

PRINCETON STUDIES IN INTERNATIONAL FINANCE, NO. 10

**Reserve-Asset Preferences of Central
Banks and Stability
of the Gold-Exchange Standard**

Peter B. Kenen

INTERNATIONAL FINANCE SECTION
DEPARTMENT OF ECONOMICS
PRINCETON UNIVERSITY • 1963

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IN INTERNATIONAL FINANCE

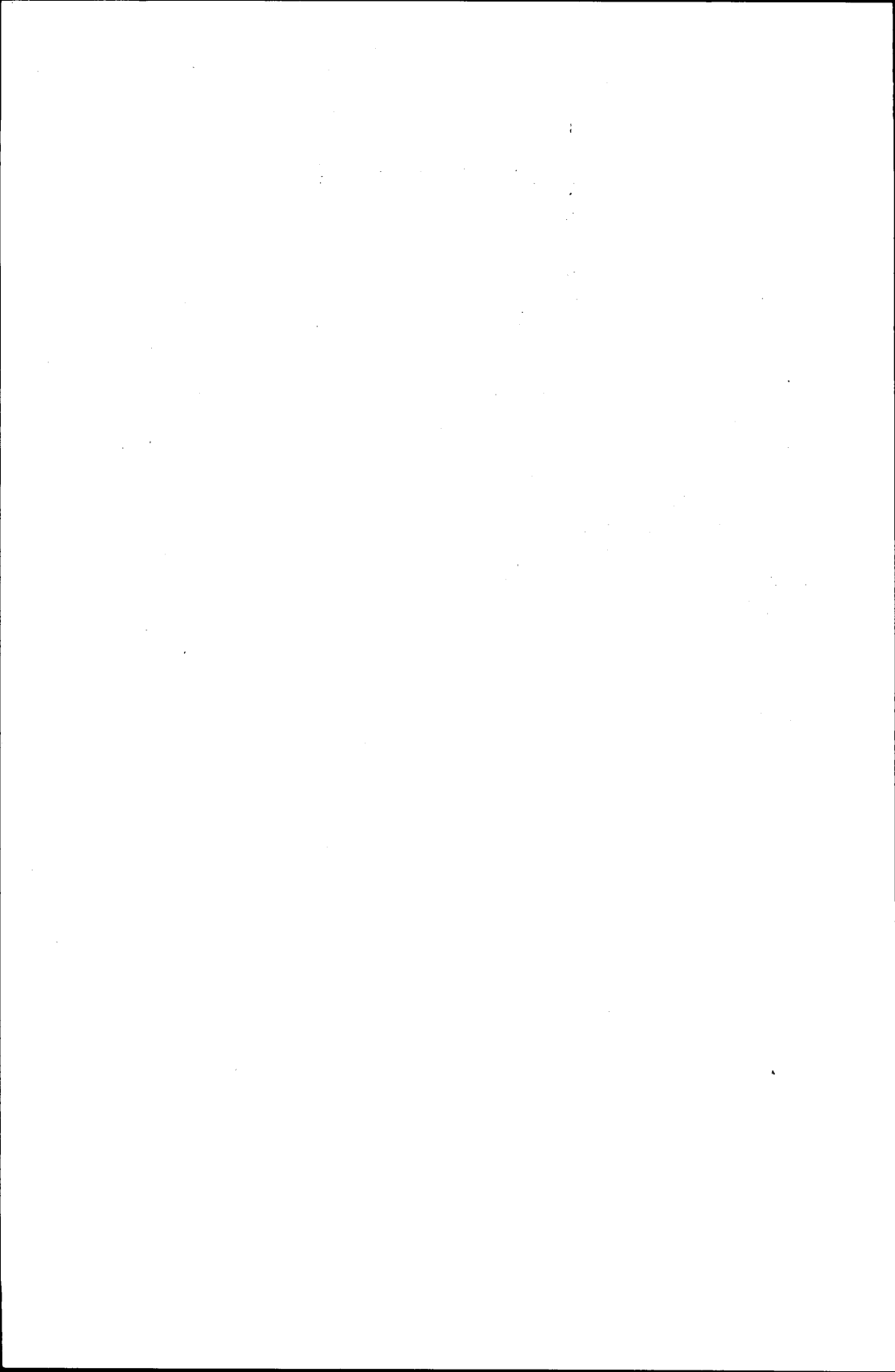
THIS is the tenth number in the series called PRINCETON STUDIES IN INTERNATIONAL FINANCE, published from time to time under the sponsorship of the International Finance Section of the Department of Economics at Princeton University. The author, Peter B. Kenen, is Associate Professor of Economics at Columbia University.

