Optimal Exchange Rate Beyond Purchase Power Parity

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ABSTRACT

This paper expounds a novel theory which considers banking and social instabilities to determine optimal currency value. Under this theory, a low enough currency value attracts global business enterprises to create new jobs in a country. But keeping the currency value too low leads to excessive creation of money for the exporters and expatriates. Excess money in the system induces banks to relax standards for lending to frivolous projects yielding little returns. Growth in frivolous lending (which is testable) is likely to increase the quantum of nonperforming loans which may lead to instability in the banking system. The excess money, created due to lower currency values, for a small segment of national population will likely generate (testable outcomes like) wealth disparity and social instability. The optimal exchange value of a currency should thus be determined by balancing growth in jobs with rising social and banking instability.[*] This paper also argues for creation of central currency clearing registers to pave the way for free floats.

INTRODUCTION

The value of a currency stems from its power to purchase a basket of goods and services. The exchange rate between two currencies is their relative value, which by conventional wisdom is determined via the well-known purchase power parity (PPP) theory. But the PPP can be valid only when there is free exchange of capital, labor, material and services across national boundaries. With barriers to free exchange, the PPP cannot be the sole basis of determination of optimal exchange rates.

This paper expounds a novel theory in which banking and social instabilities play crucial roles in determining the optimal exchange rate of a currency. By this theory, a lower currency value attracts sufficient global business enterprises to create new jobs in a country. But keeping the currency value too low leads to excessive creation of fiat money for the exporters and expatriates. The excessive money in the system may induce banks to relax standards for lending to frivolous projects that may yield little returns. The projects may yield little returns because they are likely to be promoted by the kith, kin and cronies of government officials who create the money and oversee the banking system. An increased likelihood of frivolous lending (which is testable) can raise the quantum of nonperforming loans which may lead to instability in the banking system. The excess money created, due to low currency values, for a small segment of people (exporters and expatriates) of the country may likely generate (testable outcomes like) wealth disparity and hence social instability. The optimal exchange value of a currency should thus be determined by balancing growth in jobs with rising social and banking instability.

This paper is not about whether the government or the market should determine the exchange rates. It is about how the developing nations facing many constraints may determine optimal exchange rates which can be different from those implied by the PPP theory.

[*] This theory was first presented by the author on August 14, 2003 at the Hong Kong Monetary Authority. The author was also slated to present it at the People's Bank of China but could not visit Beijing due to SARS. Within a few weeks of the presentation, the Chiefs of Hong Kong Monetary Authority and People's Bank of China met to grant more power to a newly established bank regulatory authority to monitor non-performing bank loans. Then in a few months China has infused about $70 billion to recapitalize bank equity. It seems that China's unpublished but potentially explosive growth in nonperforming bank loans alarmed the Chinese authorities in order to take preemptive actions of recapitalizing their banking industry. President Hu of China has been expressing serious desires about narrowing the wealth gap to avert social tensions. The July 2005 decision to link yuan to a basket of currencies instead of just to the dollar appears to be a step towards fulfillment of such desires.

Our novel theory is redundant for exchange rates of countries which face no barriers among them for free trades of labor, material, capital and service. The developed world comprising the western European countries, USA and Japan have free trades with virtually no barriers and so their exchange rates are likely to based almost solely by the PPP. The trade barriers between the developing countries and the developed world are, however, significant. We argue that even with trade barriers, central currency clearing registries can pave the way for free floating of currencies.

UNIQUE CHARACTERISTICS OF A DEVELOPING ECONOMY

Developing economies like that of China, India, Russia and Brazil face unique characteristics that are crucial for determination of the optimal values of their currencies.

