This PDF is a selection from an out-of-print volume from the National Bureau of Economic Research

Volume Title: The International Transmission of Inflation

Volume Author/Editor: Michael R. Darby, James R. Lothian and Arthur E. Gandolfi, Anna J. Schwartz, Alan C. Stockman

Volume Publisher: University of Chicago Press

Volume ISBN: 0-226-13641-8

Volume URL: http://www.nber.org/books/darb83-1

Publication Date: 1983

Chapter Title: The United States as an Exogenous Source of World Inflation under the Bretton Woods System

Chapter Author: Michael R. Darby

Chapter URL: http://www.nber.org/chapters/c6139

Chapter pages in book: (p. 478 - 490)

16 The United States as an Exogenous Source of World Inflation under the Bretton Woods System

Michael R. Darby

The evolution of the American price level under the Bretton Woods system was essentially independent of international influences. America was a source but scarcely a victim of inflationary trends in the rest of the world. This indictment follows from the special role of the United States as provider of a fiat reserve currency. This is not the role suggested by the "gold-exchange standard," but it is the role the United States in fact appears to have pursued.

The essential independence from foreign influences of a fiat reserve country is demonstrated in section 16.1. In particular, it is shown that the world inflation trends are determined by the reserve country alone and that world money and world reserves adjust passively without causal significance. Section 16.2 examines the evidence on the empirical question as to whether the United States acted as a fiat or commodity reserve country. Neither balance-of-payments deficits nor decreases in the gold stock induced any reduction in the American money supply, so the fiat reserve interpretation is supported. Domestic monetary policy is seen in section 16.3 to be the dominant determinant of American inflation, especially over longer periods. Other domestic and foreign influences have played decidedly minor roles which are trivial in explaining inflationary trends. Conclusions and implications complete the chapter.

16.1 A Model of a Fiat-Reserve-Currency System

This section proposes a simple model of a fiat-reserve-currency system as a stylized description of the Bretton Woods System. Since our primary concern is inflationary trends, it is assumed that we are dealing with a time period sufficiently long that the monetary approach to the balance of payments with exogenously given purchasing power parities is applicable. As will be obvious, the essential nature of a fiat reserve country as an independent exogenous source of world inflation would not be altered by allowing for the nonreserve countries to affect their parities via commercial policies or to pursue partial sterilization policies.[1]

The reserve country is defined by the fact that other countries peg the exchange rates E_i between their currencies and that of the reserve country. The reserve country in turn is on a fiat standard and makes no effort to peg its exchange value relative to any commodity or other currency. For our purposes let the "world" consist of a currency bloc of n countries, the nth of which is the reserve currency. Floating exchange rates insulate this world from other worlds built around other reserve currencies; so they can be ignored for now. Each of the first $n-1$ countries holds reserves R_i in the form of bonds issued by country n. In the long-run equilibrium being considered, real income y_i grows at a constant rate $\overline{\Gamma y_i}$ fixed by supply conditions, where Γ is the growth rate operator.

The model contains $n-1$ purchasing power parity conditions ($\Gamma E_i = 0$):

$$\Gamma P_i = \Gamma P_n, \qquad i = 1, \ldots, n-1. \tag{16.1}$$

Money demand is determined according to the Cambridge equation with constant trend fluidity growth $\overline{\Gamma\phi_i}$:[2]

$$\Gamma M_i^D = \overline{\Gamma\phi_i} + \overline{\Gamma y_i} + \Gamma P_i, \qquad i = 1, \ldots, n. \tag{16.2}$$

Money market equilibrium holds in the long run:

$$\Gamma M_i^D = \Gamma M_i^S, \qquad \mathrm{i} = 1, \ldots, n. \tag{16.3}$$

The money multiplier in each country is assumed to grow at a constant rate $\overline{\Gamma\mu_i}$. High-powered money H_i is the sum of domestic credit D_i fixed by the local monetary authority and reserves R_i:

$$\Gamma M_i^s = \overline{\Gamma\mu_i} + \frac{D_i}{H_i}\overline{\Gamma D_i} + \frac{R_i}{H_i}\Gamma R_i, \qquad i = 1, \ldots, n. \tag{16.4}$$

Equation counting yields $4n-1$ equations to solve for the $4n$ endogenous variables (the ΓP_i, ΓM_i^D ΓM_i^S, and ΓR_i). The missing equation is obtained by noting that a fiat reserve currency producer has no need for reserves since it only exchanges one unit of its money for another. So its reserves can be fixed as zero[3] ($H_i = D_i$ or $\overline{\Gamma H_i} = \overline{\Gamma D_i}$):

$$\Gamma R_n = 0. \tag{16.5}$$

1. The short-run importance of such policies is examined at length in parts II and III of this volume.

2. Fluidity (the inverse of income velocity) is of course a function of interest rates and real income as well as payments practices and institutions. As their long-run growth rates are unaffected, we can assume constant fluidity growth without loss of generality.

