

## My Early Work on International Monetary Problems

My first publications were in this field and I am still cultivating it, 55 years later. My first book was on the gold-exchange standard. This book had developed from a seminar paper, done in 1922, and from my doctoral dissertation, completed in 1923. It was published in 1924, with the imprint 1925. Perhaps a brief description of Europe at that time can show how the book fitted in its time.

The Europe of 1914 had 10 currencies, all with fixed gold parities and fixed exchange rates. The Europe of 1920 had 27 paper currencies, none with a gold parity, none with fixed exchange rates, and several of them in various stages of inflation or hyperinflation. In Austria-Hungary the circulation of banknotes had increased 14-fold during the four war-years; in the 3½ postwar years, from the first half of 1919 to the end of 1922, the paper circulation in the new Austria increased 670-fold. This currency inflation was halted in November 1922 and the price inflation stopped instantaneously. In Germany, the neighboring country, the wartime currency inflation had been only by a factor of 5, but the acceleration of the printing press in the postwar years (chiefly to finance government expenditures in support of the civilian resistance against the French occupation of the Ruhr region) set a record. Banknotes in circulation amounted to 2,014,000,000 mark in May 1914, to 67,485,000,000 mark in March 1921, to 13,092,000,000,000 mark in June 1923, to 28,229,000,000,000 mark in September 1923, and to 496,500,000,000,000,000 mark in December 1923.

These were the happenings in the years of my university studies (1920-1923). Monetary "experts" everywhere were raising questions about the best techniques of stabilization and, possibly, of a return to the gold standard. Austria and the Netherlands had been the only two countries of Europe that before the war had operated gold-exchange standards — fixed gold parities, but no gold coins in circulation and much of the monetary reserves held in

pound sterling. What system would most countries of Europe adopt? Would it be the gold-coin, gold-bullion, or gold-exchange standard? Very little was known about the gold standard without gold coins, and when Professor Mises proposed to me to investigate it, historically as well as theoretically, I went to work.<sup>1</sup>

### The Gold-Exchange Standard (1923, 1925)

The German title of my dissertation and book was *Die Goldkernwährung*,<sup>2</sup> in literal translation the "gold-core standard", a term comprising both gold-bullion standard and gold-exchange standard. A gold-bullion standard, first proposed by Ricardo, had been operated only in England from 1819 to 1821. (England adopted it again in 1925.) The gold-exchange standard had existed in the Dutch-Indies, in India, in the Philippines, in Panama, and in several South-American countries. I reported on all these experiences as well as on the major gold-exchange system in Europe, Austria-Hungary.<sup>3</sup>

Rereading now my theoretical analysis of my student days I regret that it has never been translated into English; but when I tried, for reproduction in this article, to translate some particularly "foresightful" statements, I saw that my German style of 1923 is almost untranslatable. I had written the dissertation with a view to its acceptance by Professor Othmar Spann, who was officially the chairman of my dissertation committee (because Professor Mises, my teacher and adviser, was only *professor extraordinarius*). Spann had a very idiosyncratic style, with many words of his own coinage. Since my views on economic and monetary matters were totally different from his, indeed, antagonistic to his, I thought I should make up for my dissidence by adopting as many of his terms and expressions as I could. This strategy worked — he accepted my

<sup>1</sup> Where and when did I work? A few readers may be interested in the more personal aspects of my life. Since I was engaged in business and could not work in my office on matters not related to the business, I did my reading and writing at home between 6 and 8 o'clock in the morning and between 8 and 12 o'clock in the evening. I had trained myself to do with little sleep and my physical constitution rebelled only occasionally against this stern regime. (The rebellions took the form of stomach ulcers, which attacked me repeatedly from age 20 to the present — age 77.)

<sup>2</sup> *Die Goldkernwährung* (Halberstadt: H. Meyer, 1925).

<sup>3</sup> *Ibid.* Part 2, pp. 44-95.

dissertation — but it had the unfortunate result that some of my best sentences are less than plain in German and untranslatable into any other language, except by very free rendition. I shall have to paraphrase, instead of offering literal translations, if I want to be understood.

I began my monetary analysis with the Ricardian dictum "that the only use of a standard is to regulate the quantity, and by the quantity the value of the currency".<sup>4</sup> I warned, however, that gold had long since been removed from its previous role as regulator of the quantity of money; domestic credit creation had become responsible for an increasing portion of the nation's money supply (banknotes and deposits). I distinguished the changes in money supply that were accounted for by the "conversion principle" — the interconvertibility between gold (or foreign exchange) and domestic money — from the changes effected through extension and contraction of domestic credit. With this distinction I hoped to illuminate the continuity of economic thought, to show in particular how the monetary discussion of the 19th century, the debate between currency school and banking school, had, apart from confusions, led to insights of enduring value. The currency principle explained monetary expansion through inflows of foreign exchange or gold, while the banking principle explained the extension of domestic credit.

This model of the two origins of new money has been useful to me for over 55 years, as it could have been useful to all monetary analysts. It divides the assets acquired by the central bank or any monetary authorities into foreign and domestic; in the process of acquiring either or both, domestic money is created, but only the foreign assets count as monetary reserves. An acquisition of domestic assets — through the increase in money supply generated by that acquisition and through the associated increase in the demand for goods and services (and the consequent deficit in the payments balance) — is apt to lead to a loss of foreign reserve assets, which brings down the domestic money supply and thereby restores the foreign balance (p. 121).

I also noted that the acquisition of foreign bills of exchange and of balances in foreign banks constituted foreign lending

<sup>4</sup> DAVID RICARDO, *Proposals for an Economical and Secure Currency* (London: John Murray, 1816), p. 14. In *The Works and Correspondence of David Ricardo* (ed. by Piero Sraffa), Vol. IV (Cambridge: University Press, 1951), p. 59.

("Krediterteilung an das Ausland", p. 141), a theme taken up 40 years later in my Wicksell Lecture of 1965. It was clear to me, back in 1923, that the foreign assets in the possession of the monetary authorities had their chief use as "interventions fund" (*Interventionsfond*) to keep the domestic currency from depreciating in the foreign-exchange markets (p. 144).

Throughout my book I had a running battle with what was generally called the balance-of-payments theory of currency depreciation. This was an utterly naive theory which tried to explain the rising prices of foreign currencies by the deficit in the balance of payments, but failed to see that the deficit was determined by an excess supply of domestic money relative to monetary developments abroad. A chapter on "Gold-Exchange Standard and Balance of Payments" was devoted entirely to an attempt to straighten out the fallacies — fallacies that have been repeated whenever payments deficits occurred virtually anywhere (pp. 118-139). A (rough) translation from this chapter may be of interest:

"Under a gold standard [incl. gold-exchange standard] any excess stock of money leads to a deficit in the balance of payments, which in turn leads to an outflow of gold [reserves] and to a concomitant contraction of the money stock, restoring the balance. Under an [inconvertible] paper currency the payments deficit [consequent upon a monetary expansion] leads, not to an outflow of gold [reserves], but instead to a decline in the exchange rate of the currency. With the new ratio between domestic and foreign moneys there is no longer an excess stock of [domestic] money nor a relatively high price level, and the deficit in the balance of payments disappears. [But all this presupposes that domestic credit creation does not recreate the excess money stock and rising prices.]" (p. 121).

