Managed Floating and Financial Dollarization as a second best policy for small open economies

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Abstract

The small open economy (**SOE**) is regularly characterized by a generalized fear of floating arising from both the risk of immediate cost-push inflation due to increases in the domestic price of imported consumer, intermediate and capital goods as well as from the menace of expected (deflationary) and surprising (bankrupting) currency-mismatches due to liability dollarization affecting banks and corporate firms.

Its real sphere is, in most cases, characterized by industrial underdevelopment, high degrees of unutilized productive capacity, and an abundant labor supply which is mainly fueled from involuntary unemployment. As a result, inflationary pressures cannot come from any proximity to full employment, or from any unavailability of real resources; being the exception, those real resources which, because of being imported, are subject to the problems related to a lack of foreign currency or balance of payments constraints.

In order to grow, the **HVSOE** must continuously run favorable balance of payments surpluses allowing for a greater flexibility in terms of government deficits without major destabilizing impacts upon the level of international reserves or the exchange rate itself. In practice, at both the private level and the government level, economic growth represents a sufficiently good reason for entering into liability dollarization; at least if growth requires imported equipment, and intermediate goods. Moreover, asset dollarization appears as an excellent substitute to savings in domestic currency.

Although government deficit spending and local currency reserves face no internal constraint, they do face an external constraint, for any expansion of base money in local currency implies greater pressures within the foreign exchange market, and hence upon the nominal exchange rate, the short-term interest rate, and the limited international reserves. A managed floating scheme combined with a regulated system allowing for domestic or on-shore dollarization may prove to be stabilizing under government intervention and currency-matching. This paper explains why.

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Part I. The different spheres

1. General description of the economy:

The economy under question is a small open economy (SOE) as defined by one which is vulnerable to exchange rate variations affecting both the private sector and the government. Two particular cases are of significant relevance:

1.1 *The slightly vulnerable small open economy (SVSOE):* characterized by a relatively high degree of industrial and financial development, and by the absence of a extreme fear of floating; perhaps, because the economy is part of a bigger currency union within which most of its international trade and financial transactions take place, or, without belonging to a currency union, because the competitiveness of the domestic industrial sector depends mostly on qualitative factors rather than on relative prices. Due to its high degree of industrial and financial development, this type of SOE will not generally be characterized by high levels of financial dollarization, and to a certain degree, its national currency will still be considered a "valuable" asset − e.g. a local store of value.

1.2 *The highly vulnerable small open economy (HVSOE):* characterized by a generalized fear of floating arising from both the risk of immediate cost-push inflation due to increases in the domestic price of imported consumer, intermediate and capital goods as well as from the menace of expected (deflationary) and surprising (bankrupting) currency-mismatches due to liability dollarization within both the corporate and banking spheres. This, somehow, represents the most common and interesting case, and, therefore, will be the one to be considered in the following sections.

2. Description of the monetary and financial spheres:

The local currency, which is issued by a national central bank under the authorization and taxing power of the sovereign national government, is well-suited to allow for the circulation of all locally produced goods, as well as for advancing payments in order to utilize the services of labor. That is, the local currency works well as a unit of account, medium of payment and means of exchange for most local current transactions, although this will not be the case for most local capital transactions and purposes related to the placement of savings, long-term assets, real estate pricing, etc.

The amount of local currency in circulation is endogenously determined through the interactions within the goods, labor and financial markets, although, at any point in time, it is affected as well by both the fiscal deficit and monetary policy of the domestic government, by the balance of payments resulting from current and capital transactions, and by the fiscal and monetary policy of the major country influencing the dynamics of the global monetary system – e.g. nowadays, the US.

Thus, the monetary and financial system essentially depends on the evolution of credit. The latter is true because the demand for credit loans on the part of creditworthy individuals and firms, who usually must hold sufficient collaterals as a prerequisite to their inclusion within the credit market, causes the supply of loans to increase through the immediate activation of pre-negotiated credit lines – e.g. overdraft facilities, credit cards, and so on. This process generates new deposits and hence higher levels of required reserves; required meaning either to satisfy legal impositions or psychological concerns on the part of commercial banks.

Reserves denominated in the local currency do not face any internal constraint. However, as it is the case that the local currency is neither accepted as unit of account, nor as medium of payment and means of exchange in the international sphere, reserves denominated in the local currency do face an external constraint in the sense that their unrestrained expansion may lead to either unwanted exchange rate depreciations or to significant losses in terms of international reserves[2].

For the above reason, in order to grow, the domestic **HVSOE** must continuously run favorable balance of payments surpluses allowing for the presence of government deficits without major destabilizing impacts upon the level of international reserves or the exchange rate itself. In practice, at both the private level and the government level, economic growth represents a sufficiently good reason for entering into liability dollarization; at least if growth requires imported equipment, and intermediate goods.

Additional to the previous reasoning, a more fundamental rationale for the presence of financial dollarization arises from the fact that, as mentioned at the beginning, the domestic currency may not necessarily work well for most capital transactions, namely hoarding and saving. Indeed, it will be one the most fundamental characteristics of **HVSOEs** that their local currencies will not serve as a good store of value, the major reason for which asset dollarization appears as an excellent substitute to savings in domestic currency.

