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The Exchange Rate Mechanism and the Ruble Devaluation of 1998

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I'm writing on this subject because of my interest in the foreign exchange rate mechanism. I want to settle, in my own mind, the questions: What determines the value of a currency? And, why does this value change in relation to other currencies?

I was hoping to examine the recent Russian currency crisis as an exemplar case of devaluation in emerging markets, but as I researched the project, I discovered that the Russian case was not so typical. I was expecting to find a currency that was in fundamental disequilibrium due to a prolonged trade deficit. I was expecting to find a currency that was overvalued and maintained so by an artificially high peg to the dollar. Instead, I was surprised to find a trade surplus, which begged the question: Why wasn't the Russian currency appreciating?

With this in mind I will first examine what I see as the common sense fundamentals of the exchange rate mechanism, noting as I go, the relationship with the current Russian crisis. In my examination, I will take the simplest approach, assuming free trade, unrestricted capital movements and negligible transaction costs. Concluding, I will delve into the quagmire of the Russian situation.

Determining value:

The value of anything is determined by what you can get in exchange for it. Or, on the other hand, what you have to give up in order to obtain and keep it. So in effect, the value of anything is its opportunity cost. This holds true for money itself. It is worth what you can get for it... and, what you're willing to give up, in order to get it.

Thus, money itself is a commodity and can be used as barter in exchange for other commodities.

But why do different currencies have different value? And, why do these values change in relation to other currencies?

Purchasing Power Parity (PPP): Is the relationship between the currencies of two or more countries and the commodities that can be purchased. Parity suggests that, products that are substitutes for each other in international trade should have similar prices in all countries when measured against the same currency. But most often, it is the comparison of what a foreign currency can buy as opposed to, what the U.S. dollar can buy.

The basic idea that supports PPP is that (Ceteris Paribus) any deviation from parity would leave room for arbitrage. An entrepreneur could continuously buy an item in one country, then sell the same item in another country, making a fortune on the price differential. Because of this profit potential, eventually everyone would get in on this action, until the price differential was eliminated and there were no more profits to be had. This results in the Law of One Price... A quantity of currency in country A = An identical product = A quantity of currency in country B.

(Figure1)

- $1 U.S. dollar = 1 chicken in the U.S.A..
- 10 rubles = 1 identical chicken in Russia.
- $1 U.S. dollar = 10 rubles.
- The exchange rate of rubles to dollars is 10 rubles/dollar.

It is the parity positions of a currency, with respect to identical products, that determines its value. So, as in the above example, if a chicken costs ten rubles in Russia and an identical chicken costs one dollar in the U.S.A., then the ruble exchange rate to dollars is 10 rubles/dollar or 1 ruble = .10 cents.

We could substitute the chicken, in the above chart, for a "Big Mac" hamburger and we'd have the concept of: "Big Mac Parity".

"Big Mac Parity" assumes that the dollar value of a Big Mac hamburger should be relatively constant and any deviation from that constant, suggests an over/under valuation of a country's currency.

"Deviations from relative Big Mac parity appear to provide useful information for forecasting exchange rates. After accounting for currency-specific constants, a 10% undervaluation according to the hamburger standard in one year is associated with a 3.5% appreciation over the following year".

(Forecasting Exchange Rates And Relative Prices With The Hamburger Standard: Is What You Want What You Get With McParity? Robert E. Cumby, NBER Working Paper #5675 July 1996. p 13.)

Is there a tendency for products to converge toward PPP and/or is this so called "Big Mac Parity" just a fluke? Empirical evidence has been found to suggest that there is convergence, both toward PPP and "Big Mac Parity".

Wei and Parsley (1995) conclude that: "The estimated half-lives of the deviation from PPP are between 4 and 5 years". They also state that: " Cumby's results (Big Mac Parity) suggest very fast convergence: 70% of the price gap across countries disappears every year."

(*Purchasing Power Dis-Parity During the Floating Rate Period: Exchange Rate Validity, Trade Barriers and Other Culprits.* Shang-Jin Wei and David C. Parsley, NBER Working Paper #5032 1995.)

Traders buy and sell the currency based on perceptions of parity plus deviations in the country's balance of payments. If a country's current and capital accounts are in balance, then the country's currency should be at its parity value.

Any deviations from this parity value should be due to changes in the ratio of imports/exports and/or capital inflows/outflows. These ratios represent changes in demand for the country's currency and will cause the exchange rate to fluctuate above or below parity value.

