

THE OIL SHOCKS AND MACROECONOMIC ADJUSTMENT IN THE UNITED STATES

Jeffrey SACHS

Harvard University and NBER, Cambridge, MA 02138, USA

Though 'supply-side economics' is politically ascendant in the United States, the relative importance of supply versus demand factors in recent U.S. macroeconomic history remains in strong dispute. The direct effects of the oil shocks on aggregate supply, for example, do not appear to have been severe, in sharp distinction to the experience of other OECD economies. Real wages in the U.S. fell to absorb the oil price increases and pre-tax profitability remained strong throughout the 1970s. Demand factors seem to be paramount in the recessions of 1973-75 and 1980. Supply factors are of greater, and probably decisive importance for the miserable productivity growth since the mid-1970s, though in ways that remain unclear. My focus in this retrospective glance will be on the oil shocks and their cyclical aftermath, and I will argue for the relative importance of demand factors in these episodes. I return briefly to the productivity issue in the conclusion.

In the broad outline, the U.S. macroeconomic response to the two oil shocks was similar, though the magnitude of key effects differed, comparative data on the two shocks are summarized in table 1. As is evident, a sharp recession followed each shock. The output decline in 1974-75 was more severe and persistent than in 1979-80; in the first case, there is a seven-quarter span from peak to trough (1973:IV-1975:II) while in the latter recession the steep decline lasted only one quarter (1980:II). In fact, since 1979:I, the economy has wobbled erratically with little net growth, instead of turning decisively to a sustained recession as many forecasters predicted. The major indicators of the cycle, such as the GNP gap or the unemployment rate, confirm the deeper output decline in the first episode. With respect to wages and prices, the similarities are stronger. Both periods highlight the extreme sluggishness in wage-setting behavior in the American economy. Indeed, from 1973 to 1980, the annual percentage increase in labor compensation was always between 7.6 and 9.9 percent. No other industrial economy displays such consistency. The first and second oil shocks themselves had little effect on the rate of wage change, with nominal compensation accelerating very slightly in both cases (table 1).

Table 1
Key economic variables, United States, 1972-80.^a

	First oil shock				Second oil shock		
	1972	1973	1974	1975	1978	1979	1980
<i>Real Activity</i>							
Real GNP, p.c.	5.7	5.8	-0.6	-1.1	4.8	3.2	-0.2
GNP GAF	0.5	-1.6	2.3	6.6	1.5	1.4	4.4
Capacity utilization in manufacturing	83.0	85.5	82.5	77.0	83.8	82.5	77.5
Rate of unemployment	5.6	4.9	5.6	8.5	6.0	5.8	7.2
<i>Prices</i>							
GNP deflator, p.c.	4.2	5.7	8.7	9.3	7.3	8.5	9.0
Producer price index for finished goods (PPI), p.c.	3.1	9.1	15.3	10.8	7.8	11.1	13.5
Hourly compensation, p.c.	6.6	7.6	9.7	9.3	8.6	9.7	9.9
Real hourly compensa- tion (PPI deflated) p.c.	3.4	-1.4	-4.9	-1.3	0.7	-1.3	-3.1
<i>Profitability and Investment</i>							
Pre-tax rate of return, non-financial corpo- rate capital	11.0	10.8	8.4	9.1	9.9	9.0	n.a.
Labor share of national income	0.75	0.74	0.76	0.75	0.74	0.74	0.75
Gross business fixed investment/GNP	10.2	11.0	10.9	9.7	10.7	11.0	10.7
<i>Macroeconomic Policy</i>							
M1-B (p.c., year-end over year-end)	9.3	5.5	4.4	5.0	8.3	7.2	6.4
M3 (p.c., year-end over year-end)	14.1	11.2	8.4	9.7	11.2	9.2	10.7
High-employment surplus high-employment GNP	n.c.	-0.9	-0.1	-2.2	-1.1	-0.1	-1.2 ^p
<i>Terms-of-Trade</i>							
Share of net oil imports in GNP (%)	0.3	0.5	1.5	1.4	1.8	2.3	2.9
Price of oil imports/ GNP deflator, p.c.	3.0	29.3	227.7	-1.6	-4.5	23.0	56.1
'Real income loss' of oil price change/GNP (%)	0.0	0.1	2.3	0.0	-0.1	0.5	1.4
<i>Inventory Cycle</i>							
Inventory sales ratio, business	2.8	2.9	3.1	2.9	2.8	2.8	2.9 ^b

^aDefinitions and sources of variables: All variables are from Economic Report of the President, various years, or the Survey of Current Business, unless otherwise stated. The term p.c. denotes percentage change per year; p denotes preliminary. Hourly compensation is for the non-farm business sector. The pre-tax rate of return is from Feldstein, Poterba and Dicks-Mireaux (1981); see also footnote 2. Net oil imports is defined as net imports of S.I.T.C. 3, from the OECD Trade Statistics series A. The price of oil imports is the dollar price index for Saudi Arabian crude petroleum, the International Financial Statistics of the IMF. The real income loss for year t is calculated as $\% \Delta (P^{oil}/P^{GNP}) \cdot 1/2(S_{t-1} + S_t)$ where S_t is net oil imports per GNP. Inventory-sales ratio is real inventory stock (1972 dollars) divided by real sales, for the business sector.

