
CHAPTER V. HOW OPEC OIL PRICE INCREASES AFFECT DOMESTIC AND
INTERNATIONAL CREDIT MARKETS

Oil price increases first affect credit markets by raising nominal GNPs, nominal disposable incomes, and nominal domestic expenditures. The demand for credit rises in all the oil-importing countries, but most of all in the United States.

DEMAND FOR CREDIT INCREASES BY MORE WITHIN THE UNITED STATES THAN WITHIN OTHER COUNTRIES

Oil price increases raise short-term credit demand by increasing the total value of transactions. Oil price increases simultaneously reduce real economic activity and raise the general price level. For the United States, the rise in the price level more than offsets the fall in real activity, so that both nominal transactions and demand for credit rise. 1/

Economists disagree about the best indicator of a change in the demand for credit. Suggested indicators include changes in nominal disposable income, nominal gross national product, and nominal domestic expenditure. But by any of these measures, the predicted rise in U.S. credit demand will exceed that of its major trading partners. U.S. credit demand will rise because an oil price rise increases the general price level more than it reduces real economic activity. U.S. credit demand will rise relative to that in foreign countries because the rise in the U.S. general price level is greater than that in foreign countries (Chapter II), while the drop in economic activity is about the same (Chapter III). 2/

Whatever the correct indicator of the demand for credit, then, U.S. domestic credit markets should tighten relative to

1/ Appendix F further discusses the effect of oil price increases on nominal GNP and disposable income.

2/ See Appendix F.

those of other major oil-importing countries. (This assumes no change in central bank credit supplies, an assumption relaxed in Chapter VI.) The rise in the demand for credit within the United States will increase interest rates relative to those in other countries. That, in turn, will contribute to dollar exchange rate appreciation.

OPEC MEMBERS DEMAND DOLLAR-DENOMINATED ASSETS TO STORE THEIR SURPLUSES

When OPEC members demand dollar-denominated assets to store their financial surpluses, they hold the dollar exchange rate higher than it would otherwise be. The first of the following sections presents data indicating that, in the short run, OPEC members keep more than 75 percent of increased international reserves in dollars. The second section estimates that more than 60 percent of OPEC's nonreserve investment assets are denominated in dollars. The next two sections discuss the plausibility of major OPEC shifts into and out of dollars in view of the large share of dollar denominations in the world stock of public and private financial assets.

Currency Composition of Oil-Exporting Countries' Reserve Assets

Reserves are customarily defined as highly liquid assets that countries can use to finance current account deficits while they adjust their domestic economies. In practice, however, the definition of reserves is not very precise; the fraction of total assets comprising foreign currency reserves is whatever a country claims it to be. (The distinction is relevant here only insofar as it is possible to piece together better data on the currency denomination of reserves. Some of the problems in doing so are discussed in the notes to Table 9. 3/)

3/ The U.S. government and some international agencies have more complete and precise information than is shown here concerning oil-exporting countries' holdings of reserve and investment assets, together with the geographic location and the currency denomination of those investments. Those entities include the U.S. Departments of Treasury and Commerce, the Central Intelligence Agency, the Federal Reserve Board, the International Monetary Fund, and the Bank for International Settlements.

TABLE 9. OIL-EXPORTING COUNTRIES' HOLDINGS OF RESERVE ASSETS, DOLLAR-DENOMINATED AND OTHER, 1973-1978 (Billions of dollars)

	1973	1974	1975	1976	1977	1978
1. Cumulative OPEC Surplus Since 1973 <u>a/</u>	7.0	75.0	110.0	151.0	186.0	206.0
2. Total OPEC Reserves, End-of-Year Data <u>b/</u>	14.5	47.0	56.6	65.2	75.5	65.8
3. OPEC Reserves Held in Dollars						
a. In United States <u>c/</u>	3.4	15.3	23.2	34.2	41.6	42.0
b. In Eurodollars <u>d/</u>	4.8	19.1	24.2	27.5	31.4	19.4
c. Total	8.2	34.4	47.4	61.8	72.9	61.5
4. Percentage of Reserves Held in Dollars (4 = 3c/2)	57	73	84	95	97	93
5. Change in Dollar Reserves as Percentage of Change in Total Reserves (5 = Change in 3c/Change in 2)	—	81	135	167	108	118

NOTE: Detail may not add to totals due to rounding.

a/ Derived from data presented in International Monetary Fund, Annual Report, 1979, p. 18.

b/ Data for 1973-1977 from International Monetary Fund, Annual Report, 1978, Table 14, p. 51; data for 1978 from Annual Report, 1979, Table 18, p. 57. Original data in SDRs were converted to dollars using the SDR/dollar exchange rate for the end of year from various issues of International Financial Statistics. To make the series consistent, SDR 4.3 billion (\$5.6 billion) has been added to the 1978 value, representing the estimated foreign exchange cover against the Saudi Arabian note issue.

c/ See testimony of C. Fred Bergsten, Assistant Secretary of the Treasury for International Affairs, in The Operations of Federal Agencies in Monitoring, Reporting On, and Analyzing Foreign Investments in the United States, Hearings before the Subcommittee on Commerce, Consumer, and Monetary Affairs, House Committee on Government Operations, 96:1 (July 1979), Part 2, Table 3, p. 221. All OPEC holdings of U.S. Treasury debt were treated as official holdings, an assumption broadly supported by the aggregate data on identities of foreign holders of U.S. Treasury debt.

d/ International Monetary Fund, Annual Report, 1979, Table 20, p. 59. Original data in SDRs converted to dollars as described in note b.

Allowing for these difficulties, OPEC appears to have held more than 70 percent of its reserves in dollars since 1974 (Table 9). When OPEC members reduced their reserves in 1978, more than 100 percent of the reduction was in dollars, implying some shift out of dollars. When OPEC members added reserves between 1975 and 1977, they replaced nondollar assets with dollar assets, so the table shows for those years that more than 100 percent of reserve additions were in dollars.

