How to manage macroeconomic policies to foster growth and employment and prevent financial and external crises[1]

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My presentation focuses on the implementation of a macroeconomic policy regime which, I believe, is capable of simultaneously attaining several targets, including the promotion of growth and employment and the prevention of external and financial crises. The following are the main elements of such a regime[3]:

i) A managed floating regime, combining exchange rate flexibility with discretionary interventions by the central bank in the foreign exchange (FX) market.

ii) A competitive level trend in the real exchange rate (RER), avoiding strong appreciations in the short run.

iii) A surplus trend in the current account of the balance of payments and moderate current account deficits in the short run.

iv) The accumulation of sizeable international reserves.

v) An active monetary policy, facilitated by the sterilization of the interventions in the FX market and the inexistence of fiscal dominance. It should be implemented in coordination with short run fiscal policy. Capital controls might be necessary to simultaneously attain ii) and v) (i.e., to preserve monetary autonomy).

vi) An equilibrium trend in the fiscal accounts and moderate fiscal deficits in the short run.

Items i) to iv) focus on the promotion of growth and employment, the robustness of external accounts and the prevention of crises against negative external shocks. Item v) focuses on the control of aggregate demand and inflation. As indicated, monetary policy should be coordinated with fiscal policy. Item vi) is the long run orientation in the fiscal accounts. It focuses on allowing counter-cyclical policies in the short run

(aggregate demand and inflation control in the booming phases and expansionary stimuli in the recessionary phases) and on avoiding accumulation of significant public debts.

Let me focus now on how these elements need to be coordinated in the proposed macroeconomic policy regime.

1. The coordination of macroeconomic policies

A competitive RER provides a conductive environment for growth and development. This view has long been stressed by development economists and recently documented in many econometric studies.[4] The growth-enhancing attributes of a competitive RER operate through the enhancement of tradable sector profitability. As this sector expands, it relaxes the balance-of-payment constraint to growth and generates positive externalities to the rest of the economy in the form of learning-by-doing externalities and technological spillovers.

The adoption of a RER target is a singularity of the proposed macroeconomic policy regime, which I call the Stable and Competitive Real Exchange Rate (SCRER) regime. In addition to the standard policy objectives of any macroeconomic regime; namely, inflation and employment and activity levels, the SCRER regime also pursues economic development as an objective. The trend of the RER is the intermediate target for such an objective, in the same way a reference interest rate or a given fiscal budget operate as intermediate targets for monetary and fiscal policies focusing on inflation and employment. Once a determined trend for the RER is adopted, exchange rate policy focuses exclusively on both granting short-term volatility of the nominal exchange rate (NER) and preserving the long term stability of the RER. Thus, in normal times the NER cannot be oriented towards any other macroeconomic objective such as inflation or inflation expectations. The control of aggregate demand, inflation and inflation expectations rests on monetary and fiscal policy (an also on other policies not discussed here, such as wage and incomes policies).[5] The role of these policies in a SCRER regime is crucial at moderating the pace of aggregate demand and inflation pressures, because the SCRER –by enhancing employment growth and capital accumulation in the

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[4] See, for instance, the evidence by Gala (2007), Rodrik (2008) and Rapetti et al (2011).
[5] For formal analyses regarding the coordination of fiscal, monetary and wage policies in a SCRER regime, see Frenkel (2008) and Rapetti (2011).

tradable sector- has by itself an expansionary bias on aggregate demand. So, in the SCRER regime the three macroeconomic policies are active.

In the SCRER regime the coordination of macroeconomic policy is essential. In the first place, the intermediate targets of fiscal and monetary policies and their design should be consistent with the stability of the RER trend target. For instance, it is difficult to preserve the stability of the RER trend in a context of accelerating inflationary expectations. On the other hand, as I already mentioned, a SCRER has a permanent expansionary effect on aggregate demand. Monetary and fiscal policies must take into account that effect and must be consistently designed and implemented in order to attain the multiple real and inflation objectives. The policies should be co-ordinately formulated, implemented and monitored at the government highest level.