1. The main difference between the developed and developing economies is that the former (represented by G7 countries[†]) never borrow foreign-currency denominated funds, while the latter are constrained to borrow such loans.
2. Foreign country denominated loans make developing economies and their banks vulnerable to volatility in exchange values of their currencies.
3. For example, when Indonesian rupiah plummeted from Rp2500 to Rp20000 per U.S. dollar between June and December of 1997, Indonesians' external debt burden in terms of rupiah rose eight times.
    a. Indonesia lost $140 billion of its foreign exchange reserves in a matter of months in 1997.
    b. Its central bank was flooded with rupiahs from international short-sellers who had short-sold (borrowed and exchanged to dollars) most of the rupiahs from local commercial banks.
    c. Indonesian local banks had little funds left to lend, causing acute credit crunch.
    d. Indonesian central bank had no mechanism to circulate its accumulated rupiahs back to the commercial banks, while the country, unable to import, faced food shortages leading to riots and social instability.
    e. The International Monetary Fund and the World Bank were praising Indonesian policymakers until May 1997 about the country's stable exchange rate policy and prodding to keep the peg stable even by raising the interest rates on foreign currency denominated loans to attract investments.
4. It is naïve to believe that the IMF and World Bank were unaware of the international banks short-selling the Indonesian rupiah while their economists were singing praise for Indonesia's stable exchange rate policy.
5. It appears that the G7 nations have strategically created the IMF and World Bank as a challenge to the decolonization drive in the wake of World War II by making their currencies hard and the rest vulnerable to manipulation.
6. By pegging yuan to the US dollar, China and Hong Kong have effectively undone the G7 strategy.
7. In fact, when Malaysia (the only developing nation with little foreign currency denominated loans) too chose to peg its currency ringgit to the U.S. dollar in 1997, the White House was unnerved because of a real fear that the rest of the developing countries could follow suit.
8. Argentina followed the Malaysian strategy in 1997, but its massive dollar debt ruined the peg beyond repair.
9. China has undoubtedly succeeded or at least not faced any problem so far by pegging its exchange rate to the U.S. dollar because of relatively small external debt and massive exports. Since July 2005 China has pegged its currency to a mix of hard currencies including dollar, yen and euro. The Chinese foreign exchange reserves have reached about 1.3 trillion dollars as of August 2007.

The question is whether China has gone to an extreme by operating as a virtual surrogate of the central banks of developed countries. The Chinese yuan now is simply exhibiting the volatility in the value of the developed world currencies vis-à-vis the rest of the world's currencies. Is this one-to-one volatility in the value of yuan sanguine for China? Consider the following points.

[†] G7 countries are USA, UK, Canada, Germany, France, Japan and Italy.

1. China faces a crucial exogenous factor that does not affect its competitors, U.S., Japan or European countries: China cannot yet raise yuan-denominated debt in international capital markets, while its competitors have been raising funds in their own currencies.
2. The developed countries have succeeded in establishing an atmosphere or reputation, often aided by propaganda wars against emerging rival economies, about their stability, freedom and security to perpetuate trust of international lenders/investors.
3. The U.S. economy is perhaps the most insecure in among major countries the world due to:
    i. its massive growing trade imbalance (eight hundred billion dollars per year),
    ii. severe federal and local government budget deficits, and
    iii. massive current account deficits.
4. Yet, the U.S. does not appear to face serious threat from the rest of the world's economies, thanks to the trust in its economy of its own rivals as indicated by more than three trillion U.S. dollar reserves held by them. The U.S. does not hold significant reserves in other currencies.
5. The U.S. economy is like a mega Ponzi game in which more and more are borrowed to fund operations.
6. No Ponzi game lasts forever. Even mega games like that of the British and Roman empires have collapsed.
7. The U.S. Ponzi scheme is continuing mainly due to the collective trust of its creditors and fear of each creditor about withdrawing dollar reserves from the U.S. Federal Reserve Bank unilaterally. The rest of the world faces a classic prisoners' dilemma vis-à-vis dollar reserves held in USA.

A MODEL OF ENHANCING NATIONAL WEALTH THROUGH AN OPTIMAL EXCHANGE RATE

The above current global economic scenario and the asymmetric investor trust across various economies give rise to a model in which the optimal value of a currency like yuan can be determined. Consider the following:

a. Determination of the optimal value (X) of a decision variable within an economic model involves a trade off.
b. For example, the value of an objective function V(X) may increase if X is raised up to a point and then decrease as X is allowed to increase further.
c. Suppose that X is the exchange rate (U.S. dollars per yuan) and V(X) is a function of X representing the social welfare of Chinese people.
d. While deciding on X, policymakers keep in mind some objective function which maybe nebulas or mathematically imprecise.
e. If the true social objective function is very different from that used by decision makers, the policy will be suboptimal.
f. This may lead a country to chaos like in Indonesia which drained its valuable exchange reserves and derailed economic progress due to a faulty or confusing social welfare function.
g. The social welfare function is dependent on many parameters not easily fathomed or controlled by rulers of a country:
    i. currency manipulation by external players like hedge funds,
    ii. changes in consumption pattern for countries that depend on imports,
    iii. unanticipated wars,
    iv. social disturbance (riots),
    v. external diplomatic pressure, and
    vi. trade sanctions.
h. The above factors affect the exchange rate as well as the decision making process for determination of the exchange rate.

