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The BOP Crisis in Pakistan

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The Lahore School model takes a first cut at analyzing the BOP crisis in general equilibrium with multiple interactions. This arises from the need to capture interaction between a number of macro variables, which can only be caught more imperfectly through single relationships between these variables. This does not of course gainsay other good and complex models attempting this like the State Bank of Pakistan's model, with which we plan to collaborate.

For policy purposes, the presentation to the Finance Minister, presents a reduced form of the model summed up by two mother equations:

(1) Net Exports (NX) are a function of the exchange rate (e). This approximates the Current Account (CA) balance. It equals in a classic identity with the Capital Account (KA). This in turn is given by Net Outflows (Cf) which are a function of the interest rate (r). Both, the CA balance equal to the KA balance, in turn equal Foreign Borrowing (Bfor).

$$NX\ (e) = CF\ (r) = Bfor \qquad (1)$$

(2) The government's budget balance is given by taxation (T), minus government expenditure (G). The private balance is given by private investment (I) minus savings (S). These two borrowings, public and private, sum up to equal total borrowing, which in turn is split between foreign borrowing (Bfor) and domestic borrowing (Bdom).

$$(T - G) + (I - S) = Bdom + Bfor \qquad (2)$$

A Short Run Policy Conundrum

This framework leads to a short run policy conundrum.

The simple price solution to the model should be that if there is a deficit in the CA balance as currently estimated by us at $18 bn for 2017-18, then devaluing the exchange rate (e) should increase exports and decrease imports. So a lower e should cut the CA deficit to zero.

But our model does not predict a unique equilibrium level of e which will cut the CA balance to zero. The reason is in the second part of equation (1), that the CA balance has to equal the Capital Account (KA) balance. That a lower e will not necessarily reduce Net Outflows, CF. A lower e, will tend to do the opposite, increase Capital Outflows (CO), and reduce Capital Inflows (CI), actually raising Net Outflows (CF).

What is needed to reduce Net Outflows (CF), is to raise the interest rate (r), as equation (1) shows.

The need to raise r arises for the following reason:

We need to examine these relationships in real values, rather just nominal values. The real domestic interest rate (r dom), can be given by the nominal domestic interest rate (R dom), minus the rate of depreciation of the exchange rate say (Δe). A more complex set of equations can be summed up in reduced form as the exchange rate e being treated like the rate of inflation. So the real domestic interest rate (r dom), is simply equal to the nominal domestic interest rate (R dom) minus the rate of depreciation of the exchange rate (Δe).

$$r\ dom = R\ dom - \Delta e \qquad (3)$$

Now the way in which equation (1) above works on the Capital Account (KA) side, is that Net Outflows (CF) are not just a function of the domestic interest rate (r dom), but that it has to equal the real foreign interest rate (r for).

$$r\ dom = R\ dom - \Delta e = r\ for \qquad (4)$$

Again reducing a more complex set of equations into three possible outcomes:

So if the rate of depreciation of the exchange rate is zero, the real domestic interest rate (r dom) will equal the real foreign interest rate (r for). The resultant Net Outflows (CF) will be zero, with no significant incentive or disincentive for either outflows or inflows. And indeed depletion of reserves called Reserve Gain (RG) will be zero.

$$\text{ie: if : } \Delta e = 0,\ r\ dom = r\ for\ CF = 0\ RG = 0 \qquad (5)$$

If the exchange rate appreciates, is greater than zero, the real domestic interest rate (r dom) will rise above the real foreign interest rate (r for), by the amount of the appreciation (Δe). The resultant Net Outflows (CF) will be negative, with higher inflows (CI) attracted by the higher real domestic interest rate relative to the real foreign interest rate. And outflows will be lower (CO), because of lower interest rates abroad relative to the domestic interest rate. In which case there will be a positive Reserve gain.

$$\text{ie: if: } \Delta e > 0,\ r\ dom > r\ for\ CF < 0\ RG > 0 \qquad (6)$$

Conversely, if the exchange rate depreciates, as estimated currently at about 20% in this calendar year, ie is less than zero, then the real domestic interest rate (r dom) will fall below the real foreign interest rate (r for) by the amount of the depreciation (Δe). The resultant Net Outflows (CF) will be positive, with lower inflows (CI) deterred by the lower domestic interest rate relative to the foreign interest rate. And outflows (CO) will be higher, because of higher interest rates abroad relative to the domestic interest rate. In which case reserves will be depleted and RG negative, as indeed reserves have fallen by near $7bn.

$$\text{ie: if: } \Delta e < 0, \text{ r dom} < \text{r for CF} > 0 \text{ RG} < 0 \qquad (7)$$

Which gives a perverse relationship between change in the exchange e and change in the interest rate r. If the exchange rate depreciates as it is currently doing, it will have to be compensated by a proportionate rise in the nominal domestic interest rate, to make it equal to the real foreign interest rate. Otherwise according to equation (6) there will be Net Outflows and reserves will be depleted.

$$\text{ie: If } \Delta e \downarrow \Rightarrow \Delta r \uparrow \qquad (8)$$

A Long Run Policy Conundrum

If this short run deficit in the CA balance has led to an exchange rate depreciation, it will accordingly have to be compensated by a proportionate increase in the nominal domestic interest rate. Otherwise it will continue to lead to net outflows and a depletion of reserves. However, if interest rates are raised significantly, that will jeopardies an already low investment rate and long run growth.

Given this downside to raising the nominal domestic interest rate, lowering investment and growth, a less dampening impact can be estimated in the model, by lowering aggregate demand on the expenditure side. This can be seen summarily through equations (1) and (2). In equation (1) the BOP deficit requires an increase in foreign borrowing, which will have to be through recourse to bilateral funding or failing that, multilateral funding by the IMF SBA or EFF programs. The Foreign Borrowing (Bfor), is one part of total borrowing. Total Borrowing, of which Foreign Borrowing is a part, arises from public borrowing, which is the budget deficit (T-G) in equation (2) and private borrowing, which is the deficit in investment (I - S). Again if lowered investment is not to jeopardize growth in the long run, then the preferable macro variables to be worked on are by reducing the budget deficit by reducing government expenditure, and raising taxes, and by lowering the private deficit in investment by raising savings above their extremely low rate of 12% of GDP.