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EXPLAINING CHANGES IN BALANCES OF PAYMENTS AND

FOREIGN-EXCHANGE RATES: A POLEMIC

WITHOUT GRAPHS, ALGEBRA, AND CITATIONS

Fritz Machlup

New York University

No. 79-27

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EXPLAINING CHANGES IN BALANCES OF PAYMENTS AND
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It has become fashionable for scholars of international trade and finance to compare and contrast different theories which purport to explain foreign-exchange rates and/or balances of payments. Some of these attempts have been helpful in that they uncovered implications of theories, old or new, that had remained obscure and undetected by earlier analysts. Other attempts, however, have been rather unhelpful in that they evaluated the comparative performance of certain theories in situations quite different from those for which they had been designed. In this polemical note I shall call attention to such inappropriate evaluations and to a few fallacies which have vitiated arguments presented in recent years.

The Naive Balance-of-Payments Theory

As one who has started publishing on these subjects in the early 1920s, I may be forgiven if I include in this

review a theory which had currency then although it was so naive that no well-trained economists nowadays would take it seriously. I refer to the balance-of-payments theory of exchange rates. This theory was supposed to explain the depreciation of certain currencies by an "unfavorable" balance of payments; this balance (or imbalance) was taken as given, as not in need of explanation. Thus, changes in incomes, expenditures, money stocks, and prices, relative or absolute, were not brought into the theory. The balance of payments or, in some instances, the balance of trade, was taken as the independent variable, and the depreciation of the currency in the foreign-exchange market as the dependent variable.

The rival theory, rejected by the adherents of the balance-of-payments theory, was the so-called inflation theory, the theory that held that both the deficits in the balance-of-payments and the increase in the prices of foreign currencies were determined by the currency inflation and price inflation that had been going on for several years.

The Purchasing-Power-Parity Theory

The most successful version of the inflation theory of changes in foreign-exchange rates was Gustav Cassel's

purchasing-power-parity theory. This was only a more detailed formulation of propositions advanced by many earlier economists, including David Ricardo (1812, 1816), Sir George J. Goschen (1861), and Ludwig Bamberger (1876). However, Cassel's theory was originally designed to deal with this particular problem: if several countries, after having pursued inflationary monetary policies over a number of years, succeed in halting the expansions of money stocks and of effective demand, and the rise of commodity prices, it should be possible to estimate the new "equilibrium exchange rates" on the basis of comparisons of the rates of price inflations over the period.

Beware of confusing annual rates of an ongoing inflation with rates of a past inflation over the entire period from the beginning to the end of the upward movement of the price levels. The annual rates of price increase were assumed to be zero at the outset and again zero at the end of the period. If the general price index in country A showed an increase of 100,000 percent, while the index in country B showed an increase of only 1,000 percent over the period of inflation, one can estimate the order of magnitude by which the exchange rate between the two currencies will have changed. Assume that the exchange rate before the inflation was 5 units of A-currency

for 1 unit of B-currency, and that this rate was an equilibrium rate in the sense that, with all relevant factors unchanged, it could have remained unchanged in the long run. One could then estimate that the new exchange rate, after the inflation has come to a stop, would be in the neighborhood of 500 units of A currency for 1 unit of B currency.

One should guard against attempts to generalize the purchasing-power-parity theory and, for example, apply it to situations in which a) the inflations had not come to a halt; b) significant changes had occurred in the structure of the economy; c) restrictions on trade (tariffs, quotas, etc.) were imposed or removed; d) large movements of capital funds were taking place; or e) anything else relevant to the situation had changed. Since no one in his right mind could assume that nothing had changed in the years between the beginning and the end of the inflation, the theory would hardly ever be applicable except as a very rough approximation.

The verdict about the purchasing-power-parity theory of foreign-exchange rates is therefore one of "guilty of misrepresentation." The theory cannot be applied in the long run, except for extraordinarily large differences in past inflation rates (so that none of the

other things can count heavily relative to the differences in the price indexes), because it is impossible that nothing but money stocks and price levels have changed over a period of several years. It cannot be applied in the short run either, because changes in exchange rates from day to day are hardly at all connected with observed changes in price indexes but, instead, chiefly with short-term capital movements due to (non-observable) changes in expectations which affect individual preferences regarding asset holdings. The survival of the purchasing-power-parity theory in present-day discussions among international monetary economists is a sorry reflection of their critical judgment.

