

# THE MONETARY APPROACH TO EXCHANGE RATES: ITS HISTORICAL EVOLUTION AND ROLE IN POLICY DEBATES\*

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One of the oldest debates in economics is that between the *monetary* and *balance of payments* approaches to the determination of exchange rates in a flexible exchange rate regime. The monetary approach attributes exchange rate movements largely to actual and anticipated changes in relative money stocks. It stresses a channel of causation running from money to domestic prices to the exchange rate. By contrast, the balance of payments approach holds autonomous nonmonetary factors affecting individual items in the balance of payments to blame. It stresses a causal channel running from real factors through the balance of payments to the exchange rate and thence to domestic prices and sometimes further to the money supply. Both views underlie current discussions of the weakness of the dollar—the monetary approach holding excessive U. S. money growth to blame while the balance of payments view sees excessive oil imports and the sluggish foreign demand for U. S. exports as the culprits. Although the difference between these two rival approaches is fairly well understood, what is not so fully appreciated is that the current debate between them is largely a repetition of earlier disputes going back more than 200 years.

The purpose of this article is to trace the emergence and development of the monetary approach in three of these early controversies, namely (1) the Swedish bullionist controversy of the 1750's, (2) the English bullionist controversy of the early 19th century, and (3) the German inflation controversy during and immediately following World War I.<sup>1</sup> These debates are crucial to the evolution of the monetary approach in two respects. First, they established the analytical foundations of the monetary approach. These foundations consist of a quan-

tity theory relationship linking money to prices, a purchasing power parity relationship linking prices to the exchange rate, and an expectations theory specifying how anticipations of future money stocks are formed and how they influence the exchange rate. Second, the earlier debates are the origin of current monetarist policy prescriptions for strengthening the dollar. These prescriptions call for the gradual deceleration of the growth rate of the money supply so as to eliminate the excess supply of dollars alleged to be the basic cause of the fall of the internal and external value of the dollar.

## The Swedish Bullionist Controversy (1755-1765)

One of the earliest debates in which the monetary approach played a leading role was the Swedish bullionist controversy of the mid-1700's.<sup>2</sup> The events precipitating the debate were as follows. In 1745 Sweden shifted from a metallic monetary system with fixed exchange rates to an inconvertible paper system with flexible exchange rates. The suspension of convertibility was followed by a steady rise in the prices of commodities and foreign exchange. A debate then arose between the two main political parties of the time—the so-called Hats and the Caps, respectively—over the cause of these price increases.

**The Hat Political Party** The Hats advanced the balance of payments theory, blaming both the external and the internal depreciation of the Swedish mark on Sweden's adverse trade balance. Specifically, they held that the adverse trade balance had produced a depreciating exchange, that exchange depreciation had rendered imported goods more expensive, and that the rise in import prices had spread to the rest of the economy thereby raising the general level of prices. Here is an early example of the tendency of balance of payments theorists (1) to attribute both domestic inflation and exchange depreciation to external nonmonetary shocks and (2) to assert a chain of causation running from the exchange rate to prices rather than vice versa as in the monetary ap-

\* This article draws from the author's paper of the same title in the forthcoming volume *A Monetary Approach to International Adjustment*, ed. by Bluford H. Putnam and D. Sykes Wilford (New York: Praeger Publishers, 1978).

<sup>1</sup> For another treatment of the role of the monetary and the balance of payments approaches in these debates see Johan Myhrman, "Experiences of Flexible Exchange Rates in Earlier Periods: Theories, Evidence, and a New View," *Scandinavian Journal of Economics*, 78, no. 2, (1976), 169-196.

<sup>2</sup> On what follows, see Robert V. Eagly, *The Swedish Bullionist Controversy* (Philadelphia: American Philosophical Society, 1971).

proach. Consistent with their balance of payments view, the Hats prescribed export promotion and import restriction schemes as remedies for inflation and exchange rate depreciation. Nothing was said about money.

**The Cap Party** The opposition Cap party emphatically rejected the Hats' balance of payments theory and instead pointed to the importance of the monetary factor. They blamed both domestic inflation and the external depreciation of the Swedish mark largely on the Riksbank's overissue of banknotes following the suspension of convertibility. They favored a policy of monetary contraction to roll back prices and the exchange rate to pre-inflation levels. Their position can be summarized by the relationship

$$(1) E = E(M)$$

expressing the exchange rate  $E$  (defined as the domestic currency price of a unit of foreign currency) as a function of the domestic money stock  $M$ .

