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A SYNTHESIS OF KEYNESIAN, MONETARY, AND PORTFOLIO APPROACHES TO FLEXIBLE EXCHANGE RATES

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ABSTRACT

This paper presents a simple synthesis of Keynesian, monetary, and portfolio approaches to macroeconomic theory under flexible exchange rates. By including the key features of all the partial approaches in a general model, we show that some of the important contrasts that have been drawn between the approaches are due to a neglect of repercussions elsewhere in the economy. After reconciling these false contrasts, we show how some of the approaches still give different predictions about the effects of monetary and fiscal policy using differing assumptions about the international mobility of goods and financial assets.

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A SYNTHESIS OF KEYNESIAN, MONETARY, AND PORTFOLIO APPROACHES TO FLEXIBLE EXCHANGE RATES

Introduction

The purpose of this paper is to extend our earlier synthesis of monetary and Keynesian approaches to balance-of-payments theory under fixed exchange rates[1] to the analysis of flexible exchange rates. As they have been presented in the literature, the Keynesian, monetary, and portfolio approaches to the determination of exchange rates give very different predictions about, for example, the effects of changes in income and interest rates on exchange rates. As a result, strong contrasts have been drawn between them, especially between the Keynesian and monetary approaches.[2] Like our earlier paper, this one is intended to show that most of these contrasts are potentially misleading, since each approach can be best seen as part of a larger system. Within the larger system which we develop, we show that the different predictions of the partial approaches are based in part on ignoring other important parts of the system, and in part on particular assumptions about expectations and about the strength of the international linkages among national markets for goods and financial assets.

In Section I we introduce the general model on which our synthesis of the Keynesian, monetary, and portfolio approaches is based. Section II presents a brief review of the partial approaches in order to highlight the role of each of these in the general model; we also discuss attempts that have been made to discriminate empirically among the partial approaches. In Section III we reduce the general model to a simple diagram which illustrates the simultaneous determination of the exchange rate and output in the short and medium term, and use the diagram to analyse the effects of monetary and fiscal policy. We also discuss the role of exchange rate expectations and show how purchasing power parity and interest parity can be handled as special cases of the general model. Section IV summarizes our findings.

I. A General Model of Exchange Rate Determination

We begin by presenting a general model of exchange rate determination which, unlike the partial approaches, permits the short-run endogeneity of output, prices, and interest rates to be taken into account simultaneously. As the model is essentially short-run in nature, it suppresses many elements of economic behavior that are potentially relevant for exchange rates, especially in the longer run. In particular, we ignore the effects of capital formation and other changes in wealth on spending and aggregate supply. This we do deliberately in order to be able to present the synthesis in the simplest possible way.

Our model has a linkage between the current account and the capital account similar to that emphasized by Kouri (1976) and by Dornbusch and Fischer (1980): the exchange rate adjusts to give portfolio equilibrium in the short run, and the resulting current account surplus or deficit is the means by which the stock of foreign assets adjusts towards its new equilibrium value. While their models have much richer expectations structures than ours, our model (like those of Kenen and Allen (1980) and Tobin and Macedo (1980)) permits output to alter under a demand shock, thus providing an important additional linkage between the current account and the exchange rate.

The equations of the general model are as follows:

$$(1)\quad M = m(\overset{+}{Y}, \overset{-}{r}, \overset{-}{r^*}, (\overset{-}{\bar{e}} - e)/e)W \qquad \text{(money market)}$$

$$(2)\quad B = b(\overset{0}{Y}, \overset{+}{r}, \overset{-}{r^*}, (\overset{-}{\bar{e}} - e)/e)W \qquad \text{(bond market)}$$

$$(3)\quad eB^* = b^*(\overset{-}{Y}, \overset{-}{r}, \overset{+}{r^*}, (\overset{+}{\bar{e}} - e)/e)W \qquad \text{(foreign bonds)}$$

$$(4)\quad W = M + B + eB^* \qquad \text{(wealth)}$$

$$(5)\quad Y = E(\overset{+}{Y}, \overset{-}{r}) + G + T(\overset{-}{Y}, \overset{+}{Y^*}, \overset{+}{eP^*/P}) \qquad \text{(goods market)}$$

$$(6)\quad P = Q(\overset{+}{Y}) \qquad \text{(aggregate supply)}$$

$$(7)\quad \Delta R = PT(\overset{-}{Y}, \overset{+}{Y^*}, \overset{+}{eP^*/P}) - e\Delta B^* = 0 \qquad \text{(balance of payments)}$$