Price change in the U.S. economy is well-described as a (cyclically-sensitive) market over normal unit labor costs and raw materials costs [see, for example, Gordon (1975)]. Since the rate of wage increase is highly persistent, inflation varies year-to-year principally because of raw material price shocks or sharp cyclical fluctuations. Thus, as the data in table 1 detail, the two oil shocks brought about sharp spikes in price inflation, with corresponding downward spikes in real wage growth. In summary, there is little difference in the wage and price behavior across the two episodes.

As a consequence of the real wage moderation, the U.S. economy (alone of the large OECD economies) evidenced a fairly stable level of pre-tax profitability during the 1970s.¹ Thus, in both oil shocks, the pre-tax rate of return to corporate capital was only slightly reduced (see table 1), and labor's share of national income remained almost unchanged. The stability of pre-tax profitability contributed to the stability of the rate of gross investment as a percentage of GNP during the entire decade. As the OECD (1978) pointed out:

[A] smaller squeeze on profit margins was reversed more rapidly and more completely in the United States [and] the restoration of profit margins was essential to the investment upswing needed to sustain the expansion in its later stages. Though still relatively weak, this private non-residential investment recovery has been more apparent in the United States than elsewhere.

It must be added, though, that *net* investment rates have declined in recent years, because depreciation represents a growing share of GNP.²

The evidence on wages and profits sets the U.S. apart from other economies in this period, and also casts doubt upon a supply-side interpretation of the 1974–75 and 1979–80 recessions. With the observed factor costs and production technology in this period, it is difficult to argue that firms remained on their value-maximizing supply schedules in the two deep recessions.³ In both cases, a decline in aggregate demand, at least partially unanticipated, contributed to the recession. Moreover, the demand decline may be traced in each case both to the direct contractionary impact of the terms of trade loss, and to contractionary policies. In 1974–75, but not in 1979–80, the initial demand decline was magnified through a Metzlerian

¹For cross-country evidence, and a detailed discussion, see Sachs (1979). For trends in the U.S., see Feldstein, Poterba and Dicks-Mireaux (1981).

²See Feldstein (1981) for evidence and a detailed discussion on the differences between gross and net investment rates. It should be emphasized that Feldstein and others link a decline in *net* investment rates to a decline in the *post-tax* rate of return on corporate capital. But even looking at net investment rates and post-tax rates of return, the U.S. shows more stability than most other OECD countries for which comparable data are available.

³The use of a formal production function framework to assess the role of factor costs in output fluctuations is demonstrated in Bruno and Sachs (1981).

inventory investment multiplier-accelerator. I will suggest later that the much smaller inventory cycle in 1980 reflects a more accurate assessment by firms of the contractionary impact of an oil shock.

As was pointed out soon after the first oil shock, one macroeconomic effect of the OPEC price increases is a decline in domestic aggregate demand following the loss in real income of net oil importers [see, for example, Fried and Schultz (1975)]. In static terms, the rise in oil prices imparts an income loss measured by the increased real cost of the *initial* level of oil imports (with far-sighted agents, the loss should be measured dynamically, as the present discounted value of the cost increase of the future stream of imports). Crude calculations, shown in table 1, suggest that the static real income losses in 1973-79 and 1979-80 were of comparable magnitude as a percentage of contemporaneous GNP, with the first shock slightly larger, and the second shock distributed over two years. The second shock was a smaller percentage increase of real oil prices, though net imports of oil were a larger percentage of GNP in 1979 than in 1974.

Of course, the demand decline following an oil shock does not *necessarily* lead to an output decline if output prices are flexible and supply conditions are such as to lead to a large increase in net exports. Rapid growth in the face of a sharp domestic demand contraction is evidenced in Japan during 1979-80. In the U.S., however, with nominal price and wage stickiness, the standard Keynesian multiplier is more likely to apply in the short run.

Even more important, in both 1973 and 1979, macroeconomic policy turned sharply contractionary in the face of the rapid spurt in prices caused by the oil shocks. Thus, the *MI-B* growth rate (year-end over year-end) declined from 9.3 percent in 1972 to 4.4 percent in 1980, and from 8.3 to 6.4 percent from 1978 to 1980. The shift of the full-employment budget is in the same direction, with movements in 1973-74 and 1979-80 towards surplus of about one percent of GNP (table 1).

The contractionary demand effects of OPEC together with the contractionary policy movements were probably enough to induce a recession in 1974 and 1980. But, in each case, an additional factor magnified the initial demand decline: an extremely sharp inventory cycle in 1974, and short-lived consumer credit controls in 1974. I suspect, though have not seen widely argued, that the differences in inventory behavior in the two episodes explain most of the difference in short-run cyclical behavior. [Blinder (1981) suggests this argument, though he does not pursue it.]

