

ESSAYS IN INTERNATIONAL FINANCE

No. 84, April 1971

MONETARY THEORY AND
CONTROLLED FLEXIBILITY
IN THE
FOREIGN EXCHANGES

RONALD I. MCKINNON



INTERNATIONAL FINANCE SECTION

DEPARTMENT OF ECONOMICS

PRINCETON UNIVERSITY

Princeton, New Jersey

This is the eighty-fourth number in the series ESSAYS IN INTERNATIONAL FINANCE, *published from time to time by the International Finance Section of the Department of Economics of Princeton University.*

The author, Ronald I. McKinnon, is Professor of Economics at Stanford University. During the current year he is Rockefeller Visiting Research Professor of International Economics at the Brookings Institution in Washington, D.C. This essay is his third contribution to the publications of the International Finance Section.

The Section sponsors the essays in this series but takes no further responsibility for the opinions expressed in them. The writers are free to develop their topics as they wish. Their ideas may or may not be shared by the editorial committee of the Section or the members of the Department.

FRITZ MACHLUP, *Director*
International Finance Section

ESSAYS IN INTERNATIONAL FINANCE

No. 84, April 1971

MONETARY THEORY AND
CONTROLLED FLEXIBILITY
IN THE
FOREIGN EXCHANGES

RONALD I. McKINNON



INTERNATIONAL FINANCE SECTION

DEPARTMENT OF ECONOMICS

PRINCETON UNIVERSITY

Princeton, New Jersey

Copyright © 1971, by International Finance Section
Department of Economics
Princeton University
L.C. Card No. 74-163865

Printed in the United States of America by
Princeton University Press at Princeton, New Jersey

MONETARY THEORY AND CONTROLLED FLEXIBILITY IN THE FOREIGN EXCHANGES

Having contributed Princeton Essay No. 76, *Private and Official International Money: The Case for the Dollar* as recently as April of 1969, I owe the intrepid reader a sharply differentiated product and an explanation. The 1969 essay described the American dollar as international money by exploring the demand by private foreigners and central banks to hold dollars, the supply response via movements in the American current-account surplus and the capital account (financial intermediation), and the problem of seigniorage. In short, the world dollar standard was analyzed by asking questions common to all monetary mechanisms, whatever their domain. In contrast, the present essay focuses on problems of monetary management as related to optimal exchange-rate flexibility in market economies *other* than the United States.

This distinction is important because the United States is the center or “*nth*” country in the Bretton Woods par-value system, and a flexible exchange rate is not an option open to American policymakers. This loss of exchange-rate flexibility need not be a handicap, because the dollar is also international money and, for purposes of monetary policy, the United States can behave relatively autonomously—almost as if it were closed to foreign trade. In the first sections of this essay, it will be assumed that this autonomy is exercised wisely so that the center country and, hence, the world economy remain “stable”—in the sense to be defined presently.

For all other countries, however, the choice of an exchange-rate mechanism for adjusting international payments is a key element in the effectiveness of national monetary policy. Indeed, the operation of central banks in the foreign exchanges is simply one mode of changing the domestic money supply, which is fully as important as open-market operations or rediscounting. The parallels are described in Section I below. This unified view of monetary policy breaks with the theoretical tradition of treating the exchange rate and money supply as separable policy instruments.

Once the underlying unity between internal and external national monetary policy is established, it is possible to apply accepted monetary theories to the choice among different forms of exchange-rate flexibility. In particular, if a Keynesian view of monetary processes is adopted, the complementary foreign-exchange mechanism can be deduced from the underlying theoretical structure. This is done in Section II, where a *narrow band*, under carefully specified conditions, *is shown to be the external counterpart of Keynesian monetary policy. The quantity theory of money*—under certain assumptions more suitable for long-run analysis—*implies its own foreign-adjustment mechanism in the form of a gliding parity*, as shown in Section III. Optimal policy within either a Keynesian or a monetarist framework requires understanding of the domestic and foreign aspects of each complete model.

“Assigning” an exchange-rate mechanism to a particular monetary theory and the goals that go with it avoids the implicit theorizing inherent in simply listing pros and cons of various exchange-rate systems under widely varying assumptions. The number of “dilemma cases” of policies torn by apparently conflicting goals is correspondingly reduced.

The essay, however, is not a purely theoretical exercise. Data on divergent price-level movements in consumer and wholesale price indices over the past seventeen years are developed in Section IV for the major industrial countries. These price indices have a direct bearing on the operations of a gliding parity under the quantity theory, which is particularly relevant for rapidly growing economies. An attempt is also made to define “stable” behavior by the United States in statistical terms and appropriate “rules of the game” for various countries operating under the dollar standard. In this connection, Section V analyzes a recent Report by the Executive Directors of the International Monetary Fund, which reexamined the Bretton Woods par-value system without recommending any changes towards increased flexibility.

I. THE IMPORTANCE OF THE FOREIGN EXCHANGES FOR NATIONAL MONETARY POLICY

If the Bank of England enters the bond market to support the price of gilt-edged securities, such purchases create “high-powered” money. Similarly, if the central bank enters the foreign-exchange market to purchase dollars by selling pounds sterling to maintain a predetermined level of the exchange rate, the same creation of high-powered money occurs. Donald Mathieson of Columbia University has calculated that about 95 per cent of the net issue of high-powered money in Germany from the mid-1950’s to 1968 was created through the foreign exchanges. That is, virtually all of the German seigniorage associated with currency

issue and growth in commercial-bank reserves was used by the Bundesbank to accumulate foreign exchange or to finance official transfers of capital abroad.

Even when there is no net creation of high-powered money by the acquisition of foreign reserves, domestic monetary policy can still be governed by the foreign exchanges. The Canadian sojourn with a fixed exchange rate from 1962 to 1970, accompanied by a strict limitation on the acquisition of American dollars and gold, imposed a pattern of domestic-money issue which was virtually identical to that followed in the United States. Thus, there is no single quantitative measure of the impact of the foreign exchanges on the monetary policies of market economies, although the importance of the foreign sector is not in doubt.

Suppose our national central bank consists of two agencies: an open-market "committee" responsible for all purely domestic operations in pursuit of monetary policy such as open-market operations or rediscounting, and an exchange-stabilization "fund" responsible for all foreign-exchange operations in pursuit of the *same* monetary policy. Besides having a first-order impact on the holding of domestic money by domestic nationals, the choice of the external parity directly determines the prices of tradable goods in terms of the domestic currency. In this sense, the fund can be a stronger monetary instrument than the committee because it uses arbitrage in the international commodity markets to determine internal prices directly. Under free trade and an international-payments mechanism that functions tolerably well, the law of large numbers would predict that a group of countries constituting the world economy may be more stable than any one economy in particular and, indeed, this seems to have been true since the Second World War. Thus, the fund's willingness to decumulate or accumulate reserves in exchange for domestic money, while maintaining free international payments, can stabilize commodity prices and output within individual economies—at least in the short run.

The maintenance of Italy's foreign-exchange parity in the internal inflation of 1962-1963 had a strong stabilizing influence domestically, which was upset only when the government tried to prevent Italian commercial banks from borrowing in the Eurodollar market. The short but sharp German recession of 1966-1967 was smoothed by a huge export expansion which could not have occurred if its parity had floated upwards in response to the internal deflation. In 1968, the French inflation and internal crises were stabilized by drawing down external reserves to maintain the external parity. A sharply depreciating exchange rate may well have made it impossible for the government to bargain with the workers in money terms. The inflationary policy of the Wilson

government in Britain in the first half of 1970 might have had a far sharper impact on internal prices if the British parity had not been stable.

The optimal degree of stability in the foreign-exchange parity is, however, unlikely to be the same for all countries at all times. Greater exchange flexibility and national monetary autonomy may be desirable for large countries that have relatively small foreign-trade sectors, and where a stable external parity has, therefore, less of a smoothing impact on domestic prices and output. Furthermore, if the long-run-growth experience of countries is very different, divergent movements between the prices of tradable and nontradable goods may also increase the desirability of controlled flexibility—apart from the question of openness of the economy. The correct response of the monetary authorities to each particular problem depends on the choice of an appropriate theoretical framework—be it Keynesian or monetarist. *Assuming stability in the exogenously determined prices of internationally traded goods and that the goals of the central bank's committee are consistent with those of its fund, we now turn to the problem of integrating exchange-rate management with the corpus of accepted monetary theory.*

II. THE KEYNESIAN LIQUIDITY-PREFERENCE THEORY OF THE RATE OF INTEREST

Since my main concern is foreign-exchange policy, I shall drastically simplify orthodox Keynesian monetary theory for closed economies. I shall make heavy use of the admirable classification system developed by David Fand in "Keynesian Monetary Theories, Stabilization Policy and the Recent Inflation" and of the historical perspective provided by J. R. Hicks' "Automatists, Hawtreyians and Keynesians," both in *The Journal of Money, Credit and Banking*, August 1969. The reader might refer to these papers for assurance that the simplifications employed here are reasonably accurate.

Although there are many variants of the Keynesian orthodoxy, all hold that changes in the nominal stock of money affect the final demand for goods and services primarily through the prices of securities in capital markets rather than through any direct "wealth" effect. Insofar as monetary policy has any influence at all, it operates through "the" rate of interest as the intermediate policy variable. The *negative* relationship between the quantity of real money and real interest rates is defined by the liquidity-preference function; and, in a closed economy, there is the presumption that monetary authorities can in fact control the *real* rate of interest and the *real* stock of money by varying the nominal stock of money. Hence, the real rate of interest and the real stock of money are *not endogenous* to the economy but can be, to some significant degree,

manipulated by the monetary authorities—a view quite different from that held by monetarists, as we shall see.

Unsurprisingly, since the authorities can increase the real stock of money by increasing nominal cash balances, the Keynesian world is one where the price level is stable and expected to remain so over the relevant time horizon. More precisely, any given proportional change in the nominal stock of money leads to a substantially smaller proportional change in the price level. Empirically, the assumption of stable prices and price expectations seems most plausible when there is substantial unemployment and slack in the economy (prices being fairly sticky in not moving downward) or when individuals have had historical experience with a stable price level at close to full employment and believe that the authorities are “committed” to, and will be successful in, maintaining this stability. Relaxation of either assumption can shorten—possibly quite drastically—the time horizon over which the model is operative. In other words, the use of deviations of the money supply and of the rate of interest from their norms in order to expand or contract the economy is at most a “short-run” control device, although it may be quite important even so.