This series is intended to be restricted to meritorious research studies in the general field of international financial and economic problems, both policy and theory, which are too long for the journals and too short to warrant publication as books. The Section welcomes the submission of manuscripts for this series.

While the Section sponsors the STUDIES, the writers are free to develop their topics as they will. Their ideas and treatment may or may not be shared by the editorial committee of the Section or the members of the Department.

FRITZ MACHLUP
Director

Princeton University
April 1963



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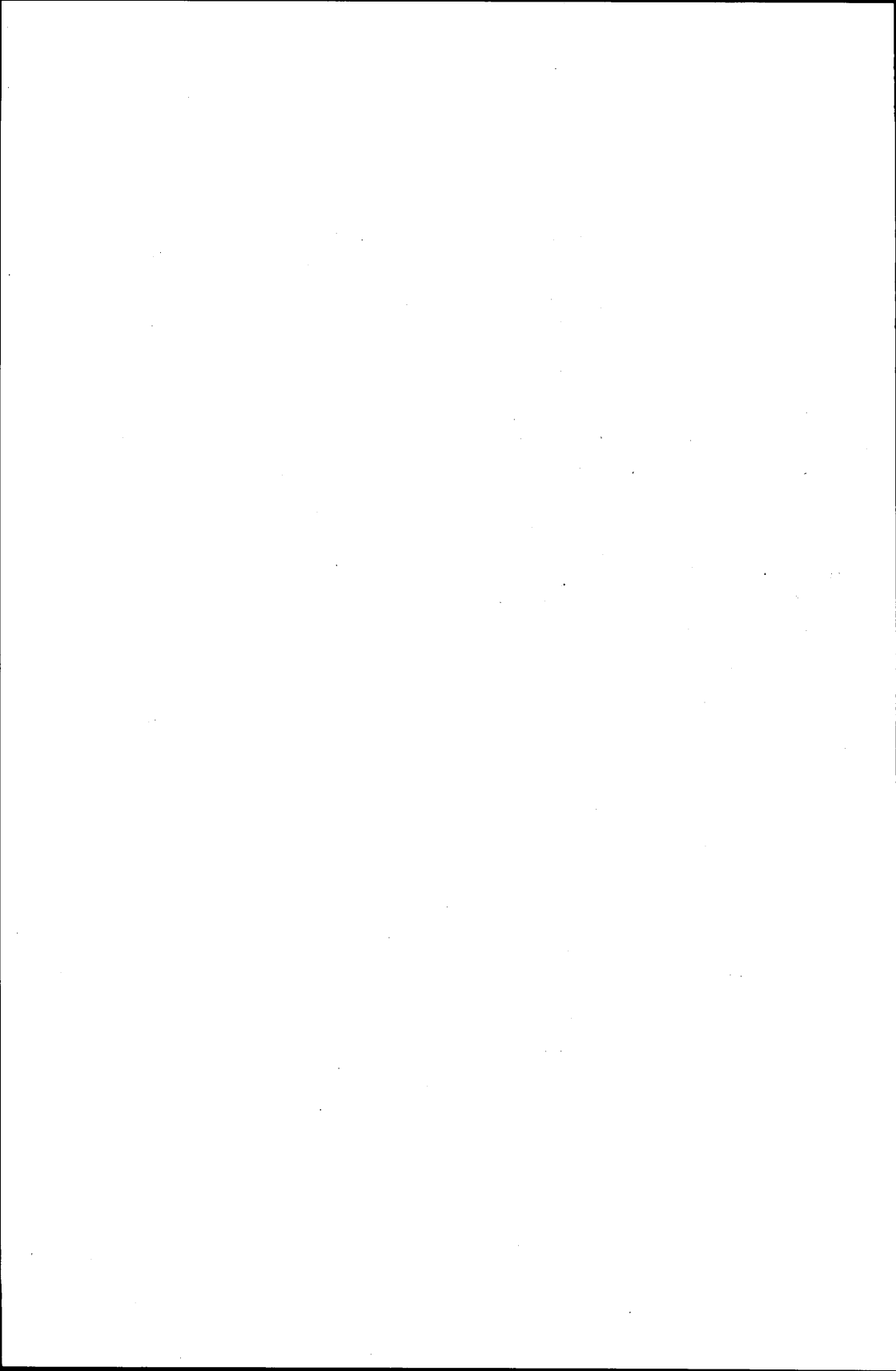
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P R E F A C E