Whatever may be the considerations of a developing economy, its optimal exchange rate policy cannot be similar to that of developed countries. The optimal exchange rate policy of a developing economy cannot even mirror that of the exchange rate policy of a developed economy. This is primarily because of the inability of a developed economy to attract international debt capital denominated in domestic currency. While the U.S. can, for instance, raise international debt capital in dollars, China cannot raise such capital in yuan, though yuan can be made to mirror dollar.

Now yuan (as a mix of dollar, euro and yen) may be floating in its value vis-à-vis the rest of the world's currencies. But China cannot raise yuan-denominated debt in international capital markets due to a lack of investor

trust in Chinese monetary policy. China is still able to attract massive amounts of foreign direct equity investment in its manufacturing shops, but that is negligible compared to the trillions invested in the U.S. While China is apt to hold massive amounts of dollars in the Federal Reserve Bank, the U.S. does not care or need to do anything similar. This shows the bias of a major developing economy like that of China against its own currency vis-à-vis a rival economy's currency.

Proposition 1: There exists an optimal value of a developing country's currency that maximizes national wealth or welfare.

Proof: Two crucial factors have not been considered in the literature or media (to the best of my knowledge) for determination of the exchange rate policy of a developing economy. They are (i) rising social instability and (ii) growth in non-performing bank loans due to excess money creation associated with a low value of a currency. It can be argued the social welfare V(X) increases as the exchange value, X, of a developing economy's currency is reduced because such a reduction in X attracts global businesses to create jobs in a country. But V(X) can decrease if X is lowered sufficiently below some threshold value of X. This is because by sufficiently lowering the value of a currency, the central bank of a country will simply create excess amount of fiat money in its banking system in the names of exporters and expatriates. Excess money is generally associated with relaxation of lending standards that lead to lending to frivolous projects that generate little returns. The kith, kin and cronies of developing countries' decision makers generally receive favor to fund fictitious projects that yield little payoffs. Excess money thus raises the quantum of nonperforming loans in the banking system of a developing economy. Excess money is created for a few in the society, those who export or serve abroad and those who usurp the newly created funds. This raises the disparity between the fringe that wangles the money and the multitude that struggles for its wherewithal. This disparity creates social tension between the very rich and the rest. Lowering the value of a currency (X) below the threshold thus begets two unintended consequences: social and banking instability that reduces the welfare V(X) of the country. The threshold value of X is thus the optimal value of the currency. []

The argument about the existence of an optimal value of a developing country's currency thus stems from the fact that vast sums of money are created for exporters and expatriates when the exchange value of a developing country's currency is fixed at a lower level than its optimal value. This makes the exporters and expatriates disproportionately wealthier than the multitude as compared to the situation of an optimal exchange value of the currency. This increases the probability of future social tension in a country like China. Vast sums of money created in the banking system in the accounts of exporters are also available as debt for deployment in the economy, tempting decision makers to make more unproductive investment decisions than they would otherwise do if the exchange value of the currency were optimal. For instance, if the yuan is really undervalued as compared to its optimal value, the Chinese decision makers might be investing more in the relatively unproductive infrastructure of the western Chinese regions than they would have done if the exchange rate were optimally set.

It is not easy for decision makers to determine the optimal value of a currency. Even the exchange markets tend to overrate or underrate a currency. Only in theory markets are presumed to determine the value of a currency close to its optimal value. There is thus no objective way to know whether yuan is undervalued currently. How will the authorities then act? There are two indicators. One is swelling of nonperforming bank assets measured objectively and the other is level of anxiety of a vast majority of Chinese through authoritative and credible survey of people earning in the bottom 95% of income.

In any case, there exists a value of a developing economy's currency (in terms of the dollar or euro or yen) that is optimal for the people in the economy. The optimality is determined by factors which are very different from those for developed countries whose values relative to each other are determined by markets.