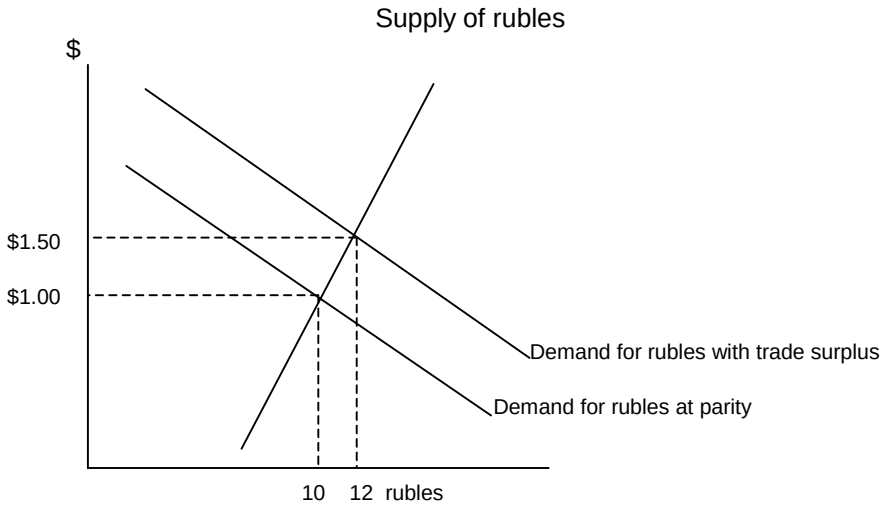
Balance of trade:

If a country has a greater demand for its exports, than it has for imports, then demand for the country's currency will increase. The exchange rate will increase. It will take more foreign currency to buy one unit of the country's currency.

After the appreciation shown in (figure 2), $1 dollar would only cost a Russian 8 rubles, instead of the 10 rubles it cost him before the appreciation.

This scenario will make imports relatively less expensive to the country's consumers, and will make the country's exports relatively more expensive to the rest of the world.

(Figure 2)



So, with free trade and a floating exchange rate, the country would start importing more and exporting less until the country's trade ratio equaled 1 and the exchange rate was at parity.

The opposite is also true: If a country has a greater demand for imports, as opposed to its exports, then demand for the country's currency will decrease. The exchange rate will decrease. It will take more local currency to buy one unit of foreign currency. Similarly, as with the above scenario, the country's exports will now become relatively cheaper to the rest of the world and there will be a tendency toward equilibrium.

If a country's trade deficit is increasing (exports down- imports up) relative to GDP and its money supply remains proportional relative to GDP and there is no change in the exchange rate, then the country's currency is overvalued. Instead of the currency's value decreasing, as it should when imports rise, the exchange rate has remained the same. Thus, it has had a relative appreciation.

This overvaluation/appreciation could be caused by several factors. One is lack of response time. Another, short-term capital inflow due to high interest rates. Another, government selling of foreign currency reserves. (Long term capital inflows would have the same effect of appreciating the currency, but as discussed later, in the case of Direct Foreign Investment (DFI), the effects of long- term investment should act to stabilize the currency at a higher value.)

Government deficits... Capital inflows... And the exchange rate:

Governments finance their deficits by borrowing. (*They can also monetarize the debt by printing money, see note(1) page 13)* When they do this, they crowd out private

investment by driving up the cost of funds. If a government's demand for funds exceed the supply of funds at a given interest rate, then the interest rate must rise until supply equals demand.

It is thus beneficial for a government to desire foreign capital to supply the additional funds necessary to finance its deficit, as this allows the country to maintain a viable interest rate while it continues to deficit spend.