<u>Notation</u>

T - trade balance (real)

Y - income (real)

e - exchange rate (units of domestic currency per unit of foreign currency)

$\bar{e}$ - expected exchange rate

P - price level

F - net capital inflow (nominal)

r - interest rate (nominal)

R - reserves (measured in domestic currency)

M - money supply (nominal)

m - money demand (real)

B - domestic bond supply (nominal)

b - demand for domestic bonds (real)

B* - domestic holdings of foreign bonds (nominal)

b* - demand for foreign bonds (real)

W - wealth (nominal)

E - private expenditure (real)

G - government expenditure (real)

Δ - first difference operator

Foreign variables are marked by asterisks.

The first four equations describe equilibrium conditions in the markets for three types of assets:[3] (i) domestic money M [equation (1) with $m_Y > 0$, $m_r < 0$ and m_{r*}, $m_{\bar{e}} < 0$]; (ii) domestically issued nontraded bonds B [equation (2) with $b_Y = 0$, $b_r > 0$, b_{r*}, $b_{\bar{e}} < 0$]; and (iii) internationally traded bonds B* which are denominated in foreign currency [equation (3) with $b^*_Y < 0$, $b^*_r < 0$, b^*_{r*}, $b^*_{\bar{e}} > 0$]. The three assets are assumed to be gross substitutes. While M and B are exogenously determined, B* is initially predetermined, but changes as a result of international capital movements. Equation (5) shows income as the sum of private expenditure E, government expenditure G, and net exports T. Private expenditure is assumed to vary directly with income ($0 < E_Y < 1$) and inversely with the interest rate ($E_r < 0$) as usual,[4] while net exports vary inversely with the level of domestic income ($T_Y < 0$) and directly with the level of foreign income ($T_{Y*} > 0$) and with relative prices at home and abroad ($T_{eP*/P} > 0$).[5] Equation (6) is a standard aggregate supply equation which can be derived from the equilibrium condition for the labor market. Gradual adjustment of either nominal wages or of price expectations to changes in the price level ensures a positively sloped supply schedule; while either condition is sufficient, neither is necessary. The focus of the analysis to follow on the short to medium term justifies the exclusion of physical capital from the supply function, even though the allocation of financial capital among alternative assets plays a key role in the model.[6]

Equation (7) defines the balance of payments as the sum of (nominal) net exports and capital inflow from abroad; $e\Delta B^*$ is the net accumulation of foreign bonds, measured in domestic currency, in the hands of domestic residents.

II. A Brief Review of Partial Approaches

Before proceeding to analyze the general model and to present the partial approaches as special cases thereof, it is useful to provide a brief overview of these approaches as they have been formulated and tested in the literature.

a. Keynesian approach. In the tradition established by Meade (1951), Mundell (1962), and Fleming (1962), this approach may be represented by rewriting the balance-of-payments equation (7) as

$$(7') \quad \Delta R = PT(\overset{-}{Y}, \overset{+}{Y^*}, \overset{+}{eP^*/P}) + F(\overset{+}{r}, \overset{-}{r^*}) = 0$$

expressing the capital account in flow form rather than in stock adjustment form.[7] With the exchange rate assumed to clear the foreign exchange market, equation (7') may be solved for e to yield:

$$(8) \quad e = f(\overset{+}{Y}, \overset{-}{Y^*}, \overset{+}{P}, \overset{-}{P^*}, \overset{-}{r}, \overset{+}{r^*})$$

This "Keynesian" exchange rate equation implies the ceteris paribus propositions shown in the first line of Table 1.[8]

b. Monetary approach. In one of its two main versions, the monetary approach emphasizes immediate and continual purchasing power parity (PPP) through the close international linkage of goods markets (Frenkel 1976, Bilson 1978a, 1978b), and may be summarized by combining domestic and foreign money market equations: $M = Pm(Y, r)$ and $M^* = P^*m^*(Y^*, r^*)$, with the PPP condition $e = P/P^*$. This yields the following exchange rate equation:

$$(9) \quad e = f(\overset{-}{Y}, \overset{+}{Y^*}, \overset{+}{M}, \overset{-}{M^*}, \overset{+}{r}, \overset{-}{r^*})$$

