EXCHANGE RATE DYNAMICS

by

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Number 167 November 1975

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I. INTRODUCTION

This paper develops a simple general equilibrium model for the determination of the level and time path of exchange rates. In line with recent literature the paper emphasizes the role of asset markets, capital mobility and expectations. Specifically, we assume that asset markets clear continuously, that perfect capital mobility serves to maintain equality between expected net yields and that expectations are "rational" in the sense that expectations about the behavior of the exchange rate are actually borne out. The dynamic aspects of exchange rate determination arise from the assumption that exchange rates and asset markets adjust fast relative to the goods market.

The analysis of a monetary expansion in this framework serves to identify three features of the adjustment process that are suggestive of recent exchange rate experience. In the short run a monetary expansion is shown to induce an immediate and more than proportionate depreciation in the exchange rate and accounts therefore for sharp fluctuations in the

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*I am indebted to Stanley Black, Franco Modigliani and Edward Tower, whose comments on a related paper provided the stimulus for the present extension. I wish to acknowledge, too, helpful suggestions from Stanley Fischer.

exchange rate. During the adjustment process, rising prices are accompanied by an appreciating exchange rate so that the cyclical behavior of exchange rates stands in strong contrast with the trend behavior of exchange rates and prices. The third aspect of the adjustment process is a direct effect of the exchange rate on domestic inflation. In this context, the exchange rate is identified as a critical channel for transmission of monetary policy in the short run.

In Part II we develop a formal model in terms of explicit functional forms. That development allows us to derive an analytical solution both for the time path of variables and in Part III, for the expectations mechanism that has the property of rationality or equivalently, in the present deterministic setting, that generates the perfect foresight path. In Part IV, the model is used to investigate the effects of a monetary disturbance.

II. THE MODEL

We will assume a country that is small in the world capital market so that it faces a given interest rate. Capital mobility will ensure the equalization of expected net yields so that the domestic interest rate, less the expected rate of depreciation, will equal the world rate. In the goods market we will assume that the world price of foreign goods is given but that domestic output is an imperfect substitute so that aggregate demand for domestic goods will determine their absolute and relative price.

1. Capital Mobility and Expectations

Assets denominated in terms of domestic and foreign currency are assumed to be perfect substitutes given a proper premium to offset anticipated
appreciation, or depreciation, of the domestic currency. Accordingly, if the domestic currency is expected to depreciate, interest rates on assets denominated in terms of domestic currency will exceed those abroad by the expected rate of depreciation. That relationship is expressed in (1) where \( r \) is the domestic interest rate, \( r^* \) is the given world rate of interest and \( x \) is the expected rate of depreciation of the domestic currency, or the expected rate of increase of the domestic currency price of foreign exchange:

\[
(1) \quad r = r^* + x
\]

Equation (1) is a representation of perfect capital mobility and it is assumed that incipient capital flows will affect interest rates or exchange rates in such a manner that (1) holds all the time.

Consider next expectations formation. Here we distinguish between the long-run exchange rate, to which the economy will ultimately converge, and the current exchange rate. Denoting the logarithms of the current and long-run rate by \( e \) and \( \bar{e} \), respectively, we assume that:

\[
(2) \quad x = \theta (\bar{e} - e)
\]

Equation (2) states that the expected rate of depreciation of the spot rate is proportional to the discrepancy between the long-run rate and the current spot rate. The coefficient of adjustment \( \theta \) is for the present taken as a parameter but will shortly be constrained to be consistent with rationality. The long-run exchange rate in (2) is assumed known and an expression for it will be developed below. The remaining element in (1) and (2) is the domestic rate of interest rate to which we turn in the next section.
2. The Money Market

The domestic interest rate is determined by the condition of equilibrium in the domestic money market. The demand for real money balances is assumed to depend on interest rates and real income, Y, and will, in equilibrium, equal the real money supply, M/P. Assuming a demand for money, the log of which is linear in the log of real income and in interest rates we have:

\[ -\lambda r + \phi y = m - p \]

where m, p, and y denote logs of the nominal quantity of money, the price level and real income. We can solve (3) for the equilibrium interest rate as a function of real income and real balances:

\[ r = \frac{1}{\lambda}(p - m) + \frac{\phi}{\lambda}y \]

From equation (4) we note the conventional properties that an increase in real income raises interest rates as does a reduction in the real money supply. For the remainder of this part we will take the nominal quantity of money and real income as given.