3. Or any other constant.

Note the recursive structure of this model: Equations (16.2) through (16.4) for country n plus (16.5) completely determine the equilibrium values for the reserve country. Given this equilibrium value of $\Gamma P_n = \overline{\Gamma \mu_n} + \overline{\Gamma H_n} - \overline{\Gamma \phi_n} - \overline{\Gamma y_n}$ and the $n - 1$ purchasing power parity conditions, all the other inflation rates $\Gamma P_1, \ldots, \Gamma P_{n-1}$, are determined. This in turn determines the money supply growth in each nonreserve country which finally determines the growth in each country's reserves given its chosen trend domestic credit growth. This simple recursive structure differs sharply from the world money supply and demand approach, which builds up world real money demand and world nominal money supply aggregates (in reserve currency units) and then solves for the world inflation rate as the difference in their growth rates.[4] The flaw in this approach is that even if there is a stable multiplier between the world money supply on the one hand and world domestic credit plus reserves on the other, world-reserves growth adjusts passively so as to equate the world inflation rate thus determined with the equilibrium ΓP_n determined in the reserve country. The crucial point is that nonreserve countries hold the reserve country's interest-bearing bonds—not its money—as reserves and those holdings have no natural constraint.[5]

The essential exogeneity of the reserve country as a source of world inflation rests on two assumptions: (1) The reserve country's nominal money supply growth $(\Gamma \mu_n + \Gamma H_n)$ does not respond to changes in its own reserves or in the reserves of other central banks. (2) The growth-rate of the reserve country's real money demand $(\Gamma \phi_n + \Gamma y_n)$ is independent of foreign influences. The empirical validity of those assumptions is the subject of sections 16.2 and 16.3.

16.2 Was the United States on a Fiat Standard?

The previous section showed that the essential thing about a fiat reserve country is that its nominal money stock is independent of international reserve flows. That is a statement about the behavior of its central

4. See, for example, Heller (1976, 1979) and the papers in Meiselman and Laffer (1975) and Parkin and Zis (1976*a*, *b*).

5. In the real world, nonreserve countries may also hold reserves as gold, SDRs, and IMF reserve position, but as indicated by Heller (1979, p. 236) the dominant source of variation in reserve growth is in fact variations in holdings of foreign exchange (and its valuation after 1971). Heller's evidence that changes in reserves have a small lagged coefficient in explaining changes in money and ultimately prices (particularly for industrialized countries) is consistent with the complete contemporaneous sterilization and lagged response which figured so prominently in parts II and III of this volume; in that case a stimulative American monetary policy results in exaggerated reserve flows as detailed in chapter 10. For further discussion, see Darby (1980).

bank—to be specific, the behavior of the Federal Reserve System. For present purposes, convertibility between money and gold, or between money and milk, is an entirely separate *relative* price program so long as the Fed does not adjust its monetary policy to maintain the pegged exchange rate between the dollar and the commodity, whether gold or milk. The question at the head of this section can thus be restated as: Did gold flows or the balance of payments enter as a significant variable in the reaction function describing the Fed's monetary policy?

The Federal Reserve Act required the Fed to hold gold certificates issued by the Treasury as reserves against Federal Reserve Notes and the Fed's deposit liabilities, the required reserve ratios being 40 and 35% respectively. After the gold price was raised from $20.67 to $35.00 per ounce in 1933–34, the Fed pursued a policy of partial if not total sterilization so that free gold holdings rose dramatically.[6] Monetization of World War II deficits reduced the free gold holdings, but Congress in 1945 reduced the gold reserve requirements on Federal Reserve Notes and deposits to 25% each when it appeared that they might impose a real limit on the Fed's monetary policy. Then beginning around the mid-1950s—about the time the GNP deflator rose significantly above its devaluation-adjusted 1929 level—total and free gold holdings began a steady decline. In March 1965, the reserve requirement against Fed deposits was eliminated, again lest monetary policy be constrained by a shortage of free gold. On 17 March 1968, the United States stopped sales and purchases of gold at $35.00 per ounce with everyone except other central banks who agreed to trade gold only among themselves thus eliminating the pegged dollar price of gold for private firms and individuals. The next day the final reserve requirement against Federal Reserve Notes was eliminated. Finally, on 15 August 1971, the United States suspended convertibility of dollars into gold even for foreign central banks.

