Foreign debt and financial fragility in the perspective of the emerging countries *

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Introduction

The aim of these notes is to analyse some basic aspects of the evolution and management of foreign debt following the financial fragility approach proposed by Hyman Minsky (1986) and later extended to foreign debt by Jan Kregel (2004).

Minsky defines financial fragility in terms of the financial structures that characterise different types of economic units in all situations, hence not only in periods of stress. Financial fragility must then be distinguished from financial instability, dynamic analysis of which requires to add complex causal relations among the selected variables. I shall not go into Minsky's instability analysis, which I see as having necessarily been developed at a lower level of abstraction, namely at a more case specific level. The present analysis is primarily directed at clarifying both the conditions that lead to external financial fragility, i.e. the ones related to foreign debt servicing, and the distinction between external and domestic fragility.

Section 1 outlines Minsky's theory of financial fragility, while section 2 builds on the extension of Minsky's approach to the analysis

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* The paper is a revised version of a lecture given at the Posgrado en Finanzas, Universidad Nacional de Uruguay, August 2005. The author thanks Elisabetta Montanaro, Silvia Marchesi and two anonymous referees for helpful comments on an earlier version of this paper.

BNL Quarterly Review, vol. LIX, no. 236, March 2006, pp. 23-48.

of foreign debt proposed by Kregel. Section 3 considers the effects of financial opening on the evolution of financial fragility in terms both of asymmetric international financial positions and of different types of capital inflows. Section 4 introduces the distinction between domestic and external aspects of financial fragility, discussing how the dynamic interplay of the economic units, including the government and its policies, may influence both the distribution and the level of domestic and external financial fragility. Section 5 offers some concluding remarks.

1. Financial fragility

1.1. *Definition of positions*

According to Minsky every economic unit is characterised by a set of features inherited from the past possessing significant degrees of rigidity. This inheritance may be summed up as consisting on the one hand of the stocks of physical, financial and immaterial capital, and on the other side of contractual obligations, among which a given debt structure. The various forms of capital are the source of future expected incomes (here considered net of the costs necessary to sustain the position), while the debt is the source of financial outflows.

A family, a firm, a financial intermediary, a state or a country may be analysed in terms of their positions. The difference will lie in the elements from which each unit derives its present and future earnings and both the nature and temporal structure of its financial outflows. For instance, at a given point in time the position of a family may be composed of a given amount of human capital (from which it expects to derive the major part of its future incomes), a given stock of real and financial capital (also a source of earnings) and a given amount and structure of debt (for instance the residual of a mortgage loan). The various forms of capital and debt possess different degrees of rigidity. While at one extreme we find the non marketability of human capital, it often happens that past decisions on the other components can be only changed with high transaction costs to be borne. This restricts the range of actions that a position may find convenient to pursue when confronted with the need to change its present and futures outcomes.

1.2. *Quasi-rents, liquidity and debt service*

In each future period an economic unit expects operative earnings net of the position's maintenance costs (quasi-rents Y_n), net returns from its financial assets (Y_f), and must allow for payment for interest and amortization of its debt (*MD*). The unit may cover part of the debt service by drawing on the liquid assets (L)[1] that are kept in excess of its normal operations. We may then write:

$$Y_{ni} + Y_{fi} + \Delta L_{i-1} \lesseqgtr r_i D_{i-1} + MD_i \qquad i = 1, ..., n \qquad (1)$$

where r is the average rate of interest on the debt D. The eventual returns from liquid assets are included in the expected financial incomes. Equation 1 expresses a mix of expectations and planning. Usually future incomes are expected to exceed the service of debt, thus leaving a surplus representing profits or savings; in some periods the opposite may be expected, producing a liquidity deficit which may be filled up, at least in part, by drawing on the stock of liquid assets, L_1, which the unit has put aside at time 1 in anticipation of these circumstances. We have consequently included in equation 1 the expected use of these assets for each future period i.[2] When a residual deficit remains, the unit must add new debt.

In each period the value of net capital (*NC*) is given by the present value of expected total net earnings (*KY*), inclusive of financial earnings, plus the residual value of liquid assets and less the present value of debt (*KD*).

$$NC_i = K_i Y + L_i - K_i D \qquad (2)$$

The position is solvent when its net capital is non negative. As we will see in the following paragraphs of this section, the viability of the position may depend not only on the realisation of the expected future earnings, but also on the conditions that will in future characteri-

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[1] More precisely L also contains those assets whose dismission does not affect the core operations of the unit.

[2] With explicit consideration of the variations in liquidity as part of the resources that are available to serve the debt, it is possible to offer a more integrated analysis than the one formalised by Minsky (1986).

se the financial markets. On these premises we may proceed to reformulate Minsky's definitions of hedge, speculative and Ponzi positions.

1.3. *Hedge positions*

A hedge position is subject to operating risks, but not to financial risks, which leads us to take the Y_f, r and L of equation 1 as predetermined values. In the case of Y_f and r this means that the unit entered into financial contracts with fixed interest rates, while L should be taken to consist of monetary assets whose value does not depend on market prices. In addition a hedge position requires that expected earnings and liquidity will always suffice to service the debt:

$$Y_{ni} + \overline{Y}_{fi} + \Delta\overline{L}_{i-1} \geq \bar{r}_i D_{i-1} + MD_i \qquad i = 1, ..., n \qquad (3)$$

where $\overline{Y}$, $\overline{L}$, $\bar{r}$ all refer to predetermined values.

If in every future period these expectations are validated, then the position will not be obliged to look for new finance; *ex ante* the position is thus expected not to be subject to financial risks.