Combining (1), (2), and (4), will give us a relationship between the spot exchange rate, the price level and the long run exchange rate given that the money market clears and net asset yields are equalized:

\[ \frac{1}{\lambda}(p - m) + \frac{\phi}{\lambda}y = r^* + \theta(e - e) \]

---

1Equation (2) is obtained by taking the logarithm of the money market equilibrium condition \( \frac{M}{P} = \Phi exp(-\lambda r) \). Throughout the paper the logs of a variable will be denoted by a lower case letter.
Equation (5) can be simplified by noting that with a stationary money supply, long-run equilibrium will imply equality between interest rates because current and expected exchange rates are equal. This implies that the long-run equilibrium price level, \( \bar{p} \), will equal:

\[
(6) \quad \bar{p} = m + (\lambda r^* - \delta y)
\]

Substituting (6) in (5) gives us a relationship between the exchange rate and the price level:

\[
(5)' \quad e = \bar{e} - (1/\lambda \theta)(p - \bar{p})
\]

Equation (5)' is one of the key equations of the model. For given long-run values of exchange rates and prices it serves to determine the current spot price of foreign exchange as a function of the current level of prices. Given the level of prices, we have a domestic interest rate and an interest differential. Given the long-run exchange rate there is a unique level of the spot rate such that the expected appreciation, or depreciation, matches the interest differential. An increase in the price level by raising interest rates will give rise to an incipient capital inflow that will appreciate the spot rate to the point where the anticipated depreciation exactly offsets the increase in domestic interest rates.

3. The Goods Market

The demand for domestic output depends on the relative price of domestic goods, \( e-p \), interest rates and real income. The demand function is assumed to have the following functional form:

\[
(7) \quad \ln D = u + \delta(e-p) + \gamma y - \sigma r
\]
where $D$ denotes the demand for domestic output and where $u$ is a shift parameter. From (7) we note that a decrease in the relative price of domestic goods raises demand as does an increase in income, or a reduction in interest rates. The rate of increase in the price of domestic goods, $\dot{p}$, is described in (8) as proportional to an excess demand measure.

\begin{equation}
\dot{p} = \pi \ln(D/Y) = \pi [u + \delta (e-p) + (\gamma - 1)y - \sigma r]
\end{equation}

Equation (9) can be simplified by solving for the long-run equilibrium relative price, $e-\bar{p}$. Setting $\dot{p}=0$ and $r=r^*$, we have

\begin{equation}
\delta (e-\bar{p}) = \sigma r^* + (1-\gamma)y - u
\end{equation}

and using that substitution in (8) yields:

\begin{equation}
\dot{p} = \pi \left[ \delta (e-e) + \delta (\bar{p}-p) + \sigma r^* - r \right]
\end{equation}

Substitution of $r^*-r = -\theta (e-e)$ and (5)' gives us the final form of the price adjustment equation:

\begin{equation}
\dot{p} = -\pi \left[ \frac{\delta + \sigma \theta}{\theta \lambda + \delta} \right] (p-\bar{p}) = -v(p-\bar{p})
\end{equation}

where

\begin{equation}
v = \pi \left[ \frac{\delta + \sigma \theta}{\theta \lambda + \delta} \right]
\end{equation}

The price adjustment equation in (10) can be solved to yield

\begin{equation}
p(t) = \bar{p} + (p_0 - \bar{p}) \exp(-vt)
\end{equation}

1The correct relative price argument in (7) is $(e+p^*-p)$ where $p^*$ is the logarithm of the foreign price level. Setting the foreign price level equal to unity implies that $p^*=0$. 
which shows that the price of domestic output will converge to its long-run level at a rate determined by (11). Substitution of (12) in (5)' gives the time path of the exchange rate:

\[ e(t) = \bar{e} - (1/\lambda \theta)(p_o - \bar{p})\exp(-vt) \]

\[ = \bar{e} + (e_o - \bar{e})\exp(-vt) \]

From (13) the exchange rate will likewise converge to its long-run level. The rate will appreciate, if prices are initially below their long-run level and conversely if prices initially exceed their long-run level.

