A Post Keynesian view of exchange rate determination

Since the final collapse of the Bretton Woods regime in 1973, research on the determinants of exchange rates has continued at a furious, if not productive, rate. The most popular alternative, the monetary approach to exchange rate determination, has performed very poorly in empirical testing (Wasserfallen, 1989, p. 511). While some version of the monetary approach may show promise in explaining one aspect of exchange rates during a given time period, that version invariably falls flat when the search for robustness begins.

Thus, we are left with a system that has not at all performed as expected and we generally do not know why. Rates have been terribly volatile, they have been misaligned for extended periods of time, and domestic monetary authorities find that they do not possess the autonomy that had been promised (McCulloch, 1986). The level of international macroeconomic policy interdependence has become so great that the nations of the industrialized world, under various guises (the Group of Five, the Group of Thirty, etc.), have started trying to coordinate their macroeconomic policies. Clearly, the political realities have outstripped the economic theorizing.

It is the contention of this author that elements of a theory that can successfully explain the determination of exchange prices under the flexible rate system can be developed from the writings of various Post Keynesian scholars. This paper is intended to provide a rough outline of that approach and to spur further refinement of the model.

I. Exchange rate behavior since 1973

Not even the most pessimistic pre-1973 predictions of the behavior of the flexible rate envisioned the level of volatility that has actually
occurred. Furthermore, those movements have been largely unpredictable and much more variable than national price levels, and have included both the real and the nominal exchange rate (Marrinan, 1989, p. 41). The longer-term exchange rates have been a mystery too. Clear misalignments have existed for very long periods of time and they show little predictable trend (Dornbusch, 1987, pp. 1–2). Daniel Gros summarizes the state of economic theory:

The highly erratic behaviour of floating exchange rates since the breakdown of the fixed exchange rate system has been a puzzle for many observers. Some claim that the degree of volatility exhibited by exchange rates is excessive and thus undesirable; others claim that an efficient foreign exchange market is a better, or more efficient, outlet for many underlying disturbances, rather than markets that might not be able to react as swiftly. Another aspect of this problem is that there seem to be tranquil and turbulent periods in the foreign exchange markets, that is the degree of volatility of rates varies over time without corresponding changes in the behaviour of the fundamentals. It is widely claimed that the degree of this volatility is due to the volatility of the underlying policies—a claim which has not, as yet been substantiated. [Gros, 1989, p. 273]

Schulmeister has further observed that the rates in the short run tend to move in “a series of upward or downward price runs interrupted by some erratic fluctuations” but that in the medium run they fluctuate around purchasing power parity (although they show no tendency to settle there) (1988, p. 343).

Thus, a successful theory of exchange rate determination must account for short-term volatility in the form of upward and downward runs, the apparent separation of short-term movements (and possibly the medium-term movements as well) from the influence of the “fundamentals,” and the persistence of balance-of-payments imbalances in the short and medium terms.¹ It is by these criteria that the model outlined here will be judged.

II. Previous work

While domestic macroeconomics seems to be the preferred domain of most Post Keynesian scholars, there are those who have written in the

¹ “Medium-term” and “medium-run” are used throughout this paper instead of “long-term” and “long-run” so that it might be consistent with Schulmeister’s (1988) work. As far as the author can tell, there is no marked difference between Schulmeister’s “medium” and other scholars’ “long.”
area of international finance. Most important to this paper are Miles and Davidson (1979), Davidson (1982), and Schulmeister (1988).²

Davidson has emphasized the role of changing expectations in an environment of uncertainty as the key to volatility. Using the concept of currency substitution (Miles and Davidson, 1979), combined with Hicks’s elasticity of expectations and classificatory scheme for holding assets in an uncertain world (Davidson, 1982), Davidson shows how, especially under a flexible exchange rate regime, foreign currencies become the object of considerable speculation.

Schulmeister’s work fills many of the voids left by Davidson. In particular, the institution of exchange trading is examined. Most important is Schulmeister’s contention that those creating the bulk of the demand for foreign exchange are not those needing liquidity for international merchandise trade and investment, but instead the bank trading desks themselves.³ Furthermore, those trading desks make frequent use of trading rules. These rules contribute to bandwagon and cash-in effects, and the consistent profits thus earned are generally accumulated at the expense of all those market participants who buy or sell foreign exchange for other reasons than short-term profit maximization from foreign exchange dealing itself (including central banks), particularly traders of goods and services who perceive and use foreign exchange for international payments rather than as a financial asset. [Schulmeister, 1988, p. 356]

Last, Schulmeister explains that traders maintain two sets of expectations about future exchange rate movements, short- and medium-term, and he explains how these interrelate.