(Figure3)

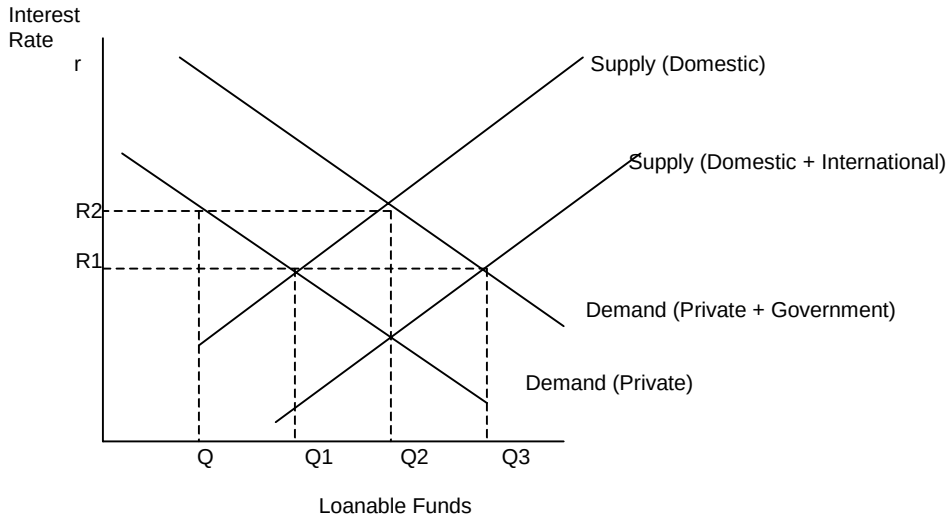


Figure 3 shows that when the government borrows it crowds out private borrowing. When the government enters the loanable funds market, the interest rate rises from R1 to R2 and thus crowds out the privately borrowed quantity of Q minus Q1.

When foreign capital inflows enter the market the supply of loanable funds shifts to the right. Now, both private and government borrowing can be financed at the lower interest rate of R1.

So, there is incentive for a government to pay for its deficit partially with foreign debt. Essentially they use this capital to purchase their own currency in

order to pay domestic debt, such as wages for government workers and to pay for other government projects including infrastructure construction and maintenance... For all the things that governments do....

The effect of this is to create excessive demand for the domestic currency. A demand that is in excess of the currency's value when it is viewed against the country's merchandise trade equilibrium. From this perspective, capital inflows in excess of capital outflows, overvalue a country's currency. It will make imports relatively cheaper than domestically produced equivalent goods. And, it will have the opposite effect on the county's exports.

A further consequence of government deficits is the need for hard currency (Generally dollars) to pay off foreign debt. As foreign debt grows, more capital is needed to service the debt, as well as providing for debt retirement. So, as long as a country maintains a budget deficit, there will be an increasing demand for loanable funds. This increasing demand will exert upward pressure on interest rates.

Cheaper imports have a positive effect for consumers, showing up as lower consumer prices and creating higher real incomes. But negatively, a government supports its fiscal deficit at the expense of the country's export industries, as well as at the expense of its domestic import competing industries and, additionally, at the expense of the entrepreneurial enterprises that depend on loanable funds. Also, it should be noted that, increased consumer spending encouraged by cheaper imports, discourages domestic savings and increases the country's dependence on foreign capital.

Further, as the deficit grows, the interest rate must rise to accommodate the increasing demand for funds. If the rate rises to some unbelievable level (like 150% in the recent Russian crisis), then private investment will virtually halt. Very few legitimate investment opportunities can match that return. Further, private lenders, if they were willing to lend, would be opening themselves to a severe adverse selection problem. At such a cost of funds, only the most risky borrowers, involved in the most risky ventures, would be seeking loans.

This is not to say that all capital inflows are bad. Direct foreign investment (DFI) represents a long-term commitment to a productive endeavor, one that can not be easily liquidated, thus inhibiting capital outflow. This type of increase in the demand for a country's currency could be viewed to be a real increase in value, rather than an excessive increase... or over-valuation.

Frankel and Rose have suggested that DFI is linked directly to productive activity. It represents a real investment in plant, equipment and infrastructure. Foreign borrowing, on the other hand, particularly short term, does not add to the productive capacity that is necessary to generate export earnings. It is these export earnings that generate the hard currency needed to service the foreign debt in the future. But, "the stronger argument in favor of DFI is that of stability. In the event of a crash, investors can suddenly dump securities and banks can refuse to roll over loans, but multi-national corporations cannot quickly pack up their factories and go home."

(Currency Crashes in Emerging Markets: Empirical Indicators, Jeffery A. Frankel, Andrew K. Rose, Working Paper #5437 NBER. 1996, p.7-8.)

Contagion of a currency crisis:

Did the Asian currency crisis spread to Russia?