In practice, this problem, whose origin is linked to the collapse of the Bretton Woods system, and hence to the global privatization of exchange rate risk, and the consequent development of financial markets within dominating economic areas, has signified the disappearance of long-term savings and finance denominated in the local currency, and, hence, the presence of further disturbances affecting the economy's external balance and foreign exchange rates. What may have not disappeared are credit loans for mortgages

[2] This is certainly not the case of the major national economy whose actions influence the dynamics of the rest of the global monetary system – nowadays, the US economy. This holds true because, in such a case, the total amount of local currency reserves is nearly equivalent to the economy's total quantity of international reserves; indeed, they are the same, although it still remains possible and common for the central bank and the government of the dominant economy to hold international reserves in the old fashioned way in the form of valuable commodities such as gold, diamonds, etc., or, in the most modern way, in the form of foreign valuable currencies issued by other leading economies – nowadays, the EU. This accounts to say with certainty that the nominal exchange rate between the local and international reserve currencies of the globally dominant economy is, at any given time, irrevocably fixed to 1.

and other long-term credit lines imposed by law, regularly, as a fixed percentage of the total loaned assets of the domestic banking system.

Regarding short-term bank credit, loans placements tend to favor those sectors insulated from international competition and hence from exchange rate risk, namely the non-tradable goods sector (including non-substitutable imports), construction, consumer credit, credit loans for automobiles, as well as loans for multinational and A-1 risk-type firms which have regular access to credit lines frequently operated as hedging instruments against exchange rate risk (or monetary exposure)[3].

3. Description of the real sphere:

The real sphere is, in most cases, characterized by industrial underdevelopment, high degrees of unutilized productive capacity, and an abundant labor supply which is mainly fueled from involuntary unemployment. Indeed, with respect to employment, the formal sector of the economy is often smaller than the informal one. As a result, inflationary pressures cannot come from any proximity to full employment, or from any unavailability of real resources; being the exception, those real resources which, because of being imported, are subject to the problems related to a lack of foreign currency or balance of payments constraints.

Mild inflationary pressures may come however from demand forces arriving from government deficit spending or simply from a particular sort of inelasticity of supply related to the financial strangulation of the productive system: the lack of access to expeditious credit lines which make the whole process of input, throughput and output production incapable of accommodating to demand even under the presence of constant marginal prime costs − e.g. the lack of access to overdraft facilities or to foreign currency to pay for the import of raw material and intermediate goods.

Indeed both sources of inflationary pressures are complementary to each other. While deficit spending is itself a direct source of demand inflation, its funding through the emission of new base money most of the time must be drained through the issuance of government bonds paying high interest rates to banks in order to avoid depreciations. The latter are definitely the major source of inflation, for any depreciation immediately implies greater domestic costs related to imported consumer, capital and intermediate goods. All of a sudden, the abundance of government bonds, to defend the currency, makes banks' business become one of "funding" the government, who issues the currency, instead of one of funding the *riskier* private sector.

[3] A-1 risk-type firms as well as multinational firms usually follow treasury policies which require exchanging local currency-denominated collections and accounts receivables for hard currency while operating local currency-denominated credit lines as working capital. Under a devaluation of the currency, while liabilities depreciate, assets appreciate.

4. Description of the international sphere:

The international sphere is characterized by an asymmetric global monetary system within which most local currencies are of not use abroad, and, hence, do not work at all for the purposes of international trade and finance. This implies, on the part of the **HVSOE**, the need for running sustained balance of payments surpluses with the rest of the world if the economy is to grow; at the global level, of course, this implies not all countries can grow at the same time.

The international sphere concentrates most of the world economy's savings – around 90% – within the frontiers of the few most dominant national economies. Neither a global taxation scheme nor an interregional transfer system exists. The global political platform, represented by the United Nations (UN), has no power to redistribute income from richer to poorer countries; the global trade multiplier/accelerator is hardly understood.

5. Description of the government:

The government sphere is regularly characterized by a democratic process, implying that the authorities must report results to society under the threat of being removed. Moreover, due to the underdevelopment of the domestic economy, the government, in order to generate positive externalities favorable to economic growth, is required to provide public goods in the form of large amounts of investments in physical and human capital; a problem mostly overcome, in the past, by developed economies.

Due to the social debt accrued through time, the government of the **HVSOE** is legitimately forced to generate sufficient social spending as well as direct jobs not provided by the private sector. In so doing, however, it tends to incur deficit spending causing, therefore, financial distress and concerns mostly associated with the evolution of the exchange rate, and the behavior of speculators participating within the market for foreign currency. Interest rate setting, exchange rate setting and deficit spending become contradictory policies[4]. An additional policy instrument is needed.

For the above reason, the government once in a while makes use of capital and foreign exchange controls, although these policies always lead to immediate financial innovations allowing for the profuse development of a parallel "black" market for foreign currency, proving these policies as ineffective in the medium run. Full dollarization, currency boards and other ways are regularly undertaken, but, at the end, all seem to be predestined to collapse, as all of them deal with the curse of inflation while forgetting about greater problems such as employment and output stabilization. Next section proposes a scheme characterized by managed floating and regulated financial

[4] As before, this is definitely not the case of the dominant economy within which the absence of major concerns about the evolution of the foreign exchange rate, allows the central bank to concentrate on the interest rate as the relevant target for monetary policy. In such a setting, deficit spending can hardly cause financial distress within the foreign exchange market; it is still possible, however, that financial speculative activities prosper, but mostly within the internal real estate market, or within the bond and stock markets.

dollarization as a second best policy for small open economies taking care of both output, employment and inflation stabilization.

Part II. The Policy

1. General description of the policy:

Managed floating implies a flexible exchange rate regime which is managed by the government and its central bank in order to avoid short-run fluctuations due to speculative reasons related to portfolio adjustments within the financial sphere and the international sphere. Long-run fluctuations of the foreign exchange rate due to factors related to the real sphere are not supposed to be avoided; only those arising from short-run financial disturbances and speculative motives are considered[5].

