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Capital Flow and Exchange Rate in India – A Contemporary Analytical Perspective

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Section – 1: Introduction

Several newspapers and magazines, the powerful and influential ones have started predicting dooms day for the Indian economy. To quote the economist (August 10^{th} – 16^{th}, 2013) "……. once vaunted economic miracle fades". As Indian rupee hits all time low against US dollar and tries to find its stabilizing value, as Indian growth falters at 5% and as business projects look grim for the foreigners with stock market and mutual funds bleed profusely, it seems India's dream run over one and half decade surely will not last. As it happens once the crisis sets in, policy advice pours in from every quarter. In India's case the advice is always about lack of reforms, i.e. further measures to reduce fiscal deficit, subsidies, creation of better business environment for investment and further growth. The entire focus seems to be on the reluctance of investors to invest in India. The reason is not hard to guess. Increase in the rate of investment directly increases growth rate. If the decline in rupee can be controlled and investors are guaranteed of a higher return through a stable rupee, the economy will bounce back on track rekindling the hope for a higher growth rate and better tomorrow. Unfortunately in India's case "growth" itself is a problem. This has to be understood in clear terms and mainly by those whose analysis usually does not go beyond economics 101, the basic principle course. We, as Indians, must reevaluate the idea of an 'optimal' rate of growth for the economy, and its pattern and inherent characteristics far beyond our concern for the value of Indian bonds and stocks in the global market. The impending crisis provides an opportunity to learn from our mistakes and we should not let it slip through our fingers. Another major issue seems to be our infatuation with sporadic foreign capital inflow and our denial of its consequences on the exchange rate. In our brief analysis we focus mostly on the latter, but provide brief remarks on the former.

It is time that we go back to the basics of balance of payments and its constituent components, trade account, current account, capital account, foreign exchange reserves and the determination of equilibrium value of rupee. Revisiting the analytical relationships that bind all the above elements would clearly demonstrate the lack of political will to intervene in sensitive yet deserving areas. In particular obsession with stop-gap measures, fascination with at best half-baked interpretation of what reforms is all about and apparent lack of understanding of fundamental macroeconomic issues usually brings the economy on the brink of disaster. Politics of postponing critical decisions which is popularly written as "policy paralysis" has a deadly consequence, not so much because policies do not convert India into Hong Kong, Dubai or Singapore overnight, but because critical interventions are delayed for ever. This is also compounded by the fact that we are ashamed of admitting the true colour of the economy. So called "feel good factors" have worked as addictive intoxicant of highest order.

To understand the real problem behind a weak and declining rupee, first one has to understand about the factors we should worry about. Weak rupee is not related to the lack of foreign investment or foreign capital inflow. Yes, lack of demand for rupee or excessive demand for dollar will affect its price. But the rest of the world's lack of interest in demanding rupee and our overzealous interest in holding onto dollars is guided by more fundamental factors, such as exports and imports. Huge gap between our imports and exports is the fundamental reason. Someone has to pay for this gap. Partially we can manage this by remittances from abroad. That is not enough if the trade gap is massive and that is why we have huge current account deficit. We need many more dollars than we can earn. Therefore, without any other support rupee must decline. This is the true colour and characteristic of our economy as it stands. It is like a patient who is having a net loss of blood and inherently anemic, but supported by occasional transfusion. Our trade gap needs attention, but rupee is kept afloat through the transfusion of sporadic capital flows. It has been such a case for quite some time, thanks to our greed for imports and structural handicap affecting our exports. With no other support system, all efforts would have been unleashed to minimize the loss of blood. But that never happened; policy makers have been interested in transfusion from outside so that even the perennially anemic patient looked plum and blushing.

Dollars received through capital flows was used to pay for imports and build up reserves. But no action was taken to tackle a potential situation when for some extraneous reason the transfusion could suddenly stop or slow down. One must remember that our current account deficit is perennially caused by our inability to increase our exports and excessive dependence on imports. In this context large inflows that sustain the value of exchange rate do not help our current account. Depreciation of rupee is required to make our exports more competitive and provide a signal that our imports are scarce by making them more expensive. Notwithstanding the fact that components of our exports and imports may be price inelastic, such movement in exchange rate is necessary as a self-correcting device. But that has always been undermined in the Indian context. Politics that does a lot of harm by hindering perennial maladies of the system under a façade of feel good factors continuously projecting the apparent rather than the real, is also at work here. Projecting a globally respectable value of rupee with borrowed and unstable foreign resources has always been deemed as a politically superior policy to the one which tries to address the long term constraints affecting our exports and imports. It should be mentioned that in a recent paper by Cheung & Sengupta (2013), it is shown that exchange rate elasticity of exports must not be undermined. Exports actually respond well to exchange depreciation.