Currency Denomination of Oil-Exporting Countries' Total Assets

By 1978, OPEC's total foreign assets (the cumulative OPEC surplus) represented more than twice the value of its reserve assets (Table 9). Unfortunately, little information exists on the currency denomination of nonreserve assets. The following section begins by presenting data on the currency denomination of newly issued international assets. It then estimates the currency denomination of all OPEC assets by assuming that OPEC nonreserve assets have the average currency denomination of new issues. Finally, it discusses the plausibility of this estimate in light of the currency denomination of combined newly issued and existing government and private assets.

Currency Composition of New Issues and Bank Assets. Dollars accounted for about 60 to 70 percent of the currency denomination of international bonds and publicly offered Eurocurrency credits between 1976 and 1978 (Table 10). The deutsche mark occupied a distant second place, with 6 to 9 percent of the offerings.

Dollar-denominated assets also represented about 70 percent of the external assets of European banks (Table 10). Moreover, most of the decline in the dollar's share of these assets between 1976 and 1978 followed from valuation effects: dollar depreciation raises the dollar value of foreign currencies held by banks. The decline was not the result of fund movements. ^{4/}

Various government officials have discussed the justification for not releasing these data. (See The Adequacy of the Federal Response to Foreign Investment in the United States, H. Rept. 1216, 96:2 (August 1980), pp. 119-29.)

^{4/} Bank for International Settlements, Annual Report, 1978/1979, p. 119.

TABLE 10. CURRENCY DENOMINATION OF SOME IMPORTANT LONG- AND SHORT-TERM FINANCIAL INSTRUMENTS
(Percent of total)

	Currency Denomination of International Bond and Eurocurrency Credit Offerings			Currency Denomination of External Assets of European Banks Reporting to the Bank for International Settlements			
	1976	1977	1978	1976	1977 <u>a/</u>	1977 <u>b/</u>	1978
Canada (Canadian Dollar)	2.3	0.9	-	-	-	<u>c/</u>	<u>c/</u>
Germany (Deutsche Mark)	6.0	8.7	7.3	16.0	18.1	18.3	19.4
Japan (Yen)	-	0.4	0.5	<u>c/</u>	<u>c/</u>	<u>c/</u>	<u>c/</u>
Switzerland (Franc)	0.1	0.2	-	5.9	6.0	6.1	5.6
United Kingdom (Sterling)	0.9	0.5	1.0	0.7	1.2	1.4	1.5
United States (Dollar)	58.5	64.1	69.9	73.4	70.2	69.8	67.6
Other Currencies <u>d/</u>	32.2	25.2	21.3	4.0	4.5	4.4	5.9

SOURCES: Currency composition of international and Eurocurrency bond offerings derived from data presented in World Bank, Borrowing in International Capital Markets, Fourth Quarter, 1978, EC-181/784 (March 1979), Tables 6, 7, and 12, pp. 85-86, 158. The currency composition of assets in European banks was derived from data presented in Bank for International Settlements, Annual Report, 1978/79, p. 118.

a/ Compare these 1977 data with 1976 data.

b/ Compare these 1977 data with 1978 data.

c/ Grouped with "other currencies."

d/ National borrowings were assigned to the "other currency" category, so the dollar denomination of these bonds is somewhat underestimated.

Estimated Currency Denomination of Total OPEC Assets. Large sums like the OPEC surplus could probably not be invested in international financial instruments without purchases of something close to the average currency denomination of that market. One estimate of the currency denomination of OPEC's reserve and non-reserve financial assets might assume that when oil-exporting countries purchase nonreserve assets they obtain the market's average currency denomination of new issues. The resulting estimate (Table 11, Estimate A) suggests that the average dollar-denominated content of the OPEC portfolio was 68 percent in 1974 and ranged between 72 and 77 percent for the balance of the

TABLE 11. ESTIMATED DOLLAR DENOMINATION OF OPEC RESERVE AND NONRESERVE FOREIGN ASSETS, 1974-1978 (In percent)

	1974	1975	1976	1977	1978
Estimate A					
OPEC dollar assets as percentage of total OPEC foreign assets (cumulative OPEC current account surplus) <u>a/</u>	68	72	74	77	77
Change in OPEC dollar assets as percentage of change in total OPEC foreign assets <u>a/</u>	63	81	79	91	79
Estimate B					
OPEC dollar assets as percentage of total OPEC foreign assets (cumulative OPEC current account surplus) <u>b/</u>	46	43	41	39	30
Change in OPEC dollar assets as percentage of change in total OPEC foreign assets <u>b/</u>	38	38	35	32	-57

a/ Total OPEC dollar-denominated reserve assets taken from Table 9. Balance of OPEC cumulative surplus (also shown in Table 9, line 1) is assumed to be divided into dollar and nondollar assets in the same proportion that dollar bonds represented in that year's international bond and Euromarket credit offerings. That distribution is shown in Table 10 for the years 1976 to 1978 and is assumed to be 0.6 for previous years.

b/ Assumes no OPEC nonreserve assets are invested in dollar-denominated assets.

period. Under such an assumption, the increase in dollar assets held as a fraction of each additional dollar of OPEC surplus would have ranged between 63 and 91 percent (line 2).

In addition to this "reasonable" estimate of the currency denomination of the OPEC portfolio, Table 11 shows an "extreme" estimate that assumes that none of the funds held by OPEC members as nonreserve assets are invested in dollar-denominated assets (line 3). Even under this assumption, which the following two sections will indicate is highly improbable, the dollar content of a rise in OPEC assets would still have ranged between 32 and 38 percent, except in 1978, when this assumption is indeed consistent with a substantial absolute drop in dollar-denominated holdings. The table does not show the other extreme assumption: that OPEC's nonreserve assets are entirely denominated in dollars. This would, of course, imply that the dollar denomination of total OPEC reserve and nonreserve assets (the cumulative OPEC surplus) exceeds the 70 to 90 percent found for reserves alone (Table 9).