These works form the basis of the more general model developed below.

II. Exchange rate determination

The role of currency trading in the world economy has changed considerably in the last twenty years. Once a market operating primarily to

² Weintraub (1981) and Zis (1989) have made important contributions, although their works tend to be more descriptive and add little in terms of formal theory. H. Peter Gray has also contributed a great deal to the literature, but his work tends to emphasize trade rather than exchange rates (Gray, 1974, 1987; Gray and Gray, 1988–89).

³ In fact, bank respondents to a recent survey reported that only 11.5 percent of their total foreign exchange activity was customer business (Schulmeister, 1988, p. 344).
grease the wheels of commerce, now outright speculation, by traders at banks, multinationals, and other unlikely agents, has come to dominate (Marsh, 1982; The Economist, 1987). As partial evidence, Schulmeister emphasizes that the daily volume of the foreign exchange market exceeds trade flows by a factor of around forty, and portfolio investment by a factor of sixty: "One can therefore conclude that foreign exchange dealing has largely emancipated itself from the direct forces implied by market fundamentals" (Schulmeister, 1988, p. 346).4

So, rates are set almost solely by foreign exchange dealers holding currency for the reasons suggested by Hicks's classificatory scheme. As suggested above, dealers maintain two sets of expectations, short-term and medium-term. While the short-term are affected primarily by political and economic (especially monetary) news, the medium-term are more likely to be influenced by such economic fundamentals as balance of payments, interest differentials, relative rates of inflation, and growth rates. In general, the present exchange rate (spot or forward) can be expressed in the functional form

\[ E_t = f[(E_{t+n}^e - E_{t-1}), (E_{t+m}^e - E_{t-1})], \]

where \( E_{t+n}^e \) is the expected medium-term exchange rate and \( E_{t+m}^e \) is the expected short-term exchange rate. Since \( E_{t-1} \) will already be known, it remains only to determine \( E_{t+n}^e \) and \( E_{t+m}^e \).

Medium-term expectations

Medium-term expectations are likely to dominate the decision making of those economic agents whose demand for foreign currency is derived solely from their desire for activities such as trading, portfolio investment, and direct investment. In turn, those concerned primarily with speculative profits, even though they plan no long-term commitment to a particular currency, will watch the fundamentals as a sign of the inherent strength of a currency. It was precisely these sorts of demand that led floating rate proponents to suggest that exchange movements would be gradual if market forces were allowed free reign (Zis, 1989, pp. 2–5).

4 One may ask why these changes have taken place. In large part, the globalization of international capital markets through technological innovation is to blame. Furthermore, declining profit rates and increasing competition among banks has made turning a profit at the exchange desk a priority (The Economist, 1987).
The variables that are important in the determination of medium-term expectations are

\[ E_{t+n}^e = f [BOCA_t, BOCA*_{n}, (r_t-r^*_t), (p_t-p^*_t), (g_t-g^*_t)] \]

where \( E_{t+n}^e \) is the current expectation of the medium-term value of the exchange rate (domestic currency units per foreign currency unit) \( n \) time periods from the present; \( BOCA \) is the balance on current account; \( r \) is the nominal interest rate; \( p \) is the rate of price inflation; \( g \) is the rate of growth of aggregate output; and "*" indicates "foreign." The sign below each determinant indicates whether a rise in that variable will cause a domestic currency appreciation (−) or depreciation (+). All the signs are fairly standard and self-explanatory, with the possible exception of the last one. In this model it is assumed that the effect of a rising rate of growth in a country—a likely characteristic of a healthy, vibrant economy—will have a greater effect on exchange rates through international investment than through trade, and will thus attract more demand for the home currency than cause supply.

Equation (2) is a simplification in one very important respect. It implies that the determinants of the expected exchange rate are the actual levels and rates at time period \( t \), when, in fact, the variables determining medium-term exchange rate expectations would be the expected values of the determinants at time period \( t \). In that case, the independent variables specified in equation (2) are actually derived from other

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5 Empirical support for all of the variables is provided by Hardouvelis (1988). In general, however, price levels and price inflation do not perform well in exchange rate models (Koch, Rosensweig, and Whitt, 1988; Hakkio and Pearce, 1985), and neither do growth rates and other measures of the business cycle. On the other hand, these studies tend to be short run, so there may be no harm in including these variables at this stage.