The importance of the rate of interest and how it operates to determine aggregate investment is a matter of some dispute among Keynesians and near-Keynesians. In 1919, Hawtrey noted the apparently substantial impact of small changes in the discount rate of the Bank of England—“Bank Rate”—say from 3 per cent to 4 per cent per annum. He concluded that these perceived increases in the real rate of interest caused business firms to reduce working capital—stocks of finished and semi-finished materials of all kinds—so as to contract significantly the whole economy. Keynes himself took the view (in *The General Theory*) that the important restrictive effect was a rise in the cost of financing new fixed investments of plant and equipment as determined by the “long” rate of interest. Of course, Hawtrey’s and Keynes’ views need not be mutually exclusive, but confidence in the Bank of England’s determination to maintain price-level stability was important for either view. Although this “term-structure” problem is still a major unresolved issue, for our purposes it is sufficient to note that interest rates on financial assets are important policy instruments under either variant of Keynesian theory.

The exchange-rate mechanism set up at Bretton Woods in 1945 was consistent with substantial national autonomy in setting rates of interest. The par-value system prevented “beggar-thy-neighbor” policies designed to promote mercantilistic expansions of trade surpluses. Fairly tight controls were maintained over international flows of financial capital and

the fund's liberalization objectives were focused primarily on freeing commodity trade from foreign-exchange restrictions. The private international capital market seemed moribund. The situation was indeed consistent with the Keynesian theoretical schema for autonomous national monetary policies facilitated by different real rates of interest. (The absence of capital flows and well-developed lines of international credit also created an international-liquidity problem, which was handled at the time by the European Payments Union, the International Monetary Fund, and government-to-government lending under the Marshall Plan.)

Leaving aside the question of how judiciously and effectively national governments exercised the autonomy open to them in the immediate postwar, the European return to convertibility in 1959 and the revival of an enormous and thriving international capital market in the 1960's has drastically curtailed national autonomy—other than for the center country—in setting rates of interest. As a result, the system of virtually fixed exchange rates under Bretton Woods is no longer consistent with independent Keynesian monetary policies—whether or not one feels the underlying Keynesian theory is appropriate. Rates of interest are quite closely bound together by international arbitrage—except in the “accidental” situation when the market is discounting a major exchange-rate change—and can no longer be useful instruments of *internal* monetary control.

The basic analytical question then is the following: if one adheres to Keynesian liquidity-preference theory and holds that national monetary autonomy in setting interest rates is important for domestic stability, what modification in the Bretton Woods system of “almost” fixed parities is called for? One solution is the retrogressive one of securing international agreement to block international flows of financial capital. However, the elaborate network of international finance has been instrumental in the truly amazing resurgence of international trade in goods and services. Capital movements cannot be divorced from the trade flows between highly open economies, and effective controls would have to be detailed and extensive, with the freedom and efficiency of commodity trade correspondingly reduced—as is true in Eastern Europe now and used to be true within Western Europe. Clearly, this retrogressive solution of repressing capital flows for restoring national monetary autonomy must be ruled out as too costly.

Accepting more or less complete international mobility of capital, one might ask whether an individual country can achieve national autonomy in interest-rate policy by allowing more flexibility in its exchange rate. Keynes toyed with this possibility in the *Treatise* and in other writings.

The issues are quite subtle. For example, a freely floating exchange rate without any "parity" commitment—implicit or explicit—may be perverse for this narrowly-defined purpose of freeing domestic monetary policy in a Keynesian sense. In particular, *a freely floating exchange rate could be inconsistent with stable domestic price expectations—the cornerstone of Keynesian liquidity-preference theory.*

The Band Hypothesis

The foreign-exchange counterpart of Keynesian liquidity-preference monetary theory is a (believably) fixed parity with a moderately wide band around it, rather than a freely floating rate. Moreover, this band would not even glide, but would be stationary as long as the international economy remained stable, in a sense to be defined more precisely later on. The band permits consistency between internal and external instruments of monetary policy *within* the Keynesian framework. Alternatively, the band may not matter much if one adopts a different intellectual point of view or, equivalently, makes assumptions under which the liquidity-preference theory becomes irrelevant as a basis for policy prescriptions.

The operation of the band as the external arm of domestic monetary policy is easily demonstrated. Suppose aggregate internal demand is deemed excessive. The authorities can raise the internal rate of interest above world rates by reducing the domestic money supply via its open-market committee *and* its exchange-stabilization fund. The committee raises the bank rate and/or sells bonds, and the fund sells foreign exchange (dollars) in order to collect and retire domestic currency. Both operations reduce the domestic money supply in the balanced fashion necessary for monetary policy to be effective in an open economy. The internal interest rate rises rapidly above its norm and the domestic currency rapidly appreciates to the top of its band.

Now the expectation is that the domestic currency will depreciate gradually downward toward its parity at the center of the band. Thus, the domestic short-term rate of interest can remain above world interest rates as international arbitrageurs discount the expected change in relative currency values so that inflows of capital are discouraged. This effect is formalized in the *forward*-exchange market by forward quotations on the domestic currency going into discount—the familiar interest-rate-parity theory (IRPT). However, movements in the spot rate have to be believable for the IRPT to become operative. A moderately wide band would permit this, but a completely fixed exchange rate would not.

The length of time and the amount by which the domestic interest rate can be kept above the world rate are directly related to the width of the

band. Without considering the complex problem of the term structure of interest rates on various security classes (which has been explored by Michael Porter of the International Monetary Fund), let us simply illustrate the effect with a one-year security. Suppose authorities wish to raise immediately the interest rate on notes maturing in one year from, say, 4 per cent to 6 per cent, with the expectation that the yield on such securities will be back to their norm of 4 per cent by the end of the year. The equivalent foreign-exchange operation is to raise immediately the spot rate by 2 per cent above its parity, and then let it decline smoothly over the course of one year back to its parity. For a given width of the band, there is an evident tradeoff between time and size of the effective interest differential: the more the domestic interest rate is raised above the world rate in the present, the shorter is the time interval over which this difference can be sustained. Moreover, the autonomy in setting rates of interest which the band affords is confined to short- rather than long-term securities.

Would an indefinitely wide band increase the freedom of national authorities to manipulate the domestic real rate of interest? The answer is negative, because significant movements in the exchange rate would upset stable domestic-price expectations and, most importantly, upset the notion of "normal" parity at the center of the band, towards which the exchange rate inevitably gravitates. In this sense, it would be similar to a freely floating rate. (Incidentally, the idea of a normal parity need not always be the subject of formal agreement in order to be effective. There have been periods when the Canadian dollar floated informally within narrow limits and the normal parity was felt to be a one-to-one correspondence with the American dollar—although the strength of this informal feeling is a matter of debate.) Thus, there is a subtle conflict between considerations in support of a narrower band and a somewhat wider one.

Could small exchange-rate movements within the band significantly destabilize domestic prices? Carrying forward our assumption that the foreign-currency prices of internationally-traded goods are stable, the discrete appreciation to the top of the band associated with the tight money policy discussed above would reduce the prices of tradable goods in the domestic currency. This price fall would, in part, offset the contraction in the *real* supply of money that the policy was designed to effect. The increase in the real rate of interest would be correspondingly dampened. Hence, for the band to support a Keynesian monetary policy requires that the impact of small and temporary movements in the exchange rate be relatively greater in the capital market on interest rates than it is on commodity prices—which seems reasonable enough if short-term interest rates move 50 per cent, that is, from 4 to 6 per cent, in re-

sponse to a 2 per cent appreciation. Moreover, the appreciation itself would have a temporary depressant effect in the commodity market so as to reinforce the objectives of the tight-money policy, apart from the Keynesian effect on the rate of interest.

The degree to which the reduction in commodity prices in domestic currency, from the appreciation, offsets the fall in the real stock of money varies directly with the openness of the economy. When the proportion of tradable goods in total output is high, the reduction in internal prices may be significant and spread fairly rapidly. If the proportion is moderate or low, the effect on the aggregate domestic-price level can, reasonably, be considered small and lagged so as to be easily ignored. Very simply, a small and highly open economy can be expected to have less control over its own real stock of money and real interest rate than a large closed one. Fortunately, the small one would also need the control less, because of the greater smoothing effect of the stable international economy. Hence the more open economy would, *ceteris paribus*, operate within a narrower band and, optimally, exercise less autonomy.

In summary, monetary autonomy in the Keynesian mode requires the central bank's fund to have access to foreign-exchange reserves and the freedom to use them within a well-defined band—much as the committee uses a stock of domestically marketable bonds. If, instead, an external deficit requires rebuilding of national reserves, the fund might have to forego sales of foreign exchange so that the foreign-exchange value of the domestic currency would no longer appreciate sharply when internal monetary policy becomes tight. Domestic rates of interest would then no longer rise and, according to Keynesian theory, monetary policy would lose its restrictive impact. The economy, however, would acquire foreign reserves as a result of the capital inflow, and the tradeoff between this consideration and that of achieving internal tightness would become manifest. In short, a Keynesian monetary policy to deal with short-run instability may not be operable if the exchange rate is substantially mis-specified and stable-price expectations are not a reasonable working hypothesis. More attention is paid later to the appropriate alignment of exchange rates with foreign and domestic prices within the context of the "long-run" quantity theory of money.

Dilemma Cases and the Assignment Problem

We have shown that a stable band *and* access to exchange reserves are sufficient to permit authorities to exercise some degree of internal ease or tightness over the relatively short time horizon appropriate in Keynesian monetary theory. If the mechanism chosen for adjusting the foreign exchanges is inappropriate, then an apparent dilemma may de-

velop between the need for internal control on the one hand and external balance on the other. For example, the attempt to juxtapose a gliding parity on the Keynesian model fomented part of the dispute between Thomas Willett and William Branson on one side and Samuel Katz on the other [Princeton Essay No. 78, *Exchange-Rate Systems, Interest Rates, and Capital Flows*, January 1970].

The nature of the dilemma is easily seen. Consider an economy with both internal and external balance and stable-price expectations. A "temporary" shock occurs such that there is an external deficit and an internal demand deficiency as, for example, if exports suddenly dropped. The authorities wish to follow a policy of easy money to buoy the domestic economy but have assigned a downward-gliding parity to restoring external balance. The consequent gradual reduction in the exchange value of the currency induces capital outflows, which force the central bank's fund to sell dollars and thus buy back its own currency. Domestic nominal rates of interest are thereby pushed above their norms, depending on how fast the parity glides. Hence domestic real rates of interest also increase, because of the stability in price expectations. As per our previous analysis, the restrictive effect of an increase in the rate of interest dominates the buoyant effect of the small exchange-rate depreciation on the commodity market over an appropriate Keynesian time horizon. The authorities then are stymied in their short-run goal of expanding the domestic economy. The seriousness of the impasse was a matter of dispute between Katz and Willett.