The preceding was not the only explanation offered by the Caps. They also adhered to an evil-speculator theory of exchange rate movements. This conspiracy theory is no part of the monetary approach. For that reason the Caps cannot be considered as full-fledged consistent advocates of the monetary approach.

**Pehr Niclas Christiernin** One participant who did articulate the monetary view was Pehr Niclas Christiernin, an academic economist at the University of Uppsala, who advanced a quantity theory explanation of the transmission mechanism linking money with the exchange rate. In his *Lectures on the High Price of Foreign Exchange in Sweden* (1761), Christiernin maintained that the chief cause of currency depreciation was an overissue of banknotes by the Riksbank and that causation flowed from money to spending to all prices, including the prices of commodities and foreign exchange. He saw monetary expansion as stimulating demand. Part of the demand pressure falls on domestic commodity markets raising prices there. The rest spills over into the current account of the balance of payments in the form of increased demand for imports. The resulting import deficit then puts upward pressure on the exchange rate which consequently rises to restore equilibrium in the current account. Clearly, money-induced changes in total spending constitute the driving force in Christiernin's version of the transmission mechanism running from money to the exchange rate. This component has been a hallmark of the monetary approach ever since.

As for policy recommendations, Christiernin was opposed to the Caps' plan to restore the exchange rate to its original pre-inflation level via contraction of the note issue. His opposition stemmed from his belief that prices adjusted sluggishly in response to deflationary pressure so that the monetary contraction required to restore the exchanges to parity would bring painful declines in output and employment rather than the desired price decreases. For this reason he recommended stabilizing the exchange rate at the level established during the inflation rather than restoring it to the pre-inflation level.<sup>3</sup> Unfortunately, his advice was ignored and the Caps enacted a deflationary policy that resulted in the very drop in output and employment that he had predicted.

#### **The English Bullionist Controversy (1797-1819)**

The monetary and balance of payments theories clashed again in the famous controversy over the cause of the fall of the British pound following the Bank of England's suspension of the convertibility of banknotes into gold during the Napoleonic wars.<sup>4</sup> As in the earlier Swedish controversy, one side blamed currency depreciation on the central bank's overissue of notes while the other side blamed it on an adverse balance of payments. This time, however, the proponents of the monetary and balance of payments views were known as the bullionists and the antibullionists, respectively.

The bullionists did more than any group before or since to develop and clarify the monetary view. The so-called strict bullionists crystallized the theory in rigorous form and the moderate bullionists refined and extended it. The strict bullionists included William Boyd, David Ricardo, and John Wheatley while the moderate bullionists included William Blake, Francis Horner, William Huskisson, and above all, Henry Thornton.

#### **The Strict Bullionists: Ricardo and Wheatley**

The strict bullionists made several major contributions to the monetary approach. They were the first to specify both the quantity theory and purchasing power parity links in the transmission mechanism connecting money and the exchange rate. In addition, they stated the monetary approach in its most rigid and uncompromising form, asserting that, under conditions of inconvertibility where money cannot

<sup>3</sup> *Ibid*, pp. 27-29, 34.

<sup>4</sup> On the English bullionist controversy see Denis P. O'Brien, *The Classical Economists* (London: Oxford University Press, 1975), pp. 147-153 and Jacob Viner, *Studies in the Theory of International Trade* (New York: Augustus Kelley, 1965), pp. 119-170.

drain out into foreign trade, the exchange rate varies in exact proportion with changes in the money supply. They arrived at this latter conclusion via the following route.

First, they assumed that under inconvertibility domestic prices  $P$  vary in strict proportion with the quantity of money in circulation  $M$ . This of course is the rigid version of the quantity theory which may be expressed as

$$(2) \quad P = kM$$

where  $k$  is a constant equal to the ratio of the circulation velocity of money to real output, both treated as constants by the strict bullionists.