4. **Equilibrium Exchange Rates**

The adjustment process of the economy can be described with the help of Figure 1. At every point in time the money market clears and expected yields are arbitraged. This implies a relationship between prices and the spot exchange rate shown in (5)' and reflected in the QQ schedule in Figure 1. The positively sloped schedule \( \dot{p}=0 \) shows combinations of price levels and exchange rates for which the goods market is in equilibrium. Points above and to the left of that schedule correspond to an excess supply for goods and rising prices and conversely for points to the right and below the schedule. The \( \dot{p}=0 \) schedule is positively sloped and flatter than a 45° line for the following reason. An increase in the exchange rate creates an excess demand for domestic goods by lowering their relative price. To restore equilibrium, domestic prices will have to increase though proportionately less, since an increase in domestic prices affects aggregate demand, both via the relative price effect and via higher interest rates.
For any given price level the exchange rate adjusts instantaneously to clear the asset markets. Accordingly, we will be all the time on the QQ schedule with money market equilibrium and international arbitrage of net expected yields. Goods market equilibrium on the contrary is only achieved in the long run. Conditions in the goods market, however, are critical in moving the economy to the long-run equilibrium by inducing rising or falling prices. Specifically, an initial position such as point B, with a price level below the long-run level and, correspondingly, an exchange rate in excess of the long-run equilibrium, implies an excess demand for goods because domestic output commands a low relative price and because the interest rate is low. Accordingly, prices will be rising and thereby induce over time a reduction in excess demand. The path of rising prices is accompanied by an appreciation of the exchange rate. As interest rates rise, as a consequence of declining real balances, the spot rate will approach the long-run rate so as to reduce the expected rate of appreciation. Once the long-run equilibrium at point A is attained, interest rates are equal internationally, the goods market clear, prices are constant and expected exchange rate changes are zero.

III. RATIONAL EXPECTATIONS

So far we have placed no restrictions on the formation of exchange rate expectations other than the assumption that the expected rate of depreciation, as shown in (2), is proportional to the discrepancy between the long-run rate and the current exchange rate. The next question then is to ascertain the conditions under which these exchange rate expectations are actually fulfilled so that actual and expected rates of depreciation are equal. Imposing the condition \( \hat{e} = x \) in (2), we have:
(14) \[ \dot{e} = \theta(\tilde{e} - e) \]

which has the solution:

(15) \[ e(t) = \tilde{e} + (e_0 - \tilde{e})\exp(-\theta t) \]

Comparison of (15) with (13) shows that expectations will be correct only if the following condition holds:

(16) \[ \theta = v \equiv \pi\left(\delta + \sigma\theta\right)/\theta\lambda + \delta \]

Equation (16) can be solved for the rational expectations coefficient of adjustment, \( \tilde{\theta} \): \(^1\)

(17) \[ \tilde{\theta}(\lambda, \delta, \sigma, \pi) = \pi(\sigma/\lambda + \delta)/2 + \pi^2(\sigma/\lambda + \delta)^2/4 + \pi\delta/\lambda \] \(^{1/2} \)

Equation (17) gives the rate of adjustment of exchange rates along the perfect foresight path. If expectations are formed according to (17), predictions will actually prove correct. The characteristics of that path depend on the structural parameters of the economy. In particular, the critical parameters are the interest response of money demand and aggregate spending, \( \lambda \) and \( \sigma \), the price elasticity of demand for domestic goods, \( \delta \), and the speed of adjustment of prices, \( \pi \).

Consider now in more detail the manner in which these parameters contribute to the speed of adjustment. For that purpose, we recognize that the speed of adjustment will be larger, the larger the reduction in inflation that is brought about by an increase in the level of prices.

\(^1\)In (17) we have chosen the positive and therefore stable root of the quadratic equation implied by (16).
Differentiating \((8)\) we note that a higher level of prices will affect excess demand and thereby inflation via two channels, relative prices and interest rates:

\[
\frac{\Delta p}{\Delta p} = \pi [\delta (\Delta e/\Delta p - 1) - \sigma \Delta r/\Delta p]
\]

A given increase in relative prices or interest rates will affect aggregate demand more the higher the price elasticity and the larger the interest response of spending. The last parameter of concern is the interest response of money demand. A high interest response of money serves to dampen the effects of higher prices on aggregate spending because it implies a smaller change in the interest rate, as shown in \((4)\), and also a smaller appreciation of the exchange rate as can be seen from \((5)\).

In summary, rational expectations involve consideration of the channels through which prices (money) affect the rate of inflation and therefore the dynamic path of the economy. An important implication of this approach is that one cannot explore the contribution of a particular parameter to the speed of adjustment without asking at the same time how it affects expectations. Accordingly, \((17)\), not \((11)\), provides the relevant framework for such questions, since it embodies the adjustment of expectations to the relevant information.