I repeated this qualification, made in the last sentence in brackets, any number of times, partly because one writer, Otto Heyn, had been busily advocating a policy of offsetting the effects of reserve losses on the domestic money supply, but chiefly because this seemed to be the policy actually pursued by several central banks. I tried to make it clear that these policies of offsetting the contractionary effects of official sales of foreign exchange by expansions of domestic credit were sabotaging the adjustment mechanism. The automatic contraction of the money supply in the course of financing the payments deficit was the very essence of the

adjustment process, and to offset this contraction was to prevent the adjustment and to make the deficit chronic (p. 117). In the same vein I wrote this passage [condensed from three pages in the book]:

"The self-regulation, or automatic restoration of balance, can be seriously hampered if money incomes of the economic agents in the country... are allowed to increase... The payments deficit is an adjustment to an excess supply of money, or to an excessive increase in prices and incomes relative to prices and incomes abroad... This adjustment, the deficit in the balance of payments, operates either through movements of the exchange rates or, under fixed exchange rates, through movements of gold [reserves] and changes in domestic money stocks" (pp. 137-139).

Among the adherents of the naive balance-of-payments theory of currency depreciation was Professor Spann, the official supervisor of my dissertation. I quoted him as saying that there is no limit to the fall of an exchange rate if the balance of payments is in deficit: "If, as in any country on the paper standard, no gold is available, the rates of foreign currencies can go on increasing incessantly".<sup>5</sup> Against this benightedness I had to quote authorities on the purchasing-power-parity theory, not just in the form in which it was expounded by Gustav Cassel, but also in its earlier versions advanced by Ricardo (1812, 1816), George J. Goschen (1861), Ludwig Bamberger (1876) and others. I reminded my readers that "the domestic price of an import good determines the upper limit to which the importer can go in bidding in the foreign-exchange market" (p. 136). On the other hand, I had to be careful lest my readers forget the role of capital movements and speculation — as so many experts do in our days, 55 years later. I therefore reminded them of the fact that flows of capital funds may, especially in day-to-day balances, play a greater role in international transactions than flows of goods and services (p. 137) and that "basically, every concrete exchange rate is a speculative rate, a rate that takes account of future developments" (p. 129).

This point — that purchasing-power comparisons are necessarily based on *present* conditions or rather, from a statistical point of view, on *past* records of prices, whereas present expectations

<sup>5</sup> OTHMAR SPANN, *Die Haupttheorien der Volkswirtschaftslehre* (Leipzig: Quelle & Meyer, 5th ed., 1920), p. 24.

necessarily concern *future* developments — is so important that one cannot place too much emphasis on it. Hence, I shall attempt another translation from my book:

“Considerations regarding future developments are the reason for why the increase in the prices of foreign currencies may run ahead of that of domestic prices of commodities [i.e., the external depreciation of the currency may be ahead of the internal depreciation, or reduction of its purchasing power]. The often-heard objection that the general price level, since it rises more slowly than the foreign-exchange rates, can therefore not be accepted as the cause of the rise in rates (and that it must be the other way around, namely, that the price level adjusts itself, with a lag, to the exchange rates) is utterly naive. Just as every economic action is based on the capacity to appraise future utilities... and future productivities, so will the formation of prices in the foreign-exchange market anticipate future developments” (p. 135-136).

I believe I can now, 55 years later, formulate this more felicitously, but I cannot help noting that the essentials of my present theory were all laid down in my first effort. I scoffed then, as I do now, at the officials who “blamed” the speculators for their disequilibrating sales and purchases of foreign exchange (p. 129). And I subscribe now to what I wrote then: “A speculative demand for foreign exchange — often called an ‘illegitimate’ demand — is nothing but the reflection of an expectation of a future ‘legitimate’ demand the satisfaction of which is deemed to be uncertain” (p. 145).

There were monetary experts, in the 1920s as later in the 1960s and 1970s, who promised that abolition of gold convertibility would give greater autonomy to monetary authorities in the pursuit of credit policies for domestic objectives. I called this a “serious error” as long as countries desired stable exchange rates:

“Exchange rates vis-à-vis currencies on a gold standard can be kept stable only if the authorities are resigned not to make use of the freedom which they supposedly obtained through the abolition of gold convertibility of the currency. Only an approximately even pace of money creation can make it possible to maintain stable exchange rates” (p. 146).

And likewise:

“A country has the choice either to pursue an independent credit policy and forget about fixed foreign-exchange rates or to maintain fixed exchange rates and forget about independence in its monetary policy... The rate of money creation is tied, with the chains of exchange-rate maintenance, to the pace of money creation in the other countries” (p. 160).

Since these formulations may sound like pronouncements of an ultra-monetarist who looks only at the quantity of money and disregards the demand for cash balances, I want to reassure the reader that qualifications regarding changes in the demand for money and in the velocity of circulation were not omitted. But I should admit that these qualifications were far from adequate. While such onesided emphasis on money supply and insufficient attention to the demand for money holding cannot be justified, it can at least be explained. First of all, the quantitative significance of the two changes was vastly different during these years, with money stocks in nominal terms increasing by a factor of several hundred, almost a thousand, and in Germany much larger. Secondly, the decline in the demand for money holdings was due to expectations which were induced by the extraordinary pace of money creation.

A few additional issues, raised in my 1923-1925 book, merit mention in this review. I found it helpful to contrast the internationalism implied in a system of fixed-exchange rates and unrestricted interconvertibility with the nationalism implied in a system of freely-flexible rates and a money supply generated only by domestic credit creation. In the former system an increase in domestic product is shared with other countries, as they can acquire additional goods in exchange for their money; if no new money is created anywhere but money is only transferred from one country to another, any increase in production is distributed among all countries and the world money stock is redistributed. On the other hand, without interconvertibility of national currencies and without foreign or international moneys held as monetary reserves, each country can keep an increase in its production for itself; and, of course, no country possesses any monetary reserves to use for making good a shortfall of its production by incurring a payments deficit. The contrast between nationalism and inter-

nationalism becomes even more conspicuous if countries combine the two principles of money creation, the conversion principle and domestic credit expansion. A country pursuing a nationalistic policy can accelerate its domestic money creation whenever its production increases so that it prevents a trade surplus from occurring, and thus it need not share the increase in its output with its trading partners; moreover, when it engages in credit expansion relatively much faster than the expansion abroad, it can produce a deficit in its payments balance and thus capture some of the production of the rest of the world. I characterized this policy as nationalistic because it can succeed in encroaching on other countries' production and in not letting other countries share in its own production. Of course, such a policy results in losses of monetary reserves or in increases in short-term indebtedness, which in the long run is not compatible with the maintenance of fixed exchange rates (p. 166-167).

A terminological proposal of mine failed to take roots, but the idea did: the idea of a "standard currency". I referred to the replacement, in the practical foreign-exchange policies of several countries, of the gold parity by the par of exchange vis-à-vis the standard currency: I considered the possibility — "by no means utopian" or improbable — of "all countries of a gold-standard community giving up their gold convertibility and taking advantage of the possibility of holding reserves of earning foreign assets in a generalized gold-exchange system" (p. 147). And I considered a development of swap-arrangements that would allow an almost unlimited increase in monetary reserves. I did not recommend such arrangements — which I compared with the notorious malpractice of kiteflying (firms issuing drafts on each other) — but I foresaw this possible development with serious misgivings (p. 148).

The notion of a country with a currency that became the standard for setting exchange values of other currencies led me irresistibly to coining another novel term: the "dollar-exchange standard" [*Dollarkernwährung*] (pp. 83, 140, 172-177). Besides the dollar-exchange standard, I had also occasion to speak of a "sterling-exchange standard" and "mark-exchange standard" (pp. 83, 140, and elsewhere).

I had serious misgivings regarding the possible development of a dollar-exchange standard where no currency except the dollar is

convertible into gold bullion and all metallic gold reserves are held in the United States:

"It is conceivable that all countries of Europe adopt such a dollar-exchange standard and thus, theoretically speaking, would be on a gold-exchange standard without minting a single gold coin [or holding a single gold bar]. In effect, however, one cannot reasonably regard such a dollar-exchange standard as the equivalent of a [genuine] gold-exchange standard. For in such circumstances one can no longer assert that gold functions as a regulator of the value of money. Instead, the monetary policy of the United States has taken over the role as regulator of the real value of gold. When there is only a single large country on a real gold standard — as at present [1923-25] — the real value of gold depends on the rate of credit creation much more than credit creation depends on [the quantity of] gold" (p. 173).