Currency Denomination of Outstanding Government Debt as a Check on the Estimate of OPEC Asset Denomination. Sizes of outstanding public debt show why OPEC could not move much of its assets out of dollars into government debt of major financial center countries without massively disrupting world financial markets (Table 12). OPEC nonreserve assets of \$150 billion exceed the entire national debts of Germany, Switzerland, or the United Kingdom. Even in countries where outstanding debt exceeds OPEC assets, the debt is already held somewhere; attempts to purchase only a fraction of that debt might have enormously disruptive effects in their financial markets. For an investor, such a purchase attempt would certainly drive down yields and might raise the exchange rate. Most of these countries, furthermore, have restrictions on who may hold their national debt and on the purposes for which the national debt may be held.

Transactions in the U.S. national debt, in contrast, are considerably less trammled than in others. A larger amount is traded actively. U.S. government bonds, moreover, are available at many different maturities, ranging between a few weeks and almost 30 years. Such spacing is valuable to investors manipulating large portfolios.

Currency Denomination of Private Instruments as a Check on the Estimate of OPEC Asset Composition. Dollar denominations also predominate among private market instruments: U.S. equities

TABLE 12. NATIONAL DEBT OF MAJOR COUNTRIES, 1979 (Billions of dollars)

Country	Amount
Switzerland <u>a/</u>	7.1
Germany	117.0
United Kingdom <u>b/</u>	136.8
Japan	241.0
United States	658.0

SOURCES: International Monetary Fund, International Financial Statistics (July 1980). Figure for United Kingdom from International Monetary Fund, Government Finance Statistics Yearbook, 1979, p. 370.

a/ End of 1977.

b/ As of March 31, 1978.

account for about 75 percent of all equities outstanding among major Western countries; U.S. private bonds account for about 50 percent of all private bonds outstanding (Table 13).

In the United States, negotiable financial instruments are relatively plentiful because public stock and bond issues have financed private capital. Other countries have fewer financial certificates relative to their capital stocks because banks and governments have, more than in the United States, financed industry directly.

Potential investors must consider the riskiness of assets, too. The United States possesses about one-third of the OECD's capital stock, 5/ but probably more than one-third of the capital stock that most investors consider secure. A variety of

5/ At current prices and exchange rates, the United States had 34.5 percent of OECD GDP in 1979; see OECD, Main Economic Indicators (December 1980), p. 169. Assuming equal capital output ratios, it would have had about the same share of the capital stock.

TABLE 13. TOTAL DOLLAR VALUE OF OUTSTANDING DOMESTIC PRIVATE BONDS AND STOCKS IN MAJOR WESTERN COUNTRIES, 1977 a/

	<u>In Billions of Dollars</u>		<u>As Percentage of Total</u>	
	Private Bonds	Private Stocks	Private Bonds	Private Stocks
Austria	6.5	3.6	0.8	0.3
Belgium	18.3	15.5	2.2	1.2
Canada	30.6	68.6	3.7	5.1
Denmark	30.2	11.7	3.7	0.9
Finland	2.3	7.2	0.3	0.5
France	17.3	27.9	2.1	2.1
Germany	144.5	37.3	17.6	2.8
Italy	51.6	22.8	6.3	1.7
Japan	116.1	69.9	14.1	5.2
Norway	5.0	3.2	0.6	0.2
United Kingdom	<u>7.9</u>	<u>73.1</u>	<u>1.0</u>	<u>5.5</u>
Subtotal	528.4	340.2	52.4	25.5
United States	<u>390.7</u>	<u>996.7</u>	<u>47.6</u>	<u>74.5</u>
Total	919.1	1,336.9	100.0	100.0

SOURCE: Organization for Economic Cooperation and Development, OECD Financial Statistics, Volume I (October 1978).

a/ End-of-period data converted from national currencies with end-of-period exchange rates. Period ending in 1977 for Canada, France, Germany, Italy, Japan, and the United States; period ending in 1976 for Belgium, Finland, Norway, and United Kingdom; period ending in 1975 for Denmark.

geographical, military, and historical factors contribute to this in obvious ways. Moreover, the United States, itself possessing large foreign assets, has a relatively strong interest in guaranteeing all investors' rights.

Because of this omnipresence of U.S. instruments in private and public portfolios, a sum as great as the cumulative OPEC

TABLE 14. CURRENCY DENOMINATION OF FOREIGN EXCHANGE RESERVES, 1973-1978 (Billions of dollars and percentages)

	1973	1974	1975	1976	1977	1978
All Countries						
Total foreign exchange reserves, measured in dollars <u>a/</u>	122.6	154.8	160.8	186.3	243.3	288.1
Total reserves held in dollars <u>b/</u>	89.1	115.7	125.2	145.0	191.2	218.8
Dollars as a percentage of total foreign exchange reserves <u>c/</u>	72.7	74.7	77.9	77.8	78.6	75.9
Oil-Exporting Countries						
Total foreign exchange reserves, measured in dollars <u>a/</u>	12.3	42.8	49.7	57.0	67.1	52.2
Saudi Arabian Monetary Authority (SAMA), other assets <u>d/</u>	0.0	0.0	15.4	22.6	25.1	N.A.
Total foreign exchange reserves held in dollars <u>e/</u>	8.2	34.4	47.4	61.8	72.9	61.5
Dollars as a percentage of total foreign exchange reserves and other SAMA holdings <u>f/</u>	66.7	80.4	72.8	77.6	79.1	--
Oil-Importing Countries						
Total foreign exchange reserves measured in dollars <u>a/</u>	110.3	112.0	111.1	129.3	176.2	235.9
Total foreign exchange reserves held in dollars <u>g/</u>	73.5	78.0	78.4	83.3	114.2	146.2
Dollars as a percentage of total foreign exchange reserves	66.6	69.7	70.6	64.4	64.8	62.0

a/ Total foreign exchange reserves are taken from International Monetary Fund, International Financial Statistics (June 1980) and converted with the end-of-period dollar/SDR exchange rate given in that source.