The difficulty lies in the inappropriate assignment of the gliding parity to "deal with" the (temporary) external deficit by *continuously* depreciating rather than operating optimally within a band. If the problem is indeed short-run and not secular, the appropriate technique would be to expand the domestic money supply by both buying bonds through the committee and buying foreign exchange via the fund. We would get an immediate *discrete* depreciation of domestic currency to the bottom of its band. The expectation would now be that there would likely be some net appreciation in the near future and domestic nominal rates of interest could be lowered—unlike the downward-gliding parity. If some of the external deficit remained, it would be appropriate to finance it by the use of exchange reserves. As we shall show, the gliding parity is best assigned to deal with long-run or secular price movements, where a somewhat different theoretical model is appropriate.

III. THE QUANTITY THEORY OF MONEY

I have chosen to begin with a coherent monetary theory, which has been subject to much critical analysis in the context of a closed economy,

and then to derive its implications for exchange rates. The monetarist view, based on the quantity theory of money, is the other obvious candidate for "equal time" in the airing of viewpoints. Paradoxically, conclusions drawn for the foreign exchanges may differ significantly from those reached by well-known quantity theorists—as will soon become clear.

Since not all of quantity theory is based on the same set of assumptions, it is more difficult to characterize simply than its Keynesian counterpart. Private expectations regarding movements in the price level may be either stationary or volatile. However, quantity theory is distinguishable in that monetary policy does *not* require changes in the real rate of interest in order to influence money income. Rather, changes in the stock of nominal money have a direct and positive wealth effect on desired expenditure for domestic and imported goods and services. Hence, unlike the Keynesian model, any complementary foreign-exchange mechanism need not be directly concerned with insulating national interest rates in order to carry out an expansive or contractionary domestic monetary policy.

The way in which this wealth effect works itself out is not always clearly specified, but it is some mixture of portfolio and consumption adjustment—depending on the way nominal money is created. That is, an increase in cash-balance holdings may induce households to acquire balancing real assets—consumer durables of all kinds, like cars and houses—or engage in "pure" current consumption, such as theatre-going. For firms with increased cash balances, adjustment of real assets would be the primary response. Thus, the wealth effect does not depend exclusively on an upward shift in the consumption function, nor—despite its misleading name—does it require an increase in the net wealth (inclusive of all human and nonhuman capital) of households and firms. Rather, increases in the stock of nominal money directly increase money income $P \times Y$ —the average price of real output times output itself—although quantity theorists such as Milton Friedman are increasingly agnostic regarding the relative proportions in which P and Y change. Nevertheless, discrepancy between the demand for and supply of money is the prime mover within the quantity theory.

Stationary Expectations and Full Employment

The simplest and least interesting application of quantity theory is to reverse the roles of price and quantity adjustment used within the Keynesian model. That is, it is assumed that prices are perfectly flexible in response to any change in aggregate monetary demand for goods and services, and output Y always remains at its full-employment level. Thus,

the whole effect of any increase in the stock of nominal money, M , is on the price level, P . Because expectations of price-level movements are stationary, that is, price changes are expected to be zero (despite the fact that prices are in fact free to vary), the real stock of money is completely determined by full-employment real income and the "natural" rate of interest. That is, the velocity of circulation is determined exogenously. Monetary authorities, therefore, *cannot* affect real interest rates or the real stock of money. The object of monetary policy is simply to stabilize the price level by controlling the nominal stock of money to offset any exogenous changes in the demand for (velocity of) real money. Control over real output is not a direct concern within this model, unlike the Keynesian one.

In an open economy, the authorities have the option of using the exchange rate as the main policy instrument. If world prices of tradable goods are stable, but the domestic demand for money shifts through time, a fixed exchange rate may be preferred because the guesswork of gauging changes in money demand is eliminated—as would be particularly important for short-term shifts in this demand. The committee of the central bank could simply set the rate of internal money growth that approximates the longer-term trend in real income growth. The fund would then respond to shorter-term shortfalls or excesses in the real demand for money by automatically buying or selling domestic currency with foreign-exchange reserves at the fixed rate in order to peg domestic prices at the international level. (Since we are not interested in insulating national interest rates, a band would merely impede this function.) If there was any secular tendency to gain or lose reserves, the committee's rate of monetary expansion could be easily adjusted.

However, the assumption of perfect internal price flexibility coincident with *expectations* of price stability makes the choice of any particular foreign-exchange mechanism noncritical. Indeed, the same could be said for monetary policy generally, as long as it was not absolutely wild. Nevertheless, in a stable world economy, a fixed parity seems closer to a pure monetarist view than do freely floating exchange rates. Limiting the power of the monetary authority to make sharp short-run changes in the nominal supply of money may be a net advantage, if one adopts the new monetarist wisdom, which is generally hostile to discretionary "fine tuning."

*Elastic Expectations and the Absence of Money Illusion:
The Fisherian Model*

Suppose individuals and firms extrapolate current movements in the price level over some relevant time horizon, in contrast to the Keynesian

and quantity-theory models just examined. How then does this affect monetary strategy under the quantity theory? Unfortunately, there is a plethora of models with different assumptions regarding the ways in which expectations adapt and no single paradigm which carries all the essential ideas.

There is a class of Fisherian models postulating perfect adjustment where not only are prices flexible in both directions, but individuals adjust to price changes very quickly with an elasticity of expectation of price movements equal to unity. In this sense, money illusion is absent. One then focuses on balanced monetary expansion above or below the rate of growth in real income. For example, if the money supply expanded above real growth by 5 per cent per year, prices would rise by 5 per cent, leading to a regular 5 per cent reduction in the exchange value of the currency and to nominal rates of interest 5 per cent above real rates. Monetary policy is then said to be "neutral" in its impact—excepting the case where deposit rates of interest on cash balances cannot adjust. In contrast to short-run Keynesian models, this model is naturally one that takes secular or longer-run price-level movements into account. Unfortunately, instability of expectations may make the relevant time span highly variable.

If hand-to-hand currency is important and/or there are restrictions on deposit rates, the real stock of money is now determined, in part, by the rate of inflation or deflation chosen by the authorities. Milton Friedman in his *Optimum Quantity of Money* (Aldine, 1969) has suggested that the optimal rate of price *deflation* is equal to "the" real rate of interest on physical capital. With this deflation rate, the maximum gains from monetizing the economy (supposedly costlessly) can be secured. On the other hand, there exist considerable writings on the advantages of using inflation as a tax on holding real cash balances in an economy incapable of raising adequate tax revenues by other means. The validity of these views need not concern us directly, except insofar as authorities are induced to pursue net deflation or inflation relative to world prices of tradable goods.

One further aspect of the literature should be noted. What happens to the demand for money during the transition from one rate of monetary expansion to another? Clearly, if the rate of monetary expansion above real-income growth moves up from 0 per cent to 4 per cent per year and this is fully anticipated by private decision-makers, there will be a once-for-all decline in the demand for real cash balances down to a level consonant with the 4 per cent inflation tax—again assuming that deposit rates of interest are fixed at zero or do not adjust. Thus, there may be an immediate burst of inflation substantially greater than the 4 per cent

rate as individuals and firms dishoard money, and expectations may take some time to settle down completely. Indeed, Milton Friedman has been concerned not only with an immediate burst of inflation but the possibility of an unstable cyclical approach to the new 4 per cent inflation path, as he discussed in "A Theoretical Framework for Monetary Analysis," *Journal of Political Economy*, March/April 1970. (One need only throw in *ad hoc* a little rigidity in prices to generate instability in real output.)

Suppose then that money illusion is absent in the sense that people correctly anticipate the rate of change in prices (to the first derivative only) and nominal rates of interest are positively correlated with rates of monetary expansion—in contrast to the negative correlation in the Keynesian model. (There is reason to believe that money illusion, on which the negative correlation depends, has declined recently and the expectation of a stable price level is no longer—by itself—an adequate working hypothesis for monetary theorizing.) Further, we presume that governments are prone to adopt secular rates of inflation (deflation) differing from that associated with stable prices for tradable goods, and that this chosen rate of inflation is occasionally changed. What then is the optimal degree of flexibility in exchange rates for an individual nation-state other than the center country?

If inflation is positive at a steady-state level of, say, 5 per cent, the need for international adjustment will force an eventual average 5 per cent per year depreciation of the domestic currency in the foreign exchanges. However, the interesting question is whether the government should formally adopt a gliding parity—without a band—which moves downward at 5 per cent per year—or should opt for a freely floating exchange rate. The narrower issue of fixed versus flexible exchange rates simply does not arise, because everyone knows that depreciation must occur from time to time, and I rule out a crisis-prone adjustable peg as an "irrational" arrangement.

Although money illusion is absent, there is still the problem of having private price expectations coalesce around a particular rate of inflation—which is particularly difficult when rates of inflation differ substantially from zero. Domestic capital markets are impeded if there is no common understanding of the rate of change of the real value of claims denominated in the domestic currency. (Such uncertainty may even induce otherwise avoidable losses in seigniorage.) A believable commitment to a known gliding parity could substantially reduce this uncertainty without imposing a sacrifice of real revenues from the inflation tax or incurring other unnecessary losses in efficiency. The operations of the central bank's fund under the gliding parity would smooth the impact of short-run

shifts in private demand for money holdings—perhaps being more volatile in the absence of money illusion—and also smooth unavoidable machinations in the short-run behavior of the central bank's own committee. Of course, the gliding parity must be consistent with the overall trend of money creation by the committee, but it seems to be the natural foreign-exchange counterpart of Fisherian quantity theory.