The paper is laid out as follows. In the next section we make some analytical points relating growth and capital inflow to the current crisis. As background material one should read basic macroeconomic texts to get the concepts right such as Dornbusch, Fischer, & Startz (2011), Barro (2007) and for Indian part various issues of ICRA bulletin and RBI reports. The last section concludes.

Section - 2

a) A Transparent Pedagogic Model :

We start with the fundamental macroeconomic equality condition:

$$Y = C + I + G + X - M \quad (1)$$

Just to reiterate C, I, G all (self-explanatory symbols) may contain imported components and we subtract that in aggregate through M.

Just rearranging we get,

$M - X = (C + I + G) - Y$ (2)

(2) tells us that the trade deficit is also captured by the difference between aggregate expenditure and output. Therefore, the popular absorption approach will indicate, excess of aggregate expenditure over output must be controlled if $(M - X)$ needs to be controlled. Again M is what we spend for the rest of the world and X is what they spend on us.

Typically if $(M - X)$ is 100$, someone has to pay for the deficit. We can borrow that amount, say, from US, or for reasons unknown to us, US citizens may invest in our country and they exchange their dollars for rupee, so we get dollars. If it is less than 100, we reduce our stock or reserve of dollars. If it is more than 100 we add the surplus to our reserves. It is a simple cash-flow problem. We need dollars and we need it from somewhere. All of these can happen with no movement in e, the exchange rate (Rupee/Dollar). $(M - X)$ is captured in terms of dollars as total expenditure on imports minus total earnings through exports. Therefore, if $\tilde{M}$ and $\tilde{X}$ are 'real' values, then $M - X = P_m \tilde{M} - P_x \tilde{X}$ where (P_m, P_x) are prices quoted in US dollars. (P_m, P_x) are rest of the world or US price levels and are held constant throughout the analysis. So $(M - X)$ actually captures changes in $\tilde{M}$ and $\tilde{X}$. The deficit is likely to be financed either by capital flows or by the RBI drawing down the reseves. However, extra capital may not flow in or the RBI may think otherwise because it may not have sufficient reserve. Let us, therefore, examine simple adjustment mechanisms.

$$M\left(\frac{eP^*}{P_{(-)}}, R_{(-)}, Y_{(+)}\right) - X\left(\frac{eP^*}{P_{(+)}}, R_{(-)}\right) - \Delta K(R - R^{*)} + \Delta Z = 0 \quad (3)$$

Note that $M, X, \Delta K, \Delta Z$ are all denoted in value terms for example in US dollars. Typically import and export are real goods and services. Therefore, they need to be multiplied by dollar prices to arrive at M and X. But in our entire analysis we do not discuss much about absolute price changes. So the real and nominal are not distinctly treated.

(3) captures a host of factors.

The import demand function negatively responds to foreign price/local price ratio. If P^* is US price level (for our purpose we take the rest of the world as the United States) and P is local price level, eP^* is the Rupee equivalent of US price and $\frac{eP^*}{P}$ is the relative price. If US products are relatively cheap M will go up. If the banks in India charge a lower interest rate R for credit cards, we will spend more and M will go up, examples- foreign travels, holiday trips, sending kids to foreign universities etc. If Y, the Indian income level is high we will import more. Note that to produce Y, possibly increasing amount of Y we need increasing amount of oil which India has to largely import. If Y grows faster M will grow faster.

X responds positively to $\frac{eP^*}{P}$, more expensive are US goods and services, India can sell more. Higher R will hurt Indian firms as credit costs will be higher affecting their production. We should have included US income Y^*in X as richer US will demand more Indian goods, but we keep it in the background.

Suppose a US citizen invests a dollar in US today, she gets $(1 + R^*)$ tomorrow. If she converts into Rupees, she gets $e_1.1$ rupees with e_1 as today's exchange rate, invests that in India gets $e_1(1 + R)$ tomorrow, convert it back to dollars, gets $\frac{e_1(1+R)}{e_2}$.