(continued)

surplus probably has a currency denomination closer to that of Estimate A than to that of Estimate B in Table 11.

OTHER OIL-IMPORTING COUNTRIES DEMAND MORE DOLLAR-DENOMINATED RESERVES

Other oil-importing countries did not draw down their reserves to finance their deficits; instead, they increased their reserves. They did not, therefore, offset OPEC demands for reserve assets--they increased them. These oil-importing countries may have increased their reserve holdings because of increased uncertainty about the effects of the OPEC price increases on their trade balances.

TABLE 14. (continued)

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- b/ Total reserves held in dollars is the sum of official claims on the United States and official assets held in Eurodollars. See International Monetary Fund, Annual Report, 1979, Table 20, p. 59.
- c/ Note that Table 9, line 4, shows dollar-denominated reserves as a fraction of total reserves, comprising gold, SDRs, and foreign exchange.
- d/ International Monetary Fund, International Financial Statistics (June 1980); latest 1977 data for SAMA are end of first quarter.
- e/ Official Eurodollar holdings of oil-exporting countries are taken from IMF, Annual Report, 1979, Table 20. OPEC holdings of U.S. government debt are taken from the testimony of C. Fred Bergsten, Assistant Secretary of the Treasury for International Affairs, in The Operations of Federal Agencies in Monitoring, Reporting On, and Analyzing Foreign Investments in the United States, Hearings before the Subcommittee on Commerce, Consumer, and Monetary Affairs, House Committee on Government Operations, 96:1 (July 1979), Part 2, Table 3, p. 221.
- f/ The figures reported by the U.S. Treasury as official OPEC holdings of dollars exceed the figures reported by the IMF as total OPEC holdings of reserves. It is likely that SAMA's other assets are treated as official holdings by the United States even though SAMA does not report them as "reserves" to the IMF. Since there is apparently no important difference in the financial instruments in which reserves and SAMA's other assets are embodied, and since no other official estimate of dollar-denominated OPEC holdings is available, SAMA's other assets were grouped with the IMF-defined reserves to compute this ratio.
- g/ Non-OPEC official holdings of Eurodollars were taken from IMF, Annual Report, 1979, Table 20, p. 59. Non-OPEC official holdings within the United States were estimated by summing U.S. liabilities to official institutions of foreign countries outside Asia; see Department of the Treasury, Treasury Bulletin (May 1980), Table IFS-3, p. 91. This underestimates non-OPEC official holdings, since it excludes the non-OPEC countries of Asia, including Japan. Estimated total holdings of dollars are the sum of Eurodollar holdings and holdings within the United States.

Non-OPEC countries held 60 to 70 percent of their foreign exchange reserves in dollar-denominated assets between 1973 and 1978, while OPEC member countries held 70 to 80 percent in dollars during the same period (Table 14). Had other oil-importing countries drawn down their reserves to finance their deficits, they would have sold assets representing, on average, 65 percent dollars at the same time that OPEC members were buying assets representing, on average, 75 percent dollars. Had that happened, the reserve-associated increase in dollar-asset demand would have been only 10 percent of the OPEC surplus.

Other oil-importing countries did not, however, draw down their reserves during the period of OPEC asset accumulation. Despite their current account deficits, they increased reserve

holdings by borrowing in international capital markets. All major country regional groups increased their foreign exchange reserves between 1973 and 1978 (Table 15, column 3). Even when current account surpluses and deficits were developing and shifting rapidly, between 1973 and 1975 or 1976, ^{6/} industrial countries and (non-oil) less-developed countries accumulated reserves; only "Other Europe" drew down reserves during this period (Table 15, columns 1 and 2). During the period of world economic recovery, from 1975 or 1976 to 1978, all regional groups except the oil-exporting countries accumulated reserves rapidly.

TABLE 15. PERCENTAGE CHANGE IN DOLLAR EQUIVALENT OF FOREIGN EXCHANGE RESERVES HELD BY MAJOR NATIONAL ECONOMIC GROUPINGS

	Percentage Change Over 1973		Percentage Change 1978 Over		
	1975	1976	1973	1975	1976
All Countries	31	52	135	79	55
Industrial Countries	2	8	109	106	94
Other Europe	-37	-17	3	63	24
Oil-Exporting Countries	304	364	324	5	-8
Other LDCs	8	55	163	143	69

SOURCE: International Monetary Fund, International Financial Statistics (July 1980), pp. 32-34.

Oil-importing countries may have increased reserve holdings because they expected the average deficit to be larger. The oil price rise directly increased the expected size of the deficit of oil-importing countries taken as a group, as it was the counterpart of the oil-exporting countries' surplus.

^{6/} This discussion compares both 1975 and 1976 with 1973 and 1978 to show that the argument does not depend critically on the choice of the mid-point year.

Oil-importing countries may also have increased reserve holdings because they were more uncertain about the likely size of the deficit. After the first OPEC price increases, national governments were unsure about the response of energy supply and demand to the oil price rise. They were also uncertain about the pattern of deficits that would emerge as different national governments used different policy mixes to secure different policy goals. The inflation induced by the oil price rise added to the uncertainty surrounding the likely changes in international trade.

Oil-importing countries did not, however, accumulate many reserves in the course of intervening in support of the dollar. ^{7/} When the dollar depreciated between 1975 or 1976 and 1978, reserves of those industrial countries that did intervene grew somewhat faster than those of other European countries but more slowly than the reserves of the non-oil LDCs; neither of the latter two groups intervened substantially to support the dollar.