Different Speeds of Money Creation, Price Increases, and Exchange-Rate Changes

One of the major infirmities of economists applying the purchasing-power-parity theory to the explanation of changes in foreign-exchange rates over short periods is their blindness to the significance of capital movements. In the discussions of the early 1920s virtually all my fellow students in Vienna had fully understood that the rates of expansion in the money supply, of the increase in the price indexes, and of the upward movement of prices of

foreign currencies were totally different in the short run. They understood the working of expectations and, in particular, the acceleration in the advances of commodity prices ~~over~~ the rate of monetary expansion, and, even more so, the acceleration of increases in the prices of foreign currencies over those of domestic commodity prices. These different rates of speed evidently worked through changes in the demand for domestic money balances. Expecting an increase in the supply of money, people tried to reduce their holdings of money; and expecting further increases in commodity prices, they tried to hold foreign money in lieu of domestic money.

The first of these induced changes in portfolio holdings was reflected in an outflow of speculative capital funds. Consequently, in some stages of monetary expansion, the external depreciation of the domestic money had to exceed its internal depreciation. This implied that a comparison of commodity-purchasing power could not explain changes in the foreign-exchange rates while money stocks and price levels were moving. These changes could be explained only by movements of speculative capital funds. It goes without saying that any theory that leaves out these capital movements is hopelessly incapable of explaining day-to-day or month-to-month movements in the foreign-exchange markets. That it is necessary in 1979 to explain these relationships, fully known to every good student in the early 1920s, signifies

a retrogression in economic theory.

Elasticity Approach and Monetary Approach

Rather bizarre misunderstandings in current discussions can be found in comparative evaluations of the so-called elasticity approach and the modern monetary approach. These two approaches are not substitutes, but complements. The elasticity approach, in its most customary form, asks for the effect of an external appreciation or depreciation of the currency upon the current-account balance if money supply and money incomes remain unchanged. The monetary approach asks what changes in the balance of payments or in foreign-exchange rates could be expected if the supply of or demand for domestic money were to change. Clearly, the two approaches must be combined if both the foreign-exchange rates and the excess supply of money were changing concurrently or successively. (One way to combine them is to conceive of supply and demand curves that take price as the dependent variable, expressed not in terms of money but with the domestic non-traded good, standing also for income, as a numéraire.)

If prices are expressed in money, it is hard to understand how the confusion could have arisen. Supply and demand curves that take quantities as functions of money prices or money prices as functions of quantities, make sense only if incomes are assumed to be given. These

curves may help explain how the excess demand for foreign currency will increase or decrease if its price, in domestic money, changes while incomes remain unchanged. If, however, increases in the supply of domestic money or decreases in the demand for money have shifted the supply and demand curves in commodity markets and in foreign-exchange markets, it is fallacious to theorize only about the elasticities of these curves. While monetary changes are taking place, there is no point in concentrating on given elasticities of supply or demand curves in terms of money prices. I conclude that it betrays a poor understanding of adjustment theory to compare the performance of the elasticity approach with that of the monetary approach in situations in which the monetary aggregates undergo significant changes.

Theory of Portfolio Adjustment

The modern monetary approach undoubtedly has afforded improved insights. This will be better appreciated if we repeat some essential points critical of the purchasing-power-parity theory. It should be clear that this theory employed comparative statics--comparing an initial equilibrium with an ultimate equilibrium--without regard to the transition. It did not explain why, as an

inflation gathers momentum, the domestic price level rises faster than the money stock and why the prices of foreign currencies rise faster than those of domestic commodities. These differences in the rates of change call for an explanation in terms of reductions in the demand for domestic money balances as a part of the total asset holdings of individuals and firms. Thus a theory of stock adjustment becomes essential.

The trouble with this theory is that many of its expositors have not been prepared to make sufficient distinctions among the types of assets held. If explanations of the leads and lags during the inflationary process, and of the changing composition of the balance of payments are wanted, a "unified" theory of portfolio adjustment is not helpful. A unified theory of portfolio adjustment has its intellectual appeals, but its explanatory power is limited. By treating purchases of foreign commodities, purchases of foreign securities, and purchases of foreign money balances indiscriminately as portfolio adjustments, we lose the ability to explain changes in three essentially different accounts of the balance of payments.