#### The New Currencies of Europe (1927)

It was this theme that became a *Leitmotif* in my second book, *Die neuen Währungen in Europa* [The New Currency Systems in Europe].<sup>6</sup> I wrote it, on the invitation of the editors of a monographic series, in 1926. The book appeared early in 1927. The first part was theoretical, the second part described the postwar and postinflation stabilization of the currencies of 16 countries, beginning with Latvia in 1922 and ending with Belgium in 1926. (France was still struggling with inflation and succeeded only in 1927 in stabilizing the franc; also several other countries, including Italy, were still working on their monetary problems when I prepared my survey.) Only four of the 16 countries provided that the monetary reserves for banknotes were to be held in gold; and only one, the Netherlands, prescribed (for a few years) gold reserves also for the deposit liabilities of the central bank. The other twelve countries allowed parts or all of their monetary reserves to be in the form of foreign exchange. Thus they had adopted the gold-exchange standard.

One may be tempted to stress the contrast with the pre-1914 conditions in the matter of gold coins: now [1926] only one of the

<sup>6</sup> *Die neuen Währungen in Europa* [Finanz- und Volkswirtschaftliche Zeitfragen] (Stuttgart: Ferdinand Enke, 1927).

16 countries, Sweden, provided for the redemption of banknotes in gold coins; and only one, Great Britain, for the redemption in gold bullion. In none of the 16 countries did gold coins come back into circulation. Thus the gold-coin standard had not survived the first world war, but I doubt that one could reasonably regard it as a "war victim". Gold circulation had not been of real significance even before 1914. The new gold-exchange standard, during the first years of operation in the 1920s, used chiefly the U.S. dollar as reserve asset; and for a few years, between 1927 and 1931, the pound sterling became the major reserve asset of the Netherlands. All in all, the situation which I had anticipated in my first book had materialized. The dollar-exchange standard had arrived. And with the United States as the only country buying and selling gold at a fixed dollar price, the value of gold in terms of commodities was now dependent on the credit policy of the Federal Reserve System.

Most of the theoretical pronouncements of Part I were improved reformulations of those made in the earlier book; improved chiefly because I was no longer constrained by the attempt to write in a language designed to please one of my referees. Attempts to translate the German text would still be difficult and unsatisfactory, for there are seldom perfect equivalents of expressions available in another language, and where acceptable equivalents exist, felicitous alliterations, assonances, and allusions are usually lost and the rhythm is almost always different. Thus, I shall abstain from offering English translations of my statements about the efforts at "stabilization" — of the internal purchasing power of money, of its value in terms of the U.S. dollar, and of its value in terms of gold (p. 6); on the demand for a return to the gold standard — not just an "invisible" but a "visible" gold standard (p. 7); on the notions of money as gold and of gold as money — the orthodox but irretrievably lost idea of the gold standard (p. 7); on the four methods of money creation — conversion of foreign assets into domestic money, extension of domestic credit, direct financing (monetizing) fiscal deficits, and monetization of newly produced gold (pp. 11-13); on fiscal policy and credit policy as sometimes competing, but often complementary factors in monetary expansion — when the question of meeting the needs of government finance and the needs of private finance is debated (pp. 12-13); on alternative plans for stabilizing the internal purchasing power of money [the general price index] by periodic adjustments of the

price of gold, of foreign-exchange rates, or rates of interest — although the effects of the adjustments on commodity prices are not even approximately known (pp. 14-16).

I want to select a few of the problems, examined in my 1927 book, for closer inspection in this survey. I raised the question to what extent gold can fulfill the function of determining the quantity of money or, at least, of restraining its increase. The case of the strict "full-bodied" gold standard was, of course, merely an imagined "ideal type"; the real question was how to control the issue of money that was neither gold coin nor gold certificate. One method of control was the imposition of legal limits, either absolute beyond a gold reserve or relative, a multiple of a gold reserve. If the gold reserve consisted of real gold, not just of claims on foreign currency convertible into gold, and if the authorities in charge of creating domestic money conscientiously obeyed the reserve requirements, there would be some ground for believing that the gold cover, or the rules for a "gold backing" however arbitrary, could really serve the purpose of preventing excessive money creation (p. 17). In actual fact, these rules of thumb limit the issue of banknotes and bank deposits only as long as the authorities are willing to be restrained. If they are willing, any other rule of thumb, not at all related to gold or gold reserves, can work just as well; if they are not willing, if they believe that they have a strong reason for creating more money, the barrier will be lifted, and any rule, golden or not, will be suspended or abolished. And if the so-called backing consists only of gold-exchange, of claims on countries with gold-convertible currencies, the reserves are no longer scarce, indeed, with credit policies internationally coordinated and with easily arranged swap arrangements, reserves have become augmentable *ad libitum* (p. 20).

The second method of control was the conversion principle, the principle of satisfying any demand for foreign exchange by a standing offer to convert any amount of domestic money into gold or gold-convertible foreign currencies at fixed rates and without restrictions. Since any excessive creation of domestic money would lead to a demand for foreign exchange, and since the sale of the demanded gold or foreign exchange would syphon out, or mop up, the excess money, this operated as an automatic control of the stock of domestic money. If, however, "cooperation or cartelization of the central banks" (p. 18) succeeds in obtaining parallel

monetary expansion and parallel upward movements of prices, outflows of gold, losses of reserves, and consequent contractions of money supplies will be avoided. "Under a cartel system of central banks things work differently. If all countries try to keep interest rates low, no international gold movements will dictate recourse to tighter discount policies" (p. 19). Although these formulations anticipate not only the substance but also the form of statements heard in the late 1970s, I must admit that the words "locomotive theory" and "convoy theory" did not occur to me in 1927.

The policy recommendations which I derived, as an unqualified anti-inflationist, from my theoretical arguments, were patently opposite to the dominant thinking of the time. Since the gold-exchange standard increased the gross reserves of the participating countries and allowed practically unlimited expansions of monetary reserves, I urged that the reserves be kept exclusively in gold metal. If these gold stocks were held abroad they ought to be earmarked as the stocks of the owner, not to be comingled with the stocks of the country in which they are held (p. 22). The practice of most countries to hold their reserves chiefly in the form of claims on the United States must stop if the gold standard is to survive (p. 23). The monetary system of the United States was a "manipulated" [managed] currency (p. 24) and the international monetary system was the dollar-exchange standard (p. 25), a "situation that cannot last" (p. 25).

One brief phrase from the historical part of the book should be quoted, because it shows that what was almost self-evident to me, as to almost all of my contemporaries, is so little understood today, 52 years later. I mentioned that the internal depreciation (price inflation) of the Austrian currency, which had, "as it is the rule in advanced phases of an inflation, been running ahead" of the increase in the quantity of money, came to a halt in September 1922, two months before the currency inflation was stopped (p. 40). Every informed student of economics at that time knew without any doubt that, when inflation accelerates, exchange rates increase faster than domestic commodity prices, and prices increase faster than the monetary expansion, even though that expansion was the necessary condition in the whole process.