This monograph sets out the result of two years' work on the composition of official reserve-assets. It is the successor to my essay on the theory of the gold-exchange standard,¹ but goes much further than that essay in an effort to answer three sets of questions:

1. Do gold and foreign-exchange balances have different roles as central-bank reserve-assets? Are foreign-exchange holdings merely working balances, or do governments hold more foreign exchange than required for daily operations in the foreign-exchange markets?

2. Are there stable "marginal propensities" to hold gold and complementary "marginal propensities" to hold foreign exchange? If so, do they differ from country to country and from the corresponding "average propensities"?

3. What part did central banks play in the much-discussed "gold rush" of 1960? Were central-bank gold purchases abnormally large or frequent? Which central banks, if any, took part in the "gold rush"?

The tentative answers supplied by this monograph may help us to assess the prospects for today's gold-exchange standard and appraise proposals for reform of the international monetary system. One should not employ my results mechanistically; my data relate to the 1950's, and much has been done in the last two years to alter central-bank behavior and to defend the gold-exchange standard against speculative onslaughts. But the statistics can help to locate our starting point and thereby to determine how far we have come and how far we have yet to go to strengthen the system.

My statistical procedures may be too crude to satisfy some readers. But I think they are at least as powerful as the methods usually employed in this area. The study of international finance has been perversely distinguished from other economic inquiries by the specialists' delight in peculiarities and their neglect of general tendencies. Too much effort is expended on the special cases and too much importance is attached to conversations with those who are "in the know." This mode of investigation is not barren, but should not be considered a substitute for the different regime that has transformed most other economic research. International monetary problems can and should be subjected to formal statistical analysis.

¹ Peter B. Kenen, "International Liquidity and the Balance of Payments of a Reserve-currency Country," *Quarterly Journal of Economics*, November 1960.

I have incurred a number of debts while working on this study. Professors Albert O. Hirschman, James W. Angell, Henry C. Aubrey and Robert Triffin have helped me to organize my thoughts and offered criticism and advice along the way. I have also exploited the members of the Workshop in International Economics at Columbia University and have had the benefit of stimulating criticism from Professor Milton Friedman and his associates in the Money and Banking Workshop at the University of Chicago. Mr. Robert Harris rendered vital aid with several problems of statistical inference, while Mrs. Patricia Pack and Messrs. Benjamin Jerry Cohen, Dietrich Weismann and Richard Magidoff gathered and processed much of the data. The study was financed by the School of International Affairs and by the Workshop in International Economics, both of Columbia University.

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1. THE PROBLEM

THE ROLE OF RESERVE-ASSET PREFERENCES

The past few years have witnessed a tardy renaissance of international monetary studies. The problems of balance-of-payments adjustment have engaged professional attention ever since the Second World War, as have the size and distribution of national reserves.¹ But the international monetary system—the processes that generate reserve-assets and decide the forms they take—was taken much for granted for several years.

