DENNIS H. ROBERTSON AND THE MONETARY APPROACH TO EXCHANGE RATES

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Prominent among competing explanations of exchange rate determination in a regime of floating exchange rates is the so-called *monetary approach,* which holds that the exchange rate between two national currencies is determined by current and prospective relative supplies of and demands for those national money stocks. This theory has a long tradition going back more than 300 years. As an integral part of pre-Keynesian international monetary theory, it formed the central analytical core of classical and neoclassical explanations of exchange rate behavior. Although it was temporarily eclipsed by the rival elasticities and foreign trade multiplier or income-expenditure approaches that gained popularity with the domination of the Keynesian revolution, it has recently made a comeback and today is widely employed by academic and business economists to explain the behavior of exchange rates in the post-Bretton Woods era of generalized floating. For example, such well-known economists as Robert Barro, John Bilson, Jacob Frenkel, and Michael Mussa have successfully employed the monetary approach to account for recent exchange rate experience, as have analysts at Citibank, Chase Manhattan, and other financial institutions. Finally, it is worth noting that certain segments of the financial press, notably the editorial pages of the *Wall Street Journal,* regularly espouse the monetary approach.

Corresponding to the growing popularity of the monetary approach has been an accompanying interest in its historical antecedents. Accordingly, in the past few years Jacob Frenkel, Johan Myhrman, and Mordechai Kreinin and Lawrence Officer, respectively, have published papers dealing with the doctrinal development of that approach.[1] These papers, however, suffer from one serious omission. For while they cite several prominent economists writing in the 1920s—notably Cassel, Gregory, Hawtrey, and Keynes—as important early proponents of the monetary approach, they say nothing about the great British economist Dennis Robertson. The result is to

foster the erroneous impression that Robertson, generally recognized as one of the leading monetary theorists of the 20th century, had virtually nothing to say about the monetary approach when in fact he was one of its principal proponents. Not only did he endorse and utilize the established components of the monetary approach, he also presaged recent developments in the theory of exchange rate expectations. For these reasons his work merits consideration.

The purpose of this article is twofold. First, it identifies and explains the essentials of the monetary approach to exchange rates. Second, it documents Robertson's views on that approach. This is a fairly easy task, since the bulk of Robertson's work on floating exchange rates is contained in one volume, namely the 1929 edition of his famous Cambridge Economic Handbook *Money.*[2] In that book he divides his discussion of exchange rate determination into two sections, one dealing with conditions of monetary stability and the other dealing with episodes of violent and rapid inflation. His views on the monetary approach are to be found in these two sections. What particular elements identifying the monetary approach should one look for in his views?

Basic Ingredients of the Monetary Approach To demonstrate that Robertson was a proponent of the monetary approach, it is necessary to spell out the key ingredients or propositions that characterize that approach.[3] These elements include the following:

1. MONETARY VIEW OF LONG-RUN EXCHANGE RATE DETERMINATION. The monetary approach holds that the long-run equilibrium exchange rate between two national currencies is determined chiefly by relative national money supplies and demands operating through relative national price levels. This proposition implies a particular monetary transmission mechanism or channel of causation linking money to exchange

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[1] See Frenkel [2], Myhrman [12], and Kreinin and Officer [7, pp. 28-31].

rates. Accordingly, the monetary approach specifies such a mechanism and identifies quantity theory of money and purchasing power parity relationships as the key links in that mechanism. The *quantity theory* says that the general price level is determined by the demand-adjusted money stock, i.e., by the nominal quantity of money per unit of real money demand. In other words, the price level equates money supply and demand by deflating the real value of the nominal money stock to the level people desire to hold. By contrast, the purchasing power parity doctrine states that the long-run equilibrium exchange rate tends to equal the ratio of the price levels in the two countries concerned. This condition ensures that the real (exchange rate-adjusted) price of goods is everywhere the same so that there exists no arbitrage advantage to buying in one country over the other. It also ensures that both moneys have the same real (exchange rate-adjusted) purchasing power such that there exists no incentive to switch from one currency to the other. Taken together, the quantity theory and purchasing power parity components imply that relative money supplies and demands operating through relative national price levels determine the long-run equilibrium exchange rate. And according to the monetary approach, the stability of that equilibrium is ensured by the self-correcting characteristic of the purchasing power parity mechanism itself. Thus, should random deviations from purchasing power parity occur, they would be quickly eliminated. For by overvaluing one currency and undervaluing the other on the foreign exchanges, such deviations would shift demand from the former currency to the latter and in so doing bid the exchange rate back to purchasing power parity equilibrium.