Therefore, $\Delta K > 0$ iff $\frac{e_1(1+R)}{e_2} > (1 + R^*)$.

or$\Delta K > 0$ iff $(1 + R) > (1 + R^*)\frac{e_2}{e_1}$ (4)

Note that e_2 is future exchange rate, hence uncertain today. Therefore, typically an US investor will look at the difference

$(1 + R) - (1 + R^*)\frac{Expected\ e_2}{e_1}$ (5)

If there is no change in exchange rate $e_2 = e_1$, we get the condition that

$\Delta K \gtreqless 0$ iff $R \gtreqless R^*$ (6)

But we must keep it in mind that even if $R = R^*$, if $\frac{Ee_2}{e_1} > 1$ i.e. Rupee is expected to depreciate, capital will flow out today.

ΔZ captures change in reserves. If ΔK is not sufficient to cover the targeted deficit level, ΔZ must be the amount that is drawn from the reserve Z.

We can rewrite (3) in the following manner,

$M\left(\frac{eP^*}{P}, R, Y\right) - X\left(\frac{eP^*}{P}, R, Y^*\right) - \Delta K(R - R^* - Ed) - \Delta Z = 0$ (7)

Where Y^* denotes US output and Ed is expected depreciation of exchange rate. (7) states the fact that *the deficit has to be financed through ΔK and ΔZ if we do not allow e to adjust*. Before we proceed further recall that typically $(M - X)$ is called trade deficit in merchandise goods. We further subtract remittances from abroad and service sector payments to arrive at the current account deficit or CAD. Then CAD is adjusted by ΔK and ΔZ. For simplicity we assume $(M - X)$ represents the CAD. It is straight forward to argue that given (P, P^*, Y, Y^*), ΔK and ΔZ, e needs to adjust so that (7) holds. For example, if $M - X - \Delta K - \Delta Z > 0$ then $(M - X)$ must fall and e must rise. Therefore, as e goes up $(M - X)$ falls and for (7) to hold we should allow e to adjust, as shown in figure 1. Also we denote $M - X = D$, therefore,

$D - \Delta K - \Delta Z = 0$ (7')

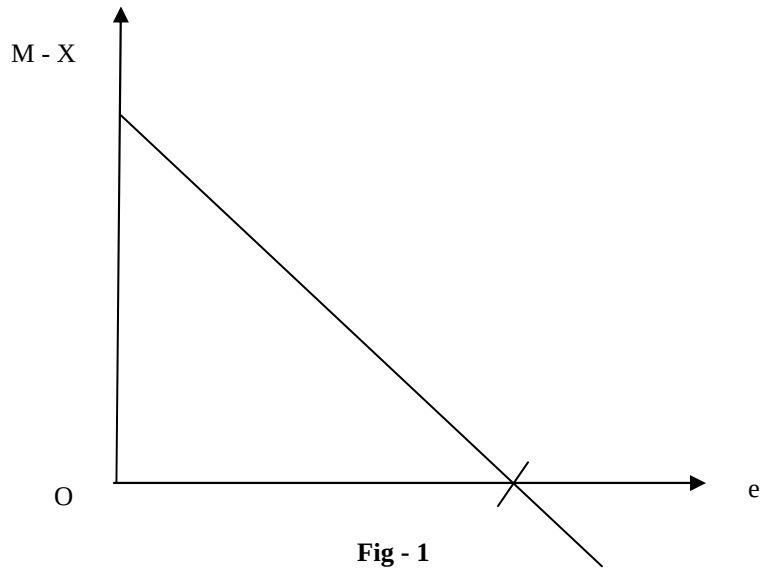

Fig - 1

What figure-1 suggests is the needed adjustment in e for balance of payments equilibrium with $\Delta K + \Delta Z = 0$ or $\Delta K = 0,\ \Delta Z = 0,\ M - X = 0$

Let us bring in 'time' into the analysis in simplest possible way and linearize the system described by (7') and treat $P = P^* = 1$

$$\left.\begin{aligned} D_t &= a - be_t \\ \Delta K_t &= \alpha(R_t - R_t^*) - \beta.\ {}_t^E d_{t+1} \end{aligned}\right\} \quad (8)$$