### The Transfer Problem (1928 and 1930)

Germany had succeeded in 1924 in establishing a new cur-

rency, the new Reichsmark, worth 1,000,000,000,000 inflated old mark — a trillion, in the American way of counting. The new currency was stable both in domestic purchasing power and in terms of the U.S. dollar. After the Dawes Plan of 1924 had stipulated the size of reparations to be paid to the victorious nations, the transfer problem became a hotly debated issue. The question was how Germany could convert the tax revenues collected in German Reichsmark into gold or foreign currencies to pay the reparations. Hjalmar Schacht, the same man who had been in charge of stopping the money-printing presses and had maintained fixed exchange rates — at times by means of a "ruthless" stop of all bank lending — now warned against borrowing from abroad, because repayment of foreign debts in addition to payment of reparations could not be managed. The country could not succeed in turning around its trade balance and achieving an export surplus sufficient to yield the foreign exchange required.<sup>7</sup>

Schacht was right in pointing to the excessive borrowing by the German governments (national, state and local) and public agencies through bond issues abroad and loans from American banks; he was right also in warning of future difficulties in servicing and repaying these debts, particularly since they had been incurred for financing unproductive public projects which yielded no returns. Schacht was wrong, however, in much of his economic theorizing about the adjustment mechanism. Since his views were shared and strongly supported by many official and academic experts, I wrote an article to explain the adjustment process and, in particular, the relation between the budgetary problem of raising the funds through domestic tax collection and the transfer problem of achieving export surpluses adequate to obtain the foreign exchange needed for the payments. My article was published in the late summer of 1928 in the journal of the Austrian Bankers' Association.<sup>8</sup>

<sup>7</sup> HJALMAR SCHACHT, *Eigene oder geborgte Währung* (Leipzig: Quelle, 1927).

<sup>8</sup> "Währung und Auslandsverschuldung: Bemerken zur Diskussion zwischen Schacht und seinen Kritikern", [Currency and Foreign Indebtedness: Comments on the Discussion between Schacht and his Critics], *Mitteilungen des Verbandes Österreichischer Banken und Bankiers*, vol. 10 (No 7/8, 1928), pp. 194-208. A rather free translation, under the title "Foreign Debts, Reparations, and the Transfer Problem", was published in my book *International Payments, Debts, and Gold* (New York: Scribners, 1964; London: Allen & Unwin, 1966; enlarged edition, New York: New York University Press, 1976), pp. 396-416.

Schacht was not ignorant of the adjustment mechanism under the gold standard, or gold-exchange standard; he knew that contraction of the domestic money supply could produce an export surplus with stable exchange rates, but he feared that the contraction might be intolerable. Today I would concede this point, but in 1928 I did not. Having lived through the postwar inflations and having observed that with strong political will one can stop inflation (and even engineer absolute contractions), and that the pains from such measures are (or, at least, were in the historical cases) small compared with the injuries suffered through hyperinflation, I was a fanatic anti-inflationist, almost insensitive to the costs of deflation. (After all, these costs would be relatively small if wage rates and prices were sufficiently flexible.) My harsh criticism of Schacht's fear of deflation was due to my inexperience with deflation and downward rigidity of wage rates.

I now admit this bias, but I do not repudiate the analysis contained in my 1928 essay. I still believe it to be useful, especially the exposition of the adjustment process under fixed exchange rates; I would still recommend it to students, though preferably in the English version, in which I toned down the most insensitive (and probably abrasive) statements about the consequences of monetary contraction. I presented three sequence-models of the adjustment process: for capital imports, debt repayments, and reparations payments. I showed first the sequences for "one-shot" transactions and then the differences for the case of serial movements, that is, for continuing flows of capital or reparations (anticipating some features of period analysis in multiplier theory, published 16 years later).

The single-shot sequence for capital imports begins with the receipt of foreign funds and the purchase of these funds by the central bank; it continues with the associated expansion of the domestic money stock and consequent increases in incomes and prices, with a resulting stimulation of imports; it ends with the use of the accumulated foreign-exchange reserves for paying for the imports, the associated reduction in the money stock and the return of incomes and prices to the previous levels.

The single-shot sequence for debts repayments by private debtors begins with the accumulation of cash balances by the debtors in preparation for the payment and with the consequent reduction in the active circulation of domestic money; it continues with

corresponding reductions of incomes and prices, leading to a decline in imports and an encouragement of exports; the receipt of foreign currency paid for the export surplus and its sale to the central bank raise domestic circulation and restore incomes and prices to previous levels; finally the foreign exchange acquired by the central bank is now available for converting the domestic balances accumulated for paying the foreign creditors.

The single-shot sequence for reparations payments is much the same as the sequence for debt payments except that the domestic balances are accumulated, not by private debtors, but by the tax payers, the tax collectors (the internal-revenue service) and the agent in charge of collecting domestic balances for later conversion into foreign exchange.

The model sequences for serial flows of funds do not end with restoring domestic money stocks, incomes, and prices to the previous levels. For, before this phase in the sequence is reached, the next installment repeats the early steps of the preceding installment, so that money stocks, incomes, and prices remain at the higher or lower level to which inflow or outflow of funds has moved them. In all cases, it is essential that the authorities abstain from offsetting policies. Regarding the process for outpayments I quote from the English version: If

"a soft-hearted central-bank policy undertakes to replace by domestic credit expansion the purchasing power withheld, then the effective circulation and the cash balances of would-be buyers are not reduced and there will be no pressure upon incomes and prices, no tightening of the money market, no increase in exports, no reduction in imports — and no transfer" (p. 411).

Again, with regard to reparations, "the transfer problem is solved once the budgetary problem — the problem of raising the domestic funds without resort to credit creation — is solved" (p. 412). The qualifications which I added to this apodictic statement were, I must admit, not adequate, because I had argued on the basis of strong assumptions regarding flexibility of wage rates and ability to pay taxes (pp. 415-416, German original, pp. 207-208).

On one important point history has proved me right. I contended that trade balances were quite flexible and could turn around under the pressure of capital flows and appropriate monetary adjustments. This is what I wrote:



"This is completely missed and misunderstood by all those economists who consider themselves certified balance-of-payments accountants but naively believe that one can project a balance of payments into the future or infer from the present state what the future state of the balance of payments will be. They all stare, as if hypnotized, at the large import surplus of today [1928], without which, they believe, the German economy cannot live. And then they raise the rhetorical question how, with such a deficit in the balance of payments, the nation can be expected to pay debts or reparations. Needless to say, if one takes the import surplus that has actually resulted from the receipt of foreign loans as given and unalterable, one can come to no other conclusion but that the repayment of the loans or the payment of reparations will be impossible. Only a handful of economists have seen the logical snare. The fallacy of the autonomy or independence of the balance of trade constitutes the fundamental defect in the naive balance-of-payments theory" (p. 408).

These lines were written in 1928, half a year before Keynes argued the contrary, referring to the trade balance as "a sticky mass with strong internal resistances". Germany's trade balance in 1927 showed a deficit of RM 2,847 million; in 1928 the deficit had declined to RM 1,230 million; in 1929 it had vanished and given place to a small surplus of RM 36 million; in 1930 the surplus increased to RM 1,642 million, and in 1931 to RM 2,872 million. These figures show what can be done in a very short time (though it was surely painful); they also show the risk of relying on the "latest" statistical data, as Keynes had based his argument on the trade statistic for 1927 with the large deficit — which no longer existed in 1929. Also he argued that Germany could not possibly do with smaller imports; in fact, import fell by almost 23 per cent from 1929 to 1930; and by another 35 per cent from 1930 to 1931.

In 1930 I published another article, "Transfer and Price Effects", in reply to Gottfried Haberler's article with the same title and referring also to the debate between Keynes and Bertil Ohlin in the pages of the *Economic Journal*.<sup>9</sup> I discussed first the limiting

<sup>9</sup> JOHN MAYNARD KEYNES, "The German Transfer Problem", *Economic Journal*, Vol. 39 (March 1929), p. 6.