2. ASSET MARKET VIEW OF SHORT-RUN EXCHANGE RATE BEHAVIOR.

The foregoing proposition refers to exchange rate determination in the long run when purchasing power parity holds. With respect to exchange rate determination in the short run when purchasing power parity may not hold, the monetary approach advances the so-called *asset market* view. According to that view the exchange rate between two national currencies behaves like an asset price in an efficient market, adjusting instantly to a level at which both asset (i.e., money) stocks are willingly held. As an efficient asset price, the current spot exchange rate is particularly sensitive to expectations of future exchange rates, expectations that are heavily conditioned by recent and current monetary policy and other indicators of the future course of monetary policy. More generally, as an efficient asset price the current exchange rate embodies all available information about current and prospective events likely to affect the future external values of the two currencies and adjusts instantaneously to incorporate new information about changed conditions. In this manner new information about future exchange rates is discounted into the current exchange rate analogously to the way that news about the future profitability of a corporation is discounted into the current market price of its equity shares.

3. ROLE OF EXPECTATIONS.

As noted above, one implication of the asset market view is that the current spot exchange rate is strongly influenced by current expectations of future exchange rates. This is so because the expected rate of change of the exchange rate is the same as the anticipated rate of return from holding foreign rather than domestic money. As such, expectations affect the relative demand for the two currencies and thereby influence the exchange rate. Thus a rise in the expected rate of depreciation of the exchange rate will, by raising the expected yield from holding foreign rather than domestic currency, shift demand from the latter to the former thereby depreciating the current spot exchange rate. In short, the spot exchange rate is determined by exchange rate expectations operating through relative money demands.

4. RATIONAL EXPECTATIONS HYPOTHESIS.

Besides explaining how expectations affect exchange rates, the monetary approach also explains how expectations themselves are determined. According to the monetary approach, people formulate exchange rate expectations consistent with the way that exchange rates are actually determined in the economy. Thus, if actual observed exchange rates are determined by money supply and demand, it follows that expected future exchange rates are determined by forecasts of future values of those same monetary variables. In particular, the monetary approach maintains that exchange rate expectations are governed by expectations of future money supplies per unit of real money demands. These latter expectations, the monetary approach asserts, are formed from all available information about prospective events likely to influence future money supplies and demands. In so arguing, the monetary approach advances the *rational expectations hypothesis* according to which the market's predictions of future exchange rates are the same as those generated by the actual mechanism that determines exchange rates. This assumption ensures that the monetary approach is internally consistent, i.e., that its explanation of expectations formation is consistent with its explanation of exchange rate determination. Such consistency is thought to be characteristic of the forecasting behavior of rational agents who use knowledge of the actual exchange rate-generating mechanism in formulating expectations of future exchange rates. Knowing that money supplies and demands determine actual exchange rates, rational agents will predict future exchange rates from forecasts of future money supplies and demands.

Constituting the central analytical core of the modern monetary approach to floating exchange rates, the foregoing ingredients must be found in Robertson's work if he is to be judged a proponent of that approach. Accordingly, the following paragraphs show what he had to say on each of the propositions listed above.

Before discussing Robertson's views, however, it should be pointed out that the long-run quantity theory version of the monetary approach (i.e., proposition one above) long predates him. That version dates back at least to the mid-sixteenth century when Spanish scholastic writers of the Salamanca School used it to explain fluctuations in the Spanish currency price of Flemish money.[4] And in the famous Bank Restriction Controversy of the early 1800s, David Ricardo, John Wheatley, and other bullionist writers employed it to explain the fall of the paper pound on the foreign exchanges following Britain's switch from fixed to floating exchange rates during the Napoleonic wars.[5] The theory was endorsed by A. Marshall

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[4] See Grice-Hutchinson [6, p. 55].