Second, they maintained that under inconvertibility the exchange rate  $E$  moves in proportion to the ratio of domestic to foreign prices  $P/P^*$ . First enunciated by Wheatley in 1803, this proposition is the famous purchasing power parity doctrine, so christened by Gustav Cassel who rediscovered it more than 100 years later in 1918. The Wheatley-Ricardo-Cassel purchasing power parity condition may be written as

$$(3) \quad E = P/P^*$$

implying that external currency valuations derive from their real internal values and that the general price level and its counterpart, the purchasing power of money, are everywhere the same when converted into a common unit at the equilibrium rate of exchange.

Third, they assumed that the foreign price component  $P^*$  of the purchasing power parity ratio was a constant equal to the given world bullion price of commodities so that exchange rate movements reflected corresponding movements in domestic paper money prices only. Given this assumption the exchange rate is a good proxy for domestic prices and may be expressed as

$$(4) \quad E = P$$

assuming the constant foreign price level is "normalized" and set equal to unity.<sup>5</sup>

Finally they substituted the exchange rate proxy for the price variable in the quantity theory relationship, thereby obtaining the result

$$(5) \quad E = kM$$

<sup>5</sup> Due to the unavailability of reliable general price indexes, the Classical economists also used the paper money price of bullion as an empirical proxy for the commodity price level. Accordingly, they interpreted a rise in the market price of gold above its mint price as both a sign and measure of general price inflation and therefore of the need for monetary contraction.

which states that the exchange rate varies in exact proportion with the money supply. On this basis they were able to conclude that a rise in the exchange rate above its gold parity constituted both proof and measure of overissue of inconvertible currency. In other words, if the exchange rate stood 5 percent above its gold parity, then this was *prima facie* evidence that the note issue was 5 percent above what it would have been under convertibility. This was most clearly stated by Ricardo who wrote

If a country used paper money not exchangeable for specie, and, therefore, not regulated by any fixed standard, the exchanges in that country might deviate from par in the same proportion as its money might be multiplied beyond that quantity which would have been allotted to it by general commerce, if . . . the precious metals had been used.<sup>6</sup>

Wheatley extended the analysis to the case where both countries are on an inconvertible paper standard. He simply substituted quantity theory relationships for both the domestic and foreign price variables in Equation 3. This gave him the result that the exchange rate varies in proportion with relative money supplies, i.e.,

$$(6) \quad E = kM/k^*M^* = K(M/M^*)$$

where  $K$  is the ratio of the constants  $k$  and  $k^*$ . Wheatley stated this result when he declared that "the course of exchange is the exclusive criterion [of] how far the currency of one [country] is increased beyond the currency of another."<sup>7</sup>

Another contribution of the strict bullionists was their assertion that exchange rate movements are purely a monetary phenomenon. They rejected the antibullionist argument that real disturbances to the balance of payments—e.g., harvest failures, wartime disruption of trade, military expenditures abroad—were responsible for the fall of the paper pound during the Napoleonic wars. Regarding supply shocks and foreign remittances, they denied that such factors could influence exchange rates even in the short run. Their position was that the slightest real pressure on the exchange rate would, by making British goods cheaper to foreigners, result in an instantaneous expansion of exports sufficient to eliminate the pressure. In their view, an adverse

<sup>6</sup> David Ricardo, *The Principles of Political Economy and Taxation* (London: J. M. Dent and Sons, 1917), p. 151, quoted in James W. Angell, *The Theory of International Prices* (New York: Augustus Kelley, 1965), p. 69 n. 3. Emphasis added.

<sup>7</sup> John Wheatley, *Remarks on Currency and Commerce* (London: Burton, 1803), p. 207, quoted in Angell, *op. cit.*, p. 52.

exchange was solely and completely the result of an excess issue of currency. Ricardo even went so far as to argue that even if foreign transfers and domestic crop failures *did* affect the exchanges by reducing real income and hence the demand for money, the cause of exchange depreciation is still an excess stock of money, albeit one arising from a reduction of money demand rather than an expansion of money supply. Ricardo's point was simply that real factors could only affect the exchange rate through shifts in money demand not offset by corresponding shifts in money supply. In such cases the latter was to blame for exchange rate movements. The notion that all factors affecting the exchange rate must do so through monetary channels, i.e., through the demand for or supply of money, is of course central to the modern monetary approach.