<sup>10</sup> Keynes, cited in the preceding footnote; BERTIL OHLIN, "The Reparations Problem", *Economic Journal*, Vol. 39 (June 1929), pp. 172-178; GOTTFRIED HABERLER, "Transfer und Preisbewegung", *Zeitschrift für Nationalökonomie*, Vol. 1 (January 1930), pp. 547-554; FRITZ MACHLUP, "Transfer und Preisbewegung", *Zeitschrift für Nationalökonomie*, Vol. 1 (January 1930), pp. 555-560.

cases, where price and income elasticities of demand were zero and made a transfer impossible no matter how much price relations were changing; and, on the other hand, where income elasticities alone could achieve a transfer without any price changing at all. I proceeded to examine the arguments which led Keynes to his conclusion that the transfer problem might be insoluble (or practically insoluble) even where the budgetary problem has been solved. I concluded that Keynes had exaggerated the difficulties; and I pleaded for a clarification of the meaning of "transfer difficulties". Just what was meant? An adverse change in the terms of trade? An increase in real transfer obligations because of lower prices? Budget troubles (tax rates, tax revenues)? Wage disputes and strikes? Unemployment because of wage rigidity despite reduced effective demand? Losses of gold and exchange reserves and severe shortages of foreign exchange, endangering the maintenance of fixed exchange rates? Reduction in the standards of living? (My appeal was not heeded. I myself tried this clarification 33 years later, in an essay written in 1963 and published as Chapter XIX in the volume on *International Payments, Debts, and Gold*.)

In a postscript to the 1964 English translation of my 1930 article I admitted "to some embarrassment about the excessive orthodoxy in my analysis" of 1928 and 1930. I added:

"A few of my transgressions along these lines have been omitted or mitigated in my translation for the present volume, but I have allowed enough of them to stand in order to avoid false pretensions regarding my performance of earlier years. By too much retouching, stressing the correct predictions or anticipations, and glossing over the wrong ones, a "reproduction" of old writings may give an exaggerated impression of the writer's wisdom or prescience. There is more justification for reproducing old articles in order to show the development of ideas over time than there is to establish priorities or prove precocity" (p. 424).

The excessive orthodoxy related, as I have said before, to the inadequate recognition of the evils of deflation in times of "pressure-resistant wage rates" (p. 424).

### Flight of Capital (1932)

During the 1920s and early 1930s the problem of capital movements inspired by fear had become increasingly serious. The

fears that motivated the flight of capital from an unsafe to a safer country were chiefly of imposition of stricter controls of transfers and conversions, of confiscation of property, and of political suppression. The dangers of communism or national socialism in Germany made capital flight from Germany a timely subject of discussion. In a lecture at Frankfurt in the Spring of 1932, I presented my "Theory of Flight of Capital".<sup>11</sup>

I began with distinctions of the sources of the funds used for remittance abroad and of the techniques employed in converting them into assets held abroad. The theoretical analysis consisted chiefly in combining different sources with different techniques. The sources were (1) existing liquid balances, (2) new saving, (3) amortization of fixed capital and liquidation of working capital, (4) sales of property, (5) collection of claims, and (6) new borrowing. The techniques of conversion were (A) taking domestic money abroad and selling it there; (B) buying foreign money on the domestic foreign-exchange market or from the central bank; (C) exporting commodities or services and leaving a part of the proceeds abroad; and (D) acquiring foreign assets or balances from other residents of the home country (pp. 514-516). I described also some other techniques employed to circumvent various foreign-exchange restrictions, but found that they could be fitted under one of the four headings. I showed that Technique D involved no net exportation of capital but merely a transfer of ownership of capital previously exported (p. 520). One case could not easily be fitted into the scheme: when the exporter of capital exchanges his domestic money against the foreign money offered by an importer of capital. It seems that the two parties merely trade places as holders of domestic and foreign assets, but the question is whether the capital import was induced by the terms of the exchange or whether it was autonomous in the sense that it would have taken place also in absence of the capital export. In the latter case the supply of capital in the home country is reduced, as it is in most of the other cases discussed (pp. 520-521).

I examined various consequences of capital flight: the resulting interest differentials (Germany 7 per cent, Switzerland 2 per cent), the liquidity position of the banks (when induced imports of

<sup>11</sup> "Die Theorie der Kapitalflucht", *Weltwirtschaftliches Archiv*. Vol. 36 (October 1932), pp. 512-529.

short-term foreign capital "replace" the potential long-term capital that flees abroad), the liquidity crisis of the banking system, or threat of insolvency, when the foreign funds are suddenly withdrawn, the probability of a transfer problem arising from capital flight, etc. I found that there were "natural" limits to the possible flight of capital — except if the central bank permits an expansion of domestic credit and thereby finances the capital exports (p. 527). In this case the central bank provides or replenishes the domestic funds that seek conversion into foreign currencies and furnished also these currencies, with the result that no net capital export takes place (since the loss of monetary reserves constitutes an official capital import) and, of course, no real transfer of resources takes place:

"Whereas otherwise [in cases without domestic credit creation] the flight of capital produces its own offsetting item in the balance of payments (in the form of additional exports) [or reduced imports], in the case of a counter-deflationary credit policy the central bank has to furnish the offsetting item (in the form of a loss in its foreign-exchange reserves)" (p. 428).

This article has never been translated into English. I did not want it included in any of the collections of my essays, chiefly because of its implied policy recommendation for central banks never to come to the aid of commercial banks confronted with sudden withdrawals of foreign loans. Such a tough position may have been justified in the case of Austrian banks which, for all I knew, had been insolvent, not merely illiquid, and were saved by the monetary authorities by means of new central-bank credits coupled with foreign-exchange controls prohibiting repayments of foreign loans. As a general principle, however, my 1932 position appears unduly dogmatic and insensitive to the painful consequences of bank failures on many sectors of the economy.

#### Official Memoranda and Articles in Newspapers (1931-1934)

Early in 1932 I was invited to submit a memorandum to the Economic Committee of the League of Nations on the monetary and financial crisis. I wrote it in German; it was distributed in French (perhaps also in English, though I have seen only the French

version) in June 1932.<sup>12</sup> The German original was published in 1933 in *Schmollers Jahrbuch*.<sup>13</sup>

The memorandum dealt with the relation between economic and financial crises; short-term credit and total indebtedness; balance of payments and the international monetary system; flight of capital and controls and restrictions in foreign-exchange markets; the trade balances of debtor countries; import restrictions of debtor and creditor countries; redistribution of the world reserves of gold; Britain's abrogation of the gold standard and the future of the gold-exchange standard; price deflation as an explanation of the crisis; restoration of confidence. It hardly needs telling that the memorandum reflected the positions which I had taken in my earlier publications, though I may have formulated with a little more restraint.

I wrote another brief memorandum for the League upon invitation of the division or section concerned with Austrian financial management and the internationally guaranteed loan to Austria. After the collapse of the Austrian Creditanstalt in 1931, Austria had introduced strict foreign-exchange controls, and the imposition of a general transfer moratorium was proposed. A new economic advisor to the Austrian government, Mr. Maurice Frère (later Governor of the Bank of Belgium) was about to assume his duties in Vienna. The officials in Geneva believed that a position paper on the Austrian system of exchange controls would be helpful at that juncture. This brief paper was distributed in French.<sup>14</sup> Mr. Frère remembered many years later how much he appreciated this introduction to his new functions. The paper argued that the credit expansion in connection with the support of the Creditanstalt had made the official foreign-exchange rates untenable. To maintain the fictitious rates by means of payments restrictions and costly controls of all international transactions was injurious to many sectors of the economy. Many export industries had already been given exemptions in the form of permission of "private clearing arrangements" under which exporters sold their foreign proceeds

<sup>12</sup> "La Crise Monétaire et Financière", Société des Nations, Hors Serie 51, Genève, 2 June 1932.