^{7/} Combined foreign currency reserves of Germany, Japan, and Switzerland rose by \$36.9 billion from their value of \$44.5 billion (the average of 1975 and 1976) and their 1978 value of \$81.3 billion. World foreign exchange reserves rose by about \$114.6 billion over the same period; if all foreign exchange acquisition by these countries was motivated by intervention in support of the dollar, then such intervention would account for at most 32 percent of the increase in reserves. Total world reserves, including gold valued at a constant price of SDR 35 per ounce, rose by \$121.8 billion over the same period; the assumed amount of intervention would have accounted for no more than 30 percent of the increase in total reserves. Valuing gold at world market prices would further reduce the share of intervention in explaining total reserve accumulation. Indeed, the foreign exchange holdings of the intervening countries increased by about 83 percent over this period (measuring reserves in dollars), less than the 119 percent rise in foreign exchange holdings of other, typically non-intervening, industrial countries. Since even countries that intervene accumulate reserves for other reasons as well, attributing all their reserve increases to intervention overestimates true intervention; less than 30 percent of reserve accumulation followed from intervention. Holdings of reserves by country and by type of reserve, and SDR exchange rates, were taken from International Monetary Fund, International Financial Statistics (June 1980), pp. 10, 32-35.

There is no reason to associate total industrial country foreign exchange accumulation with dollar support operations in the period between 1973 and 1975 or 1976. Within the industrial countries, only Germany, Japan, and Switzerland have been important intervenors in support of the dollar. Were all of their reserve accumulations between 1975 or 1976 and 1978 obtained by intervening in support of the dollar—surely an overestimate—then intervention would still explain no more than 30 percent of world reserve accumulation.

CHAPTER VI. HOW OPEC OIL PRICE INCREASES AFFECT THE DOLLAR EXCHANGE RATE

The dollar exchange rate--the price of a dollar measured in foreign currency--depends on the supply of and demand for dollars and dollar-denominated financial assets.

This chapter first discusses why, when central banks hold credit unchanged, an increase in the oil price will first raise, and later lower, the dollar exchange rate relative to the rate that would have existed without the oil price increase. Holding central bank reaction constant permits focusing on the structural, nonpolicy reaction to an oil price increase: the relatively large increase in credit demand in the United States, the rise in the demand for dollar-denominated international reserves, and the insufficiency of the rise in the U.S. deficit as a way of supplying the dollar assets demanded. It then shows why speculators can dampen, but not eliminate, these exchange rate fluctuations.

The chapter then discusses how choices of monetary and fiscal policy will change this predicted exchange rate path.

WHY THE DOLLAR WILL APPRECIATE IF CENTRAL BANKS DO NOT CHANGE CREDIT SUPPLIES

An oil price increase will first raise the value of the dollar because it:

- o increases credit demand and tightens credit markets in the United States relative to other countries;
- o increases the OPEC surplus and OPEC's demand for dollar-denominated international reserve assets;
- o increases other oil-importing countries' uncertainty about the size of their deficits and increases their demand for reserves; and
- o only partly offsets the above by increasing the U.S. trade deficit.

In the second phase of the adjustment period, the dollar will depreciate relative to what it would have been because:

- o credit markets will slacken as non-oil prices drop in response to unchanged central bank credit policies;
- o OPEC will stop accumulating reserves and will increase imports of goods and services;
- o other oil-importing countries will become more certain about the evolution of their deficits and will demand fewer dollar-denominated reserves; and
- o the foregoing will be only partly offset by the drop in the U.S. trade deficit.

For Any Oil Price Increase, U.S. Domestic Credit Demand Will Rise Relative to That of Other Countries

An oil price rise reduces U.S. and foreign real output by about the same amount, but it increases the U.S. GNP deflator and the consumer expenditures deflator by much more. Therefore, nominal GNP and disposable income will rise in the United States relative to other countries. Accordingly, relative to other countries, credit demand within the United States will also rise.

Assuming unchanged central bank credit supply policies, the rise in U.S. credit demand will reduce domestic loan availability and increase U.S. interest rates. Foreign capital will flow into the United States, and the exchange rate will rise. This exchange rate movement is roughly sketched in Panel A of Figure 1.

If, as time passes, however, the central bank continues to hold credit unchanged, the aggregate price level will fall back toward its old level. The U.S. demand for credit will fall, and the exchange rate will return toward its old level.

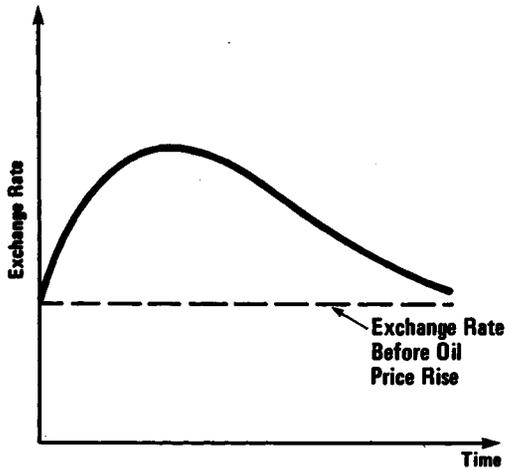
The Oil Price Rise Will Increase Foreign Demand for Dollar-Denominated Assets

While OPEC runs a surplus, its demand for dollar-denominated assets will raise the dollar exchange rate above the level that otherwise would have prevailed. This period of "high" exchange rates is labeled "Phase I" in Panel B of Figure 1.