Finally, the strict bullionists prescribed monetary restraint as the *only* cure for a depreciating currency. They held that a rise in the price of foreign exchange constituted an infallible sign that the currency was in excess and *must* be contracted. Ricardo even defined an excess issue in terms of exchange depreciation, thus implying a single unique correct money stock, namely one associated with the exchange being at its former gold standard parity.<sup>8</sup>

**The Moderate Bullionists: Blake and Thornton**  
The moderate bullionists modified the strict bullionists' analysis in three respects. First, they pointed out that it applies to long-run equilibrium situations but not necessarily to the short run. Second, while acknowledging that long-run (persistent) exchange depreciation stemmed solely from note overissue, they were willing to admit that real shocks could affect the exchanges in the short run. Their position is best exemplified by William Blake's distinction between the Real and the Nominal exchange.<sup>9</sup> According to Blake, the real exchange or real barter terms of trade  $R$  is determined by nonmonetary factors—crop failures, unilateral transfers, structural changes in trade and the like—that affect the balance of payments. The nominal exchange,  $N$ , however, reflects the relative purchasing powers of different currencies as determined by their relative supplies  $M/M^*$ . Blake's analysis can be summarized by the equation

$$(7) \quad E = RN$$

that expresses the actual exchange rate as the product of its real and nominal components, both of

<sup>8</sup> Regarding the policy implications of the Ricardian definition of excess, see O'Brien, *op. cit.*, p. 148.

<sup>9</sup> On Blake, see O'Brien, *op. cit.*, pp. 150-151.

which contribute to exchange rate movements in the short run. Blake maintained, however, that in the long run the real exchange  $R$  is self-correcting (i.e., returns to its original level) and that only the nominal exchange  $N$  can remain permanently depressed. Therefore, persistent exchange depreciation is a sure sign of an excess issue of currency.

The third modification was made by Henry Thornton, whose analysis of the money-price-exchange rate nexus was much more subtle and sophisticated than that of the strict bullionists. In particular, he argued that interest rates and the velocity of money enter the nexus, that velocity is extremely variable in the short run owing to shifts in business confidence, and that this variability invalidates the rigid money-price-exchange rate linkage postulated by the extreme bullionists.<sup>10</sup> In terms of Equations 2 and 5 he argued that the velocity-output ratio  $k$  is a variable determined by the interest rate  $i$  and the state of business confidence  $c$ , i.e.,

$$(8) \quad k = k(i, c).$$

Since  $k$  varies in the short run, the exchange rate and money do not exhibit exactly equiproportional movements. A given change in the money stock affects  $k$  as well as the exchange rate. In the long run, however,  $k$  is a constant and the equiproportionality proposition holds.

**The Antibullionists** Except for an expectations mechanism, the bullionists had assembled and integrated all the elements of the monetary theory of exchange rate determination. Compared to this accomplishment the contributions of the antibullionists appear pretty meager indeed. They attributed exchange depreciation and domestic inflation solely to real factors—crop failures, overseas military expenditures and the like—operating through the balance of payments. They correctly asserted that the exchange rate is determined by the supply and demand for foreign exchange arising from external transactions. But they failed to see that an important factor influencing supply and demand might be relative price levels determined by relative money stocks. In fact, they rejected all monetary explanations, claiming that banknote expansion could not affect the exchanges in the slightest. They thought the price of foreign exchange could rise indefinitely without indicating the existence of an excess note issue. As for policy recommendations, they urged curtailment of imports and overseas expenditures to improve the balance of

<sup>10</sup> Thornton's contribution is discussed in O'Brien, *op. cit.*, pp. 149-150.

payments and to strengthen the pound. They doubted that any conceivable reduction in the banknote issue could restore the exchanges to parity.

Their main analytical tool was the *real bills doctrine*, which they employed in an unsuccessful attempt to refute the charge that the Bank of England had overissued the currency. The real bills doctrine states that money can never be issued in excess as long as it is tied to bills of exchange arising from real transactions in goods and services. Henry Thornton, however, exposed the fallacy of this doctrine when he pointed out that rising prices would require an ever-growing volume of bills to finance the same level of real transactions. In this manner inflation would justify the monetary expansion necessary to sustain it and the real bills criterion would not effectively limit the quantity of money in existence. Thornton's demonstration of the invalidity of the real bills doctrine constituted a victory for the bullionists and for the monetary approach to the exchange rate. The victory, however, was not definitive. For when the debate erupted again in World War I, the balance of payments approach was the dominant view.