No argument is made here about swelling foreign exchange reserves of a developing country as an indicator of an undervalued currency. The amount of foreign exchange reserves cannot be a determinant of the value of a currency. This is because the U.S. maintains little foreign exchange reserves, yet the markets are able to determine the value of dollar. The arguments expanded by Japan, European Union and USA about swelling Chinese foreign exchange reserves as an indicator of undervalued yuan are not valid. Yuan's optimal value is determined by a trade off between employment growth and the negative factors like social instability and non-performing bank loan growth.

Non-performing bank loanss may ultimately lead to bank failures resulting in erosion of trust of investors in a developing country's banking system. This can irrevocably damage confidence of international investors as well as domestic lenders making it impossible for the decision makers to raise new capital. The developing country may then be forced to demonetize domestic debt by fiat by forcing domestic lenders to accept less than their bank deposits. This effectively makes the value of the currency higher than officially set because exporters get less of the local currency per dollar, ultimately, than originally promised. This is an ex post automatic revaluation thrust on the economy after a painful interlude like demonetization and erosion of investor confidence. Ex post automatic revaluation is worse than a conscious ex anti revaluation based on swelling non performing assets and budding social disparity.

FLOATING CURRENCIES: MAIN OBSTACLE

Manipulation is the main obstacle to floating developing countries' currencies freely. If a developing country pegs its currency to a sufficiently high vale, arbitrage profit opportunities due to manipulation arise because of the restrictive factors faced by developing countries. Consider the following example to see the deleterious effects of manipulation.

Proposition 2: Profits from i*nternational lending can be generated from a developing country like Indonesia or any of its companies like Telekom offering a substantially higher rate of interest on foreign-currency (U.S. dollar) loans than the borrowing cost in the foreign country (USA), if the value of its currency (rupiah) is fixed sufficiently high. Profits can be enhanced through kickbacks to the developing country's government and business executives.*
Proof: Consider an arbitrageur who simply (i) borrows enormous amount of foreign currency loans in international markets like Singapore or New York to lend to local businesses with government ownership in a developing country at an interest rate equal to the cost of foreign funds plus the developing country's risk premium plus admissible profits, and (ii) borrows enough of the developing country's currency from local banks to exchange into the foreign currency at the fixed exchange rate for immediate repatriation. The highest rate of interest on foreign currency denominated loans to local businesses in the developing country will depend on the need for foreign capital and corruption in the country. Corrupt rulers can permit depraved colluding business executives to borrow at substantially higher interest rates depending on the amount of kickbacks the arbitrageur offers. This strategy generates an instant arbitrage return equal to the developing country risk premium plus arbitrage profits minus kickbacks. The corrupt business and government executives pocket the kickbacks. The arbitrageur recognizes the profits as income, carries the loans to the developing country's businesses as assets and the amount borrowed in the local currency as liability. The arbitrageur's only potential risk is due to any rise in the value of the developing country's currency. But he knows that the country has been having the exchange rate at a sufficiently high steady rate that will only fall as other arbitrageurs engage in the same stratagems in tacit collusion with the government officials[‡].

For example, Indonesian rupiah was trading at Rp2500 per U.S. dollar, when the demand for conversion of rupiah suddenly ballooned in the wake of Thai Bhat crisis in early 1997. Investors suspected that Indonesia was reluctant to devalue rupiah below the level of Rp2500 per dollar. Perhaps this level was not quite the sustainable level for the value of rupiah. But even if this was, the demand for exchanging rupiah to U.S. dollar shot up in a few weeks following the Thai crisis. Rupiah then slid dramatically. Arbitrageurs' positions are secretive and it is difficult to pin down how much of arbitrage was done. Moderate hedge funds, often operated and assisted by major U.S. banks, can employ equity of $2 billion to bet $200 billion, which is enough to wipe out all Indonesian foreign exchange reserves (about $140 billion) by August 1998. Just setting a declining trend for rupiah was enough to create panics triggering Indonesians to convert their rupiahs into dollar.