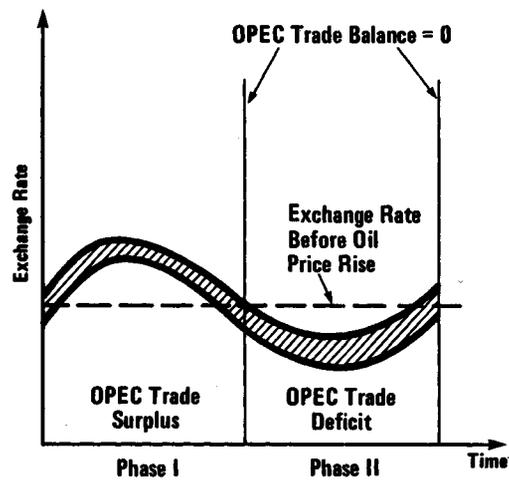
Figure 1.

Components of the Exchange-Rate Effect of Oil-Price-Related Changes in Demand for Dollars and Other Dollar-Denominated Financial Assets

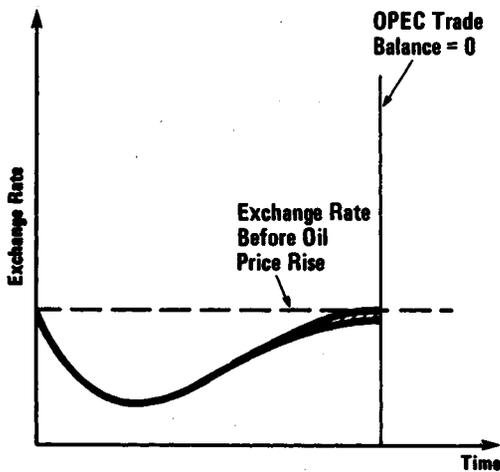
Panel A. Effect of Changes in the U.S. Transactions Demand for Money



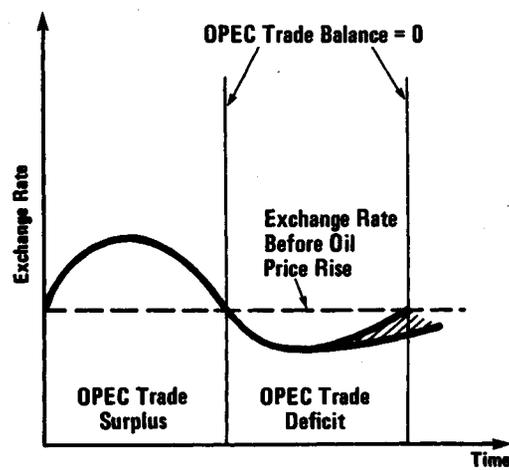
Panel B. Effect of OPEC and Foreign Demand for Reserve Assets



Panel C. Effect of Changes in the U.S. Trade Balance



Panel D. Combined Effect



At the same time, other oil-importing countries will either draw down their reserves to finance their deficits or borrow to increase their reserves because of greater uncertainty about their deficits. Depending on whether their demand rises (as it did between 1973 and 1976) or falls, the exchange rate will rise more or less. The uncertainty about combined OPEC and non-U.S. oil-importing country reserve demand is indicated by the shaded zone in Panel B.

Should OPEC imports eventually rise enough to eliminate its trade surplus, OPEC's demand for dollar assets will fall to zero. The exchange rate will return to the level that would have prevailed without an oil price increase. This point is the dividing line between Phase I and Phase II (Figure 1, Panel B).

OPEC may increase imports enough to create a trade deficit, financing it by spending accumulated dollar-denominated assets. Because of OPEC's asset reductions, the dollar will fall below the value that otherwise would have prevailed. The dollar will remain depressed until OPEC stops drawing down those reserves, either because it once again has no trade deficit (shown in Figure 1) or because it borrows to finance the deficit.

Changes in the U.S. Trade Balance Only Partly Offset the Above

The U.S. trade balance with OPEC will move into deficit when the oil price is first increased; it will then move back toward zero as OPEC imports rise (Panel C). Should OPEC eventually run a deficit, the United States might have a counterpart surplus.

If, ultimately, OPEC maintains its current market share of U.S. exports and there are no offsetting changes elsewhere, then a U.S. trade deficit will appear at the old exchange rate. This deficit must be erased with permanent "real" depreciation of the dollar relative to the level that prevailed before the oil price rise. Such real depreciation would occur either by reducing the general price level (relative to foreign price levels) at the old exchange rate or by depreciating the exchange rate while maintaining the U.S. general price level (shown as the shaded area in Panel C).

The U.S. trade deficit will not, however, supply all the dollars that OPEC members demand. The hypothetical 100 percent oil price increase discussed in Chapter IV (Table 7) would, with

1973 trade balances, increase the U.S. trade deficit with OPEC by \$0.6 billion. At the same time, it would increase the OPEC surplus by \$10.8 billion. Since, as Chapter V discussed (Table 11), OPEC will put 60 percent or more of that surplus in dollar assets, OPEC demand for dollar-denominated assets will probably rise by more than \$6 billion. This rise in demand exceeds the increase in dollar assets supplied by the U.S. trade deficit, so the exchange rate will rise.

Even in 1978, when the U.S. trade balance had grown more sensitive to oil price increases, such price increases would still increase OPEC demand for dollar assets by more than the rise in the U.S. deficit. The 100 percent oil price increase would raise the 1978 U.S. deficit by \$11.4 billion. But the OPEC surplus would rise by \$38.8 billion, of which more than \$23 billion would be placed in dollars.

Conversely, when OPEC later draws down its reserve assets to finance its trade deficit, its demand for dollars will fall. This demand decline will exceed the drop in dollar assets supplied when the U.S. trade deficit falls. When OPEC sells a dollar's worth of foreign assets, more than 60 cents is actually denominated in dollars. When OPEC buys a dollar's worth of imports, only about 18 cents actually comes from the United States. ^{1/} So when OPEC draws down reserves to buy imports, the demand for dollars falls.