IV. THE EFFECTS OF A MONETARY EXPANSION

In this part we will study the adjustment process to a monetary expansion. The analysis serves to derive substantive results but also to highlight the manner in which expectations about the future adjustment
path of the economy affect the current level of the exchange rate. This link is embodied in rational expectations and makes the impact effect of a monetary disturbance depend on the entire structure of the economy.

In Figure 2 we show the economy in initial full equilibrium at point A, with a long-run price level $\bar{p}_o$ and a corresponding long-run exchange rate $\bar{e}_o$ where the level of prices is determined, according to (6), by the nominal quantity of money, real income and the interest rate. The long-run exchange rate by (9) will depend on the level of domestic prices and characteristics of the demand for domestic goods. The asset market equilibrium schedule QQ that combines monetary equilibrium and arbitrage of net expected yields is drawn for the initial nominal quantity of money as is the goods market equilibrium schedule $\bar{p}=0$.

An increase in the nominal quantity of money that is expected to persist will cause a goods and asset market disequilibrium at the initial exchange rate and prices. To maintain asset market equilibrium, the increased quantity of money would have to be matched by higher prices. The increase in prices would, at the initial exchange rate, have to exceed the increase in money because expectations of a long-run depreciation of the exchange rate create an anticipation of depreciation that has to be offset by higher domestic interest rates. The upward shift of the asset market equilibrium schedule to Q'Q' reflects therefore both the increase in the quantity of money and the resulting expectation that the long-run exchange rate will be higher.\footnote{From (5)' we have the shift in the QQ schedule at the initial exchange rate as $dp/dm = 1 + \lambda \theta$, since $d\bar{p} = d\bar{e} = dm$. The second term reflects the effect of a monetary expansion on the long-run exchange rate and thereby on current expectations.}
FIGURE 2
The goods market equilibrium schedule is similarly affected by an increase in money. At the initial exchange rate and prices an increase in money would lower interest rates and thereby create an excess demand for goods. To eliminate that excess demand prices would have to increase, although less than the increase in money, since prices affect the demand for goods, both via the interest rate and the relative price channels. Accordingly, the goods market equilibrium schedule shifts upward to \( \dot{p} = 0 \).

It is immediately obvious that the new long-run equilibrium will be at point C, where both goods and asset markets clear and where the increase in prices and the exchange rate exactly reflect the increase in money. This long-run homogeneity result is not surprising, since there is no source of money illusion or long-run price rigidity in the system.

Consider next the adjustment process. At the initial level of prices, the monetary expansion creates an excess supply of money and thereby induces a reduction in domestic interest rates. At the same time the monetary expansion leads speculators to anticipate a depreciation in the long-run exchange rate and therefore, at the current exchange rate, a depreciating exchange rate. Both factors, therefore, serve to reduce the attraction of domestic assets and give rise to an incipient capital outflow. This incipient capital outflow causes the spot rate to depreciate. The extent of that depreciation has to be sufficient to give rise to the anticipation of appreciation at just sufficient a rate to offset the reduced domestic interest rate. The impact effect of a monetary expansion

\[ p = \frac{\delta \lambda}{(\delta \lambda + \sigma)} e + \frac{\sigma}{(\delta \lambda + \sigma)} m + \frac{\lambda}{(\delta \lambda + \sigma)} (u - (1 - \gamma)y - \phi y) / \lambda \]

Accordingly, the shift of the \( \dot{p} = 0 \) schedule at the initial exchange rate is equal to \( \frac{dp}{dm} = \sigma / (\delta \lambda + \sigma) \).

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Setting \( \dot{p} = 0 \) in (8) and substituting for the domestic interest rate from (4) yields the equation of the goods market equilibrium schedule:

\[ p = \frac{\delta \lambda}{(\delta \lambda + \sigma)} e + \frac{\sigma}{(\delta \lambda + \sigma)} m + \frac{\lambda}{(\delta \lambda + \sigma)} (u - (1 - \gamma)y - \phi y) / \lambda \]

Accordingly, the shift of the \( \dot{p} = 0 \) schedule at the initial exchange rate is equal to \( \frac{dp}{dm} = \sigma / (\delta \lambda + \sigma) \).
is therefore to induce an immediate depreciation in the spot rate and one that exceeds the long-run depreciation, since only under these circumstances will speculators anticipate an appreciating exchange rate and thus be compensated for the reduced interest on domestic assets. This is shown in Figure 2 by the move from point A to the short-run equilibrium at point B.