2. The SCRER and the inflation pressure

As I discussed above, in my proposed macroeconomic regime, because exchange rate policy is committed to the preservation of a SCRER target and because of its expansionary bias, aggregate demand management rests on monetary and fiscal policies. In normal times, these policies have to largely play braking roles on the aggregate demand and inflationary pressures.

The management of policies in the SCRER regime is not simple. On the one hand, there is a tension between the preservation of the SCRER target and the aggregate demand and inflation control. On the other hand, the braking role that monetary and fiscal policies should normally play in this context demands a sophisticated political leadership. Both observations stress the importance of macroeconomic policies coordination at the highest level of the economic policy administration.

3. The exchange rate policy

Central bank interventions in the exchange market are intended to maintain a SCRER trend. The main objective is signaling the medium and long term RER stability in order to stimulate employment and investment decisions in existent and new tradable activities. Particularly, the emergence of RER appreciation trends should be avoided. First, to avoid self-fulfilling appreciation bubbles. Second, because the effects of expected appreciation or depreciation trends in the RER are not symmetrical.

Investment in tradable sectors is mostly irreversible. Consequently, in tradable activities there are good reasons to give high weight to the appreciation risk. To promote investment and employment in tradable activities is crucial to reduce the perceived risk of RER appreciation.

The flexibility and advantages of the short run exchange rate floating should also be preserved. In that regards, the central bank interventions in the FX market have to achieve two conflicting targets: they have to prevent the formation RER appreciation expectations and allow the NER to float in order to de-incentive short term capital flows. The interventions interval has to be narrow enough to perform the first function and wide enough to also perform the second one.

Signaling the stability of the RER trend is important to optimize the real objectives of the exchange rate policy, but flexibility is worth to be preserved. It seems advisable to avoid rules, announcements and commitments and deliver signals in implicit ways, throughout the central bank interventions in the FX market. Nevertheless, in order to contribute to the expectations formation, it is important that the central bank and the government make clear the important role given to the SCRER within the development strategy, even if it does not imply any formal commitment.

The FX market is an asset market. Buying and selling decisions are to a great extent based on expectations. Thus, expectations about the future exchange rate should be the main target of central bank interventions. If central bank interventions and signals stabilize expectations around the SCRER – a necessary condition for that is the consistency of monetary and fiscal policies and the robustness of the external accounts – the market forces by themselves will tend to stabilize the NER. The monetary "costs" of central bank interventions will be lower and fewer interventions will be required. For this reason, the central bank market interventions should be strong, in order to clearly show to the market participants the willingness and strength of the monetary authority.

4. Monetary autonomy in the SCRER regime

Is monetary policy autonomous enough to influence aggregate demand in a SCRER regime? Yes.

One of the orthodox objections to central bank interventions in the FX market is that they would entail a loss of monetary autonomy. This criticism is based on the well-known "trilemma" of economies open to capital movements. The "trilemma" asserts

that the central bank cannot simultaneously control the NER and the interest rate in a context of free capital movements. The "trilemma" is false in some circumstances, and is thus false as a general characterization of open economies.

A condition for simultaneous control of the NER and monetary autonomy is the existence of an excess supply of FX at the NER and interest rate targeted by the central bank. In these circumstances, the monetary authority can set the NER by purchasing the excess supply in the FX market and can control the interest rate by sterilizing the monetary effects of this intervention, which it does by issuing treasury or central bank bonds in the money market. The central bank has two instruments for achieving its two goals: intervention in the FX market to set the NER and intervention in the money market to determine the interest rate.

A simple explanation is the following: An excess supply of FX, at the NER targeted by the central bank and current interest rate, implies an excess demand for domestic assets. A fully sterilized intervention can be seen as a policy that is implemented in two stages. First, central bank intervention in the FX market leads to an increase in the monetary base. As a result, there is a larger monetary base, an unaltered stock of domestic assets and an interest rate lower than initially. In the second stage, full sterilization completely offsets the change in the private-sector portfolio that occurred in the first stage. The central bank absorbs the increase in the monetary base and issues an amount of domestic assets equivalent to the initial excess demand for these assets (the excess supply of foreign currency), returning the domestic interest rate to its initial level (Bofinger and Wollmerhäuser, 2003).