This thumbnail sketch certainly at least raises the possibility that the ties of the dollar to gold had no real effect on monetary policy, but were merely so much political window dressing to be disposed of whenever burdensome. To proceed further, we need to work with an empirical specification of the Fed's reaction function. The reaction function (R4) contained in the Mark III International Transmission Model is a logical starting point. It is reproduced here for convenience using simplified notation:[7]

6. Free gold is the excess of the Fed's holdings of gold certificates over the required amount. Sterilization is discussed in detail in chapter 10.

7. See chapters 5 and 6 above for a discussion of this model. The standard errors appear below the estimated coefficients, and the t statistics are below the standard errors; Durbin's h cannot be computed in this case. Note that $4\Delta \log M = \Gamma M$ for one-quarter observations.

(16.6)

$$\begin{aligned}
\Delta \log M = {} & \underset{\substack{(0.003)\\ 1.59}}{0.004} + \underset{\substack{(0.00005)\\ 5.06}}{0.00025t} \\
& + \underset{\substack{(0.029)\\ 0.14}}{0.004\,\hat{g}} + \underset{\substack{(0.021)\\ 0.08}}{0.002(\hat{g}_{-1} + \hat{g}_{-2})} + \underset{\substack{(0.020)\\ 1.46}}{0.029(\hat{g}_{-3} + \hat{g}_{-4})} \\
& - \underset{\substack{(0.090)\\ -0.64}}{0.058(\log P_{-1} - \log P_{-3})} - \underset{\substack{(0.100)\\ -2.38}}{0.237(\log P_{-3} - \log P_{-5})} \\
& - \underset{\substack{(0.193)\\ -0.60}}{0.117u_{-1}} + \underset{\substack{(0.363)\\ 1.49}}{0.539u_{-2}} - \underset{\substack{(0.367)\\ -1.18}}{0.432u_{-3}} - \underset{\substack{(0.195)\\ -0.28}}{0.055u_{-4}} \\
& + \underset{\substack{(0.12)\\ 3.98}}{0.461\Delta \log M_{-1}} - \underset{\substack{(0.12)\\ -1.98}}{0.230\Delta \log M_{-2}}, \\
& \bar{R}^2 = 0.56, \quad \text{S.E.E.} = 0.0046, \quad \text{D-W} = 2.05,
\end{aligned}$$

where M is nominal money, t a time index, $\hat{g}$ the innovation in real government spending, P the price level, and u the unemployment rate; a negative subscript indicates the number of quarters a variable is lagged. This reaction function allows the Fed to respond to unanticipated changes in government spending, inflation, and unemployment.

To the basic functional form (16.6), we add three scaled balance-of-payments terms such as those included in the nonreserve reaction functions in the Mark III Model[8] and obtain

(16.7)

$$\begin{aligned}
\Delta \log M = {} & \eta_1 + \eta_2 t + \eta_3 \hat{g} + \eta_4(\hat{g}_{-1} + \hat{g}_{-2}) \\
& + \eta_5(\hat{g}_{-3} + \hat{g}_{-4}) + \eta_6(\log P_{-1} - \log P_{-3}) \\
& + \eta_7(\log P_{-3} - \log P_{-5}) + \eta_8 u_{-1} + \eta_9 u_{-2} + \eta_{10} u_{-3} \\
& + \eta_{11} u_{-4} + \eta_{12}\Delta \log M_{-1} + \eta_{13}\Delta \log M_{-2} \\
& + \eta_{14}(B/Y)\text{DUMMY} + \eta_{15}[(B/Y)_{-1} + (B/Y)_{-2}]\text{DUMMY} \\
& + \eta_{16}[(B/Y)_{-3} + (B/Y)_{-4}]\text{DUMMY} + \epsilon,
\end{aligned}$$

where (B/Y) is the balance of payments (surplus positive) as a ratio to nominal GNP. The DUMMY variable is included to allow for the possibility that the Fed was concerned about the balance of payments only until private gold sales and gold reserve requirements were eliminated or, alternatively, only until convertibility was suspended in 1971; this is detailed below but can be ignored for the moment. The fiat-reserve-

8. At least some of these terms were significantly positive in the nonreserve reaction functions reported in chapter 6.

country hypothesis implies that $\eta_{14} = \eta_{15} = \eta_{16} = 0$; the alternative hypothesis is that the balance-of-payments effect is positive.