[5] See Myhrman [12, pp. 170-173].

in the late 1880s and revived by Gustav Cassel in 1916 to explain exchange rate movements during World War I.[6] After the war the theory was widely used to explain the fall of the German mark in the famous hyperinflation episode of the early 1920s.[7] Robertson of course was well aware of this and goes out of his way to disclaim any originality in his presentation of the theory. His views on this long established or "customary" (as he called it) doctrine are presented immediately below [14, p. 58].

Long-Run Equilibrium Exchange Rate

The first proposition of the monetary approach states that the long-run equilibrium exchange rate between two national currencies is determined by the relative supplies of and demands for those national money stocks. That Robertson was in basic agreement with this proposition is evident from his discussion of the determination of the "normal level of the rate of exchange" between two inconvertible paper currencies (or "arbitrary independent standards" as he called them) [14, pp. 57, 58]. In his discussion he attributes the state of the exchanges largely to the underlying monetary conditions in the two countries concerned. Although he denies that these monetary factors are the sole determinants of exchange rates, he repeatedly refers to them as the dominant determinants. For example, in various places he specifically identifies "the monetary situation" or "the supply of money in the two countries" or "the state of a country's monetary glands" as "the essential condition for the maintenance of a given rate of exchange" [14, pp. 60, 103]. Elsewhere, when discussing the stability of exchange rate equilibrium, he reiterates his belief in the importance of the monetary factor when he notes that the exchange rate must always gravitate to that particular equilibrium level "which the existing money supply of the country as compared with that of other countries renders permanently maintainable" [14, p. 101].

Embodied in the monetary approach is a particular model of the monetary transmission mechanism connecting money with exchange rates. As usually presented, that model contains quantity theory of money and purchasing power parity relationships, the former linking money supplies and demands to prices and the latter linking prices to the exchange rate. These same elements can be found in Robertson's work. Consistent with the monetary approach, he

combines them to arrive at the conclusion that exchange rates are determined largely by relative money supplies and demands operating through price levels, particularly the prices of internationally-traded goods. He reaches this conclusion via the following route.

First, he argues that "the value of money . . . depends on the conditions of demand for it and the quantity of it available" [14, p. 32]. This of course is the quantity theory of money which may be written as

$$(1) \quad P = M/D$$

where P is the general price level (the inverse of the value of money), M the nominal money stock, and D the real demand for money. This equation, which says that the price level is determined by and varies equiproportionally with the stock of money per unit of real money demand, is expressed by Robertson in the following words: "given the conditions of demand for money . . . the general level of prices varies directly as the quantity of money available" [14, p. 26]. Note that equation 1, which may be written as $M/P = D$, also says that the price level adjusts to equate the real (price-deflated) value of the nominal money stock with the public's real demand for it, thereby clearing the market for real cash balances. Consistent with his adherence to the quantity theory, Robertson employs this alternative interpretation when he declares that, given the public's real demand for money, a ten percent rise in the nominal money stock will produce a corresponding ten percent rise in the price level such that the price-deflated or "aggregate real value of the public's money supply is no greater than it was before" [14, p. 76].

Second, he presents the purchasing power parity relationship, stating that "the normal level of the rate of exchange depends on the relative price levels, in the moneys of the two countries, of the things which enter into trade between them" [14, p. 58]. This of course is the traded-goods or commodity arbitrage version of purchasing power parity, which holds that the equilibrium exchange rate is equal to the ratio of the domestic and foreign price levels of internationally traded goods. In symbols

$$(2) \quad E = P_T/P_T^*$$

where E is the exchange rate (defined as the domestic currency price of a unit of foreign currency), and P_T and P_T^* are the domestic- and foreign currency prices of traded goods, respectively.