#### **The German Inflation Controversy (1918-1923)**

The debate reopened in 1918 when Gustav Cassel used his purchasing power parity doctrine together with the quantity theory to attack the official balance of payments explanation of the wartime fall of the German mark. Whereas the policymakers blamed the currency depreciation on real disturbances to the balance of payments—e.g., obstructions to German shipping, wartime disruption of trade and the like—Cassel blamed it on excessive monetary expansion in Germany relative to that of her trading partners.

#### **Cassel's Critique of the Balance of Payments Approach**

Cassel's criticism of the balance of payments theory was virtually the same as that of his strict bullionist counterparts, Wheatley and Ricardo. Like them, he argued that the exchange rate is automatically self-correcting in response to real shocks to the balance of payments. Therefore the theory is incapable of accounting for persistent exchange rate depreciation such as that experienced by the German mark during World War I.

Regarding the operation of the self-correcting exchange rate mechanism, he noted that when balance of payments disturbances push the external value of a currency below its internal value, the currency becomes undervalued on the foreign exchanges, i.e., its domestic purchasing power is greater than indicated by the exchange rate. Such undervaluation, he held,

will immediately invoke forces returning the exchange rate to equilibrium. For as soon as a country's currency becomes undervalued relative to its purchasing power parity, foreigners will find it profitable to purchase the currency for use in procuring goods from that country. The resulting increased demand for the currency will bid its price back to the level of purchasing power parity. In short, deviations of the exchange rate from purchasing power parity generate corrective alterations in the trade balance that eliminate the deviations. Both the balance of payments and the exchange rate return swiftly to equilibrium. Thus, contrary to the balance of payments view, external nonmonetary shocks have no lasting impact on the exchange rate.<sup>11</sup> It follows that any persistent depreciation must be due to excessive monetary growth that raises domestic prices and thereby alters the purchasing power parity or equilibrium exchange rate itself. In this connection he repeated Ricardo's dictum that an excess supply of money, whether stemming from a rise in money supply or a fall in money demand, is always and everywhere the cause of exchange rate movements.<sup>12</sup>

Cassel also criticized the proposition that exchange depreciation causes domestic inflation rather than vice-versa. He acknowledged that currency depreciations relative to purchasing power parity produce import price increases. But he denied that these import price increases could be transmitted to general prices provided the money stock and hence total spending were held in check. He maintained that, given monetary stability, the rise in the particular prices of imported commodities would be offset by compensating reductions in other prices leaving the general price level unchanged. In short, he denied that causation ran from the exchange rate to domestic prices as contended by the balance of payments approach.<sup>13</sup>

**Hyperinflation and the Reverse Causality Argument** Despite Cassel's forceful and vigorous attack, the debate did not go into high gear until the post-war hyperinflation episode of the early 1920's.<sup>14</sup>

<sup>11</sup> Gustav Cassel, *Money and Foreign Exchange After 1914* (New York: MacMillan, 1922), pp. 149, 164-165.

<sup>12</sup> Cassel held that drops in output and the demand for money could not affect the exchange rate if offset by corresponding equiproportional reductions in the money supply. Therefore an inappropriate money supply was to blame for exchange rate movements. *Ibid.*, pp. 61-62, 168-169.

<sup>13</sup> *Ibid.*, pp. 145, 167-168.

<sup>14</sup> What follows relies heavily on Ellis's classic survey of the German inflation controversy. See Howard S. Ellis, *German Monetary Theory, 1905-1933* (Cambridge: Harvard University Press, 1934), Chapters 12-16.

During this episode the price of foreign exchange rose to fantastic multiples of its prewar level and everybody wanted to know why. Advocates of the monetary approach, including Cassel and his followers, pointed to the explosive growth of the money supply as the obvious answer. But proponents of the balance of payments approach dismissed the monetary factor and instead attributed exchange depreciation to the adverse balance of payments caused by the burden of reparations payments combined with Germany's alleged "fixed need for imports" and "absolute inability to export." In their view, money had nothing to do with the fall of the mark. On the contrary, they claimed that causation ran from the exchange rate to money rather than vice-versa. They specified the following causal order of events: depreciating exchanges, rising import prices, rising domestic prices, consequent budget deficits and increased demand for money requiring an accommodative increase in the money supply.<sup>15</sup>