One Theory by Gerlach and Smets (1995) proposed that contagion could spread between "two countries linked together by trade in merchandise and financial assets." "A successful attack on one exchange rate leads to its real depreciation, which enhances the competitiveness of the country's merchandise exports. This produces a trade deficit in the second country, a gradual decline in the international reserves of its central bank, and ultimately an attack on its currency." "Further, lower import prices in the second country causes consumers to demand less of their own currency, preferring to swap domestic currency for foreign exchange. This drain on the foreign reserves of the central bank may shift the second economy from a no attack equilibrium; one where sufficient reserves exist to ward off a speculative currency attacks, to a new equilibrium in which a speculative currency attack may succeed. "

(Contagious Currency Crises, NBER Working Paper Series, #5681, July 1996
Barry Eichengreen, Andrew K. Rose, Charles Wyplosz)

So, did the Asian crisis cause the Russian crisis? Certainly not for the above mentioned causes of contagion. The Asian crisis certainly contributed to the growing risk aversion of international investors and to the timing of the Russian devaluation, but it served only as a trigger in setting off a devaluation that was basically of Russia's own making. It wasn't a matter of 'if' the ruble would devalue, but ... when it would devalue.

In the short run, authorities can counter speculative pressure by running down their international reserves or by adjusting interest rates.
"The interest rate on Russia's short- term debt preceding its August 17th devaluation soared past 150%. As money flowed out of the country the central bank's reserves diminished by around $1 billion a week." (*The Economist, August 15, 1998. p.60.)*

"Last month the central bank vowed not to intervene heavily in the foreign exchange markets after having admitted to burning through some $9 billion in July and August in a futile attempt to support the flagging ruble. That effort helped deplete the central bank's gold and hard currency reserves to an estimated $11 billion. " (*Ruble Stronger in Trade, Scarce in the Street,* Reuters, Sept. 9, 1998 NYT.)

If we consider that Russia was running a trade surplus, then this should have put upward pressure on the exchange rate, making the ruble undervalued at the pegged rate rather than overvalued. Now, considering the high interest rate and substantial foreign capital inflows, it can only be inferred that the Russians themselves were moving out of rubles, creating a huge capital outflow, large enough to offset the trade surplus and foreign investment.

This contention is supported by this quote from the CIA World Fact-book: "...capital flight continues to exceed in volume the inflow of foreign capital. The

central bank estimates that $30 billion in US currency circulates in the Russian economy. "" Russia's trade surplus, after adjustment for unreported "shuttle" trade, grew to a record $28.5 billion in 1996, according to official Russian statistics. Export growth, which slowed from 18% to 9%, was due mostly to increased raw material prices. "
(CIA World Fact-book, http://www.odci.gov/cia/publications/factbook/index.html)

Also, from the (*Economist, July 11, 1998 p. 19):* It was indicated that Russia's notorious tycoons, the so called "oligarchs" who control vast swathes of the economy, send much of their asset stripping profits abroad rather than reinvesting at home.

"A huge amount of money has fled Russia -- according to Credit Suisse-First Boston, at least $66 billion from 1994 to 1997 alone. Cyprus, the best-known offshore tax haven, is home to at least 2,000 subsidiaries of Russian companies, according to Steven Shevoley, a Thomson Bankwatch vice president who watches Russian banks from the island."
(Hooked on High-Yield Loans Creditors Reap the Whirlwind, New York Times, 8-28-98)

Having a trade surplus should have been ideal for Russia. A trade surplus, along with a constant demand for its exports and an appreciating currency should have set the stage for a dynamic economy. But a corrupt and inept banking system made it impossible to have any faith in the ruble and led to the capital outflows that devalued and virtually destroyed the currency.

Exemplifying this, the Wall Street Journal said, regarding a release of reserves from the central bank: "Russian banks don't really understand the concept of liability - and thus regard all credits as free money - the new funds will most likely show up in Switzerland. Most Russians will understand that their banks are on borrowed time and avoid doing business with them wherever possible." In the same article, " Prosecutor General Yuri Skuratov claims that large amounts of the first tranche of the IMF bailout to Russia ended up outside

Russia and that foreign credits are routinely either embezzled or grossly misallocated."
(*Russia Slides Backwards*, WSJ Editorial, Sept. 23, 1998)