Minsky offers a more complex definition that transforms the inequalities of equation 3 into equalities by means of explicit consideration of safety margins. Given the variability of operative results, they are computed net of their variance (σ_n^2), and this net value is multiplied by a coefficient $\tau < 1$. Since it is crucial for the position to remain liquid in each future period, reserves of liquidity may be kept in excess of precise calculations, albeit based on expectations, on debt servicing. This extra-liquidity, shown by coefficient $\lambda < 1$, represents a further safety margin.

$$(Y_{ni} - \sigma_n^2)\tau + \overline{Y}_{fi} + \lambda\Delta\overline{L}_{i-1} = \bar{r}_i D_{i-1} + MD_i \qquad i = 1, ..., n \qquad (4)$$

The coefficients expressing the safety margins are evaluated *ex ante* and may be revised whenever the position is subject to new evaluation, as for instance when it applies for new financing. In terms of capitalised values these safety margins produce margins on the present value of earnings and liquidity with respect to the present value of debt:

$$\Phi K_i Y + \Gamma L_i = K_i D \tag{5}$$

where Φ and Γ are lower than one. Given that $KY+L$ is the present value of assets, we may define an 'expected' leverage as:

$$\frac{K_i D}{K_i Y + L_i} \tag{6}$$

Higher safety margins, i.e. lower coefficients τ and λ, hence Φ and Γ, lead to a lower expected leverage. This particular concept of leverage is more significant than the usual one that refers to a single period. Note that in Minsky's analysis the level of leverage does not define a hedge position, but the level of its safety margin.[3]

If, as time passes, the position validates its expected values of Y_n, it will benefit by a cumulative excess of earnings and liquidity over debt servicing, therefore cumulating profits and/or savings (depending on the nature of the unit). Given that in these conditions the leverage shows a declining trend, the unit may buy new assets by assuming new debt to an extent that may leave its initial global safety margin unaltered.

These results follow the logic of a competitive system in which profits constitute remuneration for the risks taken; the safety margins that lead to the equality in equation 5 become the remuneration for risks as far as expectations are validated.[4]

A hedge position is planned to be liquid in each future period. As we will see when discussing speculative positions, if in one or more future periods the position does not validate its expectations on operative earnings, net of their variance, it may be obliged to assume new debt. This unexpected illiquidity may become insolvency if the costs associated with the new debt (related to the interest rate at that moment) are such that the new actual value of earnings plus the residual liquidity become smaller than the new actual value of debt.[5]

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[3] Miscalculations on safety margins can, however, lead to erroneous assessment of position as hedge.

[4] Extra earnings accruing to units operating in markets with imperfect or oligopolistic competition are embodied into the value of *KY*. Apart from the fact that these extra earnings may lead to less stringent safety margins, markets with imperfect competition render their units intrinsically safer than highly competitive ones.

[5] Evident, then, is the importance of keeping extra-liquidity or the possibility, normally granted to banks, to accede to liquidity at prices that do not prove excessively punitive.

1.4. *Speculative positions*

A speculative position is subject to both operative and financial risks. To be significant financial risks should have enough strength potentially to generate insolvency.

For the sake of convenience, let us start by considering two cases. With reference to equation 1, we have the first case when the values of Y_f, r and L are not predetermined; in the second case the position is planned from the outset with a liquidity deficit in some, few, future periods. In both cases the dependence of liquidity and solvency on expectations and safety margins extends to the financial variables.

If the position takes financial risks as a consequence of the variability of Y_f, r and L, we have:

$$(Y_{ni} - \sigma_n^2)\tau + (Y_{fi} - \sigma_f^2)\eta + \Delta(L_{i-1} - \sigma_L^2)\lambda = \rho(r_i + \sigma_r^2)D_{i-1} + MD_i \quad (7a)$$

$i = 1, ..., n$ and $r_i \leq r_{max}$.

Safety margins now apply to all expected variables, being considered net of their variance and multiplied by safety parameters, with τ, λ and η less than one and ρ greater than one. It is also reasonable to suppose with Minsky that the equality of equation 7a is computed with reference to a maximum value of the expected rate of interest on debt, necessary to put a ceiling to the safety margins. Future interest rates above this maximum may transform a temporary illiquidity into insolvency.

The second typology of speculative positions is planned from the outset with a liquidity deficit in some future periods. Minsky refers to few initial periods, as it is for short term debts or with the zero gross earnings that characterise the initial phase of an industrial investment. In the following periods the net expected earnings will be greater than the debt service. Assuming predetermined values for Y_f, L and r, we may then write:

$$Y_{ni} + \overline{Y}_{fi} + \Delta\overline{L}_{i-1} < \bar{r}_i D_{i-1} + MD_i \quad i = 1, ..., d \quad (7b)$$

$$(Y_{ni} - \sigma_n^2)\tau + \overline{Y}_{fi} + \lambda\Delta\overline{L}_{i-1} = r_i D_{i-1} + MD_i$$

$i = d + 1, ..., n$ and $r_i \leq r_{max}$.

The liquidity gap of the first periods forces the unit to go back to the financial market to obtain new funds. Since the conditions at which the new debt is contracted influence the future payments related to the service of the new value of debt, the rate of interest for the following periods is not predetermined. Interest rates well above their expected maximum value may transform a temporary illiquidity into insolvency.

In both cases the presence of financial risks requires that the equality of the equation is obtained by means of safety margins globally higher than in the case of a hedge position, and hence with a lower expected leverage.

Speculative positions may present themselves with the characteristics of both the above cases. As in the case of a hedge position, the validation of expectations produces profits (or savings); since the overall safety margin is now higher, the profits coming from that validation will also be higher:[6] higher risks require higher expected gross profits.

If the rates of interest should in the future increase beyond the limits for which the position has been planned, insolvency may derive if the global safety margin prove insufficient. The worst scenario appears with a decrease in operative earnings due, for instance, to a macroeconomic slowdown or recession, and a marked increase in interest rates due to the risk-free and/or the risk spread component.

