

THE MONETARY APPROACH TO THE BALANCE OF
PAYMENTS: TWO SPECIOUS ASSUMPTIONS

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Michael R. Darby

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Two assumptions of the monetary approach to the balance of payments (MABP) provide its empirical teeth: (1) The balance of payments is a source of change in base money. (2) Domestic credit is an exogenous variable. This article argues that these assumptions are unacceptable in important empirical applications.

The first of these assumptions is generally correct only under a true commodity standard or for nonreserve countries which peg their exchange rate against a reserve currency. Various authors who have related world inflation to growth in world reserves and (hence) would money supply have implicitly and erroneously assumed that the United States balance of payments is a source of change in U. S. base money. This point is elaborated in Section I below.

Empirical tests of the MABP have frequently taken the form of regressing the balance of payments on changes in domestic credit and changes in variables determining the demand for money. This procedure is generally unacceptable if domestic credit is not exogenous with respect to the balance of payments. Evidence of wide-scale short-run sterilization is inconsistent with that assumption. As a result, the empirical support for the MABP offered by these tests is spurious as discussed in Section II.

I. The Reserve Changes and the Balance of Payments

The central insight of the MABP is that the balance of payments is a source of change in base money. Therefore the balance of payments surplus is obtained if changes in base money from all other sources are subtracted from changes in the quantity of base money demanded. Other sources of change in base money (domestic credit) are assumed exogenous¹ and changes in the quantity of base money demanded are functions of variables whose changes are assumed readily predictable. This is the sense in which "the balance of payments is essentially a monetary phenomenon."²

It is not generally true, however, that the balance of payments is a source of change in base money. The central bank's purchases and sales of foreign reserve assets in exchange for base money create and destroy base money just as do open market or discount operations. But the balance of payments differs from changes in reserve assets and reserve assets are not always acquired in exchange for base money.

The balance of payments on the official settlements basis is the sum of the increase in the country's reserve assets and the decrease in the country's liabilities held by official holders in other countries. For most countries, this difference is trivial and it is sufficient to restrict the analysis to changes in the country's reserve assets. For reserve countries -- especially the United States -- the balance of payments is primarily changes in liabilities to foreign official holders. Standard analyses implicitly assume that foreign official holders acquire U. S. base money so that a U. S. balance of payments reduces the U. S. money supply as under a gold standard. In fact, foreign official demand for U. S. base money is essentially nil and changes in liabilities to foreign official holders take

the form of changes in their holdings of Treasury bills or other interest-bearing liabilities.

If the United States is best characterized as a fiat reserve-currency country which determines its domestic money supply independently of its balance of payments, the analysis is different and much simpler than standard analyses which treat total world reserves as given. The United States is perfectly free to act in this way since it does not offer to exchange its currency for any other currency at a fixed exchange rate.³ The U. S. capital markets can provide additional interest-bearing securities to foreign official holders in perpetuity.⁴

The world-money-supply-and-world-money-demand standard approach has been the standard MABP approach to world inflation.⁵ World base money is the sum of total reserves and the (exogenously determined) domestic credit of each country converted by the pegged exchange rate into reserve-currency values. A "stable" world money multiplier is applied to this base to obtain the nominal world money supply in reserve-currency units. When this is divided by the "stable" real world demand for money measured in terms of goods, the world price level results. This world price level (in reserve currency units per unit of goods) is converted by the pegged exchange rates into individual country price levels. World inflation is attributed to faster growth in the nominal world money supply than in the real world money demand. Growth in nominal world money supply comes from growth in world reserves, world domestic credit, and the world money multiplier.

This world-money approach errs because the reserve-currency country's base money is unaffected by its balance of payments.⁶ Foreign central banks can vary their purchases of, say, U. S. Treasury bills as much as desired

within the relevant range without affecting the U. S. supply of and demand for money. Therefore the U. S. price level can be determined in standard closed-economy fashion by domestic monetary conditions alone. Equilibrium foreign price levels will equal the so-determined reserve-currency price level converted by the pegged exchange rates. World inflation is determined by the difference between the growth rates of the nominal money supply and of real money demand in the reserve country alone. Faster growth rates of the domestic credit or money multipliers of nonreserve countries -- Swoboda (1976) notwithstanding -- result in slower growth in world reserves, not higher world inflation. At least in long-run equilibrium where purchasing-power-parity holds and sterilization by nonreserve countries is impossible, a nonreserve country has zero effect on the world price level while changes in the fiat reserve-currency country's nominal money supply have strictly proportionate effects on the world price level.

What are the implications for the MABP of this particular slip? Firstly, reserve-currency-country macroeconomists appear justified after-all in their use of domestic models which do not allow for international monetary repercussions. The rest of the world can be added on to the reserve country model for purposes of explaining the rest of the world, but it is unnecessary for the reserve-currency country. Secondly, the world money approach is not an appropriate vehicle for the analysis of world inflation. For the long-run one should concentrate on the reserve-currency country alone and the short-run adjustment involves transmission from the reserve to the nonreserve countries which is masked by the aggregates. Finally, small-country MABP analyses which have treated world inflation as exogenous despite the presumed effect of domestic credit creation

on world inflation turn out to be appropriately specified since the non-reserve country's domestic credit creation does not affect world inflation.

To close this section with what appears to be a digression but in fact is an introduction to Section II, consider changes in reserve assets not in exchange for base money. The most obvious examples would be the use of (transitory) government revenues from oil exports to purchase foreign securities for portfolio purposes. Since domestic credit creation is typically defined as base money less official reserves, such portfolio investments by a nation's treasury department will reduce recorded domestic credit. Frequently such domestic credit data show negative values. It would be desirable to separate the monetary reserves (changes in which influence base money) from government portfolio holdings. In practice, it is not clear how to do this.