The Combined Effect First Raises, then Reduces, the Value of the Dollar

The combined effect of the increase in domestic credit demand, demand for international dollar reserves, and rise in the U.S. trade deficit is first to raise the value of the dollar relative to what it would have been, and then to decrease it. The combined effect is roughly shown in Panel D of Figure 1. (The shaded area shows the possibility of permanent real depreciation of the dollar.)

Speculators May Partly Dampen These Price Movements

Speculators will limit the dollar's rise and fall. If they foresee the price pattern, they will sell the dollar short when it

^{1/} Total OPEC imports rose by \$71.6 billion between 1973 and 1978, while OPEC imports from the United States rose by \$12.6 billion over the same period (Table 7).

first rises and later cover their positions by purchasing when the dollar has fallen. These purchases and sales will reduce the dollar's fluctuation.

They will not, however, completely damp out the fluctuation. Speculators' expected profits must exceed their interest costs. A speculator who borrowed to short the dollar would have to expect the dollar to depreciate by at least as much as the interest rate; any less and the speculator would lose money. Even with stabilizing speculation, exchange rate swings as great as the annualized interest rate are possible; greater swings would occur when speculators required reasonable risk premiums over the interest rate.

U.S. AND FOREIGN CENTRAL BANK REACTION MAY PRODUCE A DIFFERENT DOLLAR EXCHANGE RATE

The preceding discussion assumed that central banks hold credit supplies unchanged; obviously, they will not do this. Rather, they will change credit supplies according to a variety of policy goals; they may even place prime emphasis on changing the exchange rate.

Historically, the Federal Reserve has met oil price increases with relatively restrictive credit policies. This reaction may follow from its perception that U.S. prices rise more than foreign prices, or that they rise by a great deal relative to other inflationary episodes within the United States. This reaction accentuates the dollar exchange rate appreciation: at the same time that the demand for dollars and dollar-denominated assets rises more than demand for foreign currencies and foreign-currency assets, the Federal Reserve Board increases dollar-denominated credit by less than foreign central banks expand their foreign-currency-denominated credit.

Monetary policies of other industrialized nations are equally central. The initial steadiness and subsequent rapid appreciation of the deutsche mark and Swiss franc followed from relatively restrictive credit policies in Germany and Switzerland. Those policies were possible, as will be discussed in Chapter VII, because of a greater willingness to tolerate unemployment and because of the exit of women from the labor force and of "guest workers" from the countries.

Trade policies are also relevant: Japan's huge current account surplus reduced the supply of yen-denominated assets (or,

equivalently, reduced the Japanese demand for non-yen assets) and contributed to yen appreciation (discussed further in Chapter VII).

Different central bank and government policy responses are as important as the initial differences in economic structures in determining how oil price increases affect dollar exchange rates.



OPEC oil price increases create two different problems for oil-importing countries:

- o inflation and unemployment;
- o a permanent loss in real income.

The first of the following two sections discusses the inflation and unemployment created by any rise in the price of oil, and surveys some possible policy responses. The subsequent section discusses the long-term problems arising from an oil price that some people consider excessively high; it presents a possible remedy to that problem. Since many of the policy options discussed here have been treated extensively elsewhere, this chapter will often limit itself to commenting on how the change in the oil price affects the desirability of a particular option.

The problems of rising oil prices and too high oil prices are linked. If the oil price is too high, reducing it would help to solve the macroeconomic problems caused by its increase without creating natural-resource management problems. But if the oil price is not too high, and if it will continue to rise, then other policies ought to address the macroeconomic consequences of its increase.

THE MACROECONOMIC COSTS OF A RISING OIL PRICE

The social cost of a rising oil price is the consequent unemployment, inflation, and decline in GNP. Policymakers in oil-importing countries cannot fully offset the twin effects of oil price increases: a general price increase and a decline in economic activity. These costs can be immense. In 1974 and 1975, for reasons partly following from the oil price rise, the output of the OECD countries fell below its previous growth path by about \$350 billion. In the same years, U.S. output fell over \$100 billion below its previous path. ^{1/}

^{1/} The average annual growth rate of OECD output was 4.2 percent between 1966-1967 and 1976-1977. (See OECD Economic Outlook

Monetary Policy Options

Fearing increased inflation, central banks typically do not fully offset the demand-reducing effects of an oil price increase.

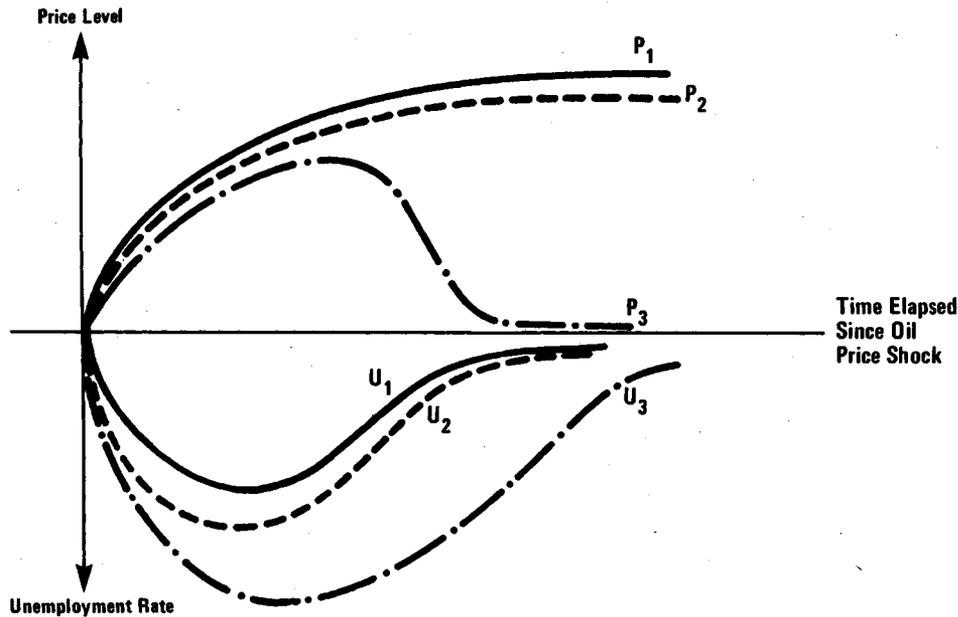
Figure 2 illustrates the central bank's problem. The rise in the aggregate price level depends upon credit policy: an accommodating policy might, over time, produce a price path like P_1 , while a tighter monetary policy could produce a lower price path, like P_2 .