Third, he assumes that in long-run equilibrium the price of traded goods bears a certain equilibrium

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[6] On Marshall, see Eshag [5, pp. 26-34]. On Cassel, see Myhrman [12, pp. 177-178].

[7] See Ellis [4, pp. 209-236].

relationship to the general price level. This relationship can be expressed as

$$(3) \quad P_T = RP$$

where R denotes the equilibrium ratio of traded-goods prices to general prices in the home country, as can be seen by rewriting the equation in the form $R = P_T/P$. Representing the relative price of traded goods in terms of the general price level, this equation summarizes the equilibrium *structure* of prices in the home country. This notion of a stable equilibrium price structure can be inferred from Robertson's statement that he is assuming conditions of "comparative stability" characterized by the absence of "violent and continuous monetary dislocation"[14, p. 58]. It can also be inferred from his willingness to substitute traded-goods prices interchangeably for general prices as a measure of the value of money.[8]

Fourth, he substitutes equations 1 and 3 into equation 2 to obtain the following result

$$(4) \quad E = (1/P_T^*) R \frac{M}{D}$$

which says that given foreign prices and the domestic price structure the exchange rate depends on the domestic money supply per unit of real money demand. Robertson states this result when he declares that "given the price level of traded goods in terms of utopes [Robertson's hypothetical foreign currency] . . . the monetary situation in England turns out to be the essential condition for the maintenance of a given rate of exchange" [14, p. 60].

Finally, he assumes that prices in the foreign country are determined analogously to their domestic counterparts. Specifically, the foreign price of traded goods is linked through a price structure variable to the foreign general price level which is determined by foreign money supply and demand. Substituting this assumption into equation 4 yields the following expression

$$(5) \quad E = \frac{R}{R^*} \frac{D^*}{D} \frac{M}{M^*}$$

which says that the long-run equilibrium exchange rate is determined by the product of three groups of factors, namely relative price structures, relative real money demands, and relative nominal money supplies, respectively.[9] Of these three groups, the first

two capture the effect of real (nonmonetary) influences on the exchange rate while the third captures purely monetary influences.

Equation 5, which summarizes Robertson's theory of long-run exchange rate determination, puts him squarely in the ranks of the monetary approach. To be sure, the equation does contain a relative price structure variable (and hence an extra channel through which real factors can affect exchange rates) not usually found in the monetary approach. Apart from this, however, the equation is exactly the same as that advanced by the monetary approach. It embodies the latter's assumption of quantity theory and purchasing power parity linkages running from money to the exchange rate, and therefore, in Robertson's words, "serves to remind us that the exchange rates are . . . connected with the supply of money in the two countries" [14, p. 60]. Moreover, like the monetary approach, it identifies relative money demands and supplies as key determinants of the exchange rate. Finally, it yields the standard monetarist homogeneity postulate that a ceteris paribus rise in the relative money supply produces an equiproportional rise in the nominal exchange rate. That Robertson accepts this homogeneity postulate is evident from his statement that if "the supply of Utopian money had become double . . . while neither the supply of English money nor any other conditions of the problem had changed, we should not be surprised to learn that the rate of exchange had become 10 utopes to the pound instead of 5" [14, p. 60]. In short, to the extent he accepts these features, Robertson is a proponent of the monetary approach.

Before concluding this section it is necessary to compare Robertson's views of the purchasing power parity relationship with those of the monetary approach. Regarding purchasing power parity there are at least three main issues, the first referring to the relevant price levels to use in calculating the parity. On this issue Robertson disagrees with the monetary approach. For whereas the latter holds that general prices should be employed in computing the purchasing power parity, Robertson argues that only the prices of internationally traded goods should be used. Thus in stating that the equilibrium exchange rate tends to equal the ratio of domestic to foreign prices, he makes it emphatically clear that he is referring to the prices of "traded goods" or "those goods which are the subject of trade" [14, pp. 60-61]. He apparently believes that purchasing power parity logically holds only for prices subject to international equalization by commodity arbitrage, for he states that it is only the movement of such prices "which

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[8] See Robertson [14, p. 61] where he refers to the value of money measured "in terms of traded goods."