Because the 1973 oil price increase was the first significant supply shock in at least thirty years, the market signals were widely misinterpreted in early 1974. The rapid run-up in prices was widely perceived to reflect a general overstimulation of the economy, rather than a one-shot price level increase. As the OECD (1976, pp. 8-10) indicates: '[T]here was a considerable speculative build-up of stocks of raw materials in response to the earlier

commodity price boom.' Moreover: 'enterprises' production plans in 1974 were generally based on the assumption that demand would pick up significantly in the course of the year.' For these reasons, the decline in late 1974 was accompanied by enormous inventory stocking. The inventory-sales ratio reached a level never before or since equalled in the post-war period. The year 1975 therefore ushered in an enormous inventory liquidation, with domestic output pushed far below final sales. Indeed the shift in total inventory investment, from \$11.6 billion (1972 dollars) in 1974 to -\$6.7 billion in 1975, exceeded the overall \$14 billion decline of real GNP in these two years.

The inventory behavior in 1979-80 is wholly different, with a much smaller rise in the inventory-to-final sales ratio, and much less subsequent de-stocking. Indeed, a recession had been forecast, incorrectly, during the entire preceding year. According to the 1980 Economic Report of the President (p. 25): '[F]orecasts of impending recession were becoming frequent by late 1978, long before the magnitude of the 1979 increase in oil prices by ... OPEC was perceived.' By the middle of 1979, such predictions were common. According to the OECD (1980), these expectations contributed, in 1980, to 'the rapid adjustment of employment and production to the fall in demand, so there is not the evidence of overhangs which have characterized similar early stages of previous downturns and given them ongoing momentum'. After the steep decline in output in 1980:II, the quick recovery in subsequent quarters (real GNP grew 2.4 percent in 1980:III) should be attributed in part to the absence of a large stock of unwanted inventories. As Blinder (1981) indicates, the result was that the 1980 recession is the first in recent memory in which a shift in inventory investment was not a preponderant share of the shift in GNP.

The 1980 cyclical peak is dated as January, 1980, for very early in the year there is evidence of a slowdown in economic activity. There is little doubt, however, that a major contribution to the downturn was a consumer credit restraint program imposed by President Carter in March, 1980. After rising at 3.1 percent in the first quarter, real GNP plummeted at an annual rate of 9.9 percent in 1980:II. Because of a drop in interest rates following the output decline, the credit controls ceased to bind in June, 1980, and were removed in July.

Conclusions

Lurking behind these cyclical events is a more momentous change in the U.S. since 1973, and that is a sharp decline in labor productivity growth. Though the economy experienced quick recoveries from the 1974-75 and 1980 recessions, largely by avoiding a profits squeeze with the attendant contraction of employment and investment, the overall rate of GNP growth

has been disappointing. The decline in growth of the net capital stock during 1974-80 explains only a part of the overall labor productivity decline. Most careful studies of the productivity puzzle conclude that a deceleration in total factor productivity is evident all of the way back to the mid-1960s.

The productivity deceleration is apparently evident throughout the OECD, suggesting that common factors such as the oil shocks, or erratic inflation, are the major causes. Though some analytical work, such as by Bruno, points in this direction, the productivity puzzle remains largely unsolved.⁴

At this date, slow productivity growth and the resulting slow growth in real incomes, ranks with inflation as the chief frustration of the U.S. economy, and lies behind the popular support for the change in direction taken by the Reagan administration.

⁴See Bruno (1981). For a cross-country discussion of the productivity issue, see Kendrick (1981).

References

- Blinder, Alan, 1981, Inventory behavior and the business cycle, *Brookings Papers on Economic Activity* 2.
- Bruno, Michael, 1981, Raw materials, profits and the productivity slowdown, NBER working paper no. 660.
- Bruno, M. and J. Sachs, 1981, Input price shocks and the slowdown in economic growth: Estimates for U.K. manufacturing, Presented at the Conference on Unemployment, Newham College, Cambridge, July.
- Economic Report of the President, 1980 (U.S. Government Printing Office, Washington, DC).
- Feldstein, Martin, 1981, Has the rate of investment fallen?, NBER working paper no. 679, May.
- Feldstein, Martin, James Poterba and Louis Dicks-Mireaux, 1981, State and local taxes and the rate of return on non-financial corporate capital, NBER working paper no. 740, Aug.
- Fried, Edward and Charles Schultz, eds., 1975, Higher oil prices and the world economy (Brookings Institution, Washington, DC).
- Gordon, Robert J., 1975, The impact of aggregate demand on prices, *Brookings Papers on Economic Activity* 3.
- Kendrick, J.W., 1981, International comparisons of recent productivity trends, in: W. Fellner, ed., *Contemporary economic problems* (American Enterprise Institute, Washington, DC).
- OECD, 1976, *Economic surveys: United States*, July, pp. 8-10.
- OECD, 1978, *Economic surveys: United States*, July, p. 10.
- OECD, 1980, *Economic surveys: United States*, Aug.
- Sachs, Jeffrey, 1979, Wages, profits, and macroeconomic activity, *Brookings Papers on Economic Activity* 2.