The degree of financial fragility of an economic system is then defined by the importance of speculative positions. As a result "the larger the weight of speculative finance, the greater the importance of preventing the emergence of very high interest rates" (Minsky 1986, p. 339). It is important to underline that speculative finance may characterise any type of economic unit and not only financial intermediation. This is why Minsky adopts a unitary approach for the analysis of real and financial phenomena and suggests looking at the economy from the viewpoint of an investment bank of Wall Street.

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[6] This when safety margins do not imply additional costs or loss of earnings. Otherwise we have a partial effective hedging of the position, hence lower residual risks. We may then distinguish the effective hedging coming from maintaining extra liquidity from the potential hedging linked to the safety margins on expected earnings.

1.5. *Ponzi positions*

A Ponzi position is normally associated with fraudulent schemes, of a pyramidal type, where the payment of unusually high returns attract an increasing quantity of investors. The trick is that these payments come from utilisation of the latecomers' capital. When the rate of increase of the new contributions slows down, it is time to close the shop and make off with the spoils.

More generally we have a Ponzi position when it is expected that during many future periods the service of debt requires resort to additional debt and/or sale of liquid assets. The result is increasing indebtedness and a continuous decrease in the unit's net capital. If this structure is planned with the expectation that a final event (or few events) will render the position solvent, the latter is ultra-speculative (a term that Minsky utilises in some of his works), but not necessarily fraudulent. At the limit we have:

$$Y_{ni} + Y_{fi} + \Delta L_{i-1} \leq r_i D_{i-1} + MD_i \qquad i = 1, \ldots, n-1 \tag{8}$$

$$Y_{ni} + Y_{fi} > r_i D_{i-1} + MD_i \qquad i = n$$

where in some of the first (n–1) periods the equality may be obtained by selling liquid assets.

Obviously this structure is extremely fragile given the large sequence of periods in which the position has to refinance itself, at whatever conditions the financial market dictates, and/or it must continuously shrink its capital base by selling liquid assets. Moreover, its solvency is linked to a few benign future events, or possibly even a single El Dorado event, as Minsky suggestively calls it. Big real investment schemes may have Ponzi characteristics if they have to begin with a strong doses of liquidity and/or swiftly increase their debt, while receiving payments subject to specified conditions: unexpected increases in costs, delays in honouring contractual commitments and increases in the rate of interest may easily render the position insolvent.

Excluding fraudulent schemes, what characterises a Ponzi position is, then, the chronic deficiency of its cash flows to serve the debt; this also applies to the interest which is consequently capitalised. Moreover, given that its solvency depends on a few favourable events expected in a

rather distant future, the degree of confidence in its solvency is quite low. Since for this type of position the cash flow is by definition inexistent or insufficient for most of the future periods, the safety margins may consist solely of reserves of liquid assets, whose volume is however limited by their high opportunity-cost. With respect to a speculative position, a Ponzi scheme is therefore characterised by a different time structure for its future cash flow, much more concentrated for the Ponzi position, by its solvency being much more sensitive to changes in interest rates, and by a continuous erosion of its net capital base until the validation of the expected favourable events eventually occurs. Moreover, financial markets with a minimum of rationality should supply to it only very short-term finance. In these conditions

> "the emergence of a skeptical attitude toward the big event materializing leads to funds not being available to keep the project afloat. *An increase in the ratio of Ponzi finance, so that it is no longer a rare event, is an indicator that the fragility of the financial structure is in a danger zone for a debt-deflation*" (Minsky 1986, p. 341, italics not added).

1.6. *Some considerations on financial fragility and instability*

The financial fragility of a position depends on its sensitivity to the conditions offered by financial markets for carrying over its debt, in terms of the cost and the availability of funds. Its residual financial risk also depends on the presence of hedge contracts – for instance, fixed interest rates on debt contracts – and on the safety margins with which the position has been planned. Although the leverage is not the source of financial fragility, its actual level affects the degree of fragility.

From a macroeconomic point of view, the importance and characteristics of speculative and Ponzi positions define the degree of financial fragility of an economic system, affecting its propensity to generate financial and real crises. The term debt-deflation, proposed by Irving Fisher in the 1930s and then adopted by Minsky, indicates the transformation of fragility into instability and stands for dynamic processes where the insolvency of Ponzi and speculative positions, and the transformation of hedge positions into speculative and Ponzi ones, go together with a crisis that deepens and becomes more general, affecting

both the financial and the real spheres at the same time. The impossibility to honour debts is central to this dynamics.

The likelihood of a crisis, its strength and its transmission mechanisms also depend on the structure of the economic system, and in particular on how risks are generated and then allocated. If, for example, the banks bear most of the risks, they are the lightning rods that will most likely transform the sum of incoherent intertemporal decisions into crisis. If it is the households that bear most of the risks – a state of affairs that many economies seem to be approaching – it is their reaction to the non-validation of their positions, mostly through their consumption decisions and their capability to service the debt, that provokes a chain reaction in the financial and real spheres. In Minsky's approach the state should keep the systemic financial fragility low and intervene with force on the outbreak of a crisis. In other words, its duty is to keep the incoherency of the system within acceptable limits.