Regulated financial dollarization means a regime already legitimate off-shore under which bond, deposit and credit dollarization is allowed on-shore, under a strict regulation aimed at avoiding currency mismatches and balance sheet problems within both the corporate sector, in the real sphere, and the banking sector, in the financial sphere. In particular, regulatory offices must ensure that until a market for hedging instruments is not well developed, capital markets and banks allocate dollar and foreign currency credit loans exclusively towards the export business sector of the economy which is the only one able to generate foreign currency by itself and hence the only one which is not exposed either to expected (deflationary) or surprising (bankrupting) currency mismatches and balance sheet problems.

The policy is characterized as a second best because: (i) it is decided by the individual sovereign country and not necessarily by the international sphere, that is, it is not the result of a global monetary and financial agreement, (ii) it deals with the consequences of the international monetary asymmetries and not with their causes, (iii) it is not a first best solution as it may not necessarily result from agreements with trade partners, or because it will never be superior to the formation of a regional currency and political union characterized by the presence of a regional central bank and a regional political and fiscal authority with taxing power and facilities to redistribute income across the member countries.

2. The policy within the monetary and financial spheres:

Credit and bond dollarization: Regulators will ensure that dollar denominated credit loans and bonds will, respectively, relate the bank and the bond market to an individual or firm who, as a debtor, is able to generate sufficient foreign currency to repay its dollar debt. The organism in charge of supervising and regulating banks should ensure the latter conform to this rule, while the same should occur through the authority of the

[5] The different mechanisms to be implemented in order to avoid short-run fluctuations of the foreign exchange rate are explained below.

commission in charge of regulating securitization in the bonds market. For obvious reasons, the stock market would be left free to operate in terms of both the local and foreign currencies independently of the capacity of the individual firm to generate dollar inflows.

Deposit Dollarization: Any firm or individual willing to hold her savings, as well as her working capital in the form of dollar savings and checking account deposits will be allowed to do so. Two sources of deposit dollarization will, therefore, arise:

Deposit Dollarization created by means of domestic credit in foreign currency: Both, national banks as well as international commercial banks with operative subsidiaries within the domestic economy will be, as previously mentioned, allowed to create dollar loans and hence dollar deposits subject to the condition that these loans are allocated to export business firms.

In so doing, banks will respond to the demand for dollar credit loans, in a way that, provided they are repaid, banks will be able to profit from charging a relatively high credit (borrowing) rate and a relatively lower debit ("lending") rate. In this case no further problem for the bank will arise in addition to those common to its regular activities operated in local currency.

The unique difference between local currency loans/deposits and foreign currency loans/deposits is that while the former are guaranteed by the domestic central bank or lender of last resort, the latter are not. This holds true, because the domestic central bank is not the issuer of the foreign currency and hence cannot be committed to assist the financial system in the case of an unlimited demand for international reserves. It can however, provide international reserves on demand up to a limited amount. Thus, the major guarantee for this type of loans is the economy's capacity to export, itself.

While US and European commercial banks with operative subsidiaries within the domestic economy will count always on access to reserves provided on demand by the FED and *hopefully* in the future by the ECB, national commercial banks will have to count either on the domestic central bank's stock of international reserves or on their investment and participation and, hence, direct access to reserves, through their subsidiaries abroad (e.g. subsidiaries of the domestic bank in the US or Europe).

It is still possible that the international commercial banks with operative subsidiaries within the domestic economy demand international reserves from the domestic central bank, as in the shocking case of Argentina during the 90s. However, that could only be the case if the international commercial banks expect the local currency, and hence part of their portfolio, to depreciate; in which case it makes sense to reduce the amount of financial assets exposed and hence the domestic size of the international bank's subsidiary; just as occurred in Argentina.

Otherwise, it would be naïve to think that in order to expand domestic dollar credit, international banks would prefer to make portfolio changes and hence to buy

international reserves from the domestic central bank when they can simply create new private electronic dollars at their headquarters abroad; obviously at an inter-company cost pre-negotiated between the bank established in the domestic economy and its center of operations abroad. As previously mentioned this will certainly induce national banks to open their subsidiaries within the frontiers of those economies currently issuing the most commonly used international reserves[6].

Deposit Dollarization as a result of currency substitution: Any savings resulting from a previous favorable balance of payments with the rest of the world have as a counterpart an increase in the stock of international reserves held at the domestic central bank[7]. Under such a situation, all economic agents who are able and willing to invest their savings in terms of foreign currency denominated assets or simply in the form of the token foreign currency itself, will do so, independently of all other factors. For this purpose, it does not matter if these savings occur domestically (on-shore) or abroad (off-shore), or if it is legal or not, or if it is through the official market or a "black" parallel one resulting from capital and regulatory controls. In so doing, inevitably, net international reserves will, in one way or another, get reduced.

In recognition of the above fact, as previously mentioned, the policy under question will allow any firm or individual willing to hold her savings in the form of dollar savings and checking account deposits to do so. This, of course, will result from that part of the stock of local currency which will end up out of circulation in exchange for foreign currency usually provided by private commercial banks and the central bank itself; evidently a factor intimately linked to income distribution and the marginal propensity to consume.

For the above reasoning, in addition to the common legal reserve requirements in local currency, the central bank will impose, as a major instrument of its monetary policy, legal reserve requirements for foreign currency deposits in the case of both national and international banks operating domestically with dollar liabilities.