6 Coincidentally, the monetary approach to exchange rate determination would also suggest that a faster-growing economy might find its currency appreciating. There, however, the mechanism is the rising transactions demand for money which, if not met by the domestic monetary authorities, will be satisfied by the increased exports and decreased imports of the domestic residents (in other words, their increased demand for money causes them to "hoard"). On the other hand, a Keynesian analysis, based usually on the assumption that the majority of currency trading would be for import/export facilitation, would suggest that rising income will raise the demand for imports and thus the demand for foreign currency. This, in turn, causes a domestic currency depreciation. The latter has clearly not been the case (Zis, 1989, p. 4), and the monetarist approach has enough problems in explaining the domestic macroeconomy to make this explanation suspect (Davidson and Weintraub, 1973).
values. This is shown by:

\[(3) \quad X_M = f(Y_M),\]

where \(X_M\) represents the expected values of the set of determinants of medium-term exchange rate expectations (the independent variables in equation (2)); and \(Y_M\) is any information that might cause agents to reevaluate the expected values of the variables represented by \(X_M\) (\(Y_M\) includes the current known values of \(X_M\)). Equation (3), therefore, reflects the effects of the often-cited "news" in exchange rate determination (Frenkel, 1981; Hakkio and Pearce, 1985; and Hardouvelis, 1988).\(^7\)

An example of \(Y_M\) might be a public comment by the Federal Reserve that they are biased against lowering interest rates over the next year. This would imply that, if the United States is the domestic country and Germany is the foreign, we can expect any \(r > r^*\) that may exist at the present, in the absence of action by the Bundesbank, to remain over the next year. On the other hand, news from the Fed that they fear recession would signal that \(r > r^*\) may soon be reduced or eliminated. A less straightforward example of \(Y_M\) would be the recent fall of the Berlin Wall. This has presumably cued investors to the possibility that, given West Germany's position to exploit the liberalization in the Eastern Bloc, \(g < g^*\) (where West Germany is "foreign") may occur over the long run. This partially explains the recent upward tendency of the deutsche mark.\(^8\)

**Short-term expectations**

Over the short-term it is possible for most of those agents using the exchange rate as a means to an end to hedge against any possible adverse movements.\(^9\) Furthermore, those involved in portfolio investment, and especially direct foreign investment and trade, will find that contracts and physical circumstances make it difficult to shift from one country to another, regardless of their expectations. Their movement will take place only over the medium run.

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\(^7\) Actually, the role of "news" is usually associated with the short-term volatility of rates. While this will be held to be true later in this paper, in this instance short-term volatility is not the object of analysis.

\(^8\) Schulmeister uses only the balance on current account and real interest rate differences in explaining medium-term movements, but arrives at very interesting results nonetheless (Schulmeister, 1988, pp. 358–363).

\(^9\) Even then, it can be expensive (Horton, 1986).
This leaves short-term movements to be determined by reserve asset holdings and speculators. The determinants themselves are largely the same as those outlined above:

\[
E^e_{t+m} = f [BOCA_t, BOCA_t^*, (r - r^*), (p_t - p_t^*), (g_t - g_t^*), RULE, RUN],
\]

where \(E^e_{t+m}\) is the expected value of the exchange rate \(m\) periods from the present \((m < n)\); \(RULE\) is the buy or sell signal given by the various technical trading rules; and \(RUN\) is the number of consecutive time periods \(E\) has moved in the same direction (the number is positive if \(E\) has been rising, negative if it has been falling).\(^{10}\) Also, as above, these determinants are really expected values:

\[
X_S = f(Y_S),
\]

where the subscript \(S\) denotes short run. Despite apparent similarities between equations (2) and (4) with respect to those determinants they have in common, there is a general tendency for the responsiveness of the dependent variable to be greater in equation (4).\(^{11}\) In Davidson’s terms, the elasticity of expectations is higher.