Basically, this means that the relevance of Minsky's definition of financial fragility depends on its being able to address and give substance to instability processes in a way that orthodox theory cannot. As pure definitions, Minsky's positions may be a starting point for very different theories of economic dynamics. However, Minsky's financial fragility and instability analysis are not compatible with the vision upon which monetarism and its sequel theories have been built. The basic tenets of the Keynesian theory obviously constitute the theoretical divide between Minsky's analysis and orthodox analyses. It is the dynamic nature of capitalism and the (true) uncertainty about the future that lead us to distinguish Keynesian dynamic multiple equilibria schemes from theories based on the uniqueness of equilibrium. The interplay of today's results with past experience and with expectations about a distant, uncertain future is responsible for the specific dynamic path followed by an economy. The rejection of Minsky's theory of instability in orthodox economics, as being based on irrational behaviours, rests on the fiction of a static economy where future results are known for certain even allowing for the possibility of different given states of nature. When the future is uncertain, the irrationality lies in the extra elements that orthodox theory must subsequently introduce to allow for instability processes, and not in a theory that rationally builds on what is only partially known (see also Kregel 1997). The following paragraphs are based on Keynes' and Minsky's view of rationality.

2. Financial fragility and foreign debt

By foreign debt I mean debt denominated in a foreign currency and held outside the debtor country. Looking at the relations between a country and the rest of the world, the balance of payments registers the sources of debt formation and of its service for the entire economy, and hence for both the private and the public sector. Let us consider a country with a positive net foreign debt (*NFD*); in absolute terms its changes are equal to the current account balance (*CA*):[7]

$$NFD - NFD_{-1} \equiv - CA \equiv -NX - NFI - UT \qquad (9)$$

where *NX* are net exports,[8] *NFI* are net incomes from abroad, *UT* are unilateral transfers, and all variables are expressed in a foreign currency in order to highlight the constraints coming from the balance of payments. A deficit of *CA* increases *NFD*.

We may then extend Minsky's analysis to the liquidity conditions for a country facing the rest of the world:

$$NX_i + r_i^{FA} FA_{i-1} + UT_i + \Delta FR_i \gtrless r_i^{FD} FD_{i-1} + MD_i \quad i = 1, ..., n \qquad (10)$$

where r^{FA} is the rate of return on foreign assets (*FA*), ΔFR is the variation of foreign reserves (utilised for smoothing temporary liquidity imbalances), r^{FD} is the average rate of interest on foreign debt (*FD*) and *MD* is the maturing debt. Apart from changes in foreign reserves, the inequalities of equation 10 express the expectations that in each future period the inflow of foreign currencies due to net exports, income from foreign assets and unilateral transfers may be higher or lower than the amount required to service the debt.

The current account balance shows, in each period, the position of the entire economy in terms of its liquidity in a foreign currency. For a country whose national money is not an international currency, currency illiquidity means that in the local exchange market the supply of currency falls short of the demand for it. This obliges some of the

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[7] Foreign reserves are here included in the net foreign debt.

[8] Net exports are defined as the difference between export and imports and include goods and services.

units in deficit (those with currency deficits between receipts and payments) to run up new debt in the international markets, i.e. foreign debt normally denominated in a foreign currency. This constitutes a capital inflow registered in the financial and capital section of the balance of payments for an amount equal to the current account deficit. While domestic policies may avoid a situation of general illiquidity for positions denominated in their own currency, the units with net foreign debt are exposed to the terms and to the availability of funds coming from the international financial markets. Hence the cumulative history and the prospects for the current account balance are critical in determining the importance of a country's external fragility, i.e. the importance for the entire economy of speculative and Ponzi positions defined in terms of a foreign currency. A long succession of large current account deficits produces a large amount of net foreign debt, therefore increasing the importance for the country of the sum of its speculative and Ponzi foreign positions, private and/or public, making them a systemic feature.

This has important consequences when we move on from illiquidity and fragility to insolvency and default. Usually, when we speak of insolvency and default for a country we are referring to its sovereign foreign debt. If the foreign debt assumed by the private sector is not large, this identification is acceptable. When, on the contrary, the amount of private foreign debt renders private speculative and Ponzi positions in foreign terms a systemic feature of the economy, their eventual insolvency due to foreign exposure provokes *de facto* a country crisis calling for some sort of public intervention. In these conditions it is not rare to see the state finding some way to shift the burden of the external position from the private to the public sector.[9] When discussing a country's positions in foreign debt, its related financial fragility and the sustainability of its debt in the following pages, we are not therefore limiting the argument to the public sector. The current account of the balance of payments necessarily brings to unity the results of the behaviour of many independent agents with consequences that may be felt by the entire system.

We have seen that the solvency of a generic position rests on the capitalised value of its future earnings not being lower than the dis-

[9] It would be interesting to analyse how many of the numerous sovereign defaults of the past had their ultimate and predominant origins in the private sector.

counted value of its debt. For a country solvency amounts to the sustainability of its foreign debt, that is to its ability to serve at least its future interest payments denominated in a foreign currency. As we have seen for the positions in general, the problem does not necessarily lie in cancelling the debt, but in paying the interest, now denominated in a foreign currency, and in the conditions on which the position can renew its maturing debt.

If we expect that in some future periods the inflow of foreign currency coming from the trade surplus will not suffice to pay for interest on debt, the country is clearly in a speculative position. The possible presence of indexed rates of interests adds to the speculative nature of the position. In a long period perspective it is the very need to roll over the debt that puts the country in a speculative position. If we expect that for many future periods the inflows of foreign currency from trade will be lower than the amount needed to pay interest on debt, the country is in a Ponzi position and the foreign debt will grow. If, like many analysts do, we link the sustainability of debt to the stability of some relative measure (such as the debt/net exports ratio or the ratio of debt to national product, both expressed in foreign currency), it means accepting that the country remains in a Ponzi scheme (this is the meaning of a persistently negative *CA*), although it is thereby limiting increase in the current account deficit and therefore limiting the dynamics of the pyramidal scheme.