Then $a - be_t = \alpha(R_t - R_t^*) - \beta.\ {}_t^E\left(\frac{e_{t+1}}{e_t} - 1\right) + \Delta Z_t$

Or $e_t = \frac{a - \alpha(R_t - R_t^*) + \beta.\ {}_t^E\left(\frac{e_{t+1}}{e_t} - 1\right) - \Delta Z_t}{b}$ (9)

We could simultaneously solve for expected value of depreciation and current exchange rate in a more complex rational expectations model. But not to complicate the matter we start from a given value of expectation $\left({}_t^E(\frac{e_{t+1}}{e_t} - 1)\right) = v_{t+1}$

Note that v_{t+1} can be affected by Y_{t+1}, Y_{t+1}^*, etc. But we keep it frozen for the time being.

Therefore following figure-1, e_{t0} denote the equilibrium exchange rate derived from (9) with given $\Delta K$and ΔZ. In fig-1, $\Delta K = \Delta Z = 0$.

Suppose now for some reason R_t^* falls and the US people put more financial capital in India when e_t was adjusting towards equilibrium. Immediately e_t falls and rupee appreciates. That increases the size of D i.e. trade deficit $(M - X)$.

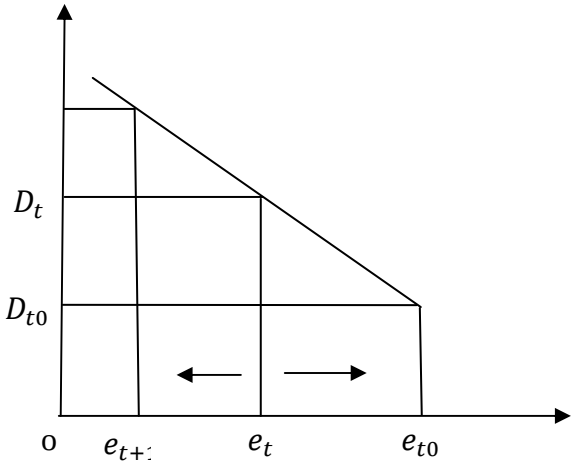

Fig - 2

$\Delta K_{t0} + \Delta Z_{t0} > 0$ (by assumption)

$D_{t0} = \Delta K_{t0} + \Delta Z_{t0}$ [as in (9)] at e_{t0}. We are at D_t and e_t to start with. Suddenly R_t^* drops, we are happy as funds pour in, SENSEX jumps up, etc. $D_t > D_{t0}$ as $e_t < e_{t0}$ and Rupee was naturally depreciating towards e_{t0}, D_t was shrinking as a consequence. But suddenly R_t^* drops and e_t falls to e_{t+1}. Note that when R_t^* suddenly drops ΔK_t gets bigger than ΔK_{t0} with no change in ΔZ. If R_t^* drops temporarily, $(\Delta K_t - \Delta K_{t0})$ will eventually vanish and e_{t0} will be the equilibrating

exchange rate. That is R_t^* will move up again upto its old value. But then the extent of depreciation of the exchange rate will be

$\frac{e_{t0}-e_{t+1}}{e_{t+1}} > \frac{e_{t0}-e_t}{e_t}$ as $e_{t+1} < e_t$ (10)

Sudden capital inflow hampers the process of adjustment of exchange rate and in turn opens up the possibility of greater crash in future. ΔK_{t0} is assumed to be some sort of a steady state inflow and $\Delta K_t > \Delta K_{to}$ is a temporary shock due to some reasons not controlled by India, R_t^* is exogeneously given. Incase ΔK_{t0} itself increases because the change in ΔK is somehow permanent e_{t0} will fall as more deficit can be accommodated with more inflows and same ΔZ. In that case extent of depreciation with capital inflow will be $\frac{\tilde{e}_{t0}-e_{t+1}}{e_{t+1}}$.

Since, $\tilde{e}_{t0} < e_{t0}$, extent of depreciation can be, theoretically speaking, smaller in size. But in a world of volatile capital inflow, anticipated crash of rupee is usually greater with sudden burst of inflow.