The International Monetary Fund was, of course, the product of detailed thought. But the IMF does not manage the monetary standard, even though some of its founders wanted it to do so. It is a financial intermediary, working to use the stock of reserve-assets more efficiently, whatever form that stock may take. The postwar gold-exchange standard has grown up very much like Topsy, bereft of a charter or plan. It did not have a Genoa resolution to give it formal sanction, and the United States became the major reserve center almost by absence of mind.

The postwar hiatus in international monetary studies is easily explained; it was more fun to theorize about the “dollar shortage” and more useful to promote the recovery of trade and restoration of convertibility. In the meantime, however, the gold-exchange standard has evolved much further than it did during the interwar years. In 1928, just before it collapsed, the international monetary system was still quite heavily weighted with gold. Today, by contrast, slightly more than half of total official reserve-assets (excluding those of the United States) are foreign exchange (Table 1.1). The gold ratio has risen since 1948, but the increase from 38 per cent to 48 per cent conceals a huge rise in total foreign-exchange holdings and a major change in composition; the total rose by half from 1951 to 1960 and the U.S. dollar component was much more than doubled (Table 1.2).²

¹ Throughout this monograph, I shall use “reserve-assets” or, simply, “reserves” to mean central-bank and government holdings of gold and foreign exchange. Some authors prefer “international liquidity” or “liquid assets,” but “liquidity” has too many normative overtones and alternative uses. (See James W. Angell, “The Reorganization of the International Monetary System,” *Economic Journal*, December 1961, p. 692.)

² The rise in the gold ratio since 1948 should not be confused with the “drift toward gold” I shall describe below. It chiefly corresponds to a decline in the total reserve-assets of the outer sterling area during 1949. For a more detailed treatment of these early events, see International Monetary Fund, *International Reserves and Liquidity*, 1958, Chapter 2.

With the very rapid growth of U.S. liabilities in the 1950's, students of American monetary policy began to take interest in the situation.³ But the structure of the international monetary system did not begin to claim close expert attention until Robert Triffin fired his first salvos at the present gold-exchange standard⁴ and, at about the same time, the U.S. balance of payments swung into gaping deficit.

TABLE 1.1
Official Gold and Foreign-exchange Holdings*
(Millions of dollars)

Year	Gold	Foreign Exchange	Total	Percentage in Gold
1928 ^b	6,054	3,250	9,300	65
1938 ^b	11,358	1,800	13,108	86
1948 ^b	8,351	13,700	22,051	38
1958 ^c	17,483	19,215	36,698	48
1960 ^{c,d}	20,246	21,670	41,916	48

* Excludes the United States and international organizations.

^b From International Monetary Fund, *International Reserves and Liquidity*, 1958, p. 102. The source gives an explanation for the arithmetical discrepancies in 1928 and 1938.

^c From International Monetary Fund, *International Financial Statistics*, December 1961; not strictly comparable with earlier data.

^d Excludes European Payments Union liabilities (included in the 1958 data); at the end of 1958, these totalled \$1,374 million.

Triffin has dramatized the long-run problem as an ugly dilemma: If the present monetary system is to generate sufficient reserve-assets to lubricate payments adjustment, the reserve-currency countries must willingly run payments deficits, enduring a deterioration of their net reserve positions that could erode foreign confidence in the reserve currencies. If, contrarily, the reserve-currency countries are to maintain their net reserve positions, there must some day be a shortage of reserve-assets and this will cause serious frictions in the process of pay-

³ See, e.g., Fred H. Klopstock, *The International Status of the Dollar*, Essays in International Finance, No. 28, Princeton University, 1957.

⁴ Robert Triffin, *Gold and the Dollar Crisis*, Yale University Press, 1960. For an algebraic treatment of Triffin's argument, see my "International Liquidity and the Balance of Payments of a Reserve-currency Country," *Quarterly Journal of Economics*, November 1960; and for arithmetic projections of the international monetary situation under the present regime and under the Triffin plan, my testimony before the Subcommittee on International Exchange and Payments of the Joint Economic Committee, *Hearings: International Payments Imbalances and Need for Strengthening International Financial Arrangements*, Government Printing Office, 1961, pp. 193-196.