To calculate arbitrage profits, suppose an arbitrageur in Citibank uses one million dollars deposited by the Americans at 6% rate of interest and lends it as a dollar-denominated loan to Indonesian Telekom at 9% on July 1, 1997 when the exchange rate is Rp 2500 per dollar. Suppose further that the exchange rate drops to Rp 13750 per dollar by June 30, 1998. The arbitrage strategy involves borrowing Rp2500 million at, say, about 10% interest rate per year from a local Indonesian bank on July 1, 1997 and then exchanging this sum at the Indonesian Reserve Bank for one million U.S. dollars for repatriation to Citibank. On June 30, 1998, the Citibank arbitrageur owes the local

[‡] Indeed the president of Indonesia and officials associated with him were reported to be selling off their rupiah assets to stash the same in foreign currencies.

Indonesian bank Rp2500 million plus 10% interest amounting to a total of principal plus interest equal to Rp2750 million. To repay this sum, the arbitrageur draws $200,000 from Citibank and converts these dollars to Rp2750 million rupiahs at the devalued exchange rate of Rp13750 per dollar on June 30, 1998. The Indonesian government owned company, Telekom, owes Citibank $1 million plus 9% interest, i.e., a sum of $1.09 million on June 30, 1998. Thus, the Citibank arbitrageur's profit as of June 30, 1998 is $0.89 million, which is $1.09 million from Telekom minus $0.20 million used on this date to repay the rupiah loan to the local Indonesian bank. The arbitrage profits of $0.89 million is on no initial investment because the initial sum of $1 million lent to Telekom has been repatriated to Citibank on July 1, 1997. Citibank could bet billions to drain all foreign exchange reserves of a country like Indonesia. []

The Chinese Indonesians converted nearly $60 billion worth of rupiahs into foreign currencies out of fear for riots. This capital fled Indonesia in a matter of six months. The rupiah value plummeted to a historic low of Rp18000 per dollar by December 1997. Riots ensued and President Suharto was ousted, wiping out his thirty-year legacy of improving the Indonesian living standard from a per-capita income of $350 as of 1967 to $3500 by July 1998. The Indonesian per-capita income dropped to the same level as existed when Suharto took the reign of the country. The fallen currency could not lift Indonesian exports, defying conventional wisdom flowing from economists attuned to operation of developed economies. Clearly, the restrictions facing a developing country are not congenial for free capital flow and exchange rate.

After successful arbitrage by banks in developed economies, the Indonesian central bank gets flooded with rupiah that arbitrageurs have borrowed from local banks to exchange for dollar in 1997. Then local banks have few rupiahs to lend to consumers and businesses, while the central bank sits with all the rupiah with no mechanism to use it. When importers need rupiah to import food, the rate of interest becomes exorbitant and the exchange value of rupiah further slips as the importer attempts to raise dollar from private individuals because of no foreign exchange reserves available at the central bank. Then the imported food price rises astronomically, leading people to riot and demand regime change. At the end of the mega currency games, arbitrageurs profit about $140 billion from Indonesia and raise the debt burden on common Indonesians 5.5 times as the currency devalues from Rp2500 per dollar to Rp13750 per dollar in just one year.

Developed countries do not borrow foreign currency loans and so face no serious risk from devaluation. They can thus afford to freely float their currencies and permit their companies borrow as much as lenders wish to lend. The central bank of a developed country with no foreign currency loans has no chance of depleting its foreign exchange reserves. There may be irrational exuberance or fear from time to time in a developed economy. But there will be no economic collapse due to any dramatic fall in currency value. A developed country does not pay any risk premium on foreign currency denominated debts because such debt is never raised. This does not, though, preclude trading on developed countries' currencies by hedgers, speculators and arbitrageurs. For example, Japanese yen fell from about 90 yens per dollar in 1990 to 147 yens per dollar in 1998. The fall in the value of yen in 1997 was dramatic. Many hedge funds were heavily short in yen because Japanese economy has stopped growing for a long time. Japanese exports are very elastic with respect to the fall in the value of yen. As the hedgers pursued hard, Japanese annual trade surplus against the U.S. ballooned to about $140 billion per year, posing enormous pressure on dollar by October 1998. From various press reports, it was clear that many hedge funds had to give up because their expectation of a complete collapse of yen against dollar did not materialize. Even if yen collapsed to 200 per dollar, there would be no serious harm on the Japanese economy (as in the case of Indonesia) because Japan does not have foreign currency denominated debt and Japanese exports are resilient to the exchange rate. In fact, Japanese exporters gain from a falling yen. The main aspect of the Japanese economy is stagnant growth due to a leveling off of consumption of satiated Japanese who are saving most of their income.