One way to control the extent of such a crash is to adjust ΔZ, so that e_t is not disturbed much and does not make it to e_{t+1}. This can be done by reducing ΔZ i.e. adding on to the reserve. RBI can buy dollars and increase the rupee value of dollar halting appreciation of rupee to some extent. This is a very simple explanation of why we should not always be too happy about sudden capital inflow. If we are exporting too little and importing too much appreciation of rupee will not be good and temporary surge in capital inflow precisely does that and add on the risk that rupee will crash more heavily in future.

(b) Capital Flows and Expectation :

We have assumed that ΔK is somehow positive per Period

i.e. $R - R^* - Expected\ Depreciation > 0$

If $R = R^* + Expected\ Depreciation$, then ΔK should vanish.

Better assumption will be that given expectation, even if initially $R > R^* + ED$, eventually it adjusts to be equal and ΔK becomes zero. In fact $\Delta K_{to} = 0$ will not change the analysis.

If initially the trade deficit is 10 bn dollars and declining with e rising i.e. depreciating. Suddenly ΔK increases, say by 5 bn dollars, e drops and then 10 bn may become 20 bn. Now next day ΔK is 3 bn, day after 2 bn till it hits zero and e also starts increasing. Rate of depreciation is larger as rupee hits higher value (lower e) when ΔK increased initially.

The assumption made so far that ΔK flows continuously is a bit odd. When $R - Expected\ Depreciation > R^*$, $\Delta K > 0\ and\ for\ R = R^* + Expected\ Depreciation$ $\Delta K = 0$. This seems more plausible. As ΔK enters India, it can buy bonds, share, etc. If demand for bonds goes up, price of bonds will rise and R will fall. If ΔK is used to buy shares, firms offering more shares will reduce supply bonds as they can raise funds through shares, supply of bonds falls, again R goes down. If we keep expectation untouched for the time being R falls to maintain interest parity. However, it is to be understood that if exchange rate is alolwed to depreciate and people expect that the system willnot return to old equilibrium since the depreciation itself will lead to further putflow of capital . Intersted readers can work it out.But in the process trade deficit may increase by inducing consumers to spend more on imports at a lower R. But export production may get a boost as working capital becomes less expensive. Anyway if demand effect dominates, when ΔK is brought to zero, trade deficit is larger than before and hence e has to depreciate further and crash of rupee will be even more painful.

Lot depends on how people expect the exchange rate to move. Till now we have kept the issue of expectation untouched. We have shown that a sudden inflow appreciates the exchange rate. e falls. Note that such inflow is unanticipated. Otherwise people would have factored that in already. If people believe that e will return to its old value eventually and it must depreciate a lot in future, they would be reluctant to invest that much. After initial boost in ΔK, it will taper off quickly and e will rise faster over time towards old value and depreciation will be less and less over time. But if people believe that the effect is permanent and e will appreciate also in future, they will invest more. This is a kind of "self-fulfilling" expectations what we believe will be true. If ΔK continuously flows into India from US because US economy has extra resource or situation is bad there, e will appreciate to a large extent making our trade deficit go through the roof and the burden of an impending future crash even more severe.

Section – 3: Concluding Remarks

If Y grows it eventually increases our import demand and it may or may not increase our export supply,depending on which sectors are growing. A drop in R coupled with higher Y is bound to increase our trade deficit particularly as our demand for oil grows fast. This is the price we pay for growth. It is possible that higher ΔK allows us to maintain a large trade deficit because we have enough foreign money for the time being but we are reluctant to address the problem of deficit. Feeling good about higher ΔK and appreciating e can be disaster because we may survive by borrowing a lot, selling our bonds and shares to US investors, but if ΔK drops suddenly and we have huge trade deficit e will depreciate sharply and rupee faces a potential crisis. It is important to determine the optimal growth for India keeping in mind the fact that excessive growth or growth of demand for scarce resources has to be contained.

The effect of ΔK on economic growth is not easy to understand. Whether ΔK from abroad is really making our economy grow is a point of research. To what extent such flows increase our rate of aggregate investment and/or level of productivity are yet to be ascertained. There has to be a balance between our growth aspirations, growing demand for oil, increasing trade deficit and sudden crash in exchange rates. Whether authorities consistently work towards such a balance is anybody's guess.

*Helpful comments from Sudipta Jha are appreciated. Remaining errors and omissions are my responsibility.

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