ments adjustment. To skirt this dilemma, Triffin wants to overhaul the monetary system—to transform the IMF into a central bankers' bank, capable of generating reserve-assets.⁵

The large U.S. payments deficits of 1958-1961 recast Triffin's dilemma into an urgent present tense. They enlarged the global stock of reserve-assets, but impaired the reserve position of the United States. In just

TABLE 1.2
The Composition of Official Foreign-exchange Holdings^a
(Millions of dollars)

Type of Asset	1951	1954	1957	1960
Gross Assets ^b	14,420	17,137	17,646	21,645
U.S. Dollars	4,014	7,067	8,231	10,484
Sterling ^c	8,694	8,157	7,222	7,563
French Francs	263	576	459
BIS Deposits	129	324	272	477
Other (and net error) ^d	1,383 ^e	1,326	1,345	2,662

^a All countries (but U.S. holdings zero before 1961). Data from International Monetary Fund, *International Financial Statistics* (IFS), January 1962, p. 27.

^b Excludes European Payments Union liabilities (included in the IFS data for 1951-1957).

^c Includes Commonwealth liabilities; total Commonwealth securities held by the sterling countries (including their commercial banks) did not exceed \$350 million in the years listed above.

^d Includes all other assets and the net error arising from the exclusion of Soviet-bloc countries from the total assets data and their inclusion in some of the liabilities data. For details, see IFS, January 1962, p. 28.

^e Differs slightly from the corresponding IFS entry (which does not jibe with the other IFS data for 1951).

four years, U.S. short-term liabilities to foreign central banks and governments rose by \$4.5 billion, and the U.S. gold stock fell by \$5.9 billion.⁶ During the last months of 1960, there was a first flurry of speculation anent an increase in the dollar price of gold; and in the

⁵ Triffin's own proposal is just one of many recent plans for international financial reform, some constructed as alternatives to the Triffin plan, others independently conceived. For a collation of the more important proposals, see Subcommittee on International Exchange and Payments of the Joint Economic Committee, *Report: International Payments Imbalances . . .*, Government Printing Office, 1961; also Angell, cited above. For a critique of Triffin's plan, see Oscar L. Altman, "Professor Triffin on International Liquidity and the Role of the Fund," *IMF Staff Papers*, May 1961.

⁶ Changes from December 31, 1957 to December 31, 1961; IMF, *International Financial Statistics*, May 1962.

spring of 1961, after the revaluation of the deutsche mark and the guilder, there was a sharp speculative assault on the pound. As some observers see it, a reform is urgently required to consolidate and strengthen the present monetary system, not merely to provide for future reserve-asset needs.

This monograph does not seek to assess the existing payments system in its entirety, nor to appraise the several plans for long-run reform. But it is directly relevant to both these tasks. If official reserve-asset preferences are unstable, any monetary regime can be subjected to rude shocks that could damage confidence in the reserve media. If they are stable but encompass high "marginal propensities" to hold gold, continued growth in the stock of reserve-assets could drain gold from the center of the system—from the United States and Britain under the present regime, or from the IMF under the Triffin plan—and this could also damage confidence.

Short-run instability. During 1960 and the first three quarters of 1961, the United States ran one small quarterly balance-of-payments surplus and six quarterly deficits. The U.S. gold stock increased with the surplus and decreased with the deficits. But the gold flows varied widely in relation to the net payments data (Table 1.3).

Some of the net variation in gold flows was due to a turn-around in private foreign short-term capital.⁷ In 1959 and the first half of 1960, foreign funds came into the United States, reducing the need for official financing and the scope for gold flows linked to current financing; in the second half of 1960, they moved out again, increasing the need for official financing and the scope for gold losses. But the gold flows were also erratic in relation to official financing; they ranged from a mere 13 per cent of official financing in the second quarter of 1960 to peaks of 70 and 80 per cent at the end of 1960 and the start of 1961.