<sup>13</sup> "Die Währungs- und Kreditkrise", *Schmollers Jahrbuch für Gesetzgebung, Verwaltung und Volkswirtschaft im Deutschen Reich*, Vol. 57 (No. 3, 1933), pp. 49-64.

<sup>14</sup> "Réglementation des devises en Autriche", Société des Nations, F/Tres/8, Genève. The German original, "Das Österreichische System der Devisenordnung", 5 June 1932.

to Austrian importers at premiums up to 30 per cent of the official rates. With some 80 per cent of foreign trade already being transacted at free-market exchange rates, there was no danger that liberalization of the remaining part would lead to higher commodity prices, provided that further credit expansion was avoided. The proposed transfer moratorium was not needed and not desirable. At the right exchange rates there would be no shortage of foreign exchange; freeing of the markets might even reduce the discount of the Austrian currency relative to its official (fictitious) parity. I finally proposed that exporters be generally permitted to sell abroad for payment in Austrian currency; this practice would strengthen the Austrian schilling in foreign markets.

It was not enough to help national, foreign, and international officials obtain a better understanding of the economic situation; it was necessary to educate the public to comprehend that regulations, bureaucratic controls and restrictions were not the right way to cope with the crisis. The influence of the daily press on public opinion was recognized by a small group of economists, who agreed to supply the newspapers with a flow of easily understandable articles. Ludwig Mises, Gottfried Haberler, Oskar Morgenstern, and myself, plus a few others, met periodically in the home of Julius Meinl, large importer of coffee and other foodstuffs, to discuss what themes would be important to discuss in articles submitted to the editors of the daily papers. In the period between September 1931 and May 1934 I had 148 articles published in Austrian newspapers, most of them in the *Neues Wiener Tagblatt*, where I started a weekly column under the heading "Two Minutes Economics" [*Zwei Minuten Volkswirtschaft*]. The column as well as the majority of my articles were published without my by-line, though some articles were "by an industrialist", "by a financial expert", "by an economist", "by an exporter", and so forth, all of which was quite truthful.

While my friends who knew of this activity of mine understood its educational value and gave me every encouragement, at least one academic economist used my journalistic enterprise as one of his several arguments against my appointment as a lecturer [*Privatdozent*] at the university. Professor Hans Mayer evidently thought that the Academic Senate would agree with him in considering popular writing for newspapers as undignified, disreputable, or at least unbecoming a scholar at the University of

Vienna. (My candidacy was kept pending for two years; I withdrew it in 1935 when I was appointed full professor at the University of Buffalo in the United States.) I have thought this experience worth telling as an interesting side-light.

### The Theory of Foreign Exchange (1939-1940)

From October 1933 to January 1935 I had a fellowship of the Rockefeller Foundation, which I spent in the United States, chiefly at Columbia, Harvard, Chicago, and Stanford Universities, doing research on subjects other than international monetary economics. During the spring term of 1935 I taught at Harvard as visiting professor, substituting for Professor John Williams, who went on leave to the Federal Reserve Bank of New York. I resumed my Rockefeller Fellowship in the autumn of 1935 and spent the period October 1935 to January 1936 in England, chiefly at Cambridge, where Keynes had just completed his *General Theory*, and at the London School of Economics, where I enjoyed stimulating discussions with Robbins, Hayek, Lerner, and many others. In February 1936 I started teaching at the University of Buffalo. My publications during these and the next few years were in a variety of fields; it was not before 1938 that I returned to the field of international monetary economics. During the summer session at Northwestern University I began to write my essay on the "Theory of Foreign Exchange". It was published in two parts in 1939 and 1940 in *Economica*.<sup>15</sup>

I once described this essay as "essentially an analysis of market equilibrium, dissecting both supply and demand in the market for foreign currency, first with flexible, then with fixed, exchange rates" (p. 2). This statement, together with the stated objective "to

<sup>15</sup> "The Theory of Foreign Exchange", Part I, *Economica*, New Series, Vol. 6 (1939), pp. 375-397; Part II, *Economica*, New Series, Vol. 7 (1940), pp. 23-49. Reproduced in Howard S. Ellis and Lloyd A. Metzler, eds., *Readings in the Theory of International Trade* (Philadelphia: Blakiston, 1949; Homewood, Ill.: Irwin), Ch. 5, pp. 104-158; also in FRITZ MACHLUP, *International Payments, Debts, and Gold* (New York: Scribners, 1964; New York University Press, 1976), Ch. 1, pp. 7-50; also in FRITZ MACHLUP, *International Monetary Economics* (London: Allen and Unwin, 1966), Ch. 1, pp. 7-50. The essay was published also in Spanish, German, and Japanese translations. — All page references in this section will be to the reproduction in my volume of collected essays.

show how the simple curve analysis can be used to advantage in the theory of foreign exchanges" (p. 7), may seem to give support to those who interpret my essay as the prototype of the "elasticity approach" to foreign-exchange and balance-of-payments analysis. I submit that this interpretation is wrong. Movements *along* the curves are described in terms of price elasticities, but movements (shifts) *of* the curves are not. Such shifts of supply and demand curves depicting conditions in the foreign-exchange market may be caused by monetary changes. As I said on the first page of the article, "Another objective of the article is to incorporate into the theory of foreign exchanges relevant results of recent work in monetary economics" (p. 7). For example, an excess supply of domestic money, caused by a rise in the stock of money or a decline in the demand for it, would shift the demand curve for foreign exchange to the right, and perhaps also the supply curve to the left. Hence, the curve analysis which I proposed may also be used in an exposition of the monetary approach to exchange-rate and balance-of-payments analysis.

I submit that the elasticity approach is relevant as long as the assumption of unchanged incomes is pertinent, but loses some of its relevance when monetary changes lead to significant changes in incomes. It is a mistake, however, to regard the elasticity approach and monetary approach as rivals; each has its applications. Even if it seems that in our days of rapid changes of money stocks we may be better served by a monetary approach, a good pedagogue will not be so naive as to stop teaching the implications of "unrealistic" assumptions. He will continue to teach movements along curves even if he believes that the effects of shifts of curves are more important in the explanation of particular changes. He will perhaps find satisfaction in his students' fascination when they learn that an adjustment process following a given event, say, an inflow of foreign capital in a certain amount, may produce very similar changes in the balance of trade with freely flexible exchange rates and unchanged money stocks, on the one hand, and with fixed exchange rates and correspondingly increased money stocks, on the other. The didactic value of such teaching much exceeds that of trying to teach only what may happen when all assumptions conform with what one believes to be the "actual" conditions of the month or year in which we live.

I have offered these observations before discussing the essay

under review because I am seriously disturbed by the interpretations offered by some recent "surveyors" of the theories in question. But I may also remark how pleased I have been with a recent reconsideration of the validity and relevance of the elasticity approach in Chipman's chapter in Dreyer's volume.<sup>16</sup> This reconsideration is based on such erudition and mathematical sophistication that I find myself overwhelmed. I could not possibly, no matter how hard I tried, reproduce Chipman's arguments in support of my own arguments. But, hoping that the younger generation of economists is better equipped to do so, I may recommend to them to study what Chipman has to say on these issues.

Now to my essay. It proceeded methodically from assumptions where curves are given and unchanged to assumptions where they shift in more or less determinate directions, and finally to assumptions where one can hardly know anything about either the shapes or the shifts of the curves, and, hence, about the most likely outcomes of specified changes and possible repercussions and adjustments. I made it clear from the outset that I was not talking about the statistical balance of trade, which reflects only the past; an *ex ante* theory, linking exchange rates with trade, has to get the time dimensions right. In order to synchronize transactions in the exchange and commodities markets, I assumed that all contracts are for future delivery, that is, that all sales and purchases of foreign-exchange occur in the forward market and all contracts for exports and imports are immediately covered (pp. 9-10). This avoids working with awkward problems of leads and lags. Also I made it clear that one cannot get around the problem of adjustment periods in the commodities market except by assuming different shapes (elasticities) of the supply and demand curves for products in the short, medium-long, and long run. To work with only one set of curves — instead of different curves for different reaction periods — is a simplification for the sake of teaching purposes, but not permissible for explanations of the past or predictions of the future (pp. 10-11).