If we reformulate equation 9, assuming for simplicity the constancy of foreign reserves (i.e. assuming the equilibrium of the balance of payments[10]) and not considering unilateral transfers, we may write:

$$NFD - NFD_{-1} \equiv -CA \equiv -NX + r^{NFD}NFD_{-1} \qquad (11)$$

The gross outflow of foreign currency due to interest payments produces an increase in net foreign debt to the extent that in absolute value net exports are lower than the debt service. Moreover, if g_{NFD} is the rate of growth of the net debt, from equation 11 we derive:

[10] In this way we adopt a medium-long period perspective.

$$g_{NFD} \equiv r^{NFD} - \frac{NX}{NFD_{-1}} \qquad (12)$$

where the rate of growth of net foreign debt depends on the difference between the unit cost and the unit return, both expressed in a foreign currency, of the cumulated net debt.

Identities 11 and 12 refer to a single period. For the purpose of sustainability analysis we must consider them over a significantly long time-horizon, also taking into account the non uniform temporal structure of the debt. From this point of view, which is necessarily one of forecasts and design of future scenarios, we may reconsider Minsky's positions and their safety margins. Starting from equation 10 we may outline some typical temporal structures of equations 11 and 12. Table 1 outlines the possible positions of a country facing the problem of its foreign debt.[11]

The most natural condition for a hedge country is to have, over time, a foreign debt equal to zero. Given that the deficits of the trade balance are necessarily temporary and of a limited amount, they can be promptly managed by means of foreign reserves variations, followed in the short period by restrictive monetary and fiscal policies. By decelerating the growth of national income, these policies re-equilibrate the current account mainly by lowering imports. Public policies are here seen as safety margins insofar as they are instruments that the debtor can apply to influence the validation of its hedge position. Low temporary trade deficits levels are required in order to limit the amount of foreign reserves (and IMF interventions), but mainly to limit the negative effects of the restrictive policies, which would otherwise lose in credibility. This was substantially the system as conceived with the Bretton Woods agreements. The safety margins for this type of position are therefore proportional to a country's amount of foreign reserves (and its access to IMF finance), the credibility of its restrictive public policies and a prudential coefficient on the evolution of net exports. In principle a hedge position could be associated with a positive net debt if this was assumed with fixed-rates and if the position had hedged renewal of the debt (its availability and cost). Given that the cost of these contracts must be limited in order not to pro-

[11] Much of what follows builds on Kregel (2004).

TABLE 1

Country position	Net foreign debt	Typical feature	Safety margins
Hedge	Zero	Small and temporary deviations from the equilibrium of the trade balance	– Foreign reserves – Monetary and fiscal policies – Prudential coefficient coefficient on net exports
Speculative	Positive, but not increasing in absolute terms	Trade balance surplus, sufficient to pay interest on debt (equilibrium of the current account balance)	– Foreign reserves – Monetary and fiscal policies – Prudential coefficient on net exports
Ponzi sustainable	Positive and increasing in absolute terms, but constant in terms of terms of *NX*, i.e. with a constant rate of growth	Trade balance surplus, but current account balance deficit. Interest partly capitalised	– Foreign reserves – Low debt ratio
Ponzi non sustainable	Positive and increasing in terms of *NX*, i.e. with an increasing rate of growth	Trade and current account balance deficit	

duce a negative current account balance, the amount of the debt should however be low, and should remain so.

The speculative position systematically holds a positive foreign debt and a trade balance surplus that covers the debt service so that the debt does not increase in absolute terms.[12] With respect to a hedge position, a speculative position requires a more stringent condition for the

[12] An inflow of foreign funds may occur independently of what is required to balance a current account deficit. However, as equation 12 shows, these funds do not change the net debt position if they do not influence the current account balance (e.g. increasing imports or the payments of incomes abroad); with an unchanged current account balance they necessarily increase the foreign reserves and/or the amount of foreign assets held by residents. Hence a non temporary increase in the net debt always reflects a Ponzi type disequilibrium.

trade balance, necessitating a surplus. We are in this case typically in an open financial environment, with foreign finance normally coming from the markets and only exceptionally from the IMF, and with adjustable exchange rates. With respect to a hedge position the structure of the balance of payments is now also characterised by the presence of the capital and financial balance. In these conditions the exchange rate reacts to the total balance, and not only to current account imbalances. For a speculative position the safety margins are the same as for a hedge position, with some doubts about the efficacy of a restrictive monetary policy; producing higher interest rates which attract more foreign funds, it slows down the dynamics of exports via its effect on the exchange rate.

Although characterised by a current account balance deficit and the need to contract new debt to pay for interests, the Ponzi position that we can optimistically define as sustainable is able to keep a constant degree of indebtedness, and hence a constant rate of growth of debt (see equation 12). This position has to meet even more stringent conditions for its trade balance, since net exports must increase in absolute terms over the periods at the same rate as net debt. The only substantial safety margin may be a low degree of initial indebtedness (net debt over net exports) thanks to which the required growth of exports can be kept low. Given the high sensitivity of the current account balance to a given shock, foreign reserves may serve to smooth small deviations, but their value should be high indeed to counter the effects of significant shocks.[13] For the same reason restrictive monetary and fiscal policies are here far less credible than for a speculative position, requiring much stronger interventions. Default on foreign debt now assumes worrying probability.

The non sustainable Ponzi position disregards any prudential requirement, producing a continuous increase in the rate of growth in the net debt. It typically presents deficits in the trade and current account balances and an increase in the degree of indebtedness; only an El Dorado type of expectation on its future current account might induce some risk-prone lenders to refinance its increasing indebtedness. In a more commonsensical context, it rapidly becomes impossible to access new finance, and hence the default.

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[13] For discussion of the strategy to borrow in order to finance "nothing but the liquidity balances of the country" see Kregel (2004, p. 584).

In line with the analysis proposed by Minsky for a closed economy, the conditions for transition from speculative to Ponzi positions are created during boom periods – in this case at the international level. Affording the possibility to honour the debt service repeatedly, these periods lower the risk perceived by both lenders and borrowers, thus lowering the safety margins.[14] In these conditions a deceleration in growth – not even a negative rate – and a modest increase in the interest rates suffice to produce the default.

