

# A macrodynamic model of financial fragility eleonora