The model used above to present the sterilization operation in simple terms assumed a greatly simplified financial structure. Agents' investment portfolios include only base money, domestic assets and external assets. There are only two interest rates, the domestic and the international rates. The foregoing analysis of sterilization is based on the following reasoning. Given a certain configuration of investment portfolios and a certain interest rate structure, it is assumed an increased preference for domestic assets, for whatever reason. At the prevailing interest rates, this change leads to an excess demand for domestic assets and the corresponding excess supply of external assets. Since the central bank issues the very domestic asset that is in excess demand (the only interest-bearing domestic asset in the model), a monetary policy of maintaining the domestic interest rate implies full sterilization of the monetary base issued as a result of interventions to purchase FX in the market. With this model, maintaining the interest

rate is equivalent to full sterilization or, what comes to the same thing, to keeping the stock of base money unchanged.

How is the above analysis affected by the existence of a wider range of domestic assets? To examine this point, a somewhat more complex model with two interest bearing domestic assets is considered here. It is assumed that the range of domestic assets consists of base money and two interest-bearing assets: short-term assets and long-term assets (bonds, for example). It is also assumed that the central bank operates only in the short-term assets market. Now let me also assume that the excess demand for domestic assets resulting from the change of preferences posited above is distributed in some way between short- and long-term domestic assets. The first step in the central bank operation (the purchasing of surplus FX to maintain the exchange rate) would result in lower short- and long-term domestic interest rates than the starting rates. In this case, if the central bank fully sterilized the base money it issued via the placement of short-term assets, the resulting short-term interest rate would be higher than the starting rate. This is because the long-term rate would be lower than it originally was and, if the elasticity of substitution between base money and short- and long-term assets were significant, the demand for base money would be higher than at the start. To keep the amount of base money equal to the original amount, the short term interest rate would have to be higher than its starting level to compensate for the effects of a lower long-term interest rate.

The rise in the short-term interest rate in the above exercise comes about because the central bank, which operates exclusively with short-term assets, carries out a full sterilization of its FX market interventions. Conversely, if the central bank wishes to restore the short-term interest rate to its starting level (because this is its monetary policy instrument, for example), it can do so. This will involve conducting a partial rather than a full sterilization, allowing the supply of base money to adapt to a higher demand via the influence of a long term rate that is lower than the starting rate.

The example using three domestic assets illustrates the more general case: a large quantity of domestic assets, including land and real-estate, which are in excess demand as a counterpart to the excess supply of external assets. Obviously the central bank cannot control the entire interest rate structure, whether in an open or a closed economy. The monetary autonomy exercised through the sterilization policy needs to be understood as the capacity of the monetary authority to control the instrument rate(s) of its monetary policy. The variable(s) targeted by the sterilization policy ought to be the

interest rate(s) of the assets with which the central bank operates and not an underlying quantitative variable (base money or other monetary variable).

There have been cases in practice (and this is often brought up) where sterilization policies have induced higher domestic interest rates. The foregoing analysis offers a possible explanation for these cases. If the central bank pursues quantitative monetary targets (e.g., for base money or other monetary variables) and fully sterilizes its currency market purchases to meet them, the interest rate of the asset class with which the bank is operating is likely to rise. In this case, the problem lies not in the nature of the sterilization policy but in the goal it is pursuing.

5. The sustainability of sterilization policy

Sterilized FX interventions to purchase foreign currency are possible at any point in time. But can this policy be applied continuously? Not in every circumstance. The sustainability of the policy depends on the interest rate earned by FX reserves, on the domestic interest rate, on the NER trend and on the evolution of the variables determining the supply of and demand for base money. In Frenkel (2007 and 2008), I show that there is a maximum domestic interest rate below which the policy of sterilization is sustainable. Under conditions of excess supply of FX at the targeted NER, the central bank can set the NER and is free to set a domestic interest rate no higher than that maximum without generating unsustainable trends.