It is unclear exactly what concept of the balance of payments is appropriate, so we tried three: (*a*) the change in gold certificates held by the Fed and thus available to satisfy reserve requirements, (*b*) the change in the total gold stock including intervention account balance, and (*c*) the balance of payments on the official reserve transaction basis. The gold stock data are described in an appendix to this chapter. We also tried three variants of the DUMMY variable as well: one with value 1 through 1968I and 0 thereafter, a second with value 1 through 1971I and 0 thereafter, and a third with value 1 throughout. Whatever the period or balance-of-payments definition, the results were qualitatively the same as summarized in table 16.1: One cannot reject the hypothesis that $\eta_{14} = \eta_{15} = \eta_{16} = 0$ or, alternatively, that $\eta_{14} = 0$ in favor of the alternative hypothesis that the balance of payments has a positive effect. Indeed, in the sample period the partial correlation was if anything negative. Inclusion of the (B/Y) terms had no significant effect on the other coefficients in the basic equation. These results correspond to the fact that the residuals of the basic reaction function (16.6) displayed no pattern of significant correlation with the residuals of any of the other behavioral equations in the Mark III Model as reported at the end of section 6.2.

An original working hypothesis of the International Transmission Project was that, contrary to popular opinion, the gold reserve requirement

Table 16.1 **Tests for Significance of Balance-of-Payments Variables in American Money Reaction Function (16.7)**

Balance-of-Payments Definition	Period of Effect†	*t* Statistic for Current (B/Y) Coefficient	*F* Statistic for All (B/Y) Coefficients§
Scaled change in gold certificates	1957I–68I	−1.356	0.742
	1957I–71II	−1.198	1.133
	1957I–76IV	−1.758	1.732
Scaled change in total U.S. gold stock	1957I–68I	−1.319	0.928
	1957I–71II	−1.172	1.662
	1957I–76IV	−1.818	2.363
Scaled official reserve transactions balance	1957I–68I	−0.892	1.463
	1957I–71II	−1.356	0.661
	1957I–76IV	−1.982	1.538

†The period of effect indicates the period for which the variable DUMMY in equation (16.7) has the value 1; otherwise DUMMY = 0. All regressions are estimated over the period 1957I–76IV using the principal components 2SLS technique and instrument list described in chapter 6 above.

§The 5% significance level of $F(3/64)$ is 2.75.

had been a significant constraint on U.S. monetary policy in the 1950s and in the 1960s until sometime around the Vietnam War, when a behavioral shift occurred and inflation got started. Extensive experimentation with alternative forms of the American money reaction function, some including various measures of the magnitude of the Vietnam War, yielded results similar to table 16.1. This ultimately forced us to conclude that such a position could not be supported by the data and that throughout the period the Fed behaved as if on a purely fiat standard.

The evidence thus indicates that the evolution of the American nominal money supply in the postwar period has not been significantly affected by international factors. Two caveats must be entered however: (1) The time trend is very powerful, accounting for an increase in steady-state money growth from 0.2% per annum at the end of 1956 to 6.0% per annum at the end of 1976.[9] A multitude of slowly changing factors, some perhaps international, may be proxied by t. (2) Foreign factors may have affected the U.S. inflation and unemployment rates and hence indirectly nominal money growth. Note, however, that unemployment effects are self-reversing and a factor increasing inflation would, with a lag, induce a partially offsetting decrease in nominal money growth.[10] Further, the simulated behavior of the American variables was nearly identical in the U.S. money-shock experiments reported in section 7.2 despite widely different responses in the nonreserve countries under pegged and floating exchange rates. Similarly the simulated effects on American nominal money of the oil-price shock was minimal—cumulating to about −1% over seven quarters as reported in chapter 8.