The other main version of the monetary approach gives priority to the maintenance of interest parity through perfect arbitrage in international financial markets (Dornbusch 1976a). In this version the PPP equation is replaced by the interest parity condition $r = r^* + (\bar{e} - e)/e$ where $\bar{e}$ is assumed to be equal to the forward exchange rate. If, as in Dornbusch (1976a), P and $\bar{e}$ are taken as largely predetermined in the short run, then this equation and the money market equations can be solved to give:[9]

$$(9') \quad e = f(\overset{-}{Y}, \overset{+}{Y^*}, \overset{+}{M}, \overset{-}{M^*}, \overset{-}{P}, \overset{+}{P^*}, \overset{+}{\bar{e}})$$

Equations (9) and (9') imply the _ceteris paribus_ propositions shown in lines 2 and 3 of Table 1. As the table shows, the partial Keynesian approach and the two partial monetary approaches generally yield different predictions about the effects on the exchange rate of changes in domestic and foreign incomes, prices, and interest rates, reflecting different assumptions about what is being held constant: In particular, the monetary approach with PPP holds constant at all times a variable, eP*/P, that plays a crucial role in the adjustment process according to the Keynesian approach.

c. _Portfolio approach_. Within this framework, exchange rates (and interest rates) are determined in the short run by equilibrium conditions in asset markets, summarized by equations (1) - (4) above. Abstracting from expectations and assuming output fixed, substitution of equation (4) into (1) and (3) gives the following quasi-reduced-form solution for the exchange rate (note that equation (2) is redundant by Walras' Law):[10]

$$(10)\quad e = f(\overset{+}{M}, \overset{?}{B}, \overset{-}{B^*}, \overset{+}{r^*})$$

This equation implies the ceteris paribus propositions shown in line 4 of Table 1. The effect of r* on e is consistent with the Keynesian approach and with the interest parity version of the monetary approach, but not with the PPP version.

The portfolio approach also includes the balance-of-payments equation (7) which governs the evolution of the exchange rate over time. If, for given Y, Y*, P, and P*, the instantaneous equilibrium solution for e from equation (10) does not result in current account equilibrium, the corresponding disequilibrium in the capital account changes B* and thus feeds back on the exchange rate through equation (10). Assuming stability,[11] this dynamic process continues until equilibrium is reached in both the current account and the capital account, implying the following medium-term equilibrium solution for the exchange rate:

$$(10')\quad e = f(\overset{+}{Y}, \overset{-}{Y^*}, \overset{+}{P}, \overset{-}{P^*})$$

This equation implies the standard "Keynesian" propositions about the effects of changes in output and prices. These predictions are contrary to some of the ceteris paribus predictions of each of the monetary approaches (see Table 1).

Empirical tests

What could one hope to learn from the results of empirical tests of the various partial approaches to the exchange rate? Although each approach offers an equation that may be estimated directly, each of these equations contains variables that have important links to the exchange rate through channels other than the one emphasized (as illustrated by Lindbeck 1976, p. 140). This poses a potentially serious problem of omitted variables, especially if the estimated equation is a quasi-reduced form rather than a structural equation. For example, estimates of equation (9) have been taken to "offer strong support for the monetary approach in general" (Bilson 1978b, p. 396), and when the equation is run against direct estimates of the PPP condition, $e = P/P^*$, it generally provides much better forecasts of the exchange rate. But how can the PPP condition, when estimated together with money demand equations, do better than the PPP equation by itself? When Bilson (1978a, p. 64) constrains the coefficients of equation (9) to be consistent with his *a priori* beliefs about the parameters of money demand equations, he finds "the harsh truth ... that the monetary model does not improve upon a sophisticated PPP model as an exchange rate forecasting tool". Yet if the true money demand parameters were included in the estimating equation, would not the resulting equation have to be identical to the directly estimated PPP equation? In the absence of fortuitous cross correlations between the errors in the money demand equations and the PPP equation, the monetary equation for the exchange rate can only be better than the PPP equation itself by the coefficients of r, Y, and M moving away from their true structural values (based on the money demand equations) to capture indirectly channels of influence not contained in the partial monetary approach. This may permit the monetary approach with PPP to predict better than PPP by itself, but is hardly grounds for satisfaction. A much more direct test of the partial monetary approach would be to estimate the structural equations directly, and to solve the three equations for the exchange rate. The same applies to Frenkel's (1976) and Clements and Frenkel's (1980) tests of the monetary approach with PPP and also to Frankel's (1979) test of the monetary approach with real interest parity.