CENTRAL TRADE REGISTRY TO FLOAT CURRENCY

The only way by which developing countries' currencies can be floated is through creation of global registers for currencies. Central currency registers can avert manipulation despite these restrictive factors faced by developing countries.

The price of a currency freely trading in several locations without a central registry can be manipulated, especially when the normal volume of transactions on the currency is low. Currently, central registries for

currencies do not exist. The idea of a central registry will thus appear to be odd for dealers of major currencies like dollar, euro and yen. Having a central registry for a currency is equivalent to banning all trades on the currency except those that pass through the issuing central bank of the country. A central bank can require all trades on its currency to be recorded in its system in order to be recognized as legitimate trades. If all trades on a currency are required to pass through a unique central registry, no fictitious trades can be made to manipulate the value of a currency, especially, of a small economy like Malaysia.

Rampant manipulation of the value of Malaysian ringgit during 1997-1998 led the Malaysian government to ban overseas trading on ringgit after it fixed the exchange rate at 3.8 ringgit per dollar in October 1998. This was a remarkable step. But one should study why there exists a unique central registry for every stock traded in USA, and how nonexistence of such unique registries for Malaysian stocks before October 1998 could be used to manipulate stock prices through Singapore exchange. Such a study should convince that every currency must have a unique central registry to preclude manipulation. Major currencies do not need such registries because manipulation of their values against each other is not easy when the volumes of trade are enormous.

Before 1998, Singapore Stock Exchange had a Central Limit Order Book (CLOB) trading system to trade Malaysian stocks. CLOB permitted trades among shareholders without recording in a unique registry and without the transfer of ownership of shares from sellers to buyers. There was no single central registry for shares of a company. In USA, there is a single registry of all shares of a company listed in an exchange like NYSE, AMEX, and NASDAQ. There can be listing and trading of a stock in multiple exchanges, but a unique registry is needed to ensure that the total number of shares remains equal to that issued by the company. This is critical to preclude creation of an unlimited number of virtual shares for short selling. For example, suppose that a company has issued a total of 100 shares owned by just one shareholder in a brokerage account. Brokers generally seek permission of shareholders to lend these shares for short selling. Only if this shareholder permits to lend his shares, can a short-seller borrow a maximum of 100 shares through brokers to sell them in the open market. The seller borrowing and selling thus remains short until he returns the shares to the broker by buying in the open market later. If the price drops after selling short, the short-seller profits from the difference between his selling and buying prices.

There cannot be obviously more shares sold short than the number of shares issued by a company. But suppose that a short-seller makes a fake sale to a colluding buyer at a fictitiously low price in some exchange that does not register shares or traders of this particular stock and displays the latest executed price. The short-seller's purpose is to show to the current legitimate owners of shares that the price has dropped. When some current owners panic and sell their shares at that fictitiously low price, the short-seller can profit by covering (buying) the shares he is short. Short-sellers have unlimited temptation to establish a low share prices by any means including fictitious trading. Legitimate exchanges will not record fictitious trading prices and it is impossible to enter illegitimate (fictitious) trades in a unique registry that records only legitimate trades on a stock.

If there are multiple registries maintained for recording trades of the same stock, as was the case for Malaysian stocks before October 1998, the price can be manipulated through fictitious trades. Only a unique registry for all trades of a stock can guarantee that no more than the outstanding number of shares is sold short. The Malaysian law did not require registration of all trades of shares of a stock in the same centralized registry system before October 1998. This gave incentive to speculators to create an unlimited number of virtual shares and fictitiously sell them short to depress the price dramatically. Shares not issued by companies listed in the KLSE index were virtually created during 1997-1998 to depress the value of the index to a point of absolute panic in the Malaysian market. If existing shareholders of a company do not lend their shares, no trader can borrow shares of this company to sell short when there is a central registry. The creation of virtual shares is unethical and cannot happen with a single registry for every stock, as in the USA and other developed economies. The Malaysian shares traded in CLOB at Singapore Stock Exchange were not, however, required to pass through a central registry before October 1998. The Malaysian government banned CLOB trading of Malaysian shares in October 1998.