More formally: at any point in time, the unit cost of sterilization is $s = i - r - e$, where s is the cost of sterilization, i the domestic interest rate, r the international interest rate and $e = dE/E$ (E = pesos / US$) the rate of increase in the price of FX. The sterilization cost s is nil if $i = r + e$, i.e., if the domestic interest rate is equal to the sum of the international interest rate and the rate of increase in the exchange rate. Or (what comes to the same thing) if the uncovered interest parity condition is strictly met.

A policy of sterilization is obviously sustainable if the cost of sterilization is nil or negative. If this were the sustainability condition, the policy of sterilization would only be sustainable if $i \leq r + e$; i.e., $r + e$ would be the maximum value of the interest rate needed to keep the policy of sterilization sustainable. Interest rates higher than this would make the policy unsustainable.

In Frenkel (2007), I show that the condition referred to is not necessary for sustainability. I demonstrate that the policy could be sustainable with domestic interest

rates higher than r + e and calculate the maximum rate at which sterilization remains sustainable. This conclusion is arrived at by simply considering the stock of central bank liabilities and taking into account the seigniorage received by the bank. In that article, I develop a simple model which takes into account the fact that, in addition to interest-bearing financial assets, the public demands and the central bank issues monetary base which does not bear interest. Note that if the intention were to determine the maximum interest rate at which the cost of sterilization operations was nil or negative, the seigniorage could not be added. Since what is to be demonstrated, however, is not a nil cost but the sustainability of all central bank monetary and financial operations taken together, the seigniorage can be included in the calculation, as indeed could other revenue items, such as returns on commercial bank debt and public bonds. In the above-mentioned article, I only take into account seigniorage.

The degree of monetary autonomy is defined here as the difference between the maximum domestic interest rate at which sterilization is sustainable and r + e. Thus, g = imax – (r + e), where imax is this maximum rate and g the degree of monetary autonomy. Given the international interest rate and the rate of increase in the exchange rate, the higher the domestic interest rate that can be set without rendering sterilization unsustainable the greater the degree of autonomy. Below, I briefly present the model.

I assume that the central bank has FX reserves as its only asset and that it issues two liabilities, base money and sterilization bills, yielding domestic interest rate i.
P = B + L
where P is the total stock of central bank liabilities, B the outstanding monetary base and L the stock of interest-bearing liabilities. At interest rate i and exchange rate E there is an excess supply of international currency C in the FX market, which the central bank purchases. R is the central bank's stock of international reserves (in international currency) and R E is the peso value of these reserves. The international reserves yield r, the international interest rate. Again, with interest rate i determined, the increase in the demand for base money is dB = B β (p + y), where p is the inflation rate, y the real GDP growth rate and β the GDP-elasticity of the money base demand.

The sustainability condition of the sterilization policy is defined as dP ≤ d(R E). The condition means that the sterilization policy is sustainable if the ratio between total central bank liabilities and the domestic-currency value of international reserves P/(R E) does not increase. In Frenkel (2007), I show that the sustainability condition is

i ≤ (e + r) / lR, where lR = L/R E is the quotient between the stock of interest-bearing central bank liabilities and the domestic-currency value of international reserves.

If lR < 1, the domestic interest rates required to preserve the sustainability of the sterilization policy can be greater than e + r, and the lower the lR quotient is, the higher they can be. As noted above, central bank operations determine the domestic interest rate and the NER at any point in time. The sustainability of these operations depends on domestic and international interest rates, lR and also on the trajectory of the NER over time. The maximum domestic interest rate at which the sterilization policy remains sustainable is imax = (r + e) / lR. Consequently, the degree of monetary autonomy is g = imax − (r + e) = (r + e) (1 − lR) / lR. The lower lR is, the higher the degree of monetary autonomy, i.e., the difference between the highest sustainable domestic rate and r + e.

The lR ratio varies over time, altering the range of sustainable interest rates and the degree of monetary autonomy. If lR increases over time, the degree of autonomy tends to diminish, and vice versa. This consideration indicates that it would be advisable to analyze the trend of the sustainability condition to establish whether the highest interest rate consistent with a sustainable policy of sterilization tends to rise or fall over time. Or, what comes to the same thing, whether the evolution of the monetary variables and the FX market tends to increase or reduce the degree of monetary autonomy.