Since each partial approach involves different endogenous variables on the right-hand side of the estimating equation, and hence provides different scope for unmodelled channels of influence to be captured unintentionally, there are difficulties with using these tests to discriminate among the different approaches. In our general model, to which we now return, we have therefore set up our equations in a way that allows the partial approaches, to the extent that they are inconsistent, to be interpreted as special cases.

III. A Synthesis of the Partial Approaches

The essence of the general model presented in Section I can be illustrated in a simple diagram. For this purpose we express the seven equations of the model as two linear quasi-reduced-form relationships between output and the exchange rate. The first is based on equations (1), (4), (5), and (6), reflecting equilibrium in the markets for domestic goods, money, and labor:[12]

$$(11) \quad e = \overset{+}{k_1}Y + \overset{-}{k_2}G + \overset{-}{k_3}M + \overset{+}{k_4}B^* + \overset{+}{k_5}B + \overset{-}{k_6}\bar{e} + \overset{-}{k_7}r^* + \overset{-}{k_8}P^* + \overset{-}{k_9}Y^* \quad \text{(K schedule)}$$

The second is based on equations (1), (3), and (4) and shows the pairs of output and the exchange rate that give instantaneous equilibrium in asset markets, including the market for foreign bonds:[13]

$$(12) \qquad e = \overset{-}{a_1 Y} + \overset{+}{a_2 M} + \overset{?}{a_3 B} + \overset{-}{a_4 B^*} + \overset{+}{a_5 \bar{e}} + \overset{+}{a_6 r^*} \qquad \text{(A schedule)}$$

The locus of both schedules depends on the three domestic exogenous policy variables of the model: M, B, and G, as well as on domestic holdings of foreign bonds B^*, the expected exchange rate $\bar{e}$, and the three foreign exogenous variables: r^*, P^*, and Y^*. M, B, and G are linked by the government budget constraint, which we shall take into account in our later discussion of the effects of monetary and fiscal policy. The balance-of-payments equation (7) ensures that the current account surplus (or deficit) implied by the above solutions for Y and e is matched by an equal deficit (or surplus) on capital account, $e\Delta B^*$.

The instantaneous equilibrium values for the level of output and the exchange rate are determined by the intersection of the K and A schedules as shown in Figure 1 (the C schedule is explained below). The slopes of the two schedules (i.e., the signs of k_1 and a_1) reflect not only the effects of income acting on the exchange rate through the current account and asset demands, but also price and interest rate effects. Thus, the positive slope of the K schedule results from the positive relationship between the exchange rate and aggregate demand via the current account that is only partially offset by the negative demand effects of depreciation through rising interest rates and prices. The negative slope of the A schedule reflects the positive relationship between the exchange rate and the excess demand for money via the domestic-currency value of wealth; by creating an excess demand for money, depreciation presses output down and interest rates up to preserve equilibrium in asset markets, and this effect is reinforced by our provisional assumption of exogenous exchange rate expectations. The arrows in Figure 1 show how the K and A schedules shift in response to increases in the predetermined variables.

The diagram shows clearly how potentially misleading it is to regress e against Y and other variables in an attempt to see whether e and Y are negatively related, as predicted by the partial monetary approaches, or positively related, as predicted by the partial Keynesian approach. In the general model e and Y can move in the same direction or in opposite directions in the short run depending on what kind of exogenous shock moves them both. For example, an increase in G, P*, or Y* shifts the K schedule to the right, lowering e and raising Y. But an increase in M, $\bar{e}$, or r*, or a decrease in B*, shifts both schedules to the right, so that Y rises while e can either rise or fall. An increase in B shifts the K schedule to the left, but the A schedule may shift in either direction, so that the effects on e and Y are uncertain.

If we were concerned only with the initial instantaneous equilibrium, this would be the end of the story: equations (1) - (6) determine Y and e as shown in Figure 1 and equation (7) gives the resulting current account position and hence eΔB*. Over time, however, as B* changes, the exchange rate and output must adjust until the final equilibrium values of Y and e simultaneously satisfy equations (1) - (7).

By rewriting the balance of payments equation (7) as

$$(7'') \qquad \Delta B^* = \frac{P}{e}T(Y,\ Y^*,\ eP^*/P)$$

we can determine the dynamic stability of the adjustment of B* by evaluating the sign of the partial derivative $\partial \Delta B^*/\partial B^*$ which depends on the direction and magnitude of the reduced-form effects of B* on e, P, and Y. Under reasonable parameter assumptions and with B* positive, an increase in B* lowers e, and thus contributes to a reduction in T and hence also in ΔB^*, thus ensuring stability.