It is perfectly true that an increase in the money supply and/or a decline in the demand for money balances (to be held at given prices of commodities and securities)

would lead to a desire to reduce domestic money balances. Such reductions, however, can mean a variety of different actions: reduced offers to sell or increased bids to purchase; and increased bids to purchase can refer to commodities or securities; and the purchases may be from residents or from foreigners. To the extent that domestic commodities are being demanded, prices of domestic commodities may be pushed up. To the extent that foreign products are demanded, imports and import prices are being pushed up. To the extent that foreign securities are demanded, capital exports are being increased. A model of portfolio adjustment that does not make these and similar distinctions cannot succeed in explaining the consequences of the excess supply of domestic money stocks.

Neglect of Foreign Variables and the Absorption Approach

One of the most widespread fallacies is to explain changes in the balance of payments and/or in foreign-exchange rates by changes in domestic variables only, in complete disregard of changes in foreign variables. This fallacy was quite conspicuous in the early version of the absorption theory. This theory tried to explain the balance of trade as the difference between domestic

production and domestic absorption of output. If a country absorbed more than it produced, it evidently had to have a deficit in the trade balance. On the other hand, a surplus in the trade balance could occur only if the country produced more than it absorbed and thus was capable of exporting the difference. These are, of course, mere truisms and, in order to make a theory out of them, one had to identify the factors that determined domestic production and absorption.

In an early version, only domestic propensities were recruited as explanatory variables, and thus the resulting changes in over-absorption or underabsorption were derived from variables which disregarded anything that happened abroad. Yet, since one country's trade deficit must be identical with other countries' trade surpluses (and vice versa), it follows that one country's over-absorption can exist only to the extent that other countries have under-absorption. It stands to reason that forces operating in only one country cannot possibly explain transactions between this country and the rest of the world.

Stock Adjustment at Home and Abroad

The fallacy of the exclusive focus on domestic variables was not confined to the absorption theory. It

was equally in evidence in some versions of the stock-adjustment theory. For example, when deficits in the balance of payments and/or depreciations of the currency were explained as results of stock adjustments consequent upon an excess supply of domestic money balances, the failure to look at foreign stock adjustments would surely vitiate the argument.

If the money holders in one country decide that they have too much domestic money and would rather exchange some of their balances for foreign goods and foreign securities, their attempts to do so would surely come in conflict with the attempts of money holders in foreign countries who likewise find themselves with larger money balances than they would care to hold at given prices and exchange rates. It becomes obvious that stock adjustments tending to increase imports could not possibly lead to import surpluses everywhere at the same time. It follows that stock-adjustment theories cannot succeed in explaining changes in foreign balances and exchange rates as long as they focus exclusively on domestic variables and disregard those that operate in foreign countries. I am not charging any one of my fellow theorists with having committed this fallacy--most of them were safeguarding their arguments by means of the small-country assumption--but I do complain that they have not

always been sufficiently careful in their exposition and have thus misled some of their readers.

Offsprings of the Purchasing-Power-Parity Theory

Of this particular error, or grievous underemphasis, the adherents of the various versions of the purchasing-power-parity theory were free; the notion of parity saved them from it. I am coming back, once more, to this sad source of confusion, not to praise it for having avoided one type of error, but to show that it is responsible for at least three highly fashionable misconceptions: the theory of over- or undervaluation of a currency by the market, the theory of overshooting the equilibrium rate, and the theory of the discrepancy between nominal and real rates of currency depreciation (or appreciation). Each of these (closely interrelated) theories deserves a good scolding.

Overvaluation and Undervaluation

Under fixed exchange rates it makes sense to say that the official rate overvalues or undervalues a particular currency. The symptoms of an overvaluation are: 1) that the currency is in excess supply, being

offered to monetary authorities who, trying to maintain the fixed rate, pay more for it than it is worth to the marginal buyers and sellers (private parties in the market), and/or 2) that the authorities in the country that has issued the currency in excess supply restricts the purposes for which it is willing to buy it back with foreign money (that is, it suppresses by control measures some of the excess demand for foreign exchange on the part of holders of its overvalued currency). In this case, as also in the opposite case of an undervalued currency, the valuation by the market is accepted as the one in terms of which the official (fixed and pegged) rate is called disaligned and the currency is considered over- or undervalued.