[9] Asterisks refer to foreign country variables.

we should expect to correspond closely to the movements of the exchanges" [13, p. 141]. Not mentioned by him is a point stressed by the monetary approach, namely that, with intercommodity substitution in production and consumption and interindustry competition for factors of production, the prices of traded and nontraded goods tend to be sufficiently closely related such that general prices can be used to approximate the purchasing power parity. Nevertheless, on at least one occasion he apparently accepts this proposition. For he uses a general price index to proxy the purchasing power parity claiming that, as a practical matter, the index is "good enough . . . to illustrate the general normal relation between price levels and exchanges" [13, p. 141].

The second issue relating to purchasing power parity concerns the purpose or role of the exchange rate. On this issue the monetary approach contends that the chief function of the exchange rate is to clear the market for money balances by equating the real purchasing power of both currencies such that both money stocks are willingly held. That Robertson is in substantial agreement with this point can be inferred from such comments of his as "the normal rate of exchange between [two countries] depends on the relative values of their moneys in terms of traded goods," and "the normal rate . . . reflects the condition of the country's money supply as compared with that of the other countries" [14, pp. 61, 102]. The first comment implies that the purchasing power parity exchange rate embodies the relative price deflator that, when applied to relative nominal national money supplies, serves to equalize the real (price-deflated) value of money across nations. Robertson's second comment implies that exchange rates, like prices, also summarize the underlying monetary conditions in each country. Both implications are consistent with the notion that the exchange rate functions to clear the market for national money balances by equating the real purchasing power of both currencies such that there exists no incentive to switch from one currency to the other.

Robertson recognizes, as do proponents of the monetary approach, that the exchange rate also plays a commodity arbitrage role, adjusting to equalize the real price of traded goods across nations so that there exists no advantage to buying in one market over another. In this connection he points out that if the real price of goods were to differ between countries such that it became advantageous to buy in the cheaper country and sell in the dearer one, the resulting excess demand for the currency of the former

country would quickly bid the exchange rate up to the purchasing power parity level at which the common currency prices of goods are everywhere the same. While recognizing the arbitrage function of the exchange rate, however, he nevertheless apparently places greater emphasis on its money market clearing role. For whereas he mentions the commodity arbitrage role but once, he repeatedly contends that the equilibrium exchange rate must be consistent with the underlying monetary conditions in the countries concerned [14, pp. 59, 60, 61, 101, 103]. In so doing, he implicitly endorses the proposition that the chief function of the exchange rate is to achieve international monetary equilibrium by clearing the markets for national money balances.

As for the third issue, namely whether the purchasing power parity is an equilibrium condition or a cause-and-effect relationship between prices and exchange rate, Robertson obviously holds it to be the former. In so doing, he agrees with the monetary approach. Like proponents of that approach, he maintains that prices and the exchange rate are both endogenous variables simultaneously determined by underlying monetary conditions. As he puts it, both variables are "rendered possible by the monetary situation," i.e., both are established at levels "which the existing money supply of the country, as compared with that of other countries, renders permanently maintainable" [14, pp. 60, 101]. In short, on this issue as with most of the others, Robertson adheres to the monetary approach.

Asset Market View The second component of the monetary approach is the asset market view according to which the exchange rate behaves like an efficient asset price, embodying all available information about the future values of the currencies and adjusting instantaneously to incorporate new information about changed circumstances. Robertson possessed a sophisticated understanding of the asset market view, which he used in explaining "the misbehavior of the foreign exchanges" during the post-World War I hyperinflation episodes of the early 1920s. For example, regarding the proposition that the current exchange rate registers the market's perceptions about the future exchange rate—i.e., market participants discount the expected future value of the currencies into the current spot exchange rate—he says that exchange rates tend "to reflect the degree of confidence felt in the future of a country's money by the nimble-witted dealers in exchange" [14, p. 101]. These dealers he describes as being especially "well-informed and impressionable" implying that, consistent with the concept of an efficient market,

they utilize all available information in predicting future exchange rates [14, p. 99].