"A key factor in Russia's collapse was a failure to collect taxes, which were supposed to replace the revenues previously generated by state-owned enterprises. And with oil prices collapsing, Russia could no longer count on enough money from what had been its most valuable resource. Without enough revenues to pay its bills, and to support ailing local banks that owned the bonds, Russia issued more GKO's with ever-higher interest rates attractive to foreign and domestic investors -- a short-term fix that eventually buried the government under a pyramid of debt that collapsed last month. "
" "Unfortunately, I think the GKO market didn't bring any real investment to the Russian economy," said Dmitri Vasiliev, chairman of Russia's Federal Commission for the Securities Market. "It just covered very high government deficits." " (New York Times, Sept. 11,1998 *Moscow Madness From the Inside: Investment Bank Goes Bust*)

The New York Times reported this example of Russian banking indiscretion: "The heavy trading on currency markets Tuesday suggested that many Russians banks were using their ruble reserves to buy dollars, now the currency of choice in Russia. "Of course, we are worried that many banks are using their credits to speculate on the currency market, not to pay their creditors," said Central Bank spokesman Irina Yasina. "But we cannot interfere with the market." " (NYT 8-26-98 *Russia Intervenes as Ruble Tumbles to a 4-Year Low)*

From the same article Charles Blitzer, the London-based director of emerging markets research for Donaldson, Lufkin & Jenrette said:
"It seems Russia's oligarchs are engaging in big-time capital flight, undermining the ruble and fleeing the country. For the Central Bank to say they can't control it is a total abdication of what a central bank's responsibilities are."

Russia's currency crisis stated simplistically, can be attributed to financing a large deficit through the issue of short-term debt rather than tax receipts, an inept and inadequately regulated banking system (including a lack of transparency), and a lack of confidence in the currency as a store of value. To a lesser extent, it could be said that, the lack of clearly defined and enforceable property rights (as well as the banking problems) has discouraged Direct Foreign Investment that would have greatly benefited the developing Russian economy. DFI would serve to encourage the development of institutions and infrastructure needed in a modern industrial economy.

Many developing countries fear foreign ownership. This fear is misplaced however, because the benefits gained far outweigh the costs. They could gain jobs, wages, infrastructure, vendor industries, taxes, as well as a myriad of ancillary benefits. The owner only takes away his profit *(which wouldn't exist except through his efforts and capital)* and this, only if he chooses to not reinvest *(which he would if he liked his profit margin).* Further, it is the country's citizens, with the power of the vote, who are ultimately in control. They are more likely to get screwed by their own oligarchs (i.e. manipulators, the power elite, the ruling class) than by foreigners. Foreign investors cannot engage in an enterprise that would be detrimental to a country unless there is collusion with local authorities. The problem of detrimental exploitation cannot be blamed on foreigners. The blame lies with corrupt local officials.

Also, fearing competition, local special interest groups may exploit and fuel the fear of foreign ownership to block DFI, thus protecting local monopoly profits.

It's easy to give advice in hindsight, but right from the beginning of its market experiment, Russia should have promoted DFI as well as instituting and maintaining some type of currency control. DFI adds stability and currency controls counter distrust in the monetary authorities. To establish trust a monetary authority must be consistent, transparent and ethical. All of which must be established over time. No one wants to hold a currency they can't trust. Unfortunately for Russia, the ruble was such a currency.

END

Note(1): Prior to 1995, Russia was using a policy of debt monetarization to compensate for it's fiscal deficit. In order to end the inflation caused by this policy, the Ministry of Finance and Treasury, began issuing short-term debt instruments (GKO'S). This had the desired effect of curbing inflation, but intensified the potential for capital flight. We witnessed the result of capital flight in the August 98 devaluation.

Russian statistics from the CIA World Fact-book:

Population = 147.7 Million.
Government spending = 30 to 40% of GDP.
Foreign investment = $6.5 Billion in 1996, which includes DFI of $2.1 Billion 1996.
External Debt = $130 Billion 1996.
Trade Surplus = 28.5 Billion 1996.
Exports = $88.5 Billion 1996.
Imports = $59.8 Billion 1996.
Inflation = 22%.
Unemployment = 9.3%
(http://www.odci.gov/cia/publications/factbook/)

Russian statistics from *The World Bank*

GDP: $492.8 billions (1997)
Total debt = 25.1% of GDP (1997)
Fiscal deficit = 7.6% of GDP (1997)
Exports = $88,697 U.S. millions (1997)
Imports = $74,451 U.S. millions (1997)
Inflation = 17.3% (1997)
(http://www.worldbank.org/)

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