Given stability, we can set $\Delta B^* = 0$ in equation (7") and solve for e as follows:

$$(13) \qquad e = \overset{+}{c_1}Y + \overset{-}{c_2}Y^* + \overset{-}{c_3}P^* \qquad \text{(C schedule)}$$

This equation describes the current account equilibrium relationship between e and Y. The C schedule is flatter than the K schedule ($c_1 < k_1$) as shown in Figure 1. To the right of the C schedule the current account is in deficit, while to the left, it is in surplus. Whenever the A and K schedules intersect off the C schedule, the resulting current account imbalance will gradually shift the A schedule towards the point of intersection of the K and C schedules. Thus, while the A and K schedules determine the exchange rate with B* treated as predetermined, the C and K schedules determine the exchange rate in the "medium term" when current account imbalances accumulate to change B*.

Effects of Monetary and Fiscal Policy

We are now in a position to make some policy experiments with the model. Assuming that the economy is initially in full equilibrium at point E in Figure 2, a tax-financed increase in government spending causes the K schedule to shift to the right so that output rises and the exchange rate falls as the economy moves to a new instantaneous equilibrium at point E'. Since E' is below the C schedule, the current account is in deficit. As the stock of foreign assets runs down, the A schedule also moves to the right. Meanwhile, the K schedule drifts further rightwards as a result of the effect of B* on the demand for money. This process continues until stock equilibrium is restored at E" where both output and the exchange rate are higher than initially, notwithstanding the initial appreciation. This conclusion would have to be qualified to the extent that the higher taxes influenced capital accumulation or introduced wage or price pressures. More importantly, the market's anticipation of the medium-term depreciation will raise $\bar{e}$ and thus reduce or reverse the initial instantaneous appreciation. These results are summarized in the first column of Table 2.

Figure 3 shows the effects of an increase in the money supply through an open market operation. The A and K schedules both shift to the right, producing a momentary equilibrium at E', with output and the exchange rate higher than initially.[14] Provided that E' lies below the C schedule as shown in Figure 3, the resulting current account deficit causes the A and K schedules to shift further to the right until the full equilibrium is reached at E". The medium-term depreciation of the currency is larger than initially, and may be accelerated by speculative arbitrage.

Money-financed and bond-financed government spending are slightly tricky to analyze with diagrams, because a sustained increase in G must require (in the absence of increased taxation) continual growth of M or B. The once-and-for-all increase in the money supply required by a one-period increase in G is like the open market operation, except the K schedule moves further to the right in the first period, and then back again in the second as G is restored to its initial level. A permanent increase in G involves a sequence of such steps. The analysis of bond-financed spending is more complicated, as even the direction of the first-period shift in the A schedule is uncertain. The first-period effects of fiscal expansion are as shown in the upper panel of Table 2, while the lower panel shows the effects of a sustained increase in G, recognizing that the portfolio is not in equilibrium because M or B is still increasing.

Some Special Cases

In our analysis of the general model the expected exchange rate $\bar{e}$ was not assigned a major role, because we emphasized the medium-term solution to the model in which the exchange rate adjusted so as to make the stock of foreign assets constant, and $\bar{e}$ could be set equal to e. But for the analysis of the dynamic path of the exchange rate toward its medium-term equilibrium value (and hence of income, prices, and the current account), the behavior of $\bar{e}$ is crucial. In this section we shall see how the expectional and other assumptions associated with the partial approaches can be treated as special cases of the general model.

a. Expectations. The following scheme shows five different ways of modelling exchange rate expectations:

(i) static expectations $\bar{e} = e_t$

(ii) regressive expectations $\bar{e} = \theta e_t + (1 - \theta)e_o \qquad (0 < \theta < 1)$

(iii)	adaptive expectations	$\bar{e} = \theta e_t + (1 - \theta)e_{t-1}$ $(0 < \theta < 1)$
(iv)	extrapolative expectations	$\bar{e} = \theta e_t + (1 - \theta)e_{t-1}$ $(\theta > 1)$
(v)	rational expectations with perfect foresight	$\bar{e} = e_{t+1}$

Here $\bar{e}$ is the expectation, formed at time t, of the value of e at time t+1, and e_o is some exogenously given value. The qualitative results we report in this paper all apply without exception if expectations are static, regressive, or adaptive, but instability is naturally a possibility with extrapolative expectations. As Kouri (1976) and others have shown, there are often a number of perfect-foresight paths that are consistent with rational expectations. He assumes that long-run perfect foresight would rule out the unstable paths. Using perfect foresight in our general model would undoubtedly change the dynamic path of the exchange rate, and could change the impact effects on the exchange rate in cases where the impact and medium-term effects are in opposite directions.