As for the speed of adjustment of exchange rates in response to new information, Robertson implies that adjustment is virtually instantaneous. For "if a country is rapidly increasing its supply of money," he says, a "lack of confidence in the future of the money . . . strikes like a flash upon the consciousness of the well-informed and impressionable gentlemen whose business it is to carry on dealings in foreign money" [14, p. 99]. As a result, these dealers "become highly willing to buy foreign money and to sell the money of their own country" and in so doing immediately bid up the exchange rate [14, p. 99]. In this manner new information about the likely future value of the currencies is immediately impounded in the current spot exchange rate, which adjusts instantly to its new equilibrium level consistent with anticipated future monetary conditions.

Having developed the asset market view, Robertson used it to explain why the *external* value of a currency (i.e., its value on the foreign exchanges) could temporarily depreciate faster than its *internal* value (i.e., its value in domestic commodity markets) during periods of rapid inflation. In so doing he presents the rudiments of a theory of differential speeds of price adjustment in asset and commodity markets, respectively. According to him, whereas the exchange rate adjusts instantaneously to changes in expectations of future monetary conditions, the prices of "home produced goods and services" adjust slowly, i.e., they "come lumbering after" the exchange rate with a lag [14, p. 101]. In other words, the market for foreign exchange is more efficient than domestic commodity markets in exploiting new information about future prospects. For this reason, expectations are discounted into exchange rates prior to being discounted into domestic commodity prices and "the external value of a country's money falls faster than the internal" [14, pp. 101, 108].

Robertson's views on asset and commodity price adjustment sound remarkably like those of the monetary approach. The same conclusions, namely that differential speeds of price response cause the exchange rate to adjust faster than commodity prices and thereby produce temporary disparities between the external and internal values of the currency, continue to be voiced by modern proponents of the monetary approach. Here, for example, is what one of those proponents, M. Mussa, has to say on the subject.

Relative adjustment speeds of prices . . . in different markets are of vital importance in understanding fluctuations in exchange rates. . . . In the asset market approach to exchange rate theory, it is asserted that the exchange rate is a relative asset price that is determined primarily by conditions of equilibrium in the market for asset stocks. What this means is that the exchange rate . . . responds essentially instantaneously to changes in economic conditions, in particular, to new information that is received by market participants. Of course, exchange rates are also related to general price levels. . . . But, if price levels adjust relatively slowly in comparison with exchange rates, then . . . exchange rate movements should frequently anticipate, rather than follow, movements in national price levels [11, pp. 196-197].

In short, because the exchange rate responds more rapidly to news about future events than do commodity prices, the external value of the currency deviates temporarily from its internal value. On this point Robertson and Mussa agree.

Prior to ending this section it should be pointed out that Robertson was not alone in endorsing the asset market view of exchange rates in the 1920s. Gustav Cassel, for example, also enunciated it. Perhaps its strongest proponent, however, was Ludwig von Mises, whose contributions to the monetary approach, like those of Robertson, have been largely overlooked. As early as 1919 von Mises wrote that exchange rates, like the prices of other assets traded on organized markets, "are speculative rates of exchange," that they reflect "not only the present but also potential future developments," and that they respond to news of excessive monetary growth "relatively soon . . . long before the prices of other goods and services" [8, p. 51]. Again, in 1923, he wrote that the current spot exchange rate "forecasts anticipated future changes in commodity prices," that it is "determined by nothing more than the anticipated future purchasing power attributed to a unit of each currency," and that it adjusts faster than commodity prices to news about future events [8, pp. 28, 31]. Any notion that the asset market view is a recent development is quickly dispelled by a reading of Robertson and von Mises.