II. Exogeneity of Domestic Credit

A standard MABP empirical "test" explains reserve changes by the amount that changes in nominal base money demanded exceed changes in domestic credit.⁷ If reserves are denoted by R , nominal money demanded by M^d , the money multiplier by μ , and domestic credit by D , the standard equation to be estimated is

$$\Delta R = \Delta\left(\frac{M^d}{\mu}\right) - \Delta D \quad (1)$$

Various functional forms are substituted for M^d and the equation varies after simplification, but the essence of the test is to show that the regression fits well and that the estimated coefficient of ΔD does not differ significantly from -1 .

This procedure does little more than test the fit of the money demand function.⁸ It is informative with respect to the balance of payments only if domestic credit is truly exogenous. If instead domestic credit is varied by the central bank, ceteris paribus, to sterilize the balance of payments which is exogenous, then it would be appropriate to estimate instead

$$\Delta D = \Delta\left(\frac{M^d}{\mu}\right) - \Delta R \quad (2)$$

The algebra of least squares⁹ implies that if $\hat{\beta}$ is the estimated coefficient of ΔR in regression (2), $\hat{\gamma}$ is the estimated coefficient of ΔD in the reverse regression (1), and r^2 is their squared partial correlation coefficient, then

$$\hat{\gamma} \equiv \frac{r^2}{\hat{\beta}} \quad (3)$$

So if $\hat{\beta}$ turns out near its expected value of -1 and there is a strong negative partial correlation between changes in domestic credit and reserves (r^2 near 1) then $\hat{\gamma}$ will be estimated near -1 even though domestic credit had no causal effect on reserve changes. However Bean (1976, p. 355) estimated relatively ill-fitting money demand functions with multiple correlation coefficients (R^2 's) ranging from 0.56 to 0.65. Since r^2 is necessarily no greater than R^2 this would imply similarly low (absolute) values of the $\hat{\gamma}$'s if the reserve-change-exogenous regression (2) exhibited $\hat{\beta}$'s near 1. In fact Bean's estimated $\hat{\gamma}$ ranged from -0.58 to -0.72.

In sum, these regressions tell us little by themselves about the short-run ability of the central bank to affect the balance of payments by varying domestic credit.

Remarkably little by the way of theory or evidence has been presented to justify the hypothesis that central bankers determine domestic credit exogenously and then let base money vary with the balance of payments. Instead the argument seems to be that sterilization is impossible in the long-run and so no central bank would attempt it in the short run. But complete concurrent sterilization of the balance of payments and lagged response to persistent deficits is also consistent with long-run stability.¹⁰ This latter pattern implies different adjustment to reserve-country monetary shocks and invalidates most of the evidence on the policy usefulness of the MABP.

In addition, the questionable nature of the domestic credit data as discussed at the end of the previous section provides further reason to interpret

the standard regression results cautiously. If base money is measured well relative to its components, the hypothesized measurement error will induce a bias toward -1 in the coefficient of domestic credit in regression (1).¹¹

SUMMARY

The balance of payments of a fiat reserve country does not affect its stock of base money. As a result, fiat-reserve-currency countries can be analyzed by the standard closed-economy-exogenous-monetary-policy macroeconomic models. The inflation rate of the reserve-currency country is the world inflation rate. World reserve assets (primarily interest-bearing securities denominated in the reserve currency) are endogenous and are not themselves a source of world inflation.

The assumption that domestic credit is exogenous has not been supported by theory or empirical evidence. Instead there appears to be general short-run sterilization of and lagged adjustment to the balance of payments. Further domestic credit and reserve assets are ill defined; so much of their negative correlation may result from measurement error. Much monetary-approach empirical work has confirmed stable money demand functions without showing evidence as to whether domestic credit affects the balance of payments or vice versa.

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FOOTNOTES

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¹This assumption is the subject of Section II.

²Frenkel and Johnson (1976), p. 21).

³Preliminary results of the NBER project on the international transmission of inflation indicate that there was an effect of the balance of payments on the U. S. money supply during the period 1957 through 1971, but that it was quite temporary in nature. See Darby and Stockman (1979). We are investigating whether this effect was more pronounced before the removal of the Federal Reserve's gold reserve requirements or the de facto suspension of exchangeability in 1968.

⁴The decline in the real value of these securities if the U. S. inflates is compensated by higher nominal interest rates. If the foreign official holders use the return-of-capital portion of the nominal interest payment to maintain the real value of their dollar-denominated reserves, this will create a potentially misleading increase in the recorded U. S. balance of payments deficit when the U. S. inflates.

⁵World inflation refers here to the central inflation rate of the group of countries joined by a fixed exchange rate. Examples of the approach appear in Meiselman and Laffer (1975) and Parkin and Zis (1976a and 1976b).

⁶Any assistance to foreign central banks in maintaining their pegged exchange rates can be perfectly sterilized.

⁷Examples are Bean (1976), Guitian (1976), and Zecher (1976). Genberg (1976) made a first attempt to account for the effects of the balance of payments on domestic credit via two stage least squares. His simple reaction functions yielded alternative estimates of sterilization for Sweden that varied from 53 to 94 percent complete.

⁸I am indebted to Edward Leamer for suggesting the exposition of this paragraph.

⁹See Leamer (1978), p. 239.

¹⁰This is a fair summary of the money supply reaction functions estimated in the NBER International Transmission Model (Mark III) for Canada, France, Germany, Italy, Japan, the Netherlands, and the United Kingdom.

¹¹This bias would also be present for $\hat{\beta}$ in regression (2) of course.