A part of this remaining variation may be indirectly linked to movements of private capital. During the fourth quarter of 1960, foreign central banks bought \$1,221 million of gold from the United States, but added only \$821 million to their own reserves.⁸ Most of the "excess" went to calm the private gold markets; the Bank of England sold gold

⁷ In the official tabulations and in Table 1.3, some types of private foreign short-term investment in the United States are treated as forms of financing, not as part of the surplus or deficit; they are put "below the line" rather than "above the line." This procedure has been criticized (*see, e.g.,* Walter Gardner, "An Exchange-market Analysis of the U.S. Balance of Payments," *IMF Staff Papers*, May 1961, pp. 195-205), and I am inclined to agree with the critics. But I have used the standard presentation here because it is more familiar.

⁸ *International Financial Statistics*, January 1962, p. 24.

TABLE 1.3
The U.S. Payments Deficit and Gold Losses, 1959-1961^a
(Millions of dollars)

Year and Quarter	Total US Deficit ^b	Private Foreign Financing ^c	Official Foreign Financing			Gold Flow as a Percentage of	
			Total	Dollars	Gold	Total Deficit	Official Financing
1959 ^d	3,826	1,462	2,364	1,633	731	19	22
1960 I	640	356	284	234	50	8	18
II	888	185	703	609	94	11	13
III	1,191	-52	1,243	606	635	54	51
IV	1,210	-523	1,733	512 ^e	1,221 ^e	101	70
1961 I	334	-130	464	93 ^f	371 ^f	111	80
II	-69	546	-615	-446 ^f	-169 ^f	245	28
III	906	161	745	450 ^{e, f}	295 ^{e, f}	33	40
IV	1,281	529	752	242	510 ^f	40	68

^a From U.S. Department of Commerce, *Survey of Current Business* (various issues), and Board of Governors of the Federal Reserve System, *Federal Reserve Bulletin* (various issues).

^b Increase in short-term U.S. liabilities to foreigners plus U.S. gold loss less increase in U.S. official holdings of convertible currencies.

^c Includes the unallocated change in foreign dollar holdings (mainly U.S. government securities with original maturities of more than one year).

^d Excludes the \$1,375 million U.S. subscription to the International Monetary Fund.

^e Adjusted to exclude two U.S. purchases of gold from the IMF (\$300 million in IV 1960 and \$150 million in III 1961).

^f Adjusted to exclude the changes in U.S. official holdings of convertible currencies (+\$25 million in I 1961, +\$161 million in II 1961, -\$124 million in III 1961, and +\$54 million in IV 1961); made on the assumption (only approximately true) that the changes in U.S. official holdings were matched by (same-signed) changes in foreign official holdings of U.S. dollars.

in London and bought gold in New York to reconstitute its holdings.⁹ But the increase in official gold holdings was still quite large, as was the U.S. gold loss after all allowances; the \$821 million net increase in official holdings was still half of all official financing in the fourth quarter of 1960. Hence, two possibilities remain:

1. Central-bank reserve-asset preferences may have been stable during the 1960-1961 episode, but the separate national "marginal propensities" to hold gold may be so very different that a change in the *destination* of the U.S. deficit (and third-country reserve movements) augmented its gold content.

2. Central-bank reserve-asset preferences may actually have changed in 1960-1961 because of the very large U.S. deficit or because of the rise in the free-market price of gold.

These explanations are not mutually exclusive, but convey very different implications. The first forecasts a large gold flow from time to time, but does not foretell damage to the gold-exchange standard unless the countries with high "marginal propensities" also have large reserve-asset appetites. The second also forecasts large gold flows but does not promise to reverse them; it could be far more damaging to the monetary system.

We cannot choose between these two hypotheses or attach the proper weight to each unless we can describe the reserve-asset preferences of the major central banks. We cannot assign part of the gold-flow variation to a spread in *stable* asset preferences unless we can measure the spread. Nor can we appraise the variation that remains after we allow for national differences unless we know the normal variation in central-bank "marginal propensities."