The stabilizing influence of a gliding parity can be illustrated by observing its impact on the transition from one rate of inflation to another—the problem which so concerned Milton Friedman for the case of a closed economy. Suppose authorities wish to slow the rate of inflation from 20 per cent per year to 10 per cent and they adopt the means to do so by convincingly reducing the secular rate of monetary expansion by their own committee and, correspondingly, reduce the downward glide of the external parity from 20 per cent to 10 per cent per year. In a closed economy, one would be particularly concerned about the once-for-all deflationary impact as individuals and firms move to build up their holdings of real money to a level consonant with the reduced 10 per cent rate of price inflation. However, in an open economy, the gliding external parity—fixed in the short run—would smooth the deflationary impact by maintaining the rise in prices of tradables at its new trend level by pumping, through the automatic operations of the fund, nominal money into the economy at whatever rate turned out to be necessary to satisfy the increased demand for it. Reserves of foreign exchange would rise commensurately. On the other hand, a freely floating exchange rate might appreciate sharply, putting the economy through the deflationary wringer as if it were closed to foreign trade.

Although the Fisherian model of expectations that are completely adapted to movements of the price level is extreme in its deviation from conditions prevailing in the real world, it does suggest that a managed gliding parity can be superior to a freely floating exchange rate in achieving monetary stability in situations of moderate secular price-level movements. This is not to deny that freely floating rates are still likely to dominate adjustable pegs or foreign-exchange restrictions in situations of chronic inflation.

The Case of the Missing Dilemma

Notice that the particular problem of a dilemma case so common in the literature cannot arise in the context of this Fisherian model where money illusion is absent. Suppose again that there exists a need for internal monetary expansion with the constraint of maintaining balanced international payments. The authorities can undertake monetary expansion so as to generate a positive wealth effect on money income. This may cause

an external deficit to develop, which is handled by a downward-gliding parity and a corresponding increase in the internal *nominal* rate of interest. However, the expansionary impact on money income of the wealth effect under the quantity theory is not offset by increases in nominal rates of interest. Thus, there is no interference with the monetary expansion and no dilemma between internal and external objectives as the foreign-exchange value of the currency glides downward to maintain balanced international payments.

This situation differs from the dilemma case examined earlier because, in the absence of expected stability of the price level, the higher nominal rate of interest is no longer an indicator of monetary tightness. That is, the real rate cannot be increased during the time period relevant to Fisherian quantity theory. Thus, it is appropriate to assign the gliding parity to adjust for longer-run secular movements in prices—its sense still to be made more precise empirically. Of course, this does not preclude the assignment of a narrow band to facilitate short-term monetary policy.

The above analysis has frequently and loosely assigned Keynesian theory and its associated band to short-run monetary policy, and assigned Fisherian quantity theory and associated gliding parity to the long run. It should be clear, however, that purely temporal distinctions are likely to be inadequate. In some cases, price expectations may not be sufficiently stable for Keynesian monetary policy to be effective in the reasonably short run. Correspondingly, there may be situations where prices are quite flexible in the short run and quantity theory with stable (non-Fisherian) expectations is the appropriate theoretical point of view. The central bank still must choose from among the various models; and I have simply tried to demonstrate *consistent* behavior between its committee and its fund within each model.

IV. ADJUSTMENT OF INTERNATIONAL PRICES AND STABILITY IN THE CENTER COUNTRY

In the preceding two sections, it was assumed that the world economy was stable relative to national economic perturbations of the kind described briefly in Section I. Indeed, the consistent assignment of foreign-exchange regimes to monetary models—either quantity-theory or Keynesian—becomes clouded for individual countries in the absence of such worldwide stability. The center country in the foreign exchanges, the United States, plays a key stabilizing role internationally. American internal fluctuations over the past five years, however, have been a more upsetting influence than in preceding years. Yet, there have been continuous complaints about the behavior of the United States, dating back to the middle 1950's, when the chronic accounting "deficit" in American

international payments was first implanted on official psyches in industrial economies. The following basic questions then pose themselves:

1. By what standards should the behavior of the United States be judged stable, or as contributing to international stability?
2. Given American "stability," what is implied statistically for optimal exchange-rate policies in other countries, particularly for those whose growth indices have been very different from those of the United States, such as Germany and Japan?
3. What *ad hoc* adjustments might be necessary to cope with American instability?

Since the center country provides an important banking function to the rest of the world and can have no independent exchange-rate policy, a deficit under either the liquidity or official-settlements definition cannot be used as a meaningful quantitative indicator of unstable behavior by the United States. Indeed, the deficit under the liquidity definition roughly measures effective foreign demand to hold additional international money—both officially and privately. As shown in Table I, foreigners have been exercising this demand for twenty years, with only two small exceptions (surpluses) in 1957 and 1968. Once intermittent sales from the American gold stock are deducted, the liquidity "deficit" measures crudely the incremental foreign demand for dollars. These dollar holdings have been a successful lubricant for the unprecedented expansion of world trade and have risen more or less in line with it.

I argued in my 1969 essay that growth in overseas dollar holdings by private or official foreigners should not even be labeled as a "deficit," because the semantic connotations of the term are strong enough to provoke unwise official intervention in international payments by several agencies of the United States Government. It is essential for the dollar standard that American foreign-exchange policy remain generally passive. Fortunately, most of these interventions have been subverted—particularly restrictions on capital flows—but more fuel is given to restrictionist lobbying on imports of goods and services. The semantic confusion is not limited to American officialdom: European central bankers began to complain about these American deficits in the late 1950's and may have contributed to unduly deflationary policy in the United States at that time.

Although other countries may have to worry about deficits—suitably defined—the United States is best judged by a quite different standard, which reflects its asymmetrical position at the center of the world monetary system. Have world prices of tradable goods remained stable *in dollar terms*; that is, has "excessive" inflation of dollar prices been avoided?

TABLE I
BALANCE OF PAYMENTS OF THE UNITED STATES,
ON LIQUIDITY BASIS AND ON OFFICIAL-SETTLEMENTS BASIS, 1950-1970
(millions of U.S. dollars)

Year	<i>Liquidity Balance (excl. SDR)</i>	<i>Liquidity Balance (excl. U. S. gold losses and SDR)</i>	<i>Official-Settlements Balance (excl. SDR)</i>
1950	-3,489	-1,746	
1951	-8	-61	
1952	-1,206	-1,585	
1953	-2,184	-1,023	
1954	-1,541	-1,243	
1955	-1,242	-1,201	
1956	-973	-1,279	
1957	578	-220	
1958	-3,365	-1,090	
1959	-3,870	-2,795	
1960	-3,901	-2,198	-3,403
1961	-2,371	-1,512	-1,347
1962	-2,204	-1,314	-2,702
1963	-2,670	-2,209	-2,011
1964	-2,800	-2,675	-1,564
1965	-1,335	330	-1,289
1966	-1,357	-786	266
1967	-3,544	-2,374	-3,418
1968	171	1,344	1,641
1969	-7,221 ^P	-8,188	2,700
1970	-4,741 ^P	-3,954 ^P	-10,686 ^P

^P Preliminary Data

Source: 1950-1969 U. S. Department of Commerce, Office of Business Economics, *Survey of Current Business*, June 1970, pages 34-35, pages 42-43.

1967-1970 U. S. Department of Commerce, Office of Business Economics, *Survey of Current Business*, December 1970, page S-3.

U. S. Department of Commerce, Office of Business Economics, *Survey of Current Business*, February 1971, page S-3.

Such a price index is the appropriate standard to apply to the United States insofar as there exists a collective international judgment institutionalized in the IMF or elsewhere, which is concerned with worldwide stability. Instead of asking itself the highly misleading question of what the "deficit" is in any year, the United States Government should ask whether the dollar-price index of tradable goods moved upwards or downwards. Fortunately, maintaining stable prices for tradable goods in the highly diversified American foreign-trade sector need not conflict with maintaining a generally balanced domestic economy. Unfortunately, a reliable index of American export and import prices is not now calculated by the U. S. Department of Commerce. Accurately measured, a stable price index of American tradable goods would provide a stable

world numeraire, and facilitate the adoption of stabilizing monetary policies in other countries along the lines suggested in this essay.

International Divergences Between Wholesale and Consumer Price Indices

Why use an index of prices of tradable goods rather than the consumer price index (CPI), the GNP deflator, or something else? The reader should be aware of the divergent behavior of common price indices in any one country through time, where the CPI rises vis-à-vis wholesale prices, which in turn rise relative to an index of export prices. This is true for all industrial countries, except for a statistical aberration in the latter relationship for the United States.

Moreover, the difference between consumer prices and wholesale or export prices is a function of the rate of growth of output per capita. Countries with a rapid increase of productivity generate much more divergent price-level movements than countries where productivity grows slowly. Rapid increases in real wages lead to increases in the cost of services to final consumers, which mainly affect the CPI and are largely *nontradable*. To illustrate this effect, three countries with fast growth of productivity—Germany, Italy, and Japan—are compared with three whose growth has been slower—Canada, Britain, and the United States (Table II).

The differences between the two groups of countries are impressive—with the divergent movements in Japanese price indices being quite extraordinary. The Japanese CPI *rose* by 97.3 per cent during a period in which its export price index *fell* by 5.2 per cent. The Japanese CPI rose more than twice as fast as the comparable American index, whereas Japanese wholesale prices rose substantially less than their American counterparts. On average over the 1953-1970 period, consumer prices rose 43 per cent more than wholesale prices in the fast-growth countries and only 14 per cent more in slow-growth countries, as indicated in column (5). Although there are many data problems (making indices of consumer prices quite useless in some countries not included in Table II), these broad divergent trends would seem to be statistically significant.

None of the three indices corresponds to a "pure" index of prices of tradable goods. The high personal-service content of the CPI rules it out. The wholesale-price index does not include personal services and it does include both importables and exportables so as to be a much better approximation. Nevertheless, wholesale prices still include nontradables such as heavy construction materials. The export-price indices exclude importables and include those commodities where the individual country has a strong comparative advantage—possibly through unusually rapid

TABLE II
 MOVEMENTS OF PRICES IN DOMESTIC CURRENCY AND RATES OF GROWTH
 IN REAL OUTPUT, 1953-1970

	<i>1st Quarter of 1970</i> (1953 = 100)					
	(1)	(2)	(3)	(4)	(5)	(6)
	<i>Output per Man-Hour¹</i>	<i>Consumer-Price Index (CPI)</i>	<i>Wholesale-Price Index (WPI)</i>	<i>Export-Price Index (EPI)</i>	<i>CPI/WPI (=2/3)</i>	<i>CPI/EPI (=2/4)</i>
<i>Rapidly Growing Economies</i>						
Germany	251.0	145.2	116.6	107.1	125.2	135.4
Italy	260.9	166.3	126.3	91.6	131.7	181.6
Japan	406.8	197.3	114.1	94.8	173.0	208.2
				Mean.....	143.0	175.1
<i>Slowly Growing Economies</i>						
Canada	185.2	142.5	129.8	129.7	109.8	109.9
United Kingdom	173.8	175.6	147.6	143.6	119.0	122.3
United States	154.9	141.4	125.3	129.6	112.8	109.1
				Mean.....	113.9	113.8

¹ 1953-1969 only. Taken from unpublished estimates supplied by the U. S. Department of Labor.

technical progress. Indeed, in all industrial countries (except the United States) the price of exports rose less than wholesale prices. In economies with rapidly growing productivity, the margin was substantial (see Table II), possibly because these countries had to accept something of a decline in the terms of trade in order to expand their share of world trade. In general, it seems reasonable to suppose that a broad price index of tradable goods would rise somewhat less than the wholesale-price index for most countries—but provisionally the latter is used here as an imperfect proxy.