b. Purchasing power parity. In this case, goods markets are assumed to be completely integrated between countries so that $T_{eP*/P} \rightarrow \infty$ and $e = P/P*$. Accordingly, for given P* the K and C schedules are replaced by the aggregate supply curve, which is completely unresponsive to changes in G, M, B, B*, $\bar{e}$, r*, P*, and Y*. It follows that (i) an increase in G has no effect on either Y or e unless it is financed by either M or B; and (ii) an increase in M by open market operations will raise both Y and e, by shifting the A schedule to the right. These, of course, are standard monetarist propositions for the short run with variable aggregate supply.

c. Interest parity. If capital markets are fully integrated through perfect substitutability between domestic and foreign bonds (i.e., b_r^*, b_{r^*}, $b_{\bar{e}} \to -\infty$, b_r, $b_{r^*}^*$, $b_{\bar{e}}^* \to \infty$), then $r = r^* + (\bar{e}-e)/e$. In this case, the general model retains its qualitative comparative-statics properties (with the only exception that a_3 in equation (12) becomes unambiguously negative). Thus, in contrast to the Mundell-Fleming model where pure fiscal expansion lowers e but leaves Y unchanged under perfect capital mobility, a tax-financed increase in G raises both e and Y in our model in the medium term; for even though r is tied to r* and M is fixed, the demand for money can be satisfied at a higher level of output through an offsetting reduction of wealth. Hence, the link between the exchange rate and asset markets preserves the efficacy of pure fiscal policy under perfect capital mobility. An expansionary open market operation also increases both e and Y in the medium term, but less than in the Mundell-Fleming model, for analogous reasons.

d. Full employment. Finally, if aggregate supply is fixed at full employment ($Q_Y \to \infty$), the K and C schedules become vertical at the full-employment level of output and completely unresponsive to exogenous shocks, but the A schedule retains a negative slope. An increase in M by open market operations as well as money- and also bond-financed increases in G cause both e and P to rise, instantaneously as well as in the medium term. If exchange rate expectations are endogenous, the initial depreciation will be larger than otherwise. Disregarding expectations effects, however, a tax-financed increase in G leaves e unchanged in instantaneous equilibrium because it does not, with Y fixed, affect portfolio balance immediately, but the increase in P resulting from the rise in G leads to decumulation of foreign assets and to currency depreciation. Thus, the medium-term effects of monetary and fiscal policy on the exchange rate and the price level at full employment are exactly as in the general case shown in Table 2.

IV. Conclusion

The main purpose of this paper has been to present a simple synthesis of Keynesian, monetary, and portfolio approaches to flexible exchange rates. By including the key features of all of the approaches in a simple general model, we were able to show that some of the contrasts that have been drawn between the approaches are due to a neglect of important feedbacks elsewhere in the economy. Even after these false contrasts were reconciled, we showed that some of the approaches still give different predictions about the effects of monetary and fiscal policy because of differing assumptions about the international mobility of goods and financial assets. Using our general model, we were able to show how each of these assumptions altered the effects of monetary and fiscal policies on the main macroeconomic variables, at least in the short and medium term.

Although we have attempted to reflect the most influential currents of theoretical and empirical work, we have restricted ourselves to the simplest specifications that are consistent with the various approaches. This simplicity was deliberate, as we wished to demonstrate as clearly as possible the reasons for the contrasting results from the various partial approaches, and to produce a general model that is amenable to fairly easy exposition. The cost, of course, is that we have not been able to deal fully with many important issues relating to information, expectations, and dynamics. Our current model is nonetheless larger and more complex than that used in our fixed-exchange-rate paper, for we have added a dynamic portfolio structure and some discussion of exchange rate expectations. We hope that the more general model provides sufficient insights to make the additional complexity worthwhile.

Table 1. Summary of Propositions of Partial Approaches

	Effect on the exchange rate of an increase in:							
	Y	Y*	P	P*	r	r*	M	M*
Keynesian approach (Equation 8)	+	–	+	–	–	+	...	...
Monetary approach with PPP (Equation 9)	–	+	+	–	+	–	+	–
Monetary approach with interest parity (Equation 9')	–	+	–	+	–	+	+	–
Portfolio approach for short run (Equation 10)	...	...	...	...	...	+	+	...
Portfolio approach for medium term (Equation 10')	+	–	+	–	...	...	...	...