3. Asymmetric financial fragility and finance typologies

Let us return to the remark that some analysts may be content with the emerging countries remaining in a sustainable Ponzi position. Actually, some (e.g. Rogoff 2003) even go as far as seeing in this the new international financial order for the next few decades, with the ageing developed countries exporting their savings (but generally keeping them denominated in an international currency) in order to pay for their future pensions; these countries must equilibrate a negative financial and capital account with a positive current account. At the other end of the rope are the emerging countries that should balance net capital inflows with a negative current account. Clearly, here we are looking at important asymmetric financial positions: while the developed countries would accumulate net foreign assets, proving super-hedged positions, the emerging countries would accumulate net foreign debt, structurally remaining Ponzi positions. As we shall see later in this section, the ageing countries scenario is but one of the explanations that support an open financial environment with emerging countries in Ponzi positions. Let us take a closer look at the real and financial aspects of the question.

As far as real production is concerned, the underlying assumption of the ageing countries scenario is that a better allocation of financial funds should increase the world rate of growth, in turn necessary to improve the ageing countries' pensions prospects. However, this

[14] See Kregel (1997), who considers this result as the effect of rational actions by lenders and borrowers, whose evaluation of safety margins is made with an eye more to recent experience than to highly unforeseeable future results.

may be a questionable conclusion since more recent experience fails to show the emerging countries generally experiencing higher rates of increase in productivity, especially if specialised in the production and export of the old and new types of commodities (Kregel 2004). Nor does the approach to growth based on human capital necessarily produce such desired results. If the emerging countries do not experience significant and sustainable increases in the growth of production and export, a limited higher growth may not balance the higher net transfer of real resources due to the service of foreign debt, making it hard for these countries to pass the barrier of development. This is the real side of a non-sustainable Ponzi position, and this is what past experience shows when we observe the net financial outflows and 'lost decades' characterising many emerging countries (Kregel 2004).[15] But even if experiencing higher growth in domestic income and exports, the emerging countries would remain in a Ponzi – and hence extremely fragile – position to the extent that they were trapped in the negative current account balance required by the ageing countries scenario. These asymmetries put the international scenario on a very sharp knife edge, whose financial fragility proves directly linked to the incidence of the Ponzi countries.[16]

With regard to financial stocks, asymmetries in financial positions produce also different capabilities to absorb and react to external shocks. Countries with substantial net foreign assets have ample reserves of foreign wealth, although with different degrees of liquidity, to cushion adverse shocks. It took two world wars to virtually destroy the super-hedged position of Great Britain. Fiscal and monetary poli-

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[15] Hardly surprising, then, is the phenomenon of 'serial defaulter' countries. For a historical overview see Eichengreen (1991) and Reinhart and Rogoff (2004).

[16] As a matter of fact, the last few years have shown a rather different picture from the ageing countries scenario. The financial turmoil of the late 1990s induced several developing countries to take an active control of their exchange rates in order to maintain or boost their international competitiveness and increase their foreign reserves. In many cases the accumulation of foreign reserves came to be seen as the most effective policy to build safety margins against possible future external shocks. The recent significant increase in the prices of commodities helped reinforce this policy. As long as these conditions last, the developed countries of the Western Hemisphere will find it difficult to obtain the structural current account surplus necessary to balance their capital outflow, thus leaning towards the status of net foreign debtors. In this scenario financial fragility will come to characterise both a number of developing countries and some developed countries, although we may expect that, if affected by a high financial fragility, the strongest developed countries will make use of their significant powers of reaction.

cies may in this case be used with a light touch and their adoption is credible. Countries with large and increasing net foreign debt have no cushions to resort to whilst they have strong obligations to satisfy; the harsh adjustment policies that would be required if a shock occurred are seldom feasible.

The more general theoretical justification for the financial opening of emerging countries refers to their saving gap, i.e. to the necessity that foreign funds fill the gap between domestic savings and their potential for investment and growth. In terms of identities derived from the national accounts expressed in national currency:

$$GNP \equiv C + G + I + CA \cdot e \tag{13}$$

$$GNP \equiv C + G + S \tag{14}$$

where *GNP* is the gross national product, $C+G$ is the sum of private and public consumption, I are investments, *CA* is the current account balance now expressed in a foreign currency, e is the exchange rate (domestic currency per unit of foreign currency) and S are gross national savings. As a consequence:

$$S \equiv I + CA \cdot e \tag{15}$$

With a deficit in the current account balance, foreign funds participate with domestic savings to finance domestic investments. We have to pay attention to equation 15 as being an identity. From it we can derive different causal links according to the sort of theoretical assumptions I further introduce. According to the orthodox approach it is the gap between domestic savings and domestic investments that produces a negative current account balance while the inflow of foreign funds finances this saving gap. Taking a Keynesian approach, on the other hand, it is the low competitiveness of a country that produces both a negative *CA* and low domestic income and savings.[17]

Since a *CA* deficit puts the country into a Ponzi position, Minsky's El Dorado is now the ability to utilise the related inflow of funds in order to obtain a balanced or positive *CA* in the future, i.e. to

[17] I do not consider the effects of an unequal distribution of income on domestic savings, which is a relevant problem for many emerging countries.

change from a Ponzi to a speculative or hedge position. To this end it is crucial to push up the dynamics of net exports. A central theme in standard discussions is whether there exists a relation between the ways in which the debt is financed and the dynamics of net exports.