16.3 Have International Factors Significantly Affected Trends in American Real Money Demand?

There is no question but that foreign developments have had a statistically significant effect on the real quantity of money demanded in the United States: Real export shocks have a statistically significant effect on both real income and nominal interest rates, the major determinants of money demand, and real American exports depend on foreign income and the real price of oil.[11] The level of real income may be significantly reduced by increases in the real price of oil, but the evidence on this

9. This steady-state growth assumes that all variables equal their expected values: $\hat{g} = \hat{g}_{-1} = \hat{g}_{-2} = \hat{g}_{-3} = \hat{g}_{-4} = 0$, $\log P_{-1} - \log P_{-3} = \log M_{-1} - \log M_{-3} - \frac{1}{2}\mu$, $\log P_{-3} - \log P_{-5} = \log M_{-3} - \log M_{-5} - \frac{1}{2}\mu$, $u_{-1} = u_{-2} = u_{-3} = u_{-4} = \bar{u}$, where μ is the steady-state growth rate of real money (see section 16.3) and $\bar{u}$, the natural rate of unemployment, is 0.0475 in 1956 and 0.0575 in 1976. The precise values of the natural unemployment rate are not important to these calculations, and the 4¾ and 5¾% figures are my approximations of the mean estimates in the literature.

10. That is, the sum of the coefficients of the u is −0.065 and the sum of the implied coefficients for a quarterly change in the price level is −0.590.

11. See tables 6.2, 6.3, 6.9, and 6.10 above in chapter 6.

is mixed.[12] The question addressed here is whether these effects have been quantitatively significant as determinants of American inflationary trends.

Both international and domestic factors can have either permanent or transitory effects on real money demand. Transitory effects are those which are temporary and self-reversing, such as the increase in real money demand associated with an unexpected increase in nominal money supply or with any other factor which *temporarily* increases real income, lowers nominal interest rates, or both. Permanent factors permanently shift the growth path of money demand up or down; examples would be the introduction of a money substitute or a permanent decrease in real income due to a permanent adverse shift in the terms of trade (OPEC).[13] By their very self-reversing nature, transitory money demand effects play practically no role in explaining inflationary trends while permanent shifts average out in their effects on inflationary trends, although not on the price level.[14]

In this section we address the empirical question of how important are factors other than nominal money growth in determining American inflation. The answer should differ with the length of period over which we are measuring the inflation rate for reasons outlined above and discussed at length in chapter 15: The longer the period of observation, the less important will be nonmonetary factors as determinants of inflation. A simple but robust measure can be obtained by running the following regression:

$$\Gamma_j P = \sum_{i=0}^{16/j} k_i \Gamma_j M_{-ij} - \mu + \nu, \tag{16.8}$$

where Γ_j is the j-quarter growth rate operator $[\Gamma_j X \equiv 4(\log X - \log X_{-j})/j]$, μ is the trend annual growth rate in the real quantity of money demanded, and the disturbance ν represents the effect on inflation of all nonmonetary factors. The four-year distributed lag on money growth appears sufficient from the previous work of others to allow for most of the effects of variations in nominal money growth on the growth rate of

12. See chapter 8.
13. See, for example, the discussions in chapters 14 and 8.
14. That is, the evolution of real money demand can be described by

$$\Delta \log m_t = \mu + \epsilon_t - \sum_{i=1}^{q} \theta_i \epsilon_{t-i},$$

where μ is the trend growth rate of real money demanded m and ϵ_t is white noise process. The permanent effect of the factors represented by ϵ_t is

$$\left(1 - \sum_{i=1}^{q} \theta_i\right)\epsilon_t .$$

If the moving average terms (the θ_i) sum to 1, then all factors affecting money demand are transitory and the disturbance u_t in $\log m_t = \log m_0 + \mu t + u_t$ is stationary. See chapter 15 for a detailed analysis of this problem as applied to purchasing power ratios.

real money demand.[15] Regressions of the form (16.8) were estimated for $j = 1, 4, 8$, and 16 using American nominal money (M_1) data for 1954IV through 1978IV.[16] The results are reported in table 16.2. We see that while nominal money growth explains most of the variance of the inflation rate for quarterly observations, nonmonetary factors are also important (and serially correlated). For annual or biennial observations, however, the standard error drops to 1.2% per annum and the serial correlation largely disappears. Looking at longer-run trends as evidenced by quadrennial observations, money growth explains 97% of the variance of the inflation rate with the remaining standard error of estimate only 0.4% per annum. These results indicate that (domestic and international) nonmonetary factors affecting real money demand may play a substantial role in short-run inflationary developments, but long-run inflation trends are dominated by movements in the average growth rate of the nominal quantity of money supplied.[17] These results complement the more formal statistical analyses of previous chapters by placing an upper bound on the potential influence of all factors other than nominal money supply as determinants of American inflation.