Role of Expectations The third proposition of the monetary approach deals with exchange rate expectations. Consistent with the monetary approach, Robertson recognized that expectations play a central role in short-run exchange rate determination. In so doing he implicitly accepted the proposition that the expected future rate of change of the exchange rate constitutes the expected cost of holding one currency rather than the other and therefore affects the current spot exchange rate through relative money demands. To be sure, he did not state this proposition explicitly. That is, he did not specify the expected rate of change of the exchange rate as a cost or rate

of return variable in the money demand function. He did, however, assume that the demand for money in each country is affected by the expected rate of inflation in that country [14, pp. 97-98]. By implication, however, this means that relative money demands are affected by expected inflation differentials. And since the expected inflation differential is closely related to the expected future rate of depreciation of the exchange rate, he implicitly reached the conclusion that expectations of exchange rate depreciation affect the current exchange rate through the channel of relative money demands. In particular, he argued that if everybody expects the currency to depreciate, they will attempt to get out of that currency into other assets, including foreign exchange. The resulting reduction in the demand for the currency will produce the very depreciation that is anticipated. In his own words, if the public expects a depreciation of the currency, "every individual passes it on as quickly as he is able, knowing that if he keeps it it will lose value still further in his hands, and seeks with ingenuity and persistence to embody his resources in any other form" [14, p. 98]. One of these forms is foreign exchange. Consequently, people "become highly willing to buy foreign money and to sell the money of their own country" and "this involves their coming on to the exchange market as purchasers of foreign money" [14, p. 99]. The resulting reduction in the demand for domestic relative to foreign money causes the exchange rate to depreciate. On this point Robertson is in perfect agreement with the monetary approach.

Rational Expectations Hypothesis Finally, Robertson endorsed the last ingredient of the monetary approach, namely the rational expectations hypothesis. The latter states that people formulate exchange rate expectations from information about prospective policy actions and other events believed to have a bearing on the future values of the monetary variables that actually determine exchange rates. Knowing that monetary policies are a basic determinant of long-run equilibrium exchange rates, rational agents will predict future equilibrium exchange rates from forecasts of future monetary policies and these forecasts will be immediately discounted into the current spot exchange rate. That this was indeed Robertson's view is evident from his statement that "the actual rate of exchange is largely governed by the *expected* behavior of the country's monetary authority" [14, p. 102]. The same idea was expressed by von Mises, who declared that the exchange rate "is affected only by changes in the relation between the demand for, and quantity of, money and the prevailing opinion

with respect to expected changes in that relationship, including those produced by governmental monetary policies" [8, p. 25].

Robertson also stressed that exchange rate changes largely stem from *unexpected* policy actions. In his words, if the monetary "authority behaves in a way which is not expected, the rate will ultimately alter" [14, p. 102]. In stating this point Robertson presaged the monetary approach's distinction between the effects of expected versus unexpected policies, respectively. According to this distinction, expected policy actions should have little or no impact on the exchange rate since those policies have already been fully anticipated and discounted into the exchange rate. Having been foreseen in advance, such policies entail no disappointed expectations, no surprises, no new information to discount into the exchange rate. By contrast, unexpected policies should indeed affect the exchange rate. Not having been foreseen in advance, they produce forecasting errors that constitute new information that the market discounts into the exchange rate. In this manner they alter the exchange rate, which adjusts to incorporate the new information represented by the policy surprises. In recognizing this point Robertson foreshadowed much of the recent research on rational expectations.

Conclusion The preceding has identified four basic essentials of the monetary approach to exchange rates and has documented Robertson's views on each. His writings indicate that he largely accepted these essentials and that he incorporated them into his own analysis of the foreign exchanges. Moreover, with respect to the asset market and rational expectations components, he contributed insights that are remarkably suggestive of recent work. All in all, his position is consistent with the monetary approach. This is not to say, however, that everything he wrote conformed to the monetary approach. On the contrary, at one point he used the rival elasticities approach to deny the existence of a stable equilibrium exchange rate [14, p. 100]. At another point he suggested, contrary to the monetary approach, that national money stocks may be endogenous rather than exogenous variables [14, p. 102]. Nor is it to claim that he was the only economist in the 1920s to recognize and discuss all the ingredients of the monetary approach. Ludwig von Mises, for one, enunciated them even more emphatically and lucidly than Robertson. Nevertheless, Robertson did endorse and utilize these ingredients and for that reason deserves to be recognized along with Cassel, Hawtrey, Keynes, and von Mises as one of the important early proponents of the monetary approach.

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