First of all, there are significant differences in the degree of financial fragility if the incoming capitals are foreign financial investments (FFIs) or foreign direct investments (FDIs). Looking at countries individually and not as grouped into blocks, FDIs decrease the liquidity of debt, shifting the risk from the financial sphere typical of FFIs (periodic renewal of the debt) to the real one (permanence of location advantages).

However, as far as debt dynamics is concerned, what matters is whether the two typologies of funds differently affect the cost of debt and the dynamics of net exports.

FFIs are funds that enter into the financial system of the country either as portfolio investments (in the capital market) or as loans to the banking sector. According to the traditional theory a mechanical link exists between the supply of funds and their demand for productive investments – a link represented by the flexibility of the rate of interest. Lowering the liquidity constraint, the inflow of funds should stimulate their demand by non financial firms, producing more investments and higher growth. As a matter of fact, a country in a speculative or Ponzi position suffers from a substantial country risk and is then able to attract these funds only by offering high real interest rates. Even if we accept the disputable assumption that returns from real investments are higher for an emerging than for a developed country, high country risk spreads may significantly reduce this advantage. Furthermore, even if these funds weaken the financial constraint, demand for funds for real investments critically depends on expectations about future demand that are not directly affected by the availability of funds. In these conditions it is highly probable that a substantial share of these funds goes to debtors with poor credit merit (indifferent to interest rate levels, like the Ponzi positions), to debtors working in sectors protected from international competition (that consequently do not favour export dynamics) and/or that remain in the financial circuit, possibly destabilising the prices of financial assets. The final external position of the country may not improve; indeed, increasing debt service may worsen it.

The other option – FDIs – is often considered, by the IMF too, as quasi-debt. Viewed as the way to import better technology and man-

agement, it is expected that FDIs will increase the country's comparative advantages, therefore increasing its future net export dynamics. The positive net long-period effects of FDIs must materialise as an increase in foreign currency inflows due to net exports not lower than the consequent outflows due to the debt service (repatriation of profits). Many specific features must be taken into account here. If the production deriving from FDIs goes to both domestic and international markets, the net currency benefits depend only on the latter. Since profits are partly repatriated, we have a net outflow of funds up to when exports materialise, and then only if their share in total production is significant. Hence net benefits depend on which sectors are affected by FDIs. The higher the share of FDIs going to non-tradable sectors, the less direct and appreciable will be the improvements in comparative advantages. Pre-default Argentina offers an interesting case-study.[18] The numerous and important privatizations of the 1990s were mostly captured by foreign capital. Given that, as usual, most of the public firms belonged to non-tradable sectors, the inflow of foreign capital had a very indirect influence, if any at all, on the competitiveness of the country. Other foreign capital went to the agricultural sector, which already possessed competitive advantages, with the result of increasing the value of repatriated corporate profits. It has been estimated that for Argentina only one third of foreign corporate profits were reinvested locally, while the rest were repatriated. Furthermore, the share of FDIs going to the production of commodities left the country with its traditional problems of high instability in prices and quantities and low elasticity to growth in international trade, not to mention the controversial topic of the long-run worsening of its terms of trade. Possibly even more important was the increase in the import content showed by the sectors affected by FDIs. Here Argentina is far from being an exception, even though it shows extreme features. These being more usual than the abstract conditions advanced by the most convinced supporters of FDIs, the result in terms of increased exports per unit of national product remain uncertain while, on the other hand, the persistent and substantial outflow of profits and a higher propensity to import are quite certain. Again, in the long run the country's degree of financial fragility may rise.

[18] On the following account see Tonveronachi (2006).

This is not to say that an open financial environment necessarily produces net negative results, but only that generalisations are not acceptable. When discussing matters like the degree of financial openness we have to work at a level of abstraction lower than the one usually adopted, taking account of the specific conditions characterising a particular country and its external environment.

4. External and domestic financial fragility

Up to now I have treated a country as a single unit while Minsky's approach rests on contractual relationships among different domestic units. The next step is, then, to consider the country as composed of macro-sectors – for instance, the household, the financial, the real and the public sectors. In an open economy each sector may be defined in terms of Minsky's positions with assets, debt, earnings and the debt service which can be denominated both in the domestic and in foreign currencies. This leads us to distinguish between domestic and external financial fragility. While the former is linked to the definitions of Minsky's positions in terms of the domestic currency, in the case of the latter we must consider how the different economic units participate to the formation of the country external position.

Basically the difference between external and domestic financial fragility depends on the fact that the accumulation of domestic assets does not coincide with the acquisition of the foreign currency necessary to serve the foreign debt. In order to illustrate this difference let us take some extreme examples. The country is in a Ponzi position in its foreign relations but the private and public sectors are not in a Ponzi position in domestic terms, i.e. in terms of national currency; for instance, the public debt is constant and the private sector increases its debt in line with its assets denominated in the local currency.[19] Alternatively, the external Ponzi position is generated by a private sector

[19] The public sector may be analysed following the methodology adopted above for a country system. With a structural positive debt the public sector cannot be in a hedge position. With a constant debt (average equilibrium of the government budget) we have a speculative position, given the necessity to renew the debt and given that in some cases its rates of interest are indexed. With budget deficits the debt increases and the state is in a Ponzi position. We get a 'sustainable' Ponzi scheme if the debt increases at the same rate as the national product. If part of the debt is denominated in foreign

that is domestically in a hedge or speculative positions, while the state, with no debt denominated in foreign currencies, is domestically in a Ponzi position. Then we may have the case in which the external position of the country is in a hedge position with both the private and public sector domestically in Ponzi positions. Finally, breaking up the private sector, the country is in an external Ponzi position, the household sector has consistent foreign assets but a much higher domestic debt, while the financial, the real and the public sectors are light on domestic debt but burdened with foreign debt.