Long-run prospects. If reserve-asset preferences are indeed unstable, a large swing in the U.S. payments posture could trigger governmental gold buying large enough to undermine the monetary system. If they are stable, the threat is not acute. But the gold-exchange standard may not be long-lived even if the "marginal propensities" to buy gold are perfectly firm. A large accumulation of reserves by countries with high

⁹ From September 31, 1960 to March 31, 1961, British gold holdings actually declined \$50 million; yet Britain bought \$500 million of gold from the United States. These two figures fix the net cost of support for the free-market gold price at \$550 million, but neglect new gold used. The OEEC puts the net gold "disappearance" at \$480 million for the fourth quarter of 1960 and \$800 million through the end of January 1961. (*Second Annual Report of the Board of Managers of the European Monetary Agreement*, Paris, 1961, p. 51.) Net "disappearance" includes the normal industrial demand for gold, but was very much larger than the normal drain during the winter of 1960-1961.

"marginal propensities" could cause a continuing flow of gold from the countries that create new reserve-assets by running payments deficits. This sort of drain could also be corrosive, for few central banks would have continued confidence in the reserve currencies if the center countries were always losing gold.¹ The same disease could also afflict the IMF if it is reformed as Triffin suggests. It would suffer gold losses if the aggregate demand for gold were sufficiently elastic with respect to reserve-assets.²

¹ The rate of change in the net reserve position of the center countries is not affected by other countries' "marginal propensities" to acquire gold. But the composition of the change (whether an increase in liabilities or a decrease in assets) does depend on the "marginal propensities." Denote the global monetary gold stock by ${}_wG$, the gold holdings of the center countries by ${}_cG$, and the gold holdings of other countries by G ($G = {}_wG - {}_cG$). Denote the foreign-exchange holdings of the other countries by F , and their reserve-assets by R ($R = F + G$). Suppose that the global gold stock and total reserve-assets outside the center are given at time t by:

$${}_wG_t = {}_wG_0 e^{gt} \text{ and } R_t = R_0 e^{rt},$$

g and r being the observed rates of change over the relevant intervals of time (devoid of normative import). Define the demand for gold outside the center in terms of a reserve-assets elasticity, η (and neglect any relationships between η and r). Then:

$$G_t = G_0 + \eta G_0 (R_t - R_0) / R_0 = G_0 [1 + \eta (e^{rt} - 1)].$$

Next, define the net reserve position of the center countries:

$${}_cG_t - F_t = {}_wG_t - R_t = {}_wG_0 e^{gt} [1 - (R_0 / {}_wG_0) e^{(r-g)t}].$$

The reserve-assets elasticity of demand for gold, η , does not appear in this equation. But it does appear in the separate equations describing the evolution of ${}_cG$ and F . Thus:

$${}_cG_t - {}_cG_0 = {}_wG_0 (e^{gt} - 1) [1 - \eta (G_0 / {}_wG_0) \frac{e^{rt} - 1}{e^{gt} - 1}],$$

so that:

$$\partial({}_cG_t - {}_cG_0) / \partial \eta = - G_0 (e^{rt} - 1),$$

which says that the increase in ${}_cG$ will be smaller (the decrease will be larger) the larger the reserve-assets elasticity of demand for gold.

² Under Triffin's plan, each central bank would have to hold a fraction of its total reserve-assets as deposits at the IMF. The IMF would create additional deposits sufficient to make good the gap between a desired rate of growth of reserves and the rate of growth of monetary gold stocks. With such a scheme, there is the double danger that central banks would be endowed with "excess" IMF deposits they could use to buy gold from the IMF and that the demand for gold would exceed the supply. Denote the IMF reserve requirement by k , total IMF deposits by B , and the desired rate of growth of total reserve-assets by \bar{r} ; use the other symbols from note 1, above. Define "excess" deposits at the IMF by E , where:

$$E_t = B_0 + (R_t - R_0) - ({}_wG_t - {}_wG_0) - kR_t.$$

But, to start, $B_0 = kR_0$, so that:

$$\begin{aligned} E_t &= (R_t - R_0)(1 - k) - ({}_wG_t - {}_wG_0) \\ &= R_0 (e^{\bar{r}t} - 1) [(1 - k) - ({}_wG_0 / R_0) \frac{e^{gt} - 1}{e^{\bar{r}t} - 1}]. \end{aligned}$$