16.4 Conclusions and Implications

The empirical results in section 16.2 demonstrated that the Federal Reserve System did not display any significant response to the balance of payments or gold flows in determining the American money supply. Indeed the point estimates of the response generally had the wrong sign for our sample period. We conclude that the United States was de facto on a fiat standard from 1957 through the present, even in those years in which the price of gold was being pegged at $35 per ounce.

15. Note that there are sixteen lag terms when $j = 1$ and only one lag term when $j = 16$. This is obviously not a model which will maximize the explanatory power of nominal money growth for the inflation rate, but should provide a good lower bound for the $\bar{R}^2$ and upper bound for the standard error of estimate. Except for the quadrennial regressions, the contemporaneous money growth ($i = 0$) term was insignificant; so reverse causation does not appear to inflate the reported $\bar{R}^2$ values.

16. This was the longest post-Accord period available for all the regressions at the time the regressions were run.

17. Similar, albeit not quite as strong, results are obtained using high-powered money H (currency held by the public + reserves) or M_2 (M_1 + time deposits at commercial banks excluding large negotiable CDs):

Observation Length	$\bar{R}^2$ for H	$\bar{R}^2$ for M_2
¼ year	0.5053	0.6600
1 year	0.6550	0.7770
2 years	0.6912	0.7783
4 years	0.9348	0.8596

Apparently for short observation lengths, variations in money-multiplier growth adversely affect the predictive power of H while for longer observation lengths, variations in the growth of time deposits do the same for M_2.

Table 16.2 **Summary Statistics for Prediction of Inflation Rate by**

$$\Gamma_j P = \sum_{i=0}^{16/j} k_i \Gamma_j M_{-ij} - \mu$$

Observation Length	S.E.E.	$\bar{R}^2$	D-W
¼ year ($j=1$)	0.0165	0.6264	1.00
1 year ($j=4$)	0.0119	0.7802	1.48
2 years ($j=8$)	0.0121	0.7586	1.74
4 years ($j=16$)	0.0040	0.9699	2.83

Note. P is the GNP deflator; M is the M_1 (currency + demand deposits) money stock; all regressions are run for 1959:1 through 1978:4 on data from 1954:4 through 1978:4.

Section 16.1 had shown that a fiat reserve country would autonomously determine world inflationary trends unless foreign factors had a significant effect on the growth rate of the real quantity of money demanded in the reserve country. So section 16.3 examined the extent that fluctuations in U.S. real money demand other than those explained by time and nominal money growth affected the rate of inflation. These nonmonetary factors played an important supporting role in determining short-run variations in the inflation rate, but were negligible for inflationary trends over a period of four years.

This chapter illuminates the meaning of some of the earlier results in this volume: There is plenty of room for significant effects of foreign variables estimated earlier to play an important role in determining the inflation rate in any particular quarter or year. But because the induced shifts in the real quantity of money demanded are in part temporary and otherwise average out over longer periods of time, United States inflation was a very nearly independent or exogenous source of trends in world inflation under the Bretton Woods system. Foreign influences had no significant effect on the evolution of American monetary policy, and that was very nearly the only factor determining the trends in American inflation.

Acknowledgments

This chapter integrates new material with results published previously in Darby (1980, 1981). The author acknowledges helpful comments from Malcolm Fisher, James Lothian, and members of the UCLA Workshop in Monetary Economics.

Appendix

Two alternative series for the American gold stock were compiled. The first of these is the Treasury gold stock at the end of the quarter. This concept, listed in table 16.3, is the value of the gold certificates issued by the Treasury and held by the Federal Reserve System. It excludes the intervention-transactions holdings of the Exchange Stabilization Fund even though those holdings could be converted into gold certificates by the stroke of a bookkeeper's pen as was done for $1 billion of gold in the first quarter of 1970. Thus the second concept, the total gold stock of the U.S. monetary authorities, adds the Exchange Stabilization Fund hold-

Table 16.3 **United States Treasury Gold Stock, End of Quarter Official Values in Billions of Dollars**