Thus, all dollar liabilities either created through domestic credit operations or through currency substitution will face legal reserve requirements. The rationale for this is that even though, due to regulatory measures, dollar liabilities created through domestic credit

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[6] In practice, most national commercial banks have already either a subsidiary or another correspondent or intermediary bank through which they work abroad. For our purposes, both are the same as long as the subsidiary or correspondent bank has access to the Federal Reserve System, or hopefully in the future, to the ECB, and the interbank dollar and euro (money) markets.

[7] Certainly, from a global point of view, the ideal result regarding the balance of payments of all national economies would be that all countries simultaneously run neither significant surpluses nor significant deficits. This holds true, because the surplus of one economy is the deficit of another. Thus, any surplus in anyone country represents a lower level of economic activity worldwide; the value of capital equipment and other materials not used in interim will be relatively preserved, but the value of the unutilized labor will be lost forever. As previously mentioned, however, the real world, and the international monetary asymmetry which reigns in it, dictates the need for all non international reserve-issuing countries to run as large as possible balance of payments surpluses in order to gain domestic and external flexibility, as well as to avoid future balance of payments constraints; certainly a major problem irrelevant for the dominant economy whose domestic and external flexibility relies on its power and privilege as the supplier of international reserves.

operations are restricted by exports themselves, dollar liabilities resulting from currency substitution face no anchor at all whenever the fiscal stance needs to be expansionary.

A relevant observation is that while the common legal reserve requirements in local currency regularly remain constant somewhere around 5% to 15%, legal reserve requirements for foreign currency deposits will be meant to be high and volatile, and perhaps, somewhere around 30% to 40%. Moreover, while local currency reserve requirements usually do not pay interest on behalf of the commercial bank, both, involuntary foreign currency reserve requirements and voluntary foreign currency reserves will pay interest on behalf of the private bank. Such interest will, in any case, be equivalent to the yield on US T-Bills minus some insignificant administrative costs.

As a result of the imposition of high and volatile legal reserve requirements in the case of dollar deposits, a new policy instrument will be put in place. *The trick is done*. Instead of using the local short-term interest rate for smoothing short-run exchange rate fluctuations arising either from financial disturbances or speculative reasons, the central bank will now be able to make frequent use of the rate of legal dollar reserve requirements. Moreover, most of the currency substitution taking place within the financial sphere will now remain within the domestic sphere; that is, what was the rule in the past, off-shore dollarization, may not be so in the future, for although a currency substitution process will continue to exist, it will remain to a greater degree attached to the domestic financial sphere without necessarily overlapping the international one.

Thus, while the interest rate as a price-instrument for defending the currency will tend to be abandoned, quantitative domestic portfolio adjustments from local currency deposits into foreign currency deposits will lead the battle; a battle which will mostly remain within the wonderful world of bookkeeping. For, just a fraction of the currency substitution will finally affect net international reserves, although this need not be the case of gross international reserves.

The reason for the above argument is straightforward. A reduction in local currency deposits will free some local currency reserves − say, 10% to 15% of the destroyed local currency deposits − which will be more than offset by the greater amount required to meet the legal foreign currency reserves, say, 30% to 40% of the new foreign currency deposits. In order to buy the new required foreign currency reserves, commercial banks as a whole will have to sell part of their holdings in government bonds and other securities, which presumably the central bank will have to buy if the depreciation of government bonds or interest variations are in general, disliked.

International reserves which, in the form of legal foreign currency reserve requirements, are transferred within internal accounts in the domestic central bank represent, on the one hand, both, a liability and an asset for the central bank itself, and on the other, a net asset for commercial banks; of course, a net asset which, by means of the *magic* coercive power of the state, will be non-disposable to them.

Thus, the central bank will just need invest the legal foreign currency reserves as it regularly does with the rest of its operative international reserves. Nevertheless, through coercion and bookkeeping, the whole amount of gross international reserves, except for those purchased by commercial banks to hold foreign currency securities abroad will not decrease, while depositors continue to feel confident about the increases in their holdings of domestic dollar bank deposits.

Under the above conditions, the domestic economy will tend to enjoy from a greater insulation against capital outflows; allowing for the interest rate to be set in order to guarantee orderly financial markets and sufficient liquidity on demand. And, without any recourse to foreign exchange controls, both the international reserves as well as the foreign exchange rate itself will fluctuate mostly in accordance to changes originated in the domestic and international real spheres; mimicking, somehow, the mechanics of the old Bretton Woods system.

3. The policy and the real sphere:

The implications of the policy for the real sphere are straightforward. The stabilization in the financial sphere generates a virtual cycle within the real sphere as financial speculative activities related to both the issuance of high yield unproductive bonds, in order to avoid depreciations, and the purchase of foreign currency denominated securities themselves, to gain from devaluations, become less interesting, increasing, therefore, the relative return on real assets. Thus, investments on real assets should increase as financial speculative activities become less profitable and riskier.

Moreover, the stability of the interest rate and the exchange rate, themselves, would make long-term credit in local currency less risky and hence more interesting for commercial banks as well. The investment of dollar savings to fund the export business sector will lead to its expansion and hence to a greater capacity to generate foreign currency. The latter, in turn, will reduce the probability of future balance of payments constraints, and will reinforce the stability within the financial sphere and the foreign exchange market.

4. The policy and the international sphere:

The role of the international sphere is very clear as well. The establishment of subsidiaries in the international reserve-issuing country will allow national commercial banks to expand dollar credit without having to recourse to the domestic central bank's limited stock of international reserves; and, of course, the same advantage will arise from the case of international commercial banks with operative subsidiaries within the domestic economy. In short, the role of international sphere will be to provide foreign currency reserves on demand through the access to the dollar and euro interbank (money) markets, and through the access to open market operations directly administered by the Federal Reserve System, and *hopefully*, in the future, as well by the ECB.