Under a regime of fixed exchange rates and fairly free trade, then, we would expect wholesale prices to be fairly closely tied together by international commodity arbitrage. Wholesale-price indices in *domestic* currencies could diverge substantially if changes in the exchange rate occurred from time to time. Uniformity would be restored, however, if exchange-rate adjustments were made to convert indices of domestic wholesale prices back into dollar terms. Table III indicates fair uniformity of movement in wholesale-price indices (converted into dollars) among industrial countries during the 1953-1970 interval. In this con-

TABLE III
PRICE INDICES IN INDUSTRIAL ECONOMIES

	<i>1st Quarter of 1970</i> (1953 = 100)		
	<i>Wholesale- Price Index (Domestic Currency)</i>	<i>Wholesale- Price Index¹ (U. S. \$)</i>	<i>Consumer- Price Index (Domestic Currency)</i>
Australia	123.05	123.05	152.50
Austria	142.80	142.80	165.06
Belgium	122.85	122.85	144.78
Canada	129.80	122.27 ²	143.64
Denmark	140.00	129.18	205.86
France	173.60	109.66	193.28
Germany	116.60	133.81	145.18
Italy	126.26	126.26	166.32
Japan	114.06	114.06	197.34
Netherlands	130.38	135.95	175.36
Norway	140.30	140.30	180.88
Sweden	145.08	145.08	179.52
United Kingdom	147.56	126.03	175.56
United States	125.28	125.28	141.36

¹ Adjusted for exchange-rate changes.

² Adjusted for exchange-rate change in June of 1970.

nection, 1953 seems to be a good base year because the major price perturbations associated with the Korean War and the massive continental devaluations of 1949 were dampened. Recovery from World War II had taken place and there were no obvious major disequilibria in the foreign exchanges. Correspondingly, 1970 is also a year where—with the exception of Canada—there were no longer obvious disequilibria in the foreign exchanges, with the possible exception of Japan as indicated by the relatively low value of its wholesale-price index in Table III. The German and French indices, however, seem to indicate “overadjustment” in the recent parity changes, which perhaps correctly anticipates future differential inflation rates. Among small countries, the wholesale-price indices for Sweden, Austria, and Norway seem a little high, although their techniques for gathering statistics could be different.

Two Models of Inflation and the Gliding Parity

It follows from the preceding analysis that stable wholesale (tradable-goods) prices in the United States enable other countries to stabilize their wholesale prices under an exchange-rate regime of fixed parities, though other major price indices need not be so linked. This stabilizing effect

may well suit countries whose growth experience is similar to that of the United States, or whose growth of productivity is faster but whose taste or tolerance for inflation in the CPI is greater, such as, perhaps, Italy. However, what is "stable" behavior for the United States, judged by its own internal needs and those of many other countries, may still be unduly inflationary in high-growth countries such as Germany and Japan. *Reducing* the rate of increase in *consumer-price indices* of the latter might actually require *continuously falling wholesale prices*, to which other slower-growing industrial economies, quite legitimately, may not wish to submit.

Thus, the rules of the game under a stable dollar standard suggest that countries with fast growth of productivity and only average tolerance for increases in the CPI should appreciate their currency steadily under a gliding parity. The rate of change in their consumer-price indices can then be stabilized as wholesale prices fall in the domestic currency. The assignment of the gliding parity to adjust for such long-run divergences in productivity trends fits quite well the model of Fisherian quantity theory constructed in Section III. Appropriate reductions in nominal rates of interest on financial assets would follow, because the basic constancy of the underlying trends should allow expectations to adapt rather easily.

Insofar as the above model fits the German and Japanese experiences, the authorities have not recognized the basic issue. Considerable onus has been placed on the United States for exporting inflation even in periods where the American wholesale-price index was fairly stable, say from 1957 to 1965 when it rose less than $\frac{1}{2}$ of 1 per cent per year. Indeed, the whole period 1953-1967 involved an increase of only 1 per cent per year—although whether that rate is "stable" or optimal may be contested by some.

The German authorities have, inappropriately, tried to maintain a fixed parity and still keep the lid on the CPI by the internal monetary stringency of the committee of its central bank. Indeed, the monetary reform of 1948 froze outstanding government debt and left the Bundesbank without any convenient internal market in which to buy bonds. Hence the fund was forced to satisfy the residual demand for real money through unwanted creation of nominal money via the purchase of dollars in the foreign exchanges and through two appreciations in crisis situations. In this sense, the inappropriate exchange-rate target caused the Bundesbank's fund and committee to carry out contradictory monetary policies! These forced parity changes have brought the dollar value of the German wholesale-price index into line with, or even above, the American, but the

CPI is probably still too high for German tastes regarding inflation. The Japanese have simply accepted high inflation in their consumer-price index, with some resistance recently so that their wholesale-price index in dollar terms is now significantly below the American, as indicated in Table III. This, too, may force an eventual appreciation of the Japanese currency. An upward-gliding parity would be a preferable instrument of internal monetary control, as compared with official inaction rationalized by pointing to "inflation" in the United States.

Besides this inflation syndrome associated with high productivity growth, there is also the more conventional quantity-theory model of the inflationary process, where excessive creation of money by the committee forces *devaluation* from time to time. Productivity growth in Britain and France notwithstanding, divergent movements in their price indices are not the prime cause of inflation, because their wholesale prices in their own currencies have increased relative to the American index, as indicated in Table III. Should authorities in these countries recognize the excessive internal propensity to inflate and smooth the adjustment problem via a continuously *downward-gliding* parity?

Foreign-exchange policy within this conventional model of inflation is basically more difficult than in the high-productivity case, because the authorities are naturally loathe to formalize their own propensities to inflate in choosing the rate of gradual downward movement of their parity—as has been done in Brazil and Chile (until recently). Further expectations of even faster downward movements may develop, since there is no objective standard for judging official policy that the foreign-exchange and money markets can use. Nevertheless, a downward-gliding parity may still be the smoothest way out of a situation that is inevitably crisis-prone.

Note again that upward-gliding parities by the fast-growing economies need *not* be similarly destabilizing. That is, the purpose of the upward glide is to compensate for the impact of relatively high productivity growth on the CPI. The need for compensation is well established by objectively determined trends in past productivity and would be a modest 2 per cent per year, give or take a percentage point. A well-defined compensatory monetary policy via a gliding parity should not give the exchange markets any cause to distrust the motives of the authorities or to cause destabilizing speculation about their future behavior. In short, the problem of fast growth is relatively easy to deal with by the gliding parity even though other causes of long-run maladjustment are less tractable. Conceptually, the two models of inflation and associated reasons for introducing gliding parities should be separated.

Adjusting to Aberrant Behavior by the United States

Instability in the center country inevitably causes considerable difficulty for the whole adjustment mechanism. However, as discussed in the preceding section, it is important not to cry "wolf" unless such aberrant behavior is clearly identified, which it was *not* prior to 1965. In the interval 1965 to the first quarter of 1970, the American wholesale-price index rose by about 14 per cent, which is enough to transmit a substantial inflationary shock to other economies. How should they adjust?

Unfortunately, the problem cannot be neatly categorized under the Keynesian and quantity-theory models of Sections II and III, because authorities in individual countries can no longer define their own monetary policies according to purely national considerations. They must make *ad hoc* judgments on the course of events in the United States in order to forecast changes in world prices of tradable goods. Correspondingly, there is little point in going through an *ad hoc* taxonomy of possible reactions to American instability. Instead, one or two leading examples should suffice.

One possibility is not to respond directly, because of the uncertainty involved, and simply to ride out the instability. This implies a basic confidence that there is substantial pressure within the United States to maintain internal balance most of the time. Not responding to American instability does not necessarily imply maintenance of a fixed parity. That is, the purely nationally oriented monetary policies described in the preceding sections, involving widened bands and gliding parities, should continue where purely domestic conditions warrant it.

This passive response to American instability is undoubtedly easier the farther away the storm center. Canada has very close direct trading relationships with the United States and may have more to gain by trying to cope directly with the disturbance. In this situation, a temporarily floating rate may be justified as an optimal insulation device. Canada did this in June of 1970, but possibly should have tried it two or three years earlier. From that earlier time, an upward-gliding parity of 2 per cent or so would have made unnecessary the abrupt change in the exchange rate that actually occurred. The theoretical cases for carefully controlled parities in the Keynesian monetary framework of Section II and the quantity-theory framework of Section III are undoubtedly weakened when the basic premise of stability in the center country is relaxed.

Even the United States, with its peculiar position of providing an international currency and having by far the largest GNP, is not monolithic in the world economy. The American balance-of-trade surplus fell

sharply from 1965 to 1969 and, as a result, the internal inflationary pressure was dampened. Overly tight monetary policy in the summer of 1966 and in 1969 was partly offset by borrowing in the Eurodollar market. Overly expansive monetary policies in 1965-1966 and 1967-1968 were partly offset by lending to the Eurodollar market. These external effects were valuable from the point of view of smoothing ill-conceived internal policies within the United States, but they did destabilize the international economy.

American price-level behavior and otherwise unstable policies over the past five years have undoubtedly been inconsistent with appropriately specified rules of a dollar standard and should be subject to international censure. On the other hand, American economic performance over the whole postwar period has been reasonably good as an international balance wheel—even in some periods when American economic policy has been quite heavily censured by foreign and international official agencies. It is important that the rules of the game become better defined by the International Monetary Fund. Substituting relevant price-level movements in tradable goods for arbitrary accounting deficits in order to judge the United States is a necessary first step; reconsidering greater exchange-rate flexibility open to other national authorities is the second. For the first, it would be useful if a comprehensive price index of tradable goods were published by the U. S. Department of Commerce to replace its export-price index based on unit values.