While common shares and bonds have common registries (centralized stock exchange clearing systems), currencies do not have such registries. Lack of a single registry for a currency can create virtual money. Before October 1998, a hedge fund could borrow a vast sum of ringgits from a Malaysian bank to exchange it to dollar. If the hedge fund sold the ringgits to any bank operating within the Malaysian central bank (Bank Negara) clearing system, the total amount of ringgits would remain equal to the amount of currency in circulation. The hedge fund could, however, sell the ringgits to Singapore Bank-A whose transactions did not clear through Bank Negara. Then

Singapore Bank-B could borrow these ringgits from Bank-A to sell to Singapore Bank-C, and Singapore Bank-D could borrow the ringgits from Bank-C to sell to Singapore Bank-E, and so on, with every such sale depressing the ringgit's exchange value. This successive trading would generate a perception of the supply of a virtually huge amount of ringgits, in comparison to the amount created by Bank Negara. The velocity of circulation of fiat money within an economy is different from the velocity of unidirectional exchange of a currency of a small developing economy into the currency of a dominant economy. An increasing velocity of exchanging a developing economy's currency could create panic and artificial devaluation, unrelated to the fundamentals of the economy. By banning offshore ringgit trades in October 1998, Malaysia effectively thwarted creation of an artificial velocity of unidirectional exchange of its foreign currencies. On the day of announcement (September 1, 1998) of ringgit trading ban, ringgit value rose from about 4.2 to 3.8 per dollar as the Singapore banks unwound their positions. Subsequently, the Malaysian government fixed the value of its currency at 3.8 ringgits per dollar.

Proposition 3: *For a stable global floating exchange system to succeed, all foreign exchange transactions across the world should clear through a single computerized system.*
Proof: The single system will stop creating virtual amounts of a currency not supported by the central bank of a country and check an artificial, panic-driven velocity of unidirectional exchange. If common stocks and bonds issued by a company must clear through the same computerized system, to stop unethical selling of truly unavailable but virtually created shares and bonds of the company, why should a similar centralized currency exchange clearing system not exist to stop unethical trading of currencies? Observe that there is a centralized price recording system, which records one value of a currency at any point in time based on the latest trade. Exchange rates are promptly and correctly recorded. But how are the exchange rates determined? One of the determinants of a currency's exchange value is obviously the demand for the currency. The other determinant is the supply or stock of the currency. The true stock of a currency is the amount created by the central bank. But there is also a virtual quantity of a currency that can be artificially floated (thus creating excess supply virtually) through exchanges among banks and individuals that do not clear centrally. A centralized currency exchange clearing system will not permit creation of a currency to raise its supply artificially with a view to depressing its price. The maximum amount of a currency that can be short-sold is equal to the total funds in circulation less the currency stock held as reserve. Absent manipulation through virtual supply of a currency, floating the currency can be facilitated at a price dictated by natural supply and demand for the currency. []

The absence of a centralized currency exchange clearing system may not seem to affect major world currencies of the largest economies like the dollar, euro and yen. Some virtual creation of the dollar overseas (in Malaysia, Singapore, South Korea or Switzerland) is unlikely to induce much volatility in the value of dollar. But the specter of a massive fall in dollar (about 20%) against the Japanese yen in October 1998 or the recent rise in the value of euro seems to suggest that a centralized currency exchange clearing system is necessary to circumvent unsavory swings in values of currencies including dollar. Press reports indicate that large hedge funds unwinding their yen-carry trades were behind the fall in dollar relative to yen in 1998 and in 2007. It is very strange that dollar was falling against yen, despite the fact that Japan was experiencing its worst recession in 1998. While the U.S. economy was poised to slow down then, it is far from being in a stage of recession.

In any case, creation of central registers for currencies will pave the way for free floating of exchange rates.

CONCLUSION

The goal of this paper was to show the existence of an optimal exchange rate for developing economies that face constraints, unlike that of developed economies. A low currency value attracts global businesses to create jobs in a country. But if the currency value is artificially kept too low, it will create undue quantum of fiat money for a small group of people of the country, namely, exporters and expatriates. This can lead to social disparity and instability. Excessive money can also lead to relaxed lending standards and uncontrollable growth in nonperforming loans which may beget banking instability. The optimal currency value is based on a balance between job growth and instability in banking and society. We also argued that central registers for currencies can facilitate free floating of currencies.

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