5. A Hypothetical Example:

A hypothetical example may help clarify some of the above arguments. Let the legal dollar reserve requirement be, firstly, set at 40%, and let the balance sheets of both the entire commercial banking system and the central bank be as in Table N° 1.

Suppose, for the sake of simplicity, that all dollar checking deposits come from dollar loans created through domestic credit operations, but that a part of them become exchanged into local currency checking deposits, say, to pay for local inputs and the wages of labor related to the activities of the domestic export business sector, while the remaining are ready to be used abroad, soon, to pay for imported inputs, contracting sales representatives in the export markets, setting up commercial offices, and so on[8]. Thus, while foreign currency loans represent 10% of total commercial banks' assets, foreign currency checking deposits represent only 8% of total commercial banks' liabilities.

Let's assume now that, an on-shore process of currency substitution, which had it not been allowed would have occurred anyway off-shore, has continuously taken place throughout time, implying that most domestic savings deposits are currently denominated in dollars. For instance, let 58% of total commercial banks' liabilities be composed by dollar savings; so that local currency savings and checking deposits as well as any other form local currency liabilities sum up to only 33% of commercial banks' total liabilities. Thus, the percentage of bank's liability dollarization is, therefore, around 67%.

Equivalently, suppose that commercial banks' asset dollarization is 72%, although most of the dollarized assets are foreign currency securities (38%) and foreign currency legally required reserves (24%). The latter are interest bearing assets for commercial banks, and are computed as the sum of the total amount of foreign currency deposits, both checking and savings deposits, multiplied by the reserve ratio which is, say, 40%. That is, ($12 + $85) *40% = $39. The rest of the assets composing the balance sheet can be read directly from Table N° 1.

Regarding the central bank's balance sheet, assets are mostly composed by liquid international reserves (67%), such as dollars, euros, SDRs, and by non-operative international reserves (18%), such as the membership in the IMF and the World Bank. Domestic credit corresponds only to the minor part (15%), for the local currency, itself, is not accepted at the international level, and because of the generalized fear of floating which forces the central bank to hold a portfolio biased towards holdings of foreign currency denominated securities opposed to one mainly composed by local currency denominated assets.

[8] Note that while dollar checking deposits represent no cost in terms of interests for the bank, this is not the case of the dollar loans themselves; for banks may incur a cost of borrowing reserves if the bank's headquarters are abroad, or a cost of borrowing reserves from other banks if a domestic interbank market for foreign currency develops, or, simply, they may incur the cost of borrowing foreign currency from the bank's own customers' savings deposits.

With respect to the central bank's major liabilities, they are: base money held by commercial banks (8%) as a result of local currency legal reserves requirements − computed at a 15% rate over all local currency deposits; foreign currency legal reserves requirements (50%) as a consequence of deposit dollarization and hence of foreign currency legal reserves requirements; and, finally, local currency denominated securities (28%) resulting from open market restrictive operations. Finally, the HPM held by the non-bank public corresponds only to 6% of total central bank's liabilities.

Under the expectation of future currency depreciations, speculative financial disturbances will imply a currency substitution process operating within the financial sphere, and mainly through exchanges from local currency-denominated deposits into foreign currency-deposits (a portfolio adjustment). Let's assume, for instance, that while foreign currency-savings deposits increase by $15 (say, thousand millions) and foreign currency-checking deposits by $3 (thousand millions), local currency savings deposits reduce in the total amount corresponding to $18 (thousand millions).

Under a managed floating regime this will put immediate pressure upon the exchange rate, making the system *cry out* for automatic stabilization. But, as the financial market system counts on no mechanism to generate stability by itself, the government will have to intervene immediately. Recall, however, that the reduction in local currency savings deposits frees some local currency reserves (LC36 * 15% = LC5.40) which can be exchanged to fully meet the increase in the legal dollar reserve requirements, so that without having to increase the local interest rate, the government can simply engineer a precise reduction in the rate of legal dollar reserve requirements, say, for instance, from 40% to 36.09% allowing banks to meet its entire legal requirements without much effort.

In the above example, under the assumption that *no* variation of the foreign exchange rate takes place, should not have the rate of legal dollar reserve requirements been reduced, total requirements of foreign currency reserves would have automatically risen in $7.20 ($18 * 40% = $7.20 or equivalently, LC36 * 40% = LC14.40). But, as the reduction in the rate does take place, commercial banks need only look for LC5.40 (or $2.70) which must be provided by the central bank, itself. But, as long as the currency substitution and deposit dollarization process remains on-shore, *the trick is done*. Although there has been a destruction of local currency deposits, new domestic dollar deposits have been generated through a currency substitution.

Out of those new and the preexistent domestic dollar deposits, 36.09% must be backed in the central bank. Thus, gross international reserves which would have otherwise decreased in $18, did not decrease at all; for only net international reserves decreased in LC5.40 (or $2.70). Moreover, should have the rate of legal dollar reserve requirements remained fixed in 40%, gross international reserves would still not have diminished; for only net international reserves would have decreased in LC14.40 (or $7.20), but the central bank's daily report of its gross international reserves would have not changed.