From equation (5)' we obtain a formal expression for the depreciation in the exchange rate, given the initial price level. Noting that $\Delta e = \Delta d = \Delta m$ we obtain from differentiation of (5)'

\[
\frac{d e}{d m} = 1 + \frac{1}{\lambda \theta}
\]

the impact effect of a monetary expansion on the exchange rate. Equation (19) confirms that the exchange rate will depreciate proportionately more than the increase in the nominal quantity of money. The extent to which the exchange rate overshoots will depend on the interest response of money demand and the expectations coefficient. A high interest response of money demand will serve to dampen the overshooting because it implies that a given expansion in the (real) quantity of money will only induce a small reduction in the interest rate. A small reduction in the interest rate in turn requires only a small expectation of appreciation to offset it and therefore, given the coefficient of expectations and the long-run rate, only a small depreciation of the spot rate (in excess of the long-run rate) to generate that expectation. A similar interpretation applies to the coefficient of expectations in (19). Given the interest response and therefore the reduction in the interest rate brought about by the monetary expansion, the depreciation in the spot rate will have to be larger the smaller the coefficient of expectations and therefore, the expected rate
of appreciation of the spot rate brought about by a given depreciation of the spot rate beyond the long-run rate.

It is quite obvious from the preceding explanation that the short-term effects of a monetary expansion are entirely dominated by asset markets and more specifically by capital mobility and expectations. This feature places in sharp relief the assumption that asset markets and exchange rates adjust fast, relative to the goods market and the price of domestic output. It is under these circumstances that a change in the nominal quantity of money is, in fact, a change in the real quantity of money and the spot rate adjustment serves to achieve equilibrium in the asset markets by creating the expectation of appreciation of just sufficient an extent to balance the reduced interest rate on domestic assets.

The interpretation of (19) has not so far used the restriction that expectations be rational. That restriction is readily introduced by substituting (17) in (19) to obtain:

\[
(20) \quad \frac{de}{dm} = 1 + \frac{1}{\lambda \theta} = 1 + \frac{1}{\frac{\pi(\sigma+\delta \lambda)/2}{\pi^{2}(\sigma+\delta \lambda)^2/4 + \pi \delta \lambda}}^{1/2}
\]

Equation (20) has two implications that cannot be derived from (19). The first is that with an interest response of money demand that approaches zero, the initial depreciation remains finite and, in fact, approaches \( \frac{de}{dm} = 1 + \frac{1}{\pi \sigma} \). This result reflects the fact that for the large interest rate changes that would result in these circumstances, the subsequent path of prices and the exchange rate is governed by the effect of interest rates on aggregate demand.
A second implication of (20) is the fact that the short-run overshooting of the exchange rate is inversely related to the speed of adjustment of the system. That fact is particularly obvious for the case where the speed of adjustment of prices, \( \pi \), becomes infinite and where accordingly, the economy jumps instantaneously to the new long-run equilibrium at point \( C \). More generally, those factors that serve to speed up the adjustment process, in particular high interest rate responsiveness of money demand, or aggregate spending, or high price elasticities, will therefore serve to dampen the impact effect of a monetary expansion on the exchange rate. This effect relies entirely on expectations about the subsequent path of the economy, rather than on current interaction between goods and asset markets.

Consider next the adjustment process from the short-run asset market equilibrium at point \( B \) to long-run equilibrium at point \( C \). We note from Figure 2 that at point \( B \) there is an excess demand for goods. That excess demand arises both from the decline in domestic interest rates and from the depreciation in the exchange rate that lowers the relative price of domestic goods. Each factor by itself is sufficient to account for this excess demand and, in fact, they constitute independent channels through which monetary changes affect aggregate demand for domestic output.

The exchange rate channel has been identified by Fleming and Mundell as an important avenue for monetary policy to act on aggregate demand.\(^2\)

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\(^1\) The slope of the \( QQ' \) schedule is \( \frac{dp}{de} = -\theta \lambda \) and the schedule becomes vertical as \( \theta \) approaches infinity.

\(^2\) In the Mundell-Fleming model with prices and interest rates fixed the depreciation, by worsening the terms of trade, creates the necessary increase in aggregate demand to support the higher level of income required by monetary equilibrium. For a further discussion see Niehans (1975) and Dornbusch (1975).
In the present context the depreciation of the spot rate that is induced by the conditions of asset market equilibrium serves to reduce the relative price of domestic goods and thereby to raise aggregate demand and give rise to inflationary pressure as opposed to an increase in output. The importance of this channel is larger, the higher the price elasticity of demand, relative to the interest response of aggregate spending. Specifically, the contribution to domestic inflation that arises from the exchange rate channel alone is given by $\frac{d\hat{p}}{dm} = \pi\delta(1+1/\tilde{\theta}\lambda)$. In assessing the importance of that channel, one may be tempted to conclude that a low price elasticity of demand is likely to make it unimportant. That reflection is not entirely correct, however, since a low price elasticity will be reflected in a lowering of $\tilde{\theta}$, which at least in part compensates by inducing larger exchange rate changes.