V. ON RECONSIDERING BRETTON WOODS

The Executive Directors of the International Monetary Fund recently published, in September 1970, a report on *The Role of Exchange Rates in the Adjustment of International Payments*, which is the most comprehensive reconsideration of exchange-rate flexibility that the Fund has yet undertaken. Essentially, the Directors opt for the *status quo* by suggesting *no changes* in the operation of the existing par-value system. In doing so, they rule out some current proposals for introducing more flexibility in exchange rates, while leaving others "open." These recommendations sometimes conflict with the pursuit of optimal national monetary policy as developed in this essay, and with the operations of the dollar standard itself as explored in my 1969 essay.

There is, however, broad agreement between my analysis and the IMF Report that the foreign exchanges need to be "organized" in order to prevent international conflict. A par-value system with a single specified intervention currency—the American dollar—seems best for securing harmonization. (An alternative organization was proposed by Donald Marsh in "The Fixed-Reserve Standard: A Proposal to Reverse Bretton

Woods" in the *Bürgenstock Papers* [Princeton University Press, 1970]. However, rigid controls over national reserves to replace controls over par values is inconsistent with the free use of reserves as instruments of national monetary policy.)

Furthermore, there is basic agreement that the importance of the exchange rate for national monetary policy impels national authorities to intervene from time to time through rate adjustments. Nevertheless, the Report fails to spell out alternative monetary models under which national intervention might optimally take place. Indeed, the Report makes no distinctions between applications of short-run Keynesian theory and long-run quantity theory, and between movements of wholesale and consumer prices. Thus, optimal use of narrow bands and gliding parities could not be sufficiently specified, so that references to dilemma cases and other ambiguities were unnecessarily prevalent. As a result, the Executive Directors were inhibited from coming to any conclusion other than maintenance of the *status quo*.

"Regimes Inconsistent with the Par-Value System"

Under the above heading, Chapter 4 of the Report identified three common proposals:

- (a) freely floating exchange rates;
- (b) substantially wider margins;
- (c) "formula-determined" parity adjustment.

The Report correctly emphasized that both freely floating exchange rates and very wide margins could lead to national policies in one country that were inconsistent with goals in adjacent countries. "Countries would need to find a new set of safeguards, comparable to those built up under the par-value system, against arbitrary actions and conflicts between national policies in the determination of exchange rates" (page 42). These safeguards would naturally lead back to formal parities with a single intervention currency, because any other system is too difficult to specify in an international agreement. Purely national monetary policy under either Keynesian or quantity theory may even be hindered by the absence of a par-value system, provided that the center country maintains its stability. Indeed, a wide band may lose the essential notion of a stable short-term parity, and yet fail to provide for long-term adjustment under either of our models of inflation. Moreover, we have shown that inflation can, potentially, be better handled by a gliding parity rather than a freely floating rate. Thus, our theoretical analysis does not conflict with conclusions (a) and (b) of the Report.

Should there be automatic adjustment of parities according to the

criteria commonly discussed of a weighted average of past spot rates and/or recent movements in exchange reserves? The Report recognizes the fact that short-term movements in the spot rate or in reserves may not be at all indicative of actual or desired secular movements. Thus, it comes out against any "automatic" (read "formula-determined") or even presumptive system based on quantitative indicators.

The difficulty is made explicit if we superimpose a short-term Keynesian monetary policy within a narrow band on an economy—say, a fast-growing one—which is using an upward-gliding parity to control secular movements in its consumer-price index. Then a policy of short-run stimulus in the form of a balanced expansion in the domestic money supply, brought about by the purchase of domestic and foreign-exchange assets, in order to reduce the interest rate below its norm, requires the authority to acquire reserves and lower the spot rate of its currency to the bottom of its band, as was shown in the analysis of Section II. The temporary decline in the spot rate, then, is an inappropriate indicator for slowing down the upward rate of glide in the parity. Similarly, the acquisition of reserves is unusual and temporary and no indication that the upward glide should be speeded up. Thus, the criteria usually thought to be appropriate as indicators of how the parity should glide are ambiguous and hardly a reasonable basis for formula-determined parity adjustment over the long run.

Only if one adopts a pure Fisherian version of quantity theory with *no* money illusion—that is, nominal rates of interest immediately adjust to movements of price levels and exchange rates—can a case be made for using past movement in spot rates as a reliable indicator of the direction in which, and the rate at which, a parity should glide. Changes in the money supply, price level, exchange rates, and interest rates simply line up according to the rate at which nominal money is being created. This overly narrow—albeit consistent—monetarist view of the long run was espoused by the present author in his article on "Exchange-Rate Flexibility and Monetary Policy" (*Journal of Money, Credit and Banking*, May 1971). Instead, a more pluralistic view, where one assigns a definite short-run role to Keynesian monetary theory, seems preferable. Hence the Report is correct in ruling out "automatic" (read "formula-determined") parity adjustment based on movements in the spot rate or in reserves.

However, the Report goes too far in ruling out all quantitative criteria—even as "presumptive" indicators. From our analysis in Section IV, high productivity growth coupled with unwanted inflation of consumer prices is a long-run phenomenon and as such could be appropriately applied to a gliding parity. (My earlier preoccupation with the spot rate

as a signaling device resulted from a failure to focus on the divergence of movement between prices of consumer goods and tradable goods.) Indeed, if authorities in fast-growing economies make known their unhappiness with "inflation," the IMF would inquire as to whether this was largely a concern about consumer prices. If so, the IMF should "presume" that the fast-growing country continuously and gradually appreciate its parity, instead of accumulating huge reserves and/or undertaking traumatic discrete appreciations of its currency from time to time. (It remains true, however, that other models of inflation are more difficult to deal with by presumptive criteria.)

Proposals Held in Abeyance

The reexamination of exchange flexibility in the Directors' Report of September 1970 was undoubtedly spawned by the foreign-exchange crises of 1967-1969, where major equilibrating changes in par value occurred. The resulting relative calm of 1970 removed much of the immediate administrative pressure for reform. Thus, major proposals for adapting the par-value system by provisions allowing greater flexibility were left, curiously, in limbo, with no recommendations for either adoption or rejection—hence, the implicit acceptance of the *status quo*. These proposals, however, are interesting and they are listed below in their most specific formats. If instituted, all three would probably require amendments of the IMF's Articles of Agreement.

- (1) In order to facilitate small and gradual parity changes without unnecessary delays, member countries would be allowed at their discretion to make such changes if they did not exceed, say, 3 per cent in any twelve-month period nor a cumulative amount of, say, 10 per cent in any five-year period.
- (2) Margins could be slightly widened to 2 per cent (or at most 3 per cent) against the intervention currency—which in most cases is the United States dollar. (The present margin is 1 per cent.)
- (3) A temporary suspension of par-value obligations as under a freely floating exchange rate.

Proposal (1) is clearly desirable to allow countries to implement a gliding parity in accordance with our quantity-theory model of Section III coupled with the high-growth syndrome discussed in Section IV. The Executive Directors' analysis, however, was stymied on two major points. First, they feared that small, almost infinitesimal, changes in par values may not be compatible with the concept of correcting a "fundamental disequilibrium," and that the frequency of such changes might undermine "exchange stability" (page 72). Secondly, once speculators

correctly anticipated the glide, "the need to establish an offsetting interest differential might . . . involve a more continuous constraint on monetary policy" (page 53). Neither argument holds if the gliding parity is assigned to a clearly identified *long-run* need. The high-growth case associated with a rapid increase in the consumer-price index relative to other indices is an example of a continuing "fundamental disequilibrium" in need of correction. Similarly, the adjustment of the *nominal* rate of interest to reflect the long-run glide does not impose a constraint on the *real* rate of interest in the short run.

Thus, from the IMF's point of view, it is perfectly safe to permit a fast-growing country to apply for parity adjustment under proposal (1) on the presumption that differential productivity trends are being compensated for. However, if a country applied for such a parity adjustment under (1) to deal with domestic short-run instability (without secular inflation) in a fairly stable world economy, this could well be an inappropriate assignment for the gliding parity. Hence, the IMF should differentiate among motives and purposes of applications for gliding-parity adjustments.

A slightly wider band under proposal (2) strengthens the ability of national authorities to attract short-term capital, as stressed in the Report. Planned depreciation to the bottom of the band could be used as a device to attract capital inflows through expected future appreciation over the short run, on the traditional argument. However, the increased availability of official credits and lending facilities of the IMF itself makes the need for manipulations of the exchange rate for this purpose somewhat redundant. Rather, reserves are best used to maintain a stable parity in the middle of the band unless a deliberate monetary stimulus is called for where they can be used vigorously to support internal monetary policy, as described earlier in this essay. Hence, the Report might have been too concerned with destabilizing movements of short-term capital among neighboring countries and underestimated the advantages of short-run national autonomy in monetary policy, where the objective is to *prevent* untoward movements of short-term capital, as per our analysis in Section II. Unlike the case of members of the European Economic Community, the slightly wider band would be more important for countries relatively closed to foreign trade, but only to secure more national monetary autonomy rather than to manipulate flows of short-term capital.

Temporary deviations from par-value obligations under proposal (3) are likely to be *ad hoc* affairs, as when a country searches for a new parity after maintaining a misaligned one. Similarly, if a country experiences monetary instability from abroad, as in the recent case of Canada, the case for maintaining a given parity is weakened. Nevertheless, while the

United States has remained passive in the market for Canadian dollars, it could not be expected to remain passive if there were a general erosion of parity commitments by major trading countries. To avoid international conflict and disorganization, the Executive Directors are probably correct in eschewing changes in the Articles of Agreement that would weaken the par-value obligations of major industrial nations.

In summary, my main disagreement with the Report concerns the failure to recommend adoption of something similar to proposal (1) in order to provide for smooth adjustment under a gliding parity. There is milder disagreement regarding proposal (2) with the failure to recommend adoption of a slightly wider band. In a way, it is a little unfortunate that 1970—when the Report was written—turned out to be a singularly calm year in the foreign-exchange markets.

PUBLICATIONS OF THE INTERNATIONAL FINANCE SECTION

The International Finance Section publishes at irregular intervals papers in four series: *ESSAYS IN INTERNATIONAL FINANCE*, *PRINCETON STUDIES IN INTERNATIONAL FINANCE*, *SPECIAL PAPERS IN INTERNATIONAL ECONOMICS*, and *REPRINTS IN INTERNATIONAL FINANCE*. All four of these should be ordered directly from the Section (P.O. Box 644, Princeton, New Jersey 08540).