	Quarter			
Year	1	2	3	4
1954	...	...	...	21.7125
1955	21.7192	21.6776	21.6837	21.6904
1956	21.7157	21.7991	21.8843	21.9495
1957	22.3058	22.6229	22.6355	22.7810
1958	22.3941	21.3562	20.8735	20.5343
1959	20.4417	19.7046	19.4907	19.4559
1960	19.4078	19.3222	18.6846	17.7666
1961	17.3882	17.5502	17.3760	16.8890
1962	16.6084	16.4352	16.0674	15.9781
1963	15.8775	15.7333	15.5816	15.5130
1964	15.4607	15.4617	15.4631	15.3877
1965	14.5635	13.9341	13.8576	13.7332
1966	13.6335	13.4335	13.2583	13.1591
1967	13.1074	13.1097	13.0061	11.9816
1968	10.4840	10.3669	10.367	10.367
1969	10.367	10.367	10.367	10.367
1970	11.367	11.367	11.117	10.732
1971	10.732	10.332	10.132	10.132
1972	9.588	10.410	10.410	10.410
1973	10.410	10.410	10.410	11.567
1974	11.567	11.567	11.567	11.652
1975	11.620	11.620	11.599	11.599
1976	11.599	11.598	11.598	11.598

Sources. "Gold Assets and Liabilities of the Treasury," in the *Treasury Bulletin*, December issues, 1955–76, and January 1979.

Note. Increase in 1972:2 and 1973:4 are due to devaluations only. Increase in 1970:1 is due to a $1 billion transfer from the Exchange Stabilization Fund. Gold is priced at $35 per ounce through 1972:1, $38 per ounce from 1972:2 through 1973:3, and $42.22 thereafter.

Table 16.4 **United States Total Gold Stock, Including Exchange Stabilization Fund, End of Quarter Official Values in Billions of Dollars**

	Quarter			
Year	1	2	3	4
1954	...	...	...	21.793
1955	21.763	21.730	21.745	21.753
1956	21.765	21.868	21.032	22.058
1957	22.406	22.732	22.759	22.857
1958	22.487	21.412	20.929	20.582
1959	20.486	19.746	19.579	19.507
1960	19.457	19.363	18.725	17.804
1961	17.433	17.603	17.457	16.947
1962	16.643	16.527	16.081	16.057
1963	15.946	15.830	15.634	15.596
1964	15.550	15.623	15.643	15.471
1965	14.639	14.049	13.925	13.806
1966	13.738	13.529	13.356	13.235
1967	13.184	13.169	13.077	12.065
1968	10.703	10.681	10.755	10.892
1969	10.836	11.153	11.164	11.859
1970	11.903	11.889	11.494	11.072
1971	10.963	10.507	10.207	10.206
1972	9.662	10.490	10.487	10.487
1973	10.487	10.487	10.487	11.652
1974	11.652	11.652	11.652	11.652
1975	11.620	11.620	11.599	11.599
1976	11.599	11.598	11.598	11.598

Sources. Tables (variously titled "Analysis of Changes in U.S. Gold Stock . . ." and "U.S. Gold Stock Holdings . . .") in the *Federal Reserve Bulletin*, January issues, 1956–77.
Note. Increase in 1972:2 and 1973:4 are due to devaluations only.

ings to the first concept (see table 16.4). Both series are affected by devaluations from $35 to $38 per ounce in 1972II and from $38 to $42.22 in 1973IV, but these took place after the end of convertibility of the dollar into gold.

References

Darby, M. R. 1980. The monetary approach to the balance of payments: Two specious assumptions. *Economic Inquiry* 18 (April): 321–26.

———. 1981. The international economy as a source of and restraint on United States inflation. In W. A. Gale, ed., *Inflation: Causes, consequents, and control*. Cambridge: Oelgeschlager, Gunn & Hain.

Heller, H. R. 1976. International reserves and world-wide inflation. *International Monetary Fund Staff Papers* 23 (March): 61–87

———. 1979. Further evidence on the relationship between international reserves and world inflation. In M. Boskin, ed., *Economics and human welfare: Essays in honor of Tibor Scitovsky*. New York: Academic Press.

Meiselman, D. I., and A. B. Laffer, eds. 1975. *The phenomenon of world-wide inflation*. Washington: American Enterprise Institute.

Parkin, M., and G. Zis, eds. 1976*a*. *Inflation in the world economy*. Toronto: University of Toronto Press.

———. 1976*b*. *Inflation in open economics*. Toronto: University of Toronto Press.