Note: A plus sign designates depreciation; a minus sign, appreciation. "..." means "not applicable".

Table 2. Effects of Monetary and Fiscal Policy on the Exchange Rate and Output

	Tax-financed fiscal expansion	Monetary expansion by open market operations	Money-financed fiscal expansion	Bond-financed fiscal expansion
		Instantaneous effects		
Exchange rate	-	+ (?)	?	?
Output	+	+	+	+ (?)
		Medium-term effects		
Exchange rate	+	+	+	+ (?)
Output	+	+	+	+ (?)

Note: A plus sign followed by a question mark in parentheses reflects our judgement that the algebraic ambiguity in question can fairly safely be ruled out by appeal to empirical evidence.

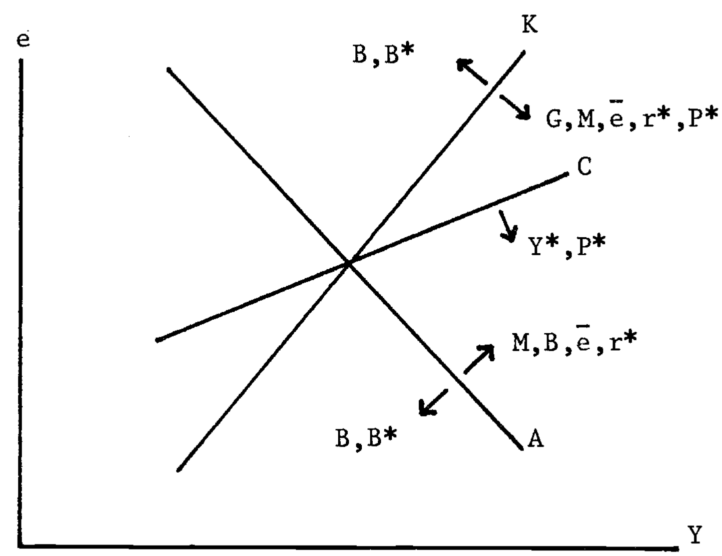

Figure 1

The K, A, and C schedules

Each schedule moves in the direction indicated by the arrows in response to an increase in one of the variables shown.

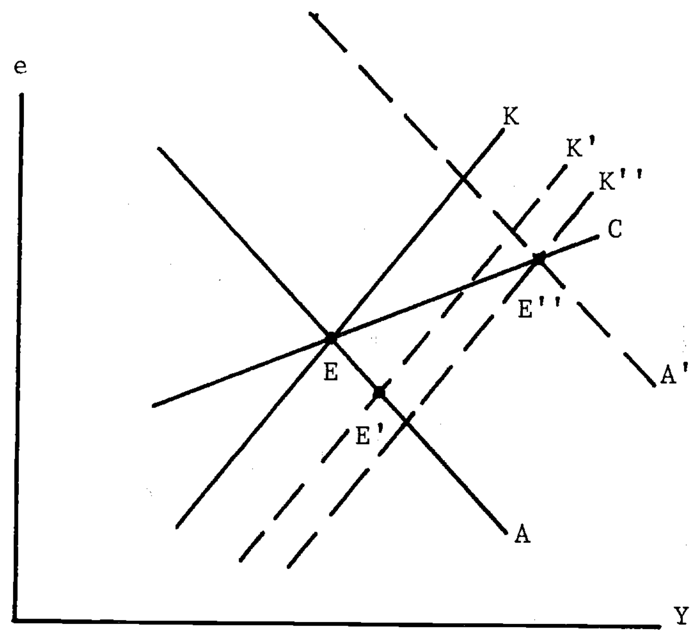

Figure 2

Effects of tax-financed increase in government spending.