These examples help to highlight that the conditions that give rise to financial instability in an open environment may cover a wide range of distinct cases, whose systemic differences have important consequences on debt dynamics and the interventions that may be applied to guarantee debt sustainability. This means that instability dynamics and stabilising policies cannot be reduced to few simple models and recipes.

Moreover, the examples suggest that the sum of domestic and external financial fragilities is the result of a complex interplay among the different typologies of economic units that constitute the structure of the economic system. The processes of generation and allocation of risks are intrinsically dynamic, with the actions and the responses by the different units shifting the risks among themselves, consequently often changing the overall level and the distribution of financial fragility. From a systemic point of view – the view proper to the public authorities – two aspects are of major interest: the set of domestic and external rules capable of maintaining financial fragility at a low profile, and the set of monetary and financial policies deemed adequate to keep financial fragility low and restore manageable conditions when illiquidity threatens solvency. In an open environment the problem is complicated by private and public actions and reactions affecting not only domestic but also external financial fragility.

Just to clarify the argument, let us consider the public policies. There is no doubt that public interventions may worsen a country's financial fragility when, for instance, the state creates new foreign debt in order to buy warfare material. If the problem for many emerging

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currencies, the state participates in the dynamics of the foreign debt. There is, however, one crucial difference between the part of the public debt denominated in domestic currency and the part denominated in foreign currencies. While for the former the state has the power to decrease or cancel it throughout its control on money and taxes, for the latter it must find ways to get foreign currencies.

countries is to increase their competitiveness, public expenditure must surely be directed to create these conditions through serious commitments to investments in infrastructures and education. This means that for many countries the structure of public expenditure and revenues is more important than the simple balancing of government budget.

In the last few decades the virtuous behaviour to be adopted by non-sustainable Ponzi countries has been seen mainly, or exclusively, in terms of government budget surpluses, at least for the primary budget (prior to interest payments on debt), coupled with resolutely anti-inflationary monetary policies and the opening of the economy to external flows of goods, services and capital. The idea is that these virtuous policies lead in general to increasing both net domestic savings and competitiveness and to lowering country risk and spread.

In the opinion of its supporters a primary surplus, oriented to balance the total accounts, frees savings that are then utilised by the private sector thus increasing the growth and the productivity of the system and/or directly decrease the current account deficit. Since domestic savings are the sum of private (S_P) and public savings (T–G), where T indicates public revenues, from equation 15 we may derive the following identity:

$$S_p + e \cdot CA \equiv I + (G - T) \tag{16}$$

i.e. *ex post* domestic investments and the public deficit are financed by private savings and foreign funds necessary to balance the current account. Many analysts use this identity to derive a direct causal relation between public deficit and the current account balance. It should be obvious that we are not allowed simply to derive this causal result from an accounting identity. The quest for primary surpluses may promptly produce negative effects on growth, savings, corporate profits and hence on investments, and then again on growth, and so on, producing a negative spiral. With low growth we may not expect the flowering of private investments, domestic or foreign, if not partly in non-tradable sectors characterised by strong market powers; this, however, does not influence exports positively. As already stressed, having to rely solely on decreases in imports, these policies should incorporate very tough measures.[20]

[20] Furthermore, as noted by Kregel (2004), expenditure on infrastructures and education are the more flexible part of public expenditure, i.e. the part easier to cut; in the long run these cuts tend to reinforce the underdevelopment trap.

The situation may be even worse for growth if severe fiscal policies go together with severe inflation-targeting monetary ones. The unquestionable effect of these policies is to produce high interest rates which stand in the way of reduction of the public deficit. Moreover, high interest rates induce many operators to prefer financial investments to real ones, as is the case with the banks that, profiting from the high returns of public debt, shift a considerable share of their assets in that direction, thus subjecting the private sector to credit rationing. Putting a brake on the creation of new productive capacity and increasing the cost of financing, these policies produce effects that are the opposite of those looked for, i.e. they give force to underlying phenomena of cost and demand driven inflation.

If, by constraining the growth of income, these policies succeed in improving the external position of the public sector and only marginally that of the country, the private sector faces a greater financial fragility, both domestic and external. Whether the higher private sector's fragility concentrates on the financial, the real or the household sector depends on the specific conditions of global risk allocation. Obviously the story does not end here, since we may expect reactions by the private units affected by these shifts in financial and real fragilities.

Once again, hardly any set of results can be considered general, depending on the conditions characterising a specific country. The analysis here proposed in very general terms suggests the necessity to consider how the interplay of forces in a domestic environment may affect external financial fragility, and how vice versa the latter is hard to keep under control in an uncoordinated domestic system.

5. Conclusions

I have reformulated Minky's exposition of hedge, speculative and Ponzi positions incorporating more explicitly the role of liquidity and financial assets, and clarifying the role of indebtedness through the definition of an expected leverage.

I then went on to schematise Kregel's extension of Minsky's theory to foreign debt, which helped to characterise more directly the external features of financial fragility and the role of the safety margins – mostly foreign reserves and credible public policies. Some simple equa-

tions derived from accounting identities were then used to clarify the link between the different types of positions and the dynamics of foreign debt.

Our distinction between sustainable and non-sustainable Ponzi positions was suggested by the analysts' and rating agencies' leniency towards countries and governments that keep their economy 'open and market friendly' although with external and domestic pyramidal schemes barely under control. This led to discussion of the implications of international asymmetric financial positions in order to show how they could affect the world's financial fragility.

Finally, distinguishing between domestic and external aspects of financial fragility, I have outlined how the dynamic interplay of the economic units, including government and its policies, may influence both the distribution and the level of domestic and external financial fragility.

My main purpose here was to outline and clarify a methodological framework that may help to reconsider, under a unified scheme of analysis, most of the phenomena and policies related to domestic and international financial instability. At this stage my interest was to derive from that framework suggestions for future research rather than specific theoretical proposals.

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