Regarding the increase in the money supply, they contended that the exchange-induced rise in prices created a need for money on the part of business and government, that it was the Reichsbank's duty to meet this need, and that it could do so without affecting prices. Far from seeing currency expansion as the source of inflation, they argued that it was the solution to the acute shortage of money caused by skyrocketing prices. Here is the familiar argument that the central bank must accommodate supply-shock inflation in order to prevent a disastrous contraction of the real (price-deflated) money stock. German proponents of the balance of payments view, however, pushed this argument to ridiculous extremes. In 1923 when the Reichsbank was already issuing currency in denominations as high as 100 trillion marks, Havenstein, the President of the Reichsbank, expressed hope that the installation of new high speed currency printing presses would help overcome the money shortage. Citing the real bills doctrine, he refused to believe that the Reichs-

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<sup>15</sup> Balance of payments theorists placed the blame for government deficits financed by new money issues squarely on inflation rather than on the actions of the policy authorities. Inflation, they said, caused government expenditures—which were largely fixed in real terms and thus rose in step with prices—to rise faster than revenues—which were fixed in nominal terms in the short run and thus adjusted sluggishly to inflation. The result was an inflation-induced deficit that had to be financed by money growth. The authorities had nothing to do with the deficit. The monetary school rejected this argument on the grounds that the government possessed the power to reduce its real expenditures and, moreover, that the authorities had deliberately engaged in deficit spending for several years prior to the hyperinflation thus establishing the monetary preconditions essential to that episode.

bank had overissued the currency. He also flatly denied that the Reichsbank's discount rate of 90 percent was too low although the market rate on short term loans was an astronomical 7,300 percent per annum.<sup>16</sup>

**Characteristics of the Balance of Payments School** It is instructive at this point to identify the chief characteristics of the German balance of payments school if only because some of these characteristics survive in vestigial form in popular discussion of the fall of the dollar. First, members of the school tended to adhere to superficial supply and demand explanations of the exchange rate. Some merely asserted that the exchange rate is determined by supply and demand without saying what influences supply and demand. Others specified certain autonomous real factors affecting the balance of payments as the underlying determinants of foreign exchange supply and demand. None recognized that relative price levels and/or relative money stocks might also play a role. These variables were effectively excluded from the balance of payments school's list of exchange rate determinants.

The school's second characteristic was its tendency to identify exchange depreciation with one or two items in the balance of payments. In particular, members singled out raw material imports as the culprit just as some analysts currently blame petroleum imports. Third, they tended to treat the items in the balance of payments as predetermined and independent when in fact they are interdependent variables determined by prices and the exchange rate. For example, they asserted that Germany's import requirements were irreducible regardless of price and that her exports were likewise fixed. They then extended this reasoning to the other accounts of the balance of payments. Fourth, they denied the operation of a balance of payments adjustment mechanism. This denial followed from their assumption that both the balance of payments and the exchange rate are exogenously determined by factors that are independent of money, prices, and the exchange rate itself. This assumption permitted no equilibrating feedback effects from the exchange rate to the balance of payments. M. J. Bonn, a prominent balance of payments theorist, expressed the point as follows.<sup>17</sup> Suppose, he said, that import contraction is impos-

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<sup>16</sup> Leland Yeager, *International Monetary Relations: Theory, History, and Policy*, 2nd edition, (New York: Harper and Row, 1976), p. 314.

<sup>17</sup> Bonn's views are discussed in Paul Einzig, *The History of Foreign Exchange* (London: MacMillan, 1962), pp. 271-272, and Ellis, *op. cit.*, pp. 248-252.

sible given Germany's dependence on imported raw materials and foodstuffs. Likewise export expansion is impossible because of tariff barriers and economic depression abroad. Now assume a disturbance that produces a deficit in Germany's trade balance thereby causing an exchange rate depreciation of the mark relative to its purchasing power parity equilibrium. According to Cassel and his school, the depreciation should, by lowering the foreign price of German exports and raising the domestic price of her imports, spur the former and check the latter thereby restoring equilibrium in the trade balance. But these price-induced readjustments in trade are impossible when imports and exports are independent of exchange rate changes. In such a case, an adverse trade balance may persist in the face of an undervalued currency, contrary to the conclusion of the monetary school. Finally, the fifth characteristic of the German balance of payments school was its categorical rejection of the proposition that money influences prices and the exchange rate. As previously mentioned, this antimonetarist view was implicit in the school's reverse causation, money shortage, and real bills doctrines.