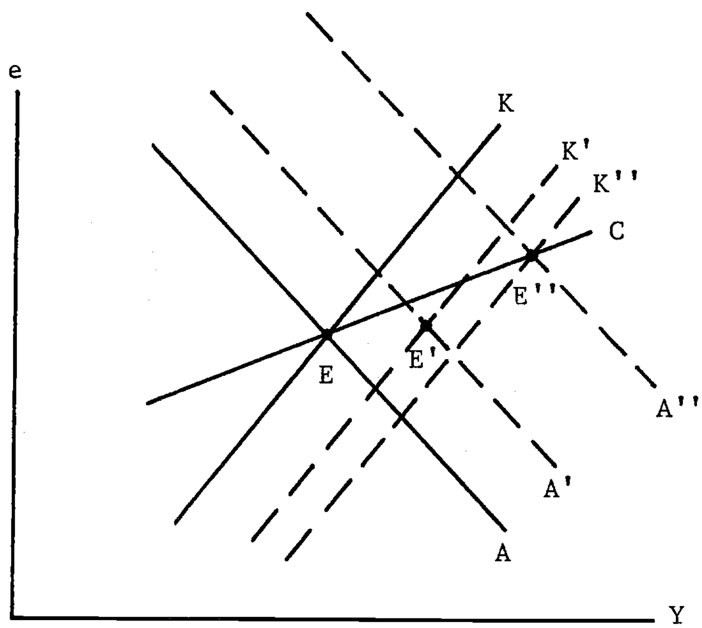

Figure 3

Effects of monetary expansion through open market operation and of money-financed increase in government spending.

FOOTNOTES

1/ See Frenkel, Gylfason, and Helliwell (1980).

2/ For example, Frenkel and Rodriguez (1975, p. 686) write " ... the equilibrium exchange rate is that relative price of monies at which the existing stocks are willingly held. This view on the role and determination of the rate of exchange is in sharp contrast with the popular notion that the exchange rate is determined in the flow market so as to assure a balanced balance of payments." In the same vein, Mussa (1976, p. 51) argues that "From the perspective of the monetary approach, however, all of this discussion of elasticities is fundamentally irrelevant since the traditional theory on which it is based contains two serious conceptual errors. First, it views the exchange rate as the relative price of national outputs, rather then as the relative price of national monies. Second, it assumes that the exchange rate is determined by the conditions for equilibrium in the markets for flows of funds, rather than by the conditions for equilibrium in the markets for stocks of assets." See also Kouri (1976, p. 281), Frenkel (1976, p. 201), and the surveys by Magee (1976), Kreinin and Officer (1978), and Isard (1978).

3/ Note that the balance-sheet constraint (4) implies that only two of the first three equations are independent. By restricting ourselves to these three assets, we are neglecting international holdings of currency and real assets, although B* could be any aggregate of net claims on non-residents, with r* as the representative rate of return. These assets and equations are the same as those used by Branson (1979), except we include income as an argument in the asset demand functions.

4/ By assuming that private expenditure is a function only of Y and r, and not of eP*/P, we suppress the distinction between the prices of domestic output and of expenditure which underlies the well-known Laursen-Metzler effect. It is easy to make the distinction, but it complicates the analysis slightly without materially altering the results.

5/ In principle, exports should be inflated by P, and imports by eP*, in the balance-of-payments identity instead of simply inflating T by P.

6/ For simplicity we have also excluded imported factors of production from the supply function. Their inclusion would complicate the analysis slightly without materially altering the results.

7/ In the general model, this specification of the capital account is overridden by the portfolio balance equations.

8/ It should be emphasized that these propositions are specific to the simple formulation outlined in the text. While Keynesian models of exchange rate determination almost always include more endogenous variables than we indicate, the simpler formulation represented by equation (8) has often been contrasted to the monetary approach by proponents of the latter (see references in footnote 2).

9/ In a second version of the interest parity approach (Frankel 1979), real interest parity is assumed, giving a quasi-reduced form that includes the same signs as (9) and (9') on income and money supplies, the opposite signs to (9) on interest rates, and includes the differnce between the expected domestic and foreign inflation rates with a positive sign.

10/ Concerning the ambiguous effect of B on e, the currency depreciates if B and M are closer substitutes in asset portfolios than B and B*, but appreciates in the opposite case.

11/ One potential source of instability is net foreign interest receipts (see Branson 1979). Instability may also arise if the country is a net debtor so that $B^* < 0$ (see Masson 1981).

12/ The signs of the k coefficients rest on the fairly plausible assumption that the effects of exchange rate changes on private expenditure through expectations and asset revaluation effects on the demand for money are minor relative to the exchange rate effects on the current account.

13/ The sign of $a_2 - a_3$ is unambiguously positive, even though the sign of a_3 is indeterminate (cf. footnote 10). The positive sign of a_5 presupposes that B and B* are closer substitutes in asset portfolios than M and B*.

14/ There is in the algebra the possibility that the increased transactions demand for money may lead temporarily to negative valuation effects on the exchange rate, but this possibility can easily be ruled out by speculative foresight.

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