A mailing list is maintained for free distribution of *ESSAYS* and *REPRINTS* as they are issued and of announcements of new issues in the series of *STUDIES* and *SPECIAL PAPERS*. Requests for inclusion in this list will be honored, except that students will not be placed on the permanent mailing list, because waste results from frequent changes of address.

For the *STUDIES* and *SPECIAL PAPERS* there will be a charge of \$1.00 a copy, payable in advance. This charge will be waived on copies distributed to college and university libraries here and abroad. In addition the charge is sometimes waived on single copies requested by persons residing abroad who find it difficult to make remittance.

For noneducational institutions there is a simplified procedure whereby all issues of all four series will be sent to them automatically in return for an annual contribution of \$25 to the publication program of the International Finance Section. Any company finding it irksome to order individual *SPECIAL PAPERS* and *STUDIES* is welcome to take advantage of this plan.

Orders for one or two copies of the *ESSAYS* and *REPRINTS* will be filled against a handling charge of \$1.00, payable in advance; the charge for additional copies of these two series will be \$0.50 a copy. These charges may be waived to foreign institutions of education and research. Charges may also be waived on single copies requested by persons residing abroad who find it difficult to make remittance.

For the convenience of our British customers, arrangements have been made for retail distribution of the *STUDIES* and *SPECIAL PAPERS* through the Economists' Bookshop, Portugal Street, London, W.C. 2, and Blackwells, Broad Street, Oxford. These booksellers will usually have our publications in stock.

The following is a complete list of the publications of the International Finance Section. The issues of the four series that are still available from the Section are marked by asterisks. Those marked by daggers are out of stock at the International Finance Section but may be obtained in xerographic reproductions (that is, looking like the originals) from University Microfilm, Inc., 300 N. Zeeb Road, Ann Arbor, Michigan 48106. (Most of the issues are priced at \$6.00.)

ESSAYS IN INTERNATIONAL FINANCE

- †No. 1. Friedrich A. Lutz, *International Monetary Mechanisms: The Keynes and White Proposals*. (July 1943)
- † 2. Frank D. Graham, *Fundamentals of International Monetary Policy*. (Autumn 1943)
- † 3. Richard A. Lester, *International Aspects of Wartime Monetary Experience*. (Aug. 1944)
- † 4. Ragnar Nurkse, *Conditions of International Monetary Equilibrium*. (Spring 1945)
- † 5. Howard S. Ellis, *Bilateralism and the Future of International Trade*. (Summer 1945)
- † 6. Arthur I. Bloomfield, *The British Balance-of-Payments Problem*. (Autumn 1945)
- † 7. Frank A. Southard, Jr., *Some European Currency and Exchange Experiences: 1943-1946*. (Summer 1946)
- † 8. Miroslav A. Kriz, *Postwar International Lending*. (Spring 1947)
- † 9. Friedrich A. Lutz, *The Marshall Plan and European Economic Policy*. (Spring 1948)
- † 10. Frank D. Graham, *The Cause and Cure of "Dollar Shortage."* (Jan. 1949)
- † 11. Horst Mendershausen, *Dollar Shortage and Oil Surplus in 1949-1950*. (Nov. 1950)
- † 12. Sir Arthur Salter, *Foreign Investment*. (Feb. 1951)
- † 13. Sir Roy Harrod, *The Pound Sterling*. (Feb. 1952)
- † 14. S. Herbert Frankel, *Some Conceptual Aspects of International Economic Development of Underdeveloped Territories*. (May 1952)
- † 15. Miroslav A. Kriz, *The Price of Gold*. (July 1952)
- † 16. William Diebold, Jr., *The End of the I.T.O.* (Oct. 1952)
- † 17. Sir Douglas Copland, *Problems of the Sterling Area: With Special Reference to Australia*. (Sept. 1953)
- † 18. Raymond F. Mikesell, *The Emerging Pattern of International Payments*. (April 1954)
- † 19. D. Gale Johnson, *Agricultural Price Policy and International Trade*. (June 1954)
- † 20. Ida Greaves, *"The Colonial Sterling Balances."* (Sept. 1954)
- † 21. Raymond Vernon, *America's Foreign Trade Policy and the GATT*. (Oct. 1954)
- † 22. Roger Auboin, *The Bank for International Settlements, 1930-1955*. (May 1955)
- † 23. Wytze Gorter, *United States Merchant Marine Policies: Some International Implications*. (June 1955)
- † 24. Thomas C. Schelling, *International Cost-Sharing Arrangements*. (Sept. 1955)
- † 25. James E. Meade, *The Belgium-Luxembourg Economic Union, 1921-1939*. (March 1956)
- † 26. Samuel I. Katz, *Two Approaches to the Exchange-Rate Problem: The United Kingdom and Canada*. (Aug. 1956)
- † 27. A. R. Conan, *The Changing Pattern of International Investment in Selected Sterling Countries*. (Dec. 1956)
- † 28. Fred H. Klopstock, *The International Status of the Dollar*. (May 1957)
- † 29. Raymond Vernon, *Trade Policy in Crisis*. (March 1958)
- † 30. Sir Roy Harrod, *The Pound Sterling, 1951-1958*. (Aug. 1958)
- † 31. Randall Hinshaw, *Toward European Convertibility*. (Nov. 1958)
- † 32. Francis H. Schott, *The Evolution of Latin American Exchange-Rate Policies since World War II*. (Jan. 1959)
- † 33. Alec Cairncross, *The International Bank for Reconstruction and Development*. (March 1959)
- † 34. Miroslav A. Kriz, *Gold in World Monetary Affairs Today*. (June 1959)

- † 35. Sir Donald MacDougall, *The Dollar Problem: A Reappraisal*. (Nov. 1960)
- † 36. Brian Tew, *The International Monetary Fund: Its Present Role and Future Prospect*. (March 1961)
- † 37. Samuel I. Katz, *Sterling Speculation and European Convertibility: 1955-1958*. (Oct. 1961)
- † 38. Boris C. Swerling, *Current Issues in International Commodity Policy*. (June 1962)
- † 39. Pieter Liefstinck, *Recent Trends in International Monetary Policies*. (Sept. 1962)
- † 40. Jerome L. Stein, *The Nature and Efficiency of the Foreign Exchange Market*. (Oct. 1962)
- † 41. Friedrich A. Lutz, *The Problem of International Liquidity and the Multiple-Currency Standard*. (March 1963)
- † 42. Sir Dennis Robertson, *A Memorandum Submitted to the Canadian Royal Commission on Banking and Finance*. (May 1963)
- † 43. Marius W. Holtrop, *Monetary Policy in an Open Economy: Its Objectives, Instruments, Limitations, and Dilemmas*. (Sept. 1963)
- † 44. Harry G. Johnson, *Alternative Guiding Principles for the Use of Monetary Policy*. (Nov. 1963)
- † 45. Jacob Viner, *Problems of Monetary Control*. (May 1964)
- † 46. Charles P. Kindleberger, *Balance-of-Payments Deficits and the International Market for Liquidity*. (May 1965)
- † 47. Jacques Rueff and Fred Hirsch, *The Role and the Rule of Gold: An Argument*. (June 1965)
- † 48. Sidney Weintraub, *The Foreign-Exchange Gap of the Developing Countries*. (Sept. 1965)
- † 49. Tibor Scitovsky, *Requirements of an International Reserve System*. (Nov. 1965)
- † 50. John H. Williamson, *The Crawling Peg*. (Dec. 1965)
- † 51. Pieter Liefstinck, *External Debt and Debt-Bearing Capacity of Developing Countries*. (March 1966)
- † 52. Raymond F. Mikesell, *Public Foreign Capital for Private Enterprise in Developing Countries*. (April 1966)
- † 53. Milton Gilbert, *Problems of the International Monetary System*. (April 1966)
- † 54. Robert V. Roosa and Fred Hirsch, *Reserves, Reserve Currencies, and Vehicle Currencies: An Argument*. (May 1966)
- † 55. Robert Triffin, *The Balance of Payments and the Foreign Investment Position of the United States*. (Sept. 1966)
- † 56. John Parke Young, *United States Gold Policy: The Case for Change*. (Oct. 1966)
- * 57. Gunther Ruff, *A Dollar-Reserve System as a Transitional Solution*. (Jan. 1967)
- * 58. J. Marcus Fleming, *Toward Assessing the Need for International Reserves*. (Feb. 1967)
- † 59. N. T. Wang, *New Proposals for the International Finance of Development*. (April 1967)
- † 60. Miroslav A. Kriz, *Gold: Barbarous Relic or Useful Instrument?* (June 1967)
- * 61. Charles P. Kindleberger, *The Politics of International Money and World Language*. (Aug. 1967)
- * 62. Delbert A. Snider, *Optimum Adjustment Processes and Currency Areas*. (Oct. 1967)
- † 63. Eugene A. Birnbaum, *Changing the United States Commitment to Gold*. (Nov. 1967)
- † 64. Alexander K. Swoboda, *The Euro-Dollar Market: An Interpretation*. (Feb. 1968)
- * 65. Fred H. Klopstock, *The Euro-Dollar Market: Some Unresolved Issues*. (March 1968)

- * 66. Eugene A. Birnbaum, *Gold and the International Monetary System: An Orderly Reform*. (April 1968)
- * 67. J. Marcus Fleming, *Guidelines for Balance-of-Payments Adjustment under the Par-Value System*. (May 1968)
- * 68. George N. Halm, *International Financial Intermediation: Deficits Benign and Malignant*. (June 1968)
- † 69. Albert O. Hirschman and Richard M. Bird, *Foreign Aid—A Critique and a Proposal*. (July 1968)
- † 70. Milton Gilbert, *The Gold-Dollar System: Conditions of Equilibrium and the Price of Gold*. (Nov. 1968)
- * 71. Henry G. Aubrey, *Behind the Veil of International Money*. (Jan. 1969)
- * 72. Anthony Lanyi, *The Case for Floating Exchange Rates Reconsidered*. (Feb. 1969)
- * 73. George N. Halm, *Toward Limited Exchange-Rate Flexibility*. (March 1969)
- * 74. Ronald I. McKinnon, *Private and Official International Money: The Case for the Dollar*. (April 1969)
- * 75. Jack L. Davies, *Gold: A Forward Strategy*. (May 1969)
- * 76. Albert O. Hirschman, *How to Divest in Latin America, and Why*. (Nov. 1969)
- * 77. Benjamin J. Cohen, *The Reform of Sterling*. (Dec. 1969)
- * 78. Thomas D. Willett, Samuel I. Katz, and William H. Branson, *Exchange-Rate Systems, Interest Rates, and Capital Flows*. (Jan. 1970)
- † 79. Helmut W. Mayer, *Some Theoretical Problems Relating to the Euro-Dollar Market*. (Feb. 1970)
- * 80. Stephen Marris, *The Bürgenstock Communiqué: A Critical Examination of the Case for Limited Flexibility of Exchange Rates*. (May 1970)
- * 81. A. F. Wynne Plumptre, *Exchange-Rate Policy: Experience with Canada's Floating Rate*. (June 1970)
- * 82. Norman S. Fieleke, *The Welfare Effects of Controls over Capital Exports from the United States*. (Jan. 1971)
- * 83. George N. Halm, *The International Monetary Fund and Flexibility of Exchange Rates*. (March 1971)
- * 84. Ronald I. McKinnon, *Monetary Theory and Controlled Flexibility in the Foreign Exchanges*. (April 1971)