Technical trading rules in foreign exchange trading (\(RULE\) in equation (4)) are both widespread and consistently profitable. Their effect on the exchange rate is to make upturns and downturns more substantial than they otherwise might be. Specifically, they contribute to the “bandwagon effect” (Schulmeister, 1988, pp. 347–350). Consider the following sequence of events:

“news” \(\rightarrow\) upward \(\rightarrow\) buy DM \(\rightarrow\) trigger \(\rightarrow\) buy DM
favorable revision to DM \(\rightarrow\) “buy DM” programs
of \(E^e_{t+m}\)

Here, some event in the market causes market participants to expect a rise in the value of the deutsche mark. For this example, let us say that

\(^{10}\) It was pointed out in note 8 that the support for including price and growth rates may be a bit weak. Since the evidence is derived from models specified in different ways from the present one, however, final judgment should be reserved until the present theory is tested.

\(^{11}\) In other words, the value of the partial derivative of the dependent variable with respect to the common independent variables is greater in absolute value terms in equation (3) than in equation (1).
the Bundesbank announces that it has decided to attack German inflation vigorously, causing traders to expect higher interest rates. Depending on the expected timing of the German action, equations (3) and (5) (and therefore equations (2) and (4)) will be reevaluated, and the DM will be expected to rise. This spurs traders to buy DM and therefore raises its value (equation (1)). As the DM appreciates, it may begin to pass those levels at which technical trading programs indicate “buy.” If they do buy, then more traders jump on the bandwagon and the DM soars even higher. This force can work to increase depreciation as well.

Finally, \( R\) represents the cash-in effect (Schulmeister, 1988, p. 346). As the DM rises in the above example, for instance, the temptation to sell will rise. Thus, as the DM appreciates, it can be expected that negative “news” will carry more and more weight with traders, while the impact of positive news will decline.

With both \( E_{t+n}^e \) and \( E_{t+m}^e \) defined, the model is complete. Recalling equation (1), changes in \( E_{t+n}^e \) and \( E_{t+m}^e \) (since \( E_{t-1} \) cannot change once time period \( t-1 \) is past) will cause a change in the exchange rate. In practice, most rate changes are likely to be the result of traders' reevaluation of \( E_{t+m}^e \), while \( E_{t+n}^e \) provides a medium-run trend, dampening movements away from \( E_{t+n}^e \) and magnifying those toward it (Schulmeister, 1988, p. 346).

**Short-term volatility**

It still remains to be explained why exchange rates are so volatile in the short run. In terms of the above equations, any volatility would be likely explained by rapid reevaluation of the exchange rate expectations associated with equations (4) and (5). Such rapid reevaluation is very likely in an environment of uncertainty, historical time, and irreversible decision making.

Uncertainty implies that, given the multitude of determinants that are represented by \( Y_s \), only a small subset is ever known. Furthermore, neither the relative importance of the known determinants nor the total number of all determinants (if, indeed, such a concept is relevant) is known. Combine this with the relative irreversibility of taking action, which eliminates recontracting and helps put the model in historical time, and the purchase and sale of foreign currency is seen in a new light. Now, given the importance of making a decision (spurred by animal spirits)—an irreversible one at that—and the guesswork involved in determining which decision to make, the stage is set for economic agents
to attribute to each new piece of news much more weight than it would deserve in a world of perfect certainty. As new information becomes known, expectations are rapidly reviewed and altered, and actions soon follow. Expectations are volatile, therefore actions are volatile, therefore economic variables are volatile.

**Medium-term misalignment**

One last feature of the international monetary system that has not been properly addressed is the medium-term misalignment of exchange rates. Typically, calling an exchange rate “misaligned” means that the country in question has a persistent current account imbalance. Of course, the balance on current account is only one of many factors considered as important by traders. The term “misalignment” itself is a holdover from exchange theories that assumed, either implicitly or explicitly, that the main demand for foreign currency was trade-related. Were that true, then of course persistent balance-of-payments disequilibria would correct themselves.

Another factor that may be at work is the passage of historical time, a concept very familiar to Post Keynesian macroeconomists. Benninga and Protopapadakis (1988) have found that modeling trade outside a general equilibrium framework can, by itself, produce price and exchange rate movements that show no systematic tendency toward purchasing power parity.

**III. Conclusions**

This model can explain all the salient features of the post–Bretton Woods float, especially short-run volatility and medium-run misalignment. It makes use of uncertainty, historical time, and irreversible decision making, and shows these to be important features of the real world.

But one element is lacking: empirical verification. While the nature of the short-run determinants may be such that they do not lend themselves to statistical testing, it may be possible to examine the medium-run determinants. Until this work is begun, however, perhaps the above model offers a starting point for a Post Keynesian theory of exchange rate determination.

**REFERENCES**