Central Bank

(in thousand millions of both the LC and USD$, FX = 2 LC/ 1 USD$)

Assets				Liabilities			
Description	LC	USD $	%	Description	LC	USD $	%
Liquid International Reserves: USD$, euros, SDRs	115	$58	67%	International Reserve Liabilities with the ROW	13	$7	8%
Non-operative International Reserves: IMF, World Bank	30	$15	18%	Commercial Bank Reserves in foreign currency - **Legal Reserves Required**	78	$39	50%
Domestic Credit: Government Securities, Discount Operations, etc.	26	$13	15%	Commercial Bank Reserves in foreign currency - **Voluntarily held**	0	$0	0%
				Commercial Bank Reserves in local currency - **Legal Reserves Required**	13	$6	8%
				Commercial Bank Reserves in local currency - **Voluntarily held**	0	$0	0%
				Base money held by non-banks	9	$5	6%
				Other local currency liabilities: with the treasury and from MP	44	$22	28%
Total Assets	171	$86	100%	**Total Liabilities**	157	$78	100%
Gross available International Reserves	115	$58	N/A	**Total Capital**	15	$7	9%

Commercial Banks

(in thousand millions of both the LC and USD$, FX = 2 LC/ 1 USD$)

Assets				Liabilities			
Description	LC	USD $	%	Description	LC	USD $	%
Local Currency Loans	45	$23	14%	Local Currency Checking Deposits	45	$23	15%
Securities: Government Bonds, Central Bank Bonds, Corporate Bonds	22	$11	7%	Local Currency Savings Deposits	41	$21	14%
Commercial Bank Reserves in local currency - **Legal Reserves Required**	13	$6	4%	Foreign Currency Checking Deposits	24	$12	8%
Commercial Bank Reserves in local currency - **Voluntarily held**	0	$0	0%	Foreign Currency Savings Deposits	170	$85	58%
Commercial Bank cash held at the agencies, and ATMs	2	$1	1%	Other liabilities	12	$6	4%
Foreign Currency Loans	31	$16	10%				
Foreign Currency Securities	120	$60	38%				
Commercial Bank Reserves in foreign currency - **Legal Reserves Required**	78	$39	24%				
Commercial Bank Reserves in foreign currency - **Voluntarily held**	0	$0	0%				
Other assets	7	$4	2%	`			
Total Assets	317	$159	100%	**Total Liabilities**	292	$146	100%
				Total Capital	25	$13	8%

Table N° 1: *Ex ante* Balance Sheets of the Central Bank and the whole Commercial Banking System before changes in expectations

Central Bank

(in thousand millions of both the LC and USD$, FX = 2 LC/ 1 USD$)

Assets				Liabilities			
Description	LC	USD $	%	Description	LC	USD $	%
Liquid International Reserves: USD$, euros, SDRs	115	$58	67%	International Reserve Liabilities with the ROW	13	$7	8%
Non-operative International Reserves: IMF, World Bank	30	$15	18%	Commercial Bank Reserves in foreign currency - **Legal Reserves Required**	83	$41	53%
Domestic Credit: Government Securities, Discount Operations, etc.	26	$13	15%	Commercial Bank Reserves in foreign currency - **Voluntarily held**	$0	$0	0%
				Commercial Bank Reserves in local currency - **Legal Reserves Required**	8	$4	5%
				Commercial Bank Reserves in local currency - **Voluntarily held**	0	$0	0%
				Base money held by non-banks	9	$5	6%
				Other local currency liabilities: with the treasury and as a result from MP	44	$22	28%
Total Assets	171	$86	100%	**Total Liabilities**	157	$78	100%
Gross available International Reserves	115	$58	N/A	**Total Capital**	15	$7	9%

Commercial Banks

(in thousand millions of both the LC and USD$, FX = 2 LC/ 1 USD$)

Assets				Liabilities			
Description	LC	USD $	%	Description	LC	USD $	%
Local Currency Loans	45	$23	14%	Local Currency Checking Deposits	45	$23	15%
Securities: Government Bonds, Central Bank Bonds, Corporate Bonds	22	$11	7%	Local Currency Savings Deposits	5	$3	2%
Commercial Bank Reserves in local currency - **Legal Reserves Required**	8	$4	2%	Foreign Currency Checking Deposits	30	$15	10%
Commercial Bank Reserves in local currency - **Voluntarily held**	0	$0	0%	Foreign Currency Savings Deposits	200	$100	68%
Commercial Bank cash held at the agencies, and ATMs	2	$1	1%	Other liabilities	12	$6	4%
Foreign Currency Loans	31	$16	10%				
Foreign Currency Securities	120	$60	38%				
Commercial Bank Reserves in foreign currency - **Legal Reserves Required**	83	$41	26%				
Commercial Bank Reserves in foreign currency - **Voluntarily held**	0	$0	0%				
Other assets	7	$4	2%	`			
Total Assets	317	$159	100%	**Total Liabilities**	292	$146	100%
				Total Capital	25	$13	8%

Note: All of a sudden savers expect a currency depreciation to which they react in advance by reducing their savings deposits in local currency as well as by increasing their savings deposits in foreign currency (LC36 = $18). As a result local currency reserve requirements get reduced in LC5.4, becoming as temporarily voluntary. The central banker engineers a reduction in the foreign currency reserve requirements rate from 40% to 36.09%; that is, only 391 basis points. In so doing, voluntary reserves in local currency match the needs for foreign currency reserve requirements. The central bank then simply exchanges the amount LC5.4=$2.7.

Table N° 2: *Ex post* Balance Sheets of the Central Bank and the whole Commercial Banking System after changes in expectations

Thus, for a given rate of legal dollar reserve requirements, and under the absence of off-shore dollarization through the purchase of dollar securities on the part of commercial banks, the loss of net international reserves will be fractional and the loss of gross international reserves will be null.