But society pays for tighter central bank control over the aggregate price level with increased short-run unemployment: the credit policy that produced the lower price path, P_2 , would also produce a higher path for the unemployment rate, like U_2 . A draconian central bank policy that held credit supplies unchanged in the face of an oil price increase might eventually restore the former price level (as in path P_3), but would also produce the greatest transitional unemployment (U_3).

Choices among price levels correspond to choices among inflation rates. The more accommodating central bank policy associated with price path P_1 (Figure 2) implies higher and longer-lasting inflation rates like P_1 (Figure 3). That more accommodating credit policy also secures a lower rate and a shorter period of unemployment. The tighter central bank policy

(December 1979), Table 1, p. 13.) The actual rates of growth of output in 1974 and 1975 were 0.5 percent and -0.4 percent, respectively. (Ibid., p. 130.) The deviation of actual growth from trend growth was, therefore, 3.8 percent in 1974 and 4.6 percent in 1975. For the OECD countries taken as a group, gross domestic product in 1974 was \$4,063.92 billion, measured in 1975 prices and 1975 exchange rates. (OECD, Main Economic Indicators (August 1980), p. 169.) The deviation from trend in absolute terms was, therefore, about \$150.4 billion in 1974 and \$186.9 billion in 1975. Trend growth for the United States was 2.8 percent annually over the same period, while 1974 GDP was \$1,541.42 billion. Actual U.S. growth was -1.3 percent in 1974 and -1.0 percent in 1975, so the deviation from trend growth in those two years was -4.1 and -3.8 percent, respectively. The loss in absolute terms in 1974 was \$63.2 billion; in 1975, \$58.6 billion.

Figure 2.
 Illustrative Sketch of Price Level and Unemployment Rate
 After Oil Price Increase

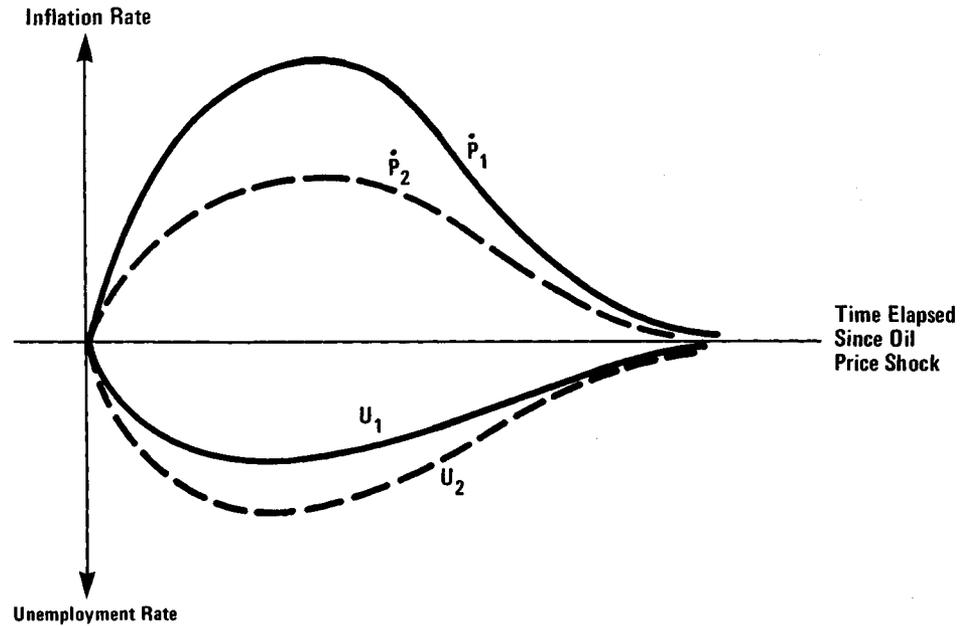


associated with price path P_2 (Figure 2) implies lower inflation rates lasting a shorter period, as in \hat{P}_2 (Figure 3), but, in contrast to the more accommodating policy, it also implies higher unemployment rates of longer duration. Had the inflation path associated with price level P_3 been drawn, it would have shown a period of inflation followed by a deflation until the original price level had been restored. This improbable policy is not illustrated in Figure 3.

Reducing the general inflation caused by an oil price rise will increase unemployment in the short run. Little comfort can be derived from knowing that eventually the unemployment rate will return to its former level, for the costs of the short-run unemployment are immense.

The central bank must solve the policy problem of choosing the socially best combination of unemployment and inflation

Figure 3.
 Illustrative Sketch of Inflation Rate and Unemployment Rate
 After Oil Price Increase



in responding to the oil price shock. Each policy incurs costs from both unemployment and inflation; the central bank must weigh each against the other. (The numerous problems associated with measuring these costs are discussed elsewhere and need not be reviewed here.) Once the costs are known, the central bank must take proper account of their different time patterns: a cost incurred now hurts more than the same cost incurred later.

The choice facing a central bank is vexatious. The bank cannot know its technical options with precision; it cannot know the precise effect of the price shock on the aggregate price level; and it must be concerned that wage- and price-setting behavior elsewhere in the economy depends, in part, on the policies that observers expect of the bank.

Nonetheless, most technical examinations of this issue have concluded that the central bank should accommodate most of the oil