In Frenkel (2007), I define the permanence condition of the degree of monetary autonomy as: d(L/R E) = dlR ≤ 0. If the monetary and currency market variables meet this condition, the highest sustainable interest rate and the degree of autonomy tend to remain stable or increase. If they do not meet it, the degree of autonomy tends to fall, although this does not mean that sterilization rapidly becomes unsustainable.

I show that the permanence condition of the degree of autonomy could be expressed as a constraint on the domestic interest rate:

i ≤ (e + r) + (B/L) β (p + y) − (C/R)(1 − lR) / lR

Domestic rates equal to or lower than the second member of the expression are required to maintain the degree of autonomy over time. Higher rates imply that the degree of autonomy is tending to fall, because the ratio between the central bank's stock of interest-bearing liabilities and its reserves is tending to rise. The constraint depends on the ratio between the monetary base and the stock of interest-bearing central bank liabilities (B/L) and on the rate of growth in the demand for base money β (p + y). As can be seen in the last term of the expression, the constraint depends negatively on the ratio between the flow of central bank purchases in the FX market and the stock of

reserves (C/R) (equivalent to the rate of international reserves growth, net of interest). The insight is clear: the greater the purchases of the central bank in the currency market, the faster the stock of sterilization liabilities and its cost will increase.

The above analysis assumes freedom of capital movements. Over and above the theoretical discussion, however, it highlights the functions that can be performed by controls on capital inflows and foreign currency purchases by the government. Capital controls that moderate the scale of central bank purchasing help preserve whatever degree of autonomy is possessed by the economy at a given time. In the same way, fiscal policy can also help preserve monetary autonomy. If there is a fiscal surplus, the government can invest part of that surplus in external assets, thereby reducing the amounts the central bank needs to purchase to keep the exchange rate on target.

In summary, the conclusions I arrived in Frenkel (2007) are as follows. If the conditions

$i \leq (e + r) / lR$ and also $i \leq (e + r) + (B/L) \beta (p + y) - (C/R)(1 - lR) / lR$ are met, the policy of sterilization is sustainable and the degree of autonomy is permanent. Conversely, if $(e + r) + (B/L) \beta (p + y) - (C/R) (1 - lR) / lR < i \leq (e + r) / lR$, the sterilization policy is sustainable but the degree of autonomy tends to diminish.

The study presents a number of numerical exercises, involving different inflation and growth scenarios and using plausible data and parameters. The results suggest that sterilization policies are sustainable and that a considerable degree of permanent monetary autonomy exists in contexts that are by no means uncommon in many developing economies. The conclusion must be that exchange rate policy in a SCRER regime does not usually inhibit the exercise of monetary policy. The orthodox criticism is not valid. Even with freedom of capital movements (on the obvious assumption that domestic and external assets are not perfect substitutes), this regime is not incompatible with a considerable degree of monetary autonomy.

The above conclusion does not imply, however, that in a SCRER regime (or, more generally, in any context in which the central bank intervenes in the FX market to avoid the appreciation of the RER) the control of aggregate dynamics and inflation pressures can exclusively rest on the monetary policy. The sustainability conditions put an upper limit to the policy interest rates. These constraints could combine with a low interest rate elasticity of the aggregate demand to generate circumstances in which the regulatory capacity of monetary policy becomes greatly impaired. The level of the interest rate capable of influencing the aggregate demand dynamics could be higher than

the maximum sustainable interest rate (Frenkel, 2008). A low elasticity of aggregate demand is observable even in economies with a high degree of financial intermediation. It seems highly probable that many developing economies share this feature. My conclusion in that regards is that in a SCRER regime active monetary policy can and should be practised because all available instruments should be used to control the pace of aggregate demand and inflationary pressures. But the responsibility could not rest primarily or exclusively on monetary policy. This observation highlights the crucial role that fiscal policy has to play in a SCRER regime.

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