For instance, for a given rate of legal dollar reserve requirements of 40%, if the amount of foreign currency needed to suffocate a speculative demand is, say, $50, then the loss of net international reserves will be $30 − that is only 60% of the whole amount, but the loss of gross international reserves would be null, for only a transfer of *interest bearing but non disposable*-reserves to the commercial banks' accounts within the central bank would take place. Note, nevertheless, that in the whole process, the local base money (or HPM) is reduced as the result of the currency substitution process operating within the financial sphere (speculative activities competing against productive ones), but the resulting withdrawal from circulation will not affect the economy further than what it does in the case of the dominant economy in charge of issuing the international reserve currency.

The latter is true because the local interest rate need not be increased much by the central bank, for both, a greater stock of dollarized assets and liabilities now remains on-shore rather than off-shore − e.g. a greater buffer stock of international reserves is available, and for the loss of net international reserves itself is just a fraction (60%) and not the total amount of the substituted deposits. Indeed, gross international reserves remain the same for the central bank as they simply pass from being a net asset to being both an asset and a liability. In short, the loss in net international reserves for the central bank is a gain in net international reserves for commercial banks; but gross international reserves remain on-shore and unvaried.

In any case if an expected depreciation is to lead to a process of currency substitution, most dollar assets will still remain within the domestic economy, either within the private banking sector or within the central bank. But, why would one prefer to hold one's own dollar account within the domestic subsidiary of Citibank and not within Citibank New York? Perhaps, because of transaction costs or the proximity to a local agency, it is not clear, but what is clear is that this is the case of both the economies of Peru and Bolivia, just to mention a few countries; although both of them have failed to implement regulatory measures to avoid balance sheet problems and currency-mismatches, and for that reason, both economies have suffered from a great fear of floating affecting their interest rates and real spheres.

At this point it is important to understand the meaning of asset dollarization; something which might be clearer when analyzed from the viewpoint of the Circuit School. While in the case of an economy whose currency is considered an international reserve, savings mean a withdrawal from circulation which depresses aggregate demand but which can still be used to repay old loans by means of securitization, *off-shore dollarization* of savings in the **HVSOE**, represent a currency substitution process which not only reduces aggregate demand but that as well generates pressures upon the interest rate and the foreign exchange rate. As suggested above, this is not the case, however, of the *on-shore dollarization* of savings in the **HVSOE**, for whenever accompanied by an appropriate

managed floating scheme, a currency-matching rule and other regulatory measures, the stabilization of both the level of the interest rate, the nominal exchange rate and the level of international reserves becomes possible.

From the domestic point of view, however, foreign currency savings are lost forever unless they are used by banks in order to supply long-term financing for export business firms, or in case savers themselves exchange their dollar savings back into local currency for some convenient reason such as repaying one's old loans or most commonly paying one's own income taxes. In the best case of all, however, foreign currency savings could be used as well in order to finance direct investment in real assets, although the latter would necessarily require that the expected rate of return on real assets exceeds that on financial speculative activities, which in the case of the **HVSMOE** is commonly not the case, as it directly depends on capital gains related to self-fulfilling expectations about future currency depreciations.

It is precisely the latter what the policy under question avoids, for through the stabilization of the interest rate and the foreign exchange rate, returns on speculative activities become relatively lower and less probable than the returns on real assets. Note however, that even though one's own savings in foreign currency can be used to repay one's own debts in local currency, the same will not be true at the aggregate level, as those firms outside the export business sector will be, *by regulation*, excluded from the domestic dollar credit and bond markets. This is merely the cost of avoiding currency mismatches or balance sheet problems operating within both the non-tradable good sector and the banking sector.

In short, the implications of the policy for the financial and monetary system is a gain in terms of greater short-run financial stability as the result of the partial retention, as well as of the regulation, of the financial dollarization process within the frontiers of the domestic economy. The consequences in terms of smoother changes in the foreign exchange rate, the quantity of international reserves and the local interest rate, allow for concentrating on the latter as the appropriate target of monetary policy aimed at guaranteeing orderly financial markets and at accommodating the expansion of credit on behalf of the real sphere.

Stabilization in the financial sphere will as well tend to generate a virtual cycle within the real sphere as financial speculative activities related to both the issuance of high yield unproductive bonds, in order to avoid depreciations, and the purchase of foreign currency denominated securities themselves, to gain from devaluations, become less profitable and probable, increasing, therefore, the relative return on real assets.

Regulated on-shore financial dollarization means the possibility of taking advantage of the credit divisor, bookkeeping practices and the coercive power of the state. While off-shore dollarization implies a 100% loss of the net international reserves transferred abroad, regulated on-shore financial dollarization implies only a fractional loss of net international reserves − 100% minus the rate of legal dollar reserve requirements − and no loss at all in terms of gross international reserves as they are never transferred abroad

but are simply moved from one account to another within the central bank accounting system on behalf of commercial banks.

The exception to the above rule will be that part of savings deposits which savers themselves prefer to hold abroad, say, for example, in Citibank New York rather than within the domestic subsidiary of Citibank, or that part of the currency substitution which is undertaken by commercial banks themselves when switching from local currency denominated securities to foreign currency securities.

A reaction to the latter form of off-shore financial dollarization, may still take place if, as a substitute for foreign securities, dollar denominated securities issued by the domestic central government or its central bank are issued with a yield above that guaranteed by other governments in the international market. In such a case, the central bank could capture commercial banks' funds for foreign securities, and invest them abroad, losing only an interest rate differential between the international interest rate, say the rate on US T-Bills, and the rate paid by the central bank to commercial banks; the cost of not being able to print the international reserve currency.