I first assumed that all offers and bids in the foreign-exchange

<sup>16</sup> JOHN S. CHIPMAN, "A Reconsideration of the 'Elasticity Approach' to Balance-of-Payments Adjustment Problems", in Jacob S. Dreyer, ed., *Breadth and Depth in Economics: Fritz Machlup - The Man and His Ideas* (Lexington, Mass.: Heath and Company, 1978), pp. 48-85.

market were exclusively those of commodity traders, the exporters offering foreign currency for sale, the importers bidding for foreign currency, and no one selling from and adding to his stocks of foreign or domestic money, no one making or receiving gifts to or from foreigners, no one making, taking, repaying, or collecting a foreign loan, no one selling or buying fixed assets or securities to or from residents of foreign countries, and no one, least of all the central bank, selling or buying gold. On these assumptions a surplus or deficit in the balance of trade is logically impossible and complete adjustment is achieved instantaneously, without the possibility of a time lag (p. 11). If incomes are given and unchanged, the elasticities of the supply and demand curves in the exchange market are indispensable variables in the analysis of the effects of changes in tastes, production costs, tariffs and other trade barriers, etc. The first task was to explain, following Haberler's earlier analysis, how these elasticities were derived from the elasticities in the markets for exports and imports, and these in turn from the elasticities in the markets for exportables and importables (pp. 12-19).

The next step was to introduce long-term capital movements and unilateral transfers. The other assumptions were maintained, especially the exclusion of changes in stocks of foreign and domestic money, and in short-term lending and borrowing. The effects of the newly admitted payments and receipts, either unrequited or for long-term securities, are unambiguous and instantaneous. By logical necessity, dictated by the assumptions, the new price of foreign currency and the new balance of trade is determined by the direction and size of the assumed noncommodity transactions and the elasticities of the "given" market curves. Despite all tautological reasoning and implicit theorizing, the simple exercise elucidates the very important but often neglected possibility

"that in consequence of [a] capital export, commodity imports may show an increase in terms of dollars but a decrease in terms of foreign currency. Statisticians, trying to 'verify' a fall in imports due to increased capital exports, should beware of the trap" (p. 22).

They rarely do, I am sorry to say.

The next step admits "invisible trade" or the sales and purchases of services to and from foreign residents. There are

different things to say regarding different services — say, freight and shipping, tourism, and income from foreign securities and direct investment — and I have often tried, unfortunately in vain, to persuade the statisticians to separate the data. Because of substitutabilities and complementarities between various goods and services the assumption of given elasticities of supply and demand in the foreign-exchange market has to be relaxed, but as long as changes in the money supply are excluded the curves will shift only modestly as a result of the other changes admitted to the model (pp. 25-27). At this juncture I made some observations about the limitations of the purchasing-power-parity theory, altogether in line with what I had said in my earlier publications (p. 27).

In the subsequent section I introduced movements of gold and foreign balances under the gold standard or any system with pegged exchange rates. With this step the applicability of the elasticity approach has come to an end, which should be obvious to any reader for, if the price of gold or foreign currency is maintained by official sales and purchases, the elasticities of supply and demand beyond the gold points or outside the narrow band of permitted flexibility are irrelevant. What matters instead are the changes in the money supply associated with the official interventions, and the corresponding shifts in the curves due to the increase or reduction of income and effective demand. Thus, the monetary approach becomes relevant. Of course, the changes in the stock of money operate through incomes and prices; and relative incomes and prices are therefore the factors that determine the international flows of goods and services. (This is why, many years later, I preferred to speak of relative prices rather than elasticities: relative prices remain significant when money stocks change, while elasticities of "given" supply and demand curves do not.) The question is whether changes in the stock of money should be taken as independent variables or as dependent variables determined by fixed behaviour rules of the monetary authorities. The gold standard or the system of fixed exchange rates prescribe rules of the game; if these rules are observed, and if no discretionary restrictions are imposed on trade and payments, the authorities, in purchasing all foreign currency offered and in selling all foreign currency demanded at the set exchange rates, create the domestic money they pay and destroy the domestic money they collect for the foreign exchange.

The resulting shifts in the supply and demand curves for foreign exchange cannot be read off any given diagram — unless one assumes unchanging ratios of central-bank money to the total money stock, unchanging relationships between changes in money stocks and changes in real incomes, and unchanging relationships between changes in real incomes and changes in the effective demand for imports. For the fun of playing monetary theory, it is legitimate to make all these assumptions; but for purposes of predicting actual developments, it would be unwise to do so. However, one can without such strong assumptions explain and predict with sufficient accuracy the course of events that constitute adjustment. All that is needed is to assume that the monetary authorities continue to abide by the rules and not violate them by offsetting the changes in money stock that are associated with the changes in gold or exchange reserves. As long as the supply and demand curves have not shifted enough to intersect at the level of the fixed exchange and within the band that surrounds it, there will be an excess supply which the authorities have to absorb or an excess demand which they have to satisfy. In the process they will create or destroy money and this will go on until the adjustment is complete. The flow of gold or foreign exchange corresponds to what in later years came to be called "financing the imbalance of payments"; but the associated changes in the money stock, if not offset by domestic credit policy, will eventually restore balance (p. 31). The process takes time, whereas it is instantaneous under freely flexible rates and unchanged money stock.

I proceeded to analyse the working of various institutional changes of the gold-standard system. An Exchange Stabilisation Fund may hold both foreign and domestic balances for its interventions in the market; alternatively, it may borrow (repay) domestic money from (to) the central bank; in another variant, it may borrow (repay) in the open money market. Depending on these circumstances, the effects may differ; indeed, even the borrowing in the money market may have different consequences depending on whether the loans come from nonbanks, from commercial banks with ample excess reserves, or from banks without much excess liquidity (pp. 34-35). A capital import from abroad may then, in a system of fixed exchange rates, lead to a stiffening of the money market, and not to an increase in the money stock, if the foreign currency received from the foreign lenders or investors is acquired

by the Exchange Stabilisation Fund with domestic balances borrowed from nonbanks or loaned-up commercial banks. The increase in domestic interest rates in this process may, however, lead to some activation of hitherto idle balances (p. 36). The parts of my essay exemplified by these considerations received very little attention in the literature, as far as I know. They surely cannot be characterized as an instance of the "elasticity approach".

The final section of the essay (pp. 39-50) dealt with "exchange speculation and interest rates". In this section I dropped the assumption of organized exchange stabilization, but warned that this was "not equivalent to returning to the assumption of [freely] flexible exchange rates or, still less, to the assumption of independent currencies" (p. 40). The point was that commercial banks and specialized foreign-exchange dealers, confident regarding the authorities' latent dedication to principles of monetary stability, would engage in voluntary, informal pegging activities, at least for a short time. I incorporated these attitudes of buying and selling into the graphical representation of the foreign-exchange market, but felt compelled to state reservations which I find worth repeating:

"The graph is... open to objections on methodological grounds. Firstly, the assumptions concerning expectations of future exchange-rate changes [or absence of changes] are of one type in the case of the exporters' and importers' supply and demand, and of a totally different type in the case of the dealers' supply and demand... Secondly, the exporters' and importers' supply and demand refer to a *flow* of foreign exchange..., whereas the dealers' supply and demand refer to a *stock* of foreign exchange... The combination of all these curves and parts of curves in one graph is, I believe, legitimate for a short period (e.g., for the *period* of one month if the other curves represent *rates* per month)" (p. 41).