PRINCETON STUDIES IN INTERNATIONAL FINANCE

- †No. 1. Friedrich A. and Vera C. Lutz, *Monetary and Foreign Exchange Policy in Italy*. (Jan. 1950)
- † 2. Eugene R. Schlesinger, *Multiple Exchange Rates and Economic Development*. (May 1952)
- † 3. Arthur I. Bloomfield, *Speculative and Flight Movements of Capital in Postwar International Finance*. (Feb. 1954)
- † 4. Merlyn N. Trued and Raymond F. Mikesell, *Postwar Bilateral Payments Agreements*. (April 1955)
- † 5. Derek Curtis Bok, *The First Three Years of the Schuman Plan*. (Dec. 1955)
- † 6. James E. Meade, *Negotiations for Benelux: An Annotated Chronicle, 1943-1956*. (March 1957)
- † 7. H. H. Liesner, *The Import Dependence of Britain and Western Germany: A Comparative Study*. (Dec. 1957)
- † 8. Raymond F. Mikesell and Jack N. Behrman, *Financing Free World Trade with the Sino-Soviet Bloc*. (Sept. 1958)
- † 9. Marina von Neumann Whitman, *The United States Investment Guaranty Program and Private Foreign Investment*. (Dec. 1959)
- † 10. Peter B. Kenen, *Reserve-Asset Preferences of Central Banks and Stability of the Gold-Exchange Standard*. (June 1963)
- † 11. Arthur I. Bloomfield, *Short-Term Capital Movements under the Pre-1914 Gold Standard*. (July 1963)

- * 12. Robert Triffin, *The Evolution of the International Monetary System: Historical Reappraisal and Future Perspectives*. (June 1964)
- * 13. Robert Z. Aliber, *The Management of the Dollar in International Finance*. (June 1964)
- * 14. Weir M. Brown, *The External Liquidity of an Advanced Country*. (Oct. 1964)
- † 15. E. Ray Canterbery, *Foreign Exchange, Capital Flows, and Monetary Policy*. (June 1965)
- * 16. Ronald I. McKinnon and Wallace E. Oates, *The Implications of International Economic Integration for Monetary, Fiscal, and Exchange-Rate Policy*. (March 1966)
- * 17. Egon Sohmen, *The Theory of Forward Exchange*. (Aug. 1966)
- * 18. Benjamin J. Cohen, *Adjustment Costs and the Distribution of New Reserves*. (Oct. 1966)
- * 19. Marina von Neumann Whitman, *International and Interregional Payments Adjustment: A Synthetic View*. (Feb. 1967)
- * 20. Fred R. Glahe, *An Empirical Study of the Foreign-Exchange Market: Test of A Theory*. (June 1967)
- * 21. Arthur I. Bloomfield, *Patterns of Fluctuation in International Investment Before 1914*. (Dec. 1968)
- * 22. Samuel I. Katz, *External Surpluses, Capital Flows, and Credit Policy in the European Economic Community*. (Feb. 1969)
- * 23. Hans Aufrecht, *The Fund Agreement: Living Law and Emerging Practice*. (June 1969)
- * 24. Peter H. Lindert, *Key Currencies and Gold, 1900-1913*. (Aug. 1969)
- * 25. Ralph C. Bryant and Patric H. Hendershott, *Financial Capital Flows in the Balance of Payments of the United States: An Exploratory Empirical Study*. (June 1970)
- * 26. Klaus Friedrich, *A Quantitative Framework for the Euro-Dollar System*. (Oct. 1970)
- * 27. M. June Flanders, *The Demand for International Reserves*. (April 1971)

SPECIAL PAPERS IN INTERNATIONAL ECONOMICS

- *No. 1. Gottfried Haberler, *A Survey of International Trade Theory*. (Sept. 1955; Revised edition, July 1961)
- † 2. Oskar Morgenstern, *The Validity of International Gold Movement Statistics*. (Nov. 1955)
- * 3. Fritz Machlup, *Plans for Reform of the International Monetary System*. (Aug. 1962; Revised edition, March 1964)
- † 4. Egon Sohmen, *International Monetary Problems and the Foreign Exchanges*. (April 1963)
- † 5. Walther Lederer, *The Balance on Foreign Transactions: Problems of Definition and Measurement*. (Sept. 1963)
- * 6. George N. Halm, *The "Band" Proposal: The Limits of Permissible Exchange Rate Variations*. (Jan. 1965)
- * 7. W. M. Corden, *Recent Developments in the Theory of International Trade*. (March 1965)
- * 8. Jagdish Bhagwati, *The Theory and Practice of Commercial Policy: Departures from Unified Exchange Rates*. (Jan. 1968)
- * 9. Marina von Neumann Whitman, *Policies for Internal and External Balance*. (Dec. 1970)

REPRINTS IN INTERNATIONAL FINANCE

- †No. 1. Fritz Machlup, *The Cloakroom Rule of International Reserves: Reserve Creation and Resources Transfer*. [Reprinted from *Quarterly Journal of Economics*, Vol. LXXIX (Aug. 1965)]

- † 2. Fritz Machlup, *Real Adjustment, Compensatory Corrections, and Foreign Financing of Imbalances in International Payments*. [Reprinted from Robert E. Baldwin et al., *Trade, Growth, and the Balance of Payments* (Chicago: Rand McNally and Amsterdam: North-Holland Publishing Co., 1965)]
- † 3. Fritz Machlup, *International Monetary Systems and the Free Market Economy*. [Reprinted from *International Payments Problems: A Symposium* (Washington, D.C.: American Enterprise Institute, 1966)]
- * 4. Fritz Machlup, *World Monetary Debate—Bases for Agreement*. [Reprinted from *The Banker*, Vol. 116 (Sept. 1966)]
- † 5. Fritz Machlup, *The Need for Monetary Reserves*. [Reprinted from *Banca Nazionale del Lavoro Quarterly Review*, Vol. 77 (Sept. 1966)]
- * 6. Benjamin J. Cohen, *Voluntary Foreign Investment Curbs: A Plan that Really Works*. [Reprinted from *Challenge: The Magazine of Economic Affairs* (March/April 1967)]
- * 7. Fritz Machlup, *Credit Facilities or Reserve Allotments?* [Reprinted from *Banca Nazionale del Lavoro Quarterly Review*, No. 81 (June 1967)]
- * 8. Fritz Machlup, *From Dormant Liabilities to Dormant Assets*. [Reprinted from *The Banker*, Vol. 117 (Sept. 1967)]
- * 9. Benjamin J. Cohen, *Reparations in the Postwar Period: A Survey*. [Reprinted from *Banca Nazionale del Lavoro Quarterly Review*, No. 82 (Sept. 1967)]
- * 10. Fritz Machlup, *The Price of Gold*. [Reprinted from *The Banker*, Vol. 118 (Sept. 1968)]
- * 11. Fritz Machlup, *The Transfer Gap of the United States*. [Reprinted from *Banca Nazionale del Lavoro Quarterly Review*, No. 86 (Sept. 1968)]
- * 12. Fritz Machlup, *Speculations on Gold Speculation*. [Reprinted from *American Economic Review, Papers and Proceedings*, Vol. LVI (May 1969)]
- * 13. Benjamin J. Cohen, *Sterling and the City*. [Reprinted from *The Banker*, Vol. 120 (Feb. 1970)]
- * 14. Fritz Machlup, *On Terms, Concepts, Theories and Strategies in the Discussion of Greater Flexibility of Exchange Rates*. [Reprinted from *Banca Nazionale del Lavoro Quarterly Review*, No. 92 (March 1970)]
- * 15. Benjamin J. Cohen, *The Benefits and Costs of Sterling*. [Reprinted from *Euro-money*, Vol. I, Nos. 4 and 11 (Sept. 1969 and April 1970)]
- * 16. Fritz Machlup, *Euro-Dollar Creation: A Mystery Story*. [Reprinted from *Banca Nazionale del Lavoro Quarterly Review*, No. 94 (Sept. 1970).]

SEPARATE PUBLICATIONS

- † (1) Klaus Knorr and Gardner Patterson (editors), *A Critique of the Randall Commission Report*. (1954)
- † (2) Gardner Patterson and Edgar S. Furniss Jr. (editors), *NATO: A Critical Appraisal*. (1957)
- * (3) Fritz Machlup and Burton G. Malkiel (editors), *International Monetary Arrangements: The Problem of Choice*. Report on the Deliberations of an International Study Group of 32 Economists. (Aug. 1964) [\$1.00]

AVAILABLE FROM OTHER SOURCES

William Fellner, Fritz Machlup, Robert Triffin, and Eleven Others, *Maintaining and Restoring Balance in International Payments* (1966). [This volume may be ordered from Princeton University Press, Princeton, New Jersey 08540, at a price of \$6.50.]

Fritz Machlup, *Remaking the International Monetary System: The Rio Agreement and Beyond* (1968). [This volume may be ordered from the Johns Hopkins Press, Baltimore, Maryland 21218, at \$6.95 in cloth cover and \$2.45 in paperback.]

C. Fred Bergsten, George N. Halm, Fritz Machlup, Robert V. Roosa, and Others, *Approaches to Greater Flexibility of Exchange Rates: The Bûrgerstock Papers* (1970). [This volume may be ordered from Princeton University Press, Princeton, New Jersey 08540, at a price of \$12.50.]