As the process of financial dollarization is mainly related to savings, which are themselves determined by the social patterns of income distribution and marginal propensities to consume, dollarized savings deposits are not expected to affect in any direct way the circulation of goods and services, nor are they expected to be withdrawn from the banking system with the same frequency dollarized checking deposits are. If that occurs, however, the financial dollarization process would have become off-shore and the whole banking system would have collapsed.

Part III. Policy Conclusions

- The domestic government will introduce a change of legislation allowing for the on-shore dollarization of bonds, credit loans and deposits under the condition that all dollar funds are allocated to the export business sector. This would be known as the *currency-matching rule* (García, 2007).

- In addition to the above restriction, the central bank will impose, as a major instrument of its monetary policy, legal reserve requirements for foreign currency deposits resulting either from domestic credit operations or from currency substitution. While the common legal reserve requirements in local currency regularly tend to remain constant somewhere around 5% to 15%, legal reserve requirements for foreign currency deposits will be meant to be high and volatile, and perhaps, somewhere around 30% to 40%.

- Moreover, while local currency reserve requirements usually do not pay interest on behalf of commercial banks, both, involuntary foreign currency reserve requirements and voluntary foreign currency reserves will be interest-bearing. The reference, in any case, will be the yield on US T-Bills minus some minor administrative costs.

- Instead of using the local short-term interest rate for smoothing short-run exchange rate fluctuations arising either from financial disturbances or speculative motives, the central bank will now be able to make frequent adjustments of the rate of legal dollar reserve requirements.

- While the interest rate as a price-instrument for defending the currency will tend to be abandoned, quantitative domestic portfolio adjustments from local currency deposits into foreign currency deposits will lead the battle; a battle which will mostly remain within the wonderful world of bookkeeping. For, just a fraction of the currency substitution will finally affect net international reserves, although this need not be the case of gross international reserves.

- Under the expectation of future currency depreciations, speculative financial disturbances will imply a currency substitution process operating within the financial sphere, and mainly through exchanges from local currency-denominated deposits into foreign currency-deposits (a portfolio adjustment). Under a managed floating regime this will put immediate pressure upon the exchange rate, making the system *cry out* for automatic stabilization. But, as the financial market system counts on no mechanism to generate stability by itself, the government will have to intervene immediately.

- Recall, however, that the reduction in local currency savings deposits frees some local currency reserves which can be exchanged into foreign currency in order to partially meet the increase in the legal dollar reserve requirements. But what about the rest? Well, at any time, without recourse to a change in the local interest rate, the government can simply engineer a precise reduction in the rate of legal dollar reserve requirements allowing banks to meet its total amount of dollar deposits backings without much effort. For instance, it can reduce the rate in 5% or 6%, and the rest will be a matter of accounting.

- Note that international reserves which, in the form of legal foreign currency reserve requirements, are transferred within internal accounts in the domestic central bank represent, on the one hand, both, a liability and an asset for the central bank itself, and on the other, a net asset for commercial banks; of course, a net asset which, by means of the magic coercive power of the state, will be non-disposable to them.

- Thus, the central bank will just need invest the legal foreign currency reserves as it regularly does with the rest of its operative international reserves. Nevertheless, through coercion and bookkeeping, the whole amount of gross international reserves, except for those purchased by commercial banks to hold foreign currency securities abroad, will not decrease.

- Under the above conditions, the domestic economy will tend to enjoy a greater insulation against capital outflows; allowing for the interest rate to be set in order to guarantee orderly financial markets and sufficient liquidity on demand. And, without any recourse to foreign exchange controls, both the international reserves as well as

the foreign exchange rate itself will fluctuate mostly in accordance to changes originated in the domestic and international real spheres; mimicking, somehow, the mechanics of the old Bretton Woods system.

- The implications of the policy for the real sphere are straightforward. The stabilization in the financial sphere generates a virtual cycle which spills over the real sphere as financial speculative activities related to both the issuance of high yield unproductive bonds, in order to avoid depreciations, and the purchase of foreign currency denominated securities themselves, to gain from devaluations, become less attractive, increasing, therefore, the relative return on real assets. Thus, productive investments on real assets should increase as financial speculative activities become less profitable and riskier.

- Moreover, the stability of the interest rate and the exchange rate, themselves, would make long-term credit in local currency less risky and hence more attractive to commercial banks as well. The investment of dollar savings to fund the export business sector will lead to its expansion and hence to a greater capacity to generate foreign currency. The latter, in turn, will reduce the probability of future balance of payments constraints, and will reinforce the stability within the financial sphere and the foreign exchange market.

- The role of the international sphere is very clear as well. The establishment of subsidiaries in the international reserve-issuing country will allow national commercial banks to expand dollar credit without having to recourse to the domestic central bank's limited stock of international reserves; and, of course, the same advantage will arise from the case of international commercial banks with operative subsidiaries within the domestic economy. In short, the role of international sphere will be to provide for foreign currency reserves on demand through the access to the dollar and euro interbank (money) markets, and through the access to open market operations directly administered by the Federal Reserve System, and hopefully, in the future as well by the ECB.

- The above expected results from the central policy should allow for a greater flexibility regarding government deficit spending. However, as the latter leads to further expansions of base money in local currency, it must be limited. Otherwise speculative pressures within the foreign exchange market could not be dealt with by means of further on-shore asset dollarization.

- On-shore financial dollarization will always be a second best policy as it relaxes but does not eliminate the external constraint. It will never be superior to regional or global agreements characterized by a currency and political union counting on a central bank and a political authority with taxing power and facilities to redistribute income across member countries. It, nevertheless, may be the most efficient individual response in the meanwhile.

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