The monetary consequences of private purchases and sales of foreign exchange for and from stocks of currencies held were shown to depend on such circumstances as "the flexibility of the banks' ratios between reserves and deposits, and on the flexibility of their 'borrowed reserves'; second, on whether foreign balances are counted among the reserves" (p. 42). These conditions differed from country to country and from time to time. In the United States, at the time of writing [1938] such private purchases and sales of

exchange were likely to have expansionary and contractionary effects except where nonbank dealers had to seek the required funds in the open market from nonbank sources (p. 43).

I then proceeded to a discussion of the reaction of interest rates in the money market to an increased supply of foreign exchange that is not absorbed by the central bank, and to an increased demand for foreign exchange that is not satisfied by the central bank:

"If no central-bank funds are engaged in exchange-stabilisation transactions, a flow of capital may lead to temporarily reduced interest rates in the country from which the capital is withdrawn, or to temporarily increased interest rates in the country to which the capital is sent. This sounds paradoxical but it is nevertheless true. If we imagine that British capitalists buy American securities, we invariably associate with this the idea that interest rates in the American markets are thereby reduced. According to our customary reasoning, the transaction involves an increased demand for American securities, hence increased security prices which are equivalent to reduced long-term interest rates. Yet this reasoning is valid (abstracting from changed expectations on the part of domestic investors) only if the increased supply of pound sterling in New York (or demand for dollars in London) leads to a purchase of the pound sterling or of gold by the American monetary authorities and to a creation of American excess reserves and liquid balances. It is different if the Exchange Stabilisation Fund, pursuing a policy of offsetting, has first to raise on the open market the dollars with which to buy the pound sterling before the British capitalist can buy American securities; or, similarly, if an American dealer or speculator has first to borrow dollars with which to take over the pound sterling, before the increased demand for securities can become effective. In these cases an increased demand for loanable funds precedes the increased demand for securities; the demand for securities is thus nothing but the (immediate) re-supply of the loanable funds raised by the buyers of foreign balances.

"A simplified picture of this situation can be gained by the following description: a British capitalist desires to hold long-term American securities and offers London bank balances. By offering the sterling balances at a low dollar price, he makes an American dealer desire to hold London bank balances and offer his own promissory notes in the market. By offering promissory notes at a reduced price, i.e., at a higher discount — it is assumed that the supply of bank credit is not perfectly elastic — the dealer entices an American investor to hold promissory notes instead of securities and instead of idle cash. So the American investor will

get the foreign-exchange dealer's promissory notes, the British capitalist will get the American securities formerly held by the American investor, and the foreign-exchange dealer will get the London balances from the British capitalist. Since the impulse to these transactions starts with the offer from the British capitalist and is continued by the offer from the foreign-exchange dealer, the dollar prices of pound sterling and of American promissory notes have to recede. The decline in the price of promissory notes is, of course, identical with an increase in the short-term rate of interest.

"In the absence of frictions, this increase in the demand for liquid funds, and the higher interest rate that goes with it, would entice the holders of long-term securities and cash balances to switch some of their securities and some of their liquid balances into holdings of short-term credit instruments. Frictions of a psychological and institutional nature, however, will often arrest any tendency towards security selling, and turn the whole impulse into dishoarding and bank-credit expansion. But inasmuch as the supply of bank loans is less than perfectly elastic the increase in short-term interest rates is sustained. Prices of long-term securities did not have to fall (or only a trifle or for only a short period) in the foregoing example, partly because of the induced dishoarding and credit creation; chiefly, however, because the possibly increased willingness to part with securities on the side of American investors, which was prompted by the attractive terms for short-term loans, was met by the increased demand for American securities by the British capitalists. If, however, the increased supply of sterling balances (or gold) had been due not to increased capital exports from Britain to the United States but to increased British commodity imports from the United States, or to any other payments from Britain to the United States, then American securities prices might have receded. The increased supply of sterling balances would have, as in the other case, led to an increased demand for American short-term funds by the buyers of the cheap sterling balances (foreign-exchange dealers, speculators, or the Exchange Stabilisation Fund) without these funds being used afterwards for the purchase of the securities offered by American investors. The funds would have gone to those who had to receive payments from the foreign remitters, for instance, to American commodity exporters.

"It is thus clear that a rise in interest rates may result from a so-called favourable balance of payments if the increased supply of foreign balances (or gold) is purchased out of funds other than newly created central-bank money. Conversely, a fall in interest rates may result from a so-called adverse balance of payments if the increased demand for foreign balances (or gold) is satisfied by sales which liquidate foreign assets of individuals, firms and

commercial banks instead of wiping out central-bank money" (pp. 46-47).

With this analysis I anticipated, as far as I understand it, much of what the portfolio-adjustment approach suggested — about 30 years later. I mention this chiefly in order to re-emphasize the fact that several of the approaches regarded as rivaling one another are actually complementary, and their applicability depends on the prevailing situation: the elasticity approach is appropriate when changes in monetary variables are insignificant; the monetary approach, when central banks substantially vary the money supply; the portfolio approach, when commercial banks and nonbank holders of monetary assets are actively engaged in financing foreign transactions.

In the last pages of the article I discussed the effects of speculation "based on definite expectations", on the one hand, and of more "erratic" speculation, on the other, both by foreign-exchange dealers and by commodity traders (p. 48). I concluded that

"short-run analysis becomes... impossible if rapid, erratic and unpredictable changes in expectations make almost everybody a speculator.<sup>17</sup> Theoretical analysis is then more or less confined to the long period, and it loses, of course, some of its significance: its immediate applicability to currently observable facts is gone" (p. 49).

This view I still hold, 41 years after I put it into words. But I would add today that my skepticism is even greater concerning short-run empirical-statistical analysis. Most of the attempts to use for econometric analysis of exchange rates and payments balances, daily, monthly, quarterly, or even annual series of statistical data from periods, with ongoing inflationary processes, erratic changes

<sup>17</sup> Perhaps I may now, in 1980, add a commentary to this statement about "erratic" changes in expectations. Economic analysis is least complicated if one can reasonably assume that all or most economic agents expect present prices (rates) to remain unchanged; it is still manageable if one can assume expectations that prices will continue to move in the same direction and at the same pace as they have over the previous period (or even more slowly), or that they will revert to some previous level; analysis becomes too messy and unmanageable if expectations differ so widely that the dispersion of expectations cannot be described and, moreover, if they change from day to day or hour to hour.



in expectations, and substantial speculative transactions, seem futile. We must not rely on "findings" from such analyses and venture predictions based on the estimated coefficients.

### **A Few Observations**

The comment with which I concluded the preceding section may easily be misinterpreted as an attack on empirical research. The fact that I pointed to the impossibility of short-run *theory* of "erratic and unpredictable changes in expectations" should save both the reader and me from an interpretation prejudicial only to *empirical* analysis. When transactors in the foreign-exchange market are buffeted by contradictory news and rumors several times during a day or week, no one can reasonably expect much regularity in the recorded observations. In the absence of regularities, neither theoretical nor empirical analysis can produce valuable insights.

My commentaries on "My Early Work on International Monetary Problems" have covered my writings between 1923 and 1940, a period of 17 years, falling into the interwar period. I intend to go on with my survey of my work in international monetary economics; indeed, much of it has been drafted for publication some time in the future. There will be sections on gold policies, the foreign-trade multiplier, dollar shortage, the effects of currency depreciation and devaluation, creation of liquidity, further thought on the transfer problem, the meetings of the Bellagio Group, Mrs. Machlup's wardrobe theory of reserve needs, — and several other deeds and misdeeds of my 55 years of involvement in the study of international monetary problems. It may even come to pass that 55 is not the ultimate figure.

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