**The Monetary School's Critique** Members of the monetary school had little trouble exposing the fallacies in these views. They noted that supply and demand constitute only the *proximate* determinants of the exchange rate, that the *ultimate* determinants are the factors underlying supply and demand themselves, and that these factors include relative price levels determined by relative money stocks. They pointed out that the components of the balance of payments are variables not constants, that they are determined simultaneously by prices and the exchange rate, and that exchange rate movements primarily reflect monetary pressure on the entire balance of payments rather than nonmonetary disturbances to particular accounts. Regarding the reparations account, they noted that the depreciation of the mark was not caused by these payments per se but rather by the inflationary way they were financed, i.e., by fresh issues of paper money. As for Germany's alleged need for a fixed physical quantity of imports regardless of price, they argued that needs are not incompressible and that even the import demand for absolute necessities possesses some price elasticity. Moreover, they pointed out that exports too are responsive to changes in relative prices and that the exchange rate mechanism would therefore tend to equilibrate exports and imports were it not continually frustrated by inflation. They maintained that had domestic prices stopped rising, a further

depreciation of the mark would, by making German goods cheaper to foreigners and foreign goods dearer to Germans, have stimulated exports and restrained imports until a new equilibrium was reached. In their view, it was only the rise in domestic prices consequent upon the increase in the money supply that prevented the expansion of exports and the contraction of imports. Otherwise current account equilibrium would have been restored by the exchange-induced shift in the relative prices of exports and imports.

Most important, advocates of the monetary approach argued convincingly that exchange depreciation originated in excessive money growth and that the monetary authorities could have stopped the depreciation had they been willing to exercise control over the money stock. In short, they showed that the price of foreign exchange could not have risen indefinitely unless sustained by inflationary money growth. Had the latter ceased, the exchange rate would have stabilized.

**The Expectations Element** The German inflation controversy contributed the last of the three major elements to the monetary approach. The English bullionist writers had already established the quantity theory and purchasing power parity elements. All that remained was the statement and development of the expectations theory linking anticipations of future money supplies with the current exchange rate. This step was taken during the hyperinflation debate when the monetary school sought to explain why the dollar/mark exchange rate actually rose faster than the German money supply. According to the strict quantity theory and purchasing power parity hypotheses, the two variables should rise at roughly the same rate. Their failure to do so was taken by the balance of payments school as constituting evidence of the invalidity of the monetary approach. Advocates of the monetary approach, however, rescued it from this criticism by explaining the exchange rate-money growth disparity in terms of market expectations. In a nutshell, they contended that in disequilibrium the exchange rate is influenced by the expected future exchange rate (i.e., the *anticipated* purchasing power parity) which depends on prospective price levels governed by expected money stocks. Howard Ellis, in his *German Monetary Theory 1905-1933* (1934), cites several economists, notably Gustav Cassel, Walter Eucken, Fritz Machlup, Ludwig von Mises, Melchior Palyi, A. C. Pigou, and Dennis Robertson, who claimed that exchange rate movements reflected anticipated increases in the money stock and who argued that

As this passage suggests, members of the monetary school not only explained how expectations affect the exchange rate, but also how expectations themselves are determined. In essence, they said that people base their exchange rate expectations on observations of the behavior of the policy authorities, especially the latter's monetary and fiscal response to large budgetary commitments like reparations payments. These observations yield information about the authorities' policy strategy which people use in predicting future policy actions affecting the exchange rate. As Dennis Robertson put it in his famous

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<sup>18</sup> Cassel, *op. cit.*, pp. 149-150.

controversy of the early 1800's, and that the expectations component was added during the German inflation debate of the early 1920's. Thus all the elements of the modern monetary approach were firmly in place by the mid-1920's.

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<sup>19</sup> Dennis Robertson, *Money* (London: Cambridge University Press, 1922), p. 133.

<sup>20</sup> Expectations were not the only factor cited by the monetary school as causing the exchange rate to lead prices and money. Another was **currency substitution**, i.e., the substitution of stable dollars for unstable marks in German residents' transactions and asset money balances.

<sup>21</sup> Sir John Hicks, *Critical Essays in Monetary Theory* (London: Oxford University Press, 1967), pp. 156-158.