The lower interest rates and a lower relative price of domestic goods, that are characteristics of the short-run adjustment, will cause domestic prices to rise and therefore be reflected in falling real money balances, rising interest rates, and an appreciating exchange rate. The impact effect of money on the exchange rate and interest rates, accordingly, brings into operation an adjustment process of rising prices that over time restores the economy to the initial real equilibrium. An important feature of that adjustment process is the fact that rising prices are accompanied by an appreciating exchange rate. In terms of Figure 2, this is described by the move along Q'Q' from B to C. This result is due to the fact that rising prices cause the real money supply to be falling and interest rates to be rising. The rising interest rate, in turn, gives rise to an incipient capital inflow that appreciates the exchange rate at the same rate as
interest rates are rising and thus maintains expected net yields in line. The model therefore confirms the link between interest rates and exchange rates that is emphasized in popular interpretations of foreign exchange events. The observation is correct, in the present circumstances, because rising interest rates are accompanied by the expectation of an appreciating exchange rate.

The present analysis suggests that the cyclical behavior of exchange rates and prices stands in sharp contrast to the trend movements. The trend behavior is one where rising money and prices are reflected in a depreciating exchange rate. The cyclical pattern of adjustment to a change in the level of money (or the growth rate of money) associates rising prices with an appreciating exchange rate. The result is entirely due to the initial overshooting and, more fundamentally, to the role of expectations in the adjustment process and to the differential speeds of adjustment of goods and asset markets. The theory, therefore, provides a further explanation of the poor results achieved by "purchasing power parity" calculations when applied to the short run.

In summarizing this part we note that the ultimate effect of a monetary expansion is an equiproportionate increase in prices and the exchange rate. In the short run, however, the monetary expansion does exert real effects on interest rates, the terms of trade and aggregate demand. The details of the adjustment process will depend on the economic structure. In particular, terms of trade changes will be both larger and more persistent the lower the speed of adjustment \( \theta \).
V. CONCLUDING REMARKS

The analysis of exchange rate movements in this paper focuses on the role of capital mobility and expectations. The critical assumption that goods markets and prices adjust slowly relative to asset markets and exchange rates provides a basis for exchange rate dynamics. The perfect foresight path of the economy is explicitly derived and the implications of rational expectations for the characteristics of the adjustment process in response to a monetary expansion are noted. These characteristics include an initial overshooting of exchange rates and transitory terms of trade effects the magnitude and persistence of which is inversely related to the anticipated speed of adjustment of the economy.

In concluding this paper we should emphasize once more the critical role that is played by the assumption that goods markets and prices adjust slowly. While that assumption is no doubt descriptive of the facts, it might well be developed more explicitly along with a short-run responsiveness of supply to variations in aggregate demand. A further important extension would draw into the analysis explicit stochastic elements. Such an extension could provide theoretical support for the short-run stickiness of prices, while at the same time, having implications for the manner in which expectations are formed.¹

¹Exchange rate determination in a stochastic setting has been studied by Black (1973), Kourri (1975), and Musa (1976). Fischer (1974) has used a stochastic framework to evaluate fixed versus flexible exchange rate systems.
REFERENCES


Hamada, Koichi/Domestic distortions, 1
725441  D*BKS  00019889
3 9080 000 b46 346

Engle, Robert /Estimation of the price
726280  D*BKS  00019891
3 9080 000 b46 395

Varian, Hal R./Two problems in the the
726270  D*BKS  00020187
3 9080 000 b50 116

Bhagwati, Jagd/Optimal trade policy an
726287  D*BKS  00019892
3 9080 000 b46 411

Dornbusch, Rud/The theory of flexible
726283  D*BKS  00019896
3 9080 000 b46 262

Fischer, Stan/Long-term contracts, ra
726290  D*BKS  00019865
3 9080 000 b46 239

Dornbusch, Rud/Exchange rate dynamics
726293  D*BKS  00019888
3 9080 000 b46 312

Fisher, Frankl/Continuously dated comm
726252  D*BKS  00023128
3 9080 000 b89 254