With floating rates, without any peg, the judgment of the market can be compared only with opinions expressed by people who think they know better. These opinions, based on technical charts and curves, on price-index comparisons, and on similar superstitions developed from misunderstood and misapplied teaching, are now credited with superior validity, while the market is distrusted. The people who contend that the market is wrong, and that the currency in question is really worth more, or worth less, than what the market pays for it, do not, however, have sufficient confidence in their own opinion to back it

up with their own money or credit; if they did--if they actually entered the market as large-scale buyers or sellers--the market price would move towards the level which these sages and diviners hold to be just right. (I concede that I may not be prepared to defend all the implications which these sentences have for a general theory of government intervention and control.)

How is it possible that the opinions of nonparticipating, merely hypothetical speculators, or "currency appraisers," are taken seriously? The answer is that they are armed with the purchasing-power-parity theory, of which many persons, official or private, have heard years ago from their college teacher. Not that the forecasters are necessarily wrong; but there is no reason why they should be right in this world in which money supplies, commodity prices, and exchange rates are on the move all the time.

Overshooting

The theory of overshooting is a variant of the theory just discommended. It presupposes that experts could know the equilibrium exchange rate in a time when most variables are moving. In recent years we have observed wide swings in exchange rates between major

currencies. For example, the U.S. dollar went down for several months relative to the deutschmark and other currencies, and afterwards recovered, regained most of its loss; and such swings have recurred. With a bit of hindsight it is easy to say that both the downward and the upward movements had gone "too far." This is not the same thing as to say that the dollar rate overshot the level at which it could have been stabilized. Does it mean that the "right level," or the "equilibrium level," was crossed on the way down and again on the way up? Perhaps so, but who could at any point of time be able to know what the equilibrium exchange rate would be?

Surely no one who understands the purely hypothetical nature of equilibrium would pretend to know an actual equilibrium value. After all, equilibrium means a constellation of variables that could stay unchanged as long as no "disequilibrating change" occurs. In reality such changes occur all the time. When wages, prices, incomes, costs, investments, credits, interest rates, money stocks, liquidity preferences, expectations, capital movements, and many other relevant variables are in constant flux in financially developed countries, it would be sheer humbug to proclaim that, say, 42, 48, or 56 dollars was the equilibrium price for 100 German mark.

In the second section of this polemic it was pointed out that, in times of inflation, the rates of increase in money stocks, commodity prices, and exchange rates will rarely be equal in the short run. In early stages of the inflation, it is likely that monetary expansion leads the price increases, and that price increases lead exchange-rates changes; in later stages, the order of the procession is likely to be turned around: exchange rates lead commodity prices, and commodity prices lead the monetary variables. Does this mean that at the moment when foreign-exchange rates overtake commodity prices, or at the moment when prices overtake monetary aggregates, a position of equilibrium is being passed? Hardly. If some "believer" insists on calling these fleeting moments "equilibrium," he should not be so insensible as to think that the monetary authorities or any human power could stop all these moving figures dead in their tracks or make them march, from now on, in lock-step in closed formation.

Real Exchange-Rate Changes

This brings me to the theory of "real exchange-rate changes," or the theory holding that depreciations and appreciations of currencies in the foreign-exchange market have to be corrected for changes in commodity

prices if one wants to know what effects they can have on adjustments of the trade balance.

One infirmity of this theory is again its disregard of the difference between operational and theoretical concepts, especially its reliance on statistical figures that move at different speeds with changing leads and lags. Even more than in the previously discussed theories, the choice of irrelevant price indices can vitiate this theory, because it is supposed to "explain" the effect of exchange-rate changes on trade adjustment; there is little hope for success if the differences between changes in consumer prices, wholesale prices, export prices, and import prices are significant as they usually are in periods of inflation.

The worst defect, however, is conceptual, in that the theory fails to distinguish several very different kinds of price change: a) price changes that would have occurred also in the absence of the exchange-rate change; b) price changes that are due to changes in quantities of exports and imports supplied and demanded as a result of the exchange-rate change, but without any changes in monetary aggregates; c) price changes that are attributable to monetary changes induced by the exchange-rate change directly or by some of its effects on wages, prices, incomes, and employment. To be sure, there is no way to

separate actual price changes according to their causes by means of any known statistical operations, but this does not justify fudging them into a single strategic factor in a theory that is supposed to interpret our observations; still less does it justify generalizing such observations and foretelling future effects of depreciations and appreciations.

Lag of Trade Adjustment Behind Exchange-Rate Adjustment

Virtually all of the fallacies in theorizing have been compounded, to the disgrace of the offending analysts, when they developed a theory of a lag of trade adjustment behind exchange-rate adjustment and assumed that such a lag could be inductively determined by statistical and econometric techniques. Three difficulties are involved in such an attempt. 1) The statistics of foreign trade records shipments contracted for in the past, while the theory of trade adjustment is concerned with new contracts influenced by new exchange rates and to be carried out in the future. Statistical data mixing past, present, and future transactions are not very informative, at least not to indicate "adjustment." 2) Quantities supplied and demanded will change relatively little or relatively much

depending on the time allowed for adjustments to take place. The elasticities of supply and demand are usually much greater the longer the time allowed. The theorists, instead of working with an indefinite number of supply and demand curves with different time parameters, have accepted a set of four pairs of curves, instantaneous, short-run, medium-run, and long-run. This says nothing, however, about the length of time it takes to achieve balanced trade (or a trade balance that matches the balance of autonomous movements of capital). It says at best something about the adjustment of quantities traded to given changes in the exchange rate. 3) The theory of the adjustment lag seems to be purblind to the most important single variable in the picture: monetary policy. The lag of the adjustment of the trade balance behind an initially adequate adjustment of the exchange rate may vary between zero and infinity, depending on what happens to money, credit, and foreign reserves.

In order to hit the most important point, I assume that we are interested only in current transactions, omitting all statistical noise from past contracts. In other words, we shall not think of trade recorded at the moments when goods cross the frontier, but rather trade at the moment when contracts are made or payments are arranged for.

Assume first that neither the monetary authorities nor any bank or non-bank holders of foreign currency can or will part with any of their holdings and that no foreign funds can be secured through borrowing abroad or selling foreign or domestic assets for foreign currency. Under these assumptions there can clearly be no trade deficit. Importers of foreign goods and services have only one source of foreign exchange to pay for the imports: the foreign-currency proceeds from exports. Nobody but exporters has foreign exchange to sell and, hence, importers can import not one penny more than what exporters export. The exchange rate, in these circumstances, cannot help being at the point where trade is completely balanced. Trade adjustment and exchange-rate adjustment are simultaneous: the lag is zero.

To go to the other extreme, assume that a currency is devalued and the monetary authorities are determined to maintain the new exchange rate by selling any amount of foreign currency that is demanded and buying all that is supplied. If the monetary authorities engage in an expansionary domestic credit policy that avoids all reductions in "real" effective demand--keeping interest rates from rising, offsetting any contractionary effects of official sales of foreign exchange, financing through purchases of

government securities fiscal policies designed to maintain full employment at increasing wage rates--the lag of trade adjustment behind the exchange-rate adjustment will be infinite. Devaluation, if it is to be effective in reducing imports and increasing exports, does so chiefly by reducing, in terms of foreign money, the wages, prices, incomes, and money stocks of the devaluing country. If, however, an expansionary monetary policy raises all these magnitudes to the former levels, the devaluation cannot but be ineffective. Trade adjustment is prevented by the monetary policy pursued (as long as the country can afford continuing losses in monetary reserves or can raise funds abroad). The lag of trade adjustment behind devaluation will be infinite (or indefinite).

Between these extremes--immediate adjustment or no adjustment at all--adjustment of trade to exchange-rate changes will be fast or slow, depending on the extent of financing: internal financing through domestic credit expansion and external financing through accommodating flows of liquid capital. The extent of financing cannot be known a priori, nor can any past experience be projected into the future. Reliance on econometric studies of statistical data for anything but the history of the particular country in a particular period is utterly naive.

Measurements of the backbones of finance ministers and central-bank governors would be more informative.

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