom also kept monetary conditions tight following the oil shock, although this again was primarily related to economic conditions (e.g. including a very high inflation rate). France, by contrast, was able to ease policy somewhat after the oil shock, despite its ERM constraint, to help support a slowing economy.

Fiscal policies

Fiscal policies became expansionary almost everywhere in 1975, the second year of the downturn following the first oil shock. Budget deficits grew in all of the major industrial countries and, as is shown in Table 3, measures of “fiscal impulse” as a percentage of GNP/GDP in 1975 ranged from 1.8% in Germany to 4.7% in the

United Kingdom. Fiscal expansion was not in most cases designed as a specific response to the oil shock. Rather, as economies weakened, automatic fiscal stabilisers were allowed to operate and later discretionary policy action was taken to provide some additional stimulus to aggregate demand. In countries such as the United Kingdom, Japan and Italy significant budget deficits were already evident prior to the first oil shock, but also grew substantially subsequently. Other countries such as the United States, Canada and Germany began with either small deficit or surplus positions in 1973 which then moved to substantial deficits averaging around 4% of GDP by 1975. For example, a fiscal stimulus in the form of a \$50 cheque per taxpayer was provided in March 1975 in the United States and income taxes were cut in Germany.

The fiscal situation at the beginning of the second oil shock late in 1978 was substantially different from that prevailing five years earlier. In most industrial countries the rapid rise in government expenditures and transfers in the 1970s, a process which was accelerated by the depth of the recession in 1974-75, brought with it a series of budget shortfalls and a rapid accumulation of government debt, as is shown in Graph 11. The general growth slowdown in the 1970s also contributed to an over-estimation of budgetary revenues, as did political resistance to scaling back expenditure plans or cutting existing programmes. Budget deficit and debt levels relative to output in 1978 far surpassed those recorded in 1973, and restricted the range of fiscal responses which could be undertaken either during the oil shock itself or in the ensuing recession.

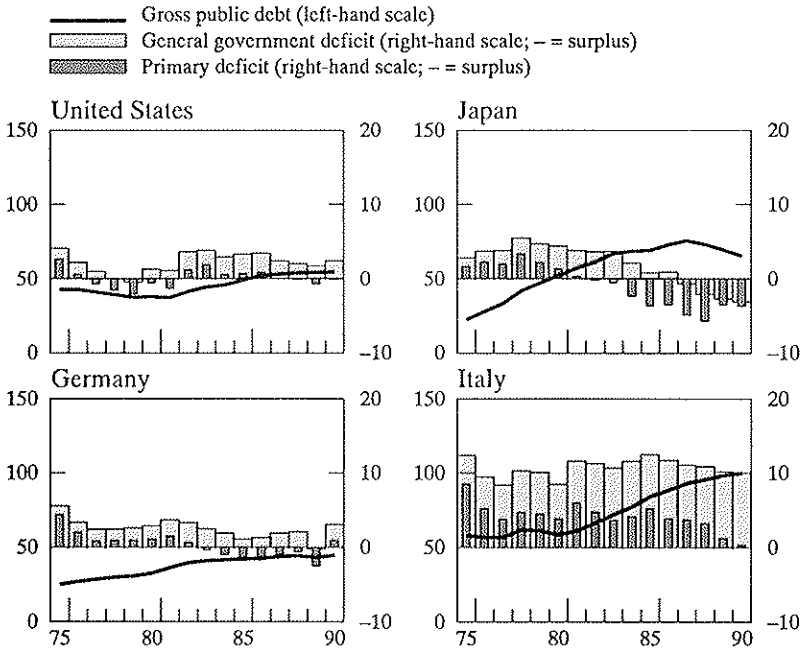
The net result of this confluence of factors was that fiscal policy was generally neutral or slightly contractionary as the industrial economies entered into a downturn in 1980-81, in sharp contrast to the policy stance taken following the first oil shock. Only Japan undertook substantial discretionary fiscal stimulus in 1980-81 after initially responding to the oil shock with some fiscal restraint, which in turn contributed to the strength of aggregate demand at the time and helped to avoid a contraction in output. But generally a new attitude of fiscal conservatism seemed to be taking hold (BIS (1980)

and (1981)). Rather than being concerned about bolstering aggregate demand, governments generally focused on questions relating to the appropriate balance between public and private sectors, and market and non-market sectors. The United Kingdom provides a good example. Under the Medium Term Financial Strategy announced in 1980, the public sector borrowing requirement (PSBR) was to be reduced steadily along with monetary growth. Although targeted levels were initially exceeded, both the PSBR and money growth were steadily reduced, and, with a sharp recession and rising unemployment, wage and price pressures finally subsided. This was the opposite response to that following the first oil shock.

The practical implication of these moves, however, was that in effect most governments were consolidating public finances at the time of the second oil shock and the ensuing downturn in economic activity. However, as automatic stabilisers were nonetheless allowed to work to some extent in most countries, budget balances tended to deteriorate. But the determined fiscal stimulus seen in response to recessionary tendencies following the first oil shock was absent. Even in the United States, which began an expansionary fiscal policy in 1982 with a major tax cut, the objective was not so much counter-cyclical policy, but rather a medium and longer-term boost to the supply side of the economy.

In some respects the stance of fiscal policy in 1990 was similar to that at the time of the second oil shock – budget consolidation was still a primary objective of governments, although automatic stabilisers were generally allowed to work as many economies slowed in the second half of the year. There were few instances of explicit discretionary fiscal stimulus, however, and where deficits did rise it was not because of a direct attempt to offset the contractionary effect of the oil shock. In particular, budget positions generally deteriorated in line with the slowdown in growth in 1990, raising average net borrowing from 1 to 1½% of GDP for the group of industrial countries. Cyclical downturns were the major factor in the worsening of financial balances in the United States, the United Kingdom, Sweden, Finland and elsewhere. A significant part of the

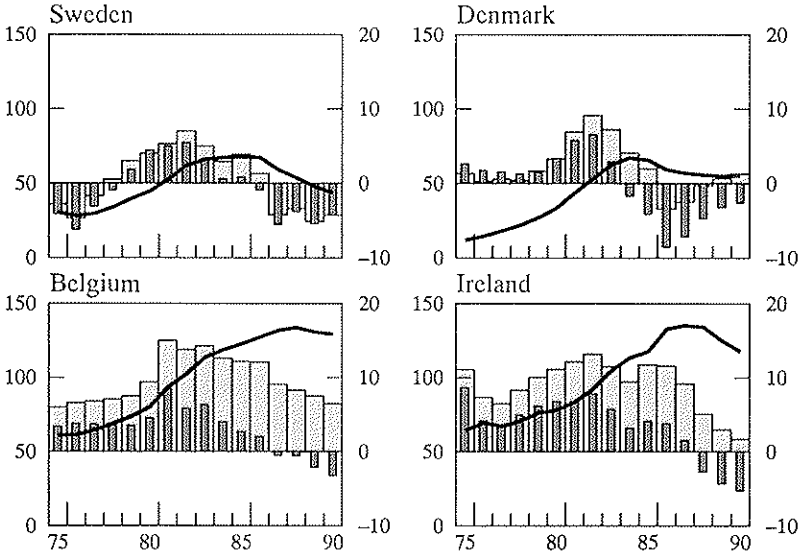
Graph 11
Gross public debt and general government deficit
 As a percentage of GNP/GDP



Sources: OECD and national data.

rise in the budget deficit in the United States, however, reflected expenditure on restructuring the savings and loan industry (amounting to financial transfers) which had little or no effect on aggregate demand. Hence, no specific discretionary fiscal stimulus was introduced to counteract the downturn in the economy. Indeed, an increase in taxes and user fees was enacted in November 1990 as part of the deficit reduction programme. The German general government financial balance swung from a small surplus in 1989 to a deficit of over 3% of GNP in 1990 (the central government deficit doubled from 0.9 to 1.8% of GNP), despite the continuation of very

Graph 11 (continued)
Gross public debt and general government deficit



robust economic conditions after the oil shock. This was almost entirely due to the costs of unification and associated transfers to the eastern part of the country, although part of the increase in the deficit was attributable to the implementation of the last stage of the tax reform programme at the beginning of the year. Deficits were projected to remain high, despite the increase in taxes and social security contributions in spring and summer 1991, because of the transfers to the eastern Länder. While these transfers and the associated rise in the budget deficit had the effect of stimulating aggregate demand growth in western Germany in the second half of

1990 and early 1991, they were totally unrelated to the oil supply shock. Japan, by contrast, increased its surplus position further in 1990 in tandem with strong economic growth.

Business and consumer confidence

One of the most important aspects of private sector adjustment following oil shocks is the extent to which business confidence and consumer confidence, and hence the investment and personal consumption components of domestic demand, are affected. The oil shock not only directly affects the business outlook, but may also have an indirect effect in interaction with other factors, thereby amplifying the degree of uncertainty over the future course of the economy. Table 4 shows a measure of business confidence one month before and six months after the start of each of the three oil price shocks for selected industrial countries. The measure is the percentage of businesses surveyed expecting improved business conditions minus the percentage expecting worsening business conditions. Owing to differences in the timing, duration and magnitude of the shocks, our use of this measure only attempts to capture the immediate effect on business confidence, rather than the impact over an extended period of time which may interact with other factors such as a subsequent downturn in activity. The starting and ending levels of business expectations are of interest, as are the change after six months and the maximum deterioration in the index during the interim period.

The decline in business confidence immediately following the first oil shock was substantially larger in most countries than that following the shocks starting in 1978 or 1990, with the maximum decline over the six-month period being particularly striking. By contrast, relatively small declines in business confidence were recorded after the 1978 shock in most countries. The decline in business confidence after the 1990 oil price hike was also quite large – despite the fact that the price rise was much smaller in relative terms compared with the other two shocks and the prevalent view that most

Table 4
Business confidence and oil shocks¹

	United States	Germany	Japan ²	France	Italy	United Kingdom	Spain
1973 September	20	0	49	30 ³	24	n.a.	24
1974 April	21	- 5	21	15 ³	16	n.a.	13
Change ⁴	1	- 5	-28	-15	- 8	n.a.	-11
Maximum deterioration ⁵	-24	-29	-28	-25	-28	n.a.	-11
1978 September	34	4	- 7	6	8	21	2
1979 April	20	6	4	15	17	24	9
Change ⁴	-14	2	11	9	9	3	7
Maximum deterioration ⁵	-28	- 7	5	0	- 6	-11	-12
1990 July	- 4	9	48	7	5	- 5	- 5
1991 January	-25	11	44	- 8	11	-30	- 5
Change ⁴	-21	2	- 4	-15	6	-25	0
Maximum deterioration ⁵	-21	- 5	- 4	-28	- 7	-25	- 7

¹ Percentage of businesses surveyed expecting improved business conditions minus percentage expecting worsening business conditions. Manufacturing sector (not seasonally adjusted) in the United States, Germany, France and the United Kingdom; all industries for Japan; enterprises for Italy; all industries excluding construction for Spain.

² Quarterly data. 1973 September is 1973.Q3, 1974 April is 1974.Q1, 1978 September is 1978.Q3, 1979 April is 1979.Q1, 1990 July is 1990.Q2 and 1991 January is 1990.Q4.

³ Source: OECD Main Economic Indicators.

⁴ Change from month preceding to six months after the beginning of the oil price rise.

⁵ The maximum decline during the period.

countries were far better prepared in 1990 to absorb a shock than had previously been the case. Particularly large drops were noted in the United States, the United Kingdom and France. The United States, however, had experienced maximum declines of a similar order of magnitude following the two previous shocks. Particularly noteworthy in the cases of the United States and the United Kingdom were, in addition, the low initial starting points of business confidence – in July, prior to the oil shock, most businesses in both countries were expecting a worsening economic climate. Starting from a low base to begin with, business confidence in the United States and the United Kingdom fell to extremely low levels by January 1991.

Table 5
Consumer sentiment and expectations in the United States
 July 1990–March 1991

	Consumer sentiment		Consumer expectations	
	University of Michigan	Conference Board	University of Michigan	Conference Board
1990 July	88.2	101.7	77.3	91.8
August	76.4	84.7	62.9	74.2
September	72.8	85.6	58.8	77.7
October	63.9	62.6	50.9	55.6
November	66.0	61.7	52.8	56.1
December	65.5	61.2	53.7	59.8
1991 January	66.8	55.1	55.2	55.3
February	70.4	59.4	62.0	63.6
March	87.7	81.0	84.5	100.7
Six-month change	-24%	-46%	-29%	-40%
Eight-month change	- 1%	-20%	9%	10%
Maximum change	-28%	-46%	-34%	-40%

Source: *Survey of Current Business*, US Department of Commerce, June 1991, Volume 71, No. 6, page c2.

A sharp decline in consumer confidence following the 1990 oil shock also occurred in the United States, as is shown in Table 5. Four measures are shown; survey measures of consumer sentiment and consumer expectations undertaken by the University of Michigan and the Conference Board. The maximum declines in these indicators in the period immediately following the beginning of the oil price hike ranged from 28 to 46%. Six months after the shock, comparable to Table 4, declines ranged from 24 to 46%. Eight months after the shock, and in the aftermath of the allied military victory, consumer confidence had recovered significantly, particularly with respect to expectations as to the future course of the economy.

The extent of the fall-off in business and consumer confidence in 1990 was largely unexpected. On the one hand, the low level of confidence prior to the oil shock was probably related to signs of a slowdown in activity already under way in several countries and, in the United States, a climate of uncertainty over the fragility of the financial system, the budgetary outlook and other factors discussed

above. Part of the decline from that point most likely reflected the increased risk of an oil supply disruption and the potential for military conflict in the Gulf. On the other hand, there seems to have been an additional interactive factor – existing weak business conditions and other concerns in some countries apparently made economies especially vulnerable to an oil shock, thereby magnifying the adverse effect on business and consumer confidence and, finally, on aggregate demand growth.

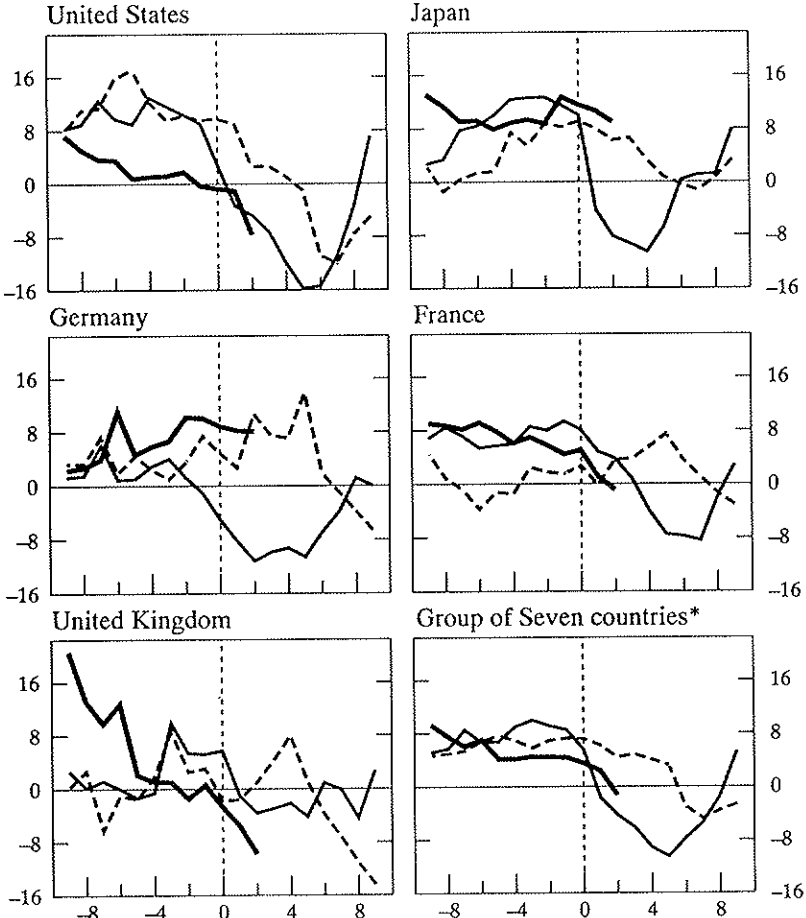
In particular, a sharp decline in real investment occurred in most industrial countries immediately following the 1990 oil shock and the growth of personal consumption expenditure fell off markedly (Graphs 12 and 13) in line with the collapse of business and consumer confidence. Among the large industrial countries, real investment fell most in Canada, the United Kingdom and the United States (-9.8, -9.8 and -7.7%, respectively, between the first quarter of 1990 and the first quarter of 1991) and a marked deceleration occurred in France. Among the smaller industrial countries, real gross fixed investment dropped to 1.5% in 1990 from 7.6% in 1989, with absolute declines in Australia, Denmark, Finland, Norway, South Africa and Sweden. The overall average decline was much greater than that following the beginning of the 1978 shock (Graph 12) but was somewhat less than that immediately following the 1973 shock (primarily because of robust investment in western Germany and Japan in 1990). As in 1973, some slowdown in real investment was expected before the oil shock as growth was already decelerating in many economies, particularly in Canada and the United Kingdom. But the steepness and widespread nature of the decline was largely unexpected.

Unexpectedly weak growth in real personal consumption expenditure was also evident immediately following the 1990 shock (Graph 13), reflecting the fall in consumer confidence in the latter part of the year. Average real personal consumption expenditure in the major industrial economies declined to less than 1% in early 1991 (first quarter of 1990 to first quarter of 1991), compared with over 2% in the third quarter of 1990. The United States experienced

Graph 12
Real investment
 Changes over four quarters, in percentages

Date of oil shock (and period covered):

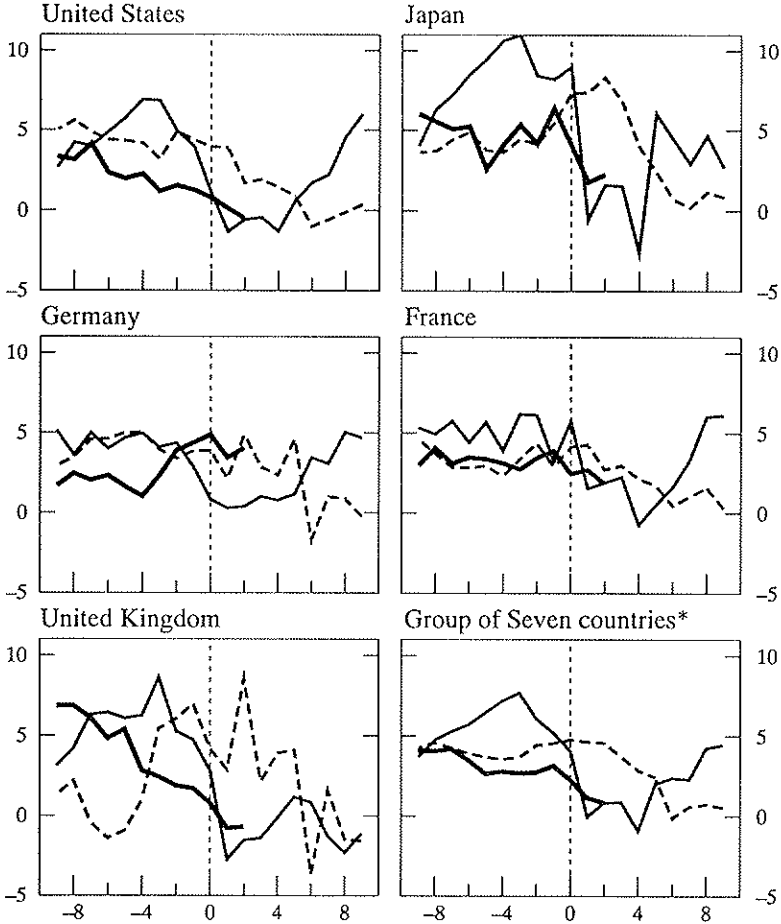
- 4th quarter 1973 (3rd quarter 1971-1st quarter 1976)
- - - 4th quarter 1978 (3rd quarter 1976-1st quarter 1981)
- 3rd quarter 1990 (2nd quarter 1988-1st quarter 1991)



* Calculated using 1988 GDP weights and exchange rates.

Graph 13
Real personal consumption expenditure
 Changes over four quarters, in percentages

Date of oil shock (and period covered):
 — 4th quarter 1973 (3rd quarter 1971-1st quarter 1976)
 - - - 4th quarter 1978 (3rd quarter 1976-1st quarter 1981)
 — 3rd quarter 1990 (2nd quarter 1988-1st quarter 1991)



* Calculated using 1988 GDP weights and exchange rates.

almost no growth in personal consumption in 1990 owing to the drop-off at the end of the year. An absolute decline was also recorded in the first quarter of 1991. A significant slowdown was registered in Japan, and large absolute declines were recorded in the United Kingdom, Canada and elsewhere.

In the light of the optimistic scenarios painted by most analysts in the early months following the oil shock in the late summer and autumn of 1990, the sharp deterioration in economic conditions by the end of the year was surprising. The slowdown in activity in many respects resembled that following the 1973 shock, despite the fact that the industrial economies were seemingly better placed to absorb the shock from a structural perspective (e.g. reduced dependence on energy in production and a lower percentage of oil in total energy usage), that the rise in oil prices was much smaller in real terms, and that the starting level of oil prices was quite low. Looking beyond the direct effect of the energy shock itself, however, to the cyclical downturn already under way at the time and, perhaps more significantly, to the high degree of uncertainty and associated low level of business and consumer confidence evident before the price hike, sheds some light on why economic conditions weakened so dramatically.

V.

Summary and conclusions

This paper has attempted to evaluate how aggregate demand conditions in the industrial economies influenced the transmission of the 1990 oil shock to the economy in comparison with the 1973-74 and 1978-80 episodes. Aggregate demand interactions with oil shocks were considered from three perspectives: the "structural" features of the economy which determine the real income and wealth effects of an oil shock, the initial cyclical conditions prevailing at the time of oil price swings, and the policy responses to shocks. Our analysis of aggregate demand characteristics from these perspectives

suggests that in many ways the major industrial economies should have been in a better position to absorb an oil shock in mid-1990 than had been the case for either of the shocks in the 1970s. However, the circumstances surrounding the mid-1990 shock had several elements in common with previous experience, which in turn were largely responsible for the unexpectedly sharp deterioration in economic activity in the months immediately after the increase in oil prices.

With respect to the structural characteristics of the industrial economies, the wealth and real income loss – and the dampening effect on aggregate demand running directly through this channel of transmission – arising from a given oil price rise in mid-1990 was smaller than that following the 1978–80 shock because dependence on oil imports and the energy intensity of production had been reduced significantly since the early 1980s. Moreover, given the fall in oil prices to close to their pre-shock levels in the early months of 1991, the adverse wealth effect was less than had been the case in 1973 despite roughly similar or, in the United States, appreciably higher energy import dependence. But in any case, the direct wealth effects of oil shocks are probably not a dominating factor. For example, although the direct real income or wealth loss (Table 2) associated with the second oil shock was much larger than that following the first shock, the ultimate drop in output was much smaller.

Other structural characteristics also suggested that a smoother absorption of the oil price hike in 1990 compared with those in the 1970s would be likely. In particular, the first oil price hike in the early 1970s was followed by some confusion over whether it represented a shock to the general price level or a relative price shift, as well as over the types of adjustment which were needed to deal with the shock. One consequence of the limited understanding of the nature of supply shocks at that time was that a huge inventory overhang developed, which, when stocks were finally drawn down, greatly exacerbated the subsequent downturn in economic activity. Adjustment to the second oil shock was much smoother, suggesting that a similarly favourable response would have been likely after the 1990 price hike. The maintenance of comparatively low inventory/

sales ratios in the United States and Canada through the early months of 1991, despite the sharp slowing of economic activity, lends support to this view.

In terms of initial cyclical demand conditions, most of the major industrial countries had much lower inflation rates and less inflationary pressure generally prior to the oil shock in August 1990 than was the case in either 1973 or 1978. Real output growth was lower on average, business cycle conditions were less synchronised across countries, and, judging by measured unemployment rates and wage compensation growth, more slack was evident in labour markets. A significant part of the better performance in terms of inflation may be attributable to the pre-emptive tightening of monetary conditions in 1988 before inflation got out of control, as well as more moderate wage and price expectations associated with greater central bank credibility in its commitment to price stability. By contrast, although monetary tightening preceded the 1973-74 oil shock, it came too late to stem the cumulative build-up of inflationary pressures, to which the oil price increase contributed. Money growth was also more moderate and real interest rate levels much higher in mid-1990 than had been the case prior to the earlier shocks.

With regard to policy responses, a more favourable inflation climate in 1990 compared with the periods preceding previous oil hikes generally allowed central banks to avoid a major tightening of monetary policies following the shock. Moreover, any inflationary pressure that may have been created was presumably reversed by the subsequent oil price decline in early 1991. By contrast, the deep recession of 1974-75 was directly attributable to monetary tightening aimed at controlling the build-up of inflationary pressures that were already well advanced before the 1973-74 oil shock. The oil shock contributed to the depth of the downturn, but the slowdown in real output growth preceded the oil shock by almost a year. The "too little, too late" monetary response to the build-up in inflationary pressures in the early 1970s, in large part due to institutional constraints associated with the Bretton Woods (and later Smithsonian)

system of fixed exchange rate parities, forced a sharper monetary contraction and downturn in the economy than would otherwise have been needed to squeeze out inflation. This was particularly evident in Japan.

Inflationary pressures were much less pronounced in most industrial countries before the second oil price hike, and in most countries the growth cycle was cut short by the shock. Money growth was more stable, the rise in inflation more modest, and feedback effects passed on through price and wage inflation expectations were in large measure avoided. In some countries, notably Japan and Germany, this development was partly attributable to the adoption of policies in the mid and late 1970s designed to focus greater attention on monetary aggregate growth paths – an innovation made possible by the move to increased exchange rate flexibility which in turn allowed greater monetary autonomy. The downturn in the United States following the second oil shock was far worse than that in most other industrial countries, however, partly because inflationary pressures were stronger (comparable to those prevailing at the time of the first oil shock), which in turn elicited a more restrictive policy response. Moreover, although moves to tighten money and credit growth were taken prior to the second oil shock in the United States, new monetary procedures were not introduced until October 1979, by which time inflation was running at double-digit rates.

All of the above considerations suggest that a greatly reduced, perhaps even negligible, adverse effect was to be expected from the 1990 oil shock compared with earlier experiences. Indeed, many forecasts released immediately following the shock predicted quite small output and inflationary consequences. In retrospect, however, it is clear that there are several similarities with the previous oil shocks which were not sufficiently emphasised in the more sanguine forecasts of the autumn of 1990. In the event, these similarities turned out to be important elements in explaining the greater-than-expected weakness in many industrial economies following the shock.

Firstly, the oil shock in mid-1990 came on top of a slowdown in economic activity already under way in the United States, the United Kingdom, Canada, Sweden, Australia and elsewhere. Although this downturn was not as widespread or as sharp as that in the latter part of 1973, its momentum and intensity in many countries, as well as the incremental effect of the oil shock in an already weak business climate, were not fully appreciated. Secondly, a very low level of business and consumer confidence existed in several major industrial countries before any signs of crisis in the Persian Gulf, indicating that weaker conditions would be likely to ensue. A number of country-specific elements prior to August 1990 had led to low levels of confidence; in the United States, low confidence was probably related to increased uncertainty and concerns over domestic financial fragility, particularly the mounting savings and loan debacle and evidence of weakness at a number of large banks. The acrimonious debate and political impasse over the approach to reducing large and growing federal government budget deficits was also a factor. The collapse of the Bretton Woods system of fixed exchange rates – the hallmark of the international monetary system for almost thirty years – in early 1973 generated a similar environment of uncertainty and lack of business confidence prior to the first oil shock.

Finally, and perhaps most importantly, business and consumer confidence fell dramatically immediately after the oil price hike in mid-1990. The increase in uncertainty and consequent decline in confidence were not simply related to the future levels and variability of oil prices. Rather, the heightened risk of a major oil supply disruption and looming military conflict were probably more significant. This was similar to the heightened uncertainty in late 1973 in connection with the Yom Kippur war and the disruption in oil supplies as a result of the embargo by Arab nations on exports of oil to a number of industrial countries. Moreover, the extent of the drop in confidence in late 1990 may have been magnified by the low level of confidence prevailing in several countries even before the oil price hike – essentially leading to a greater cumulative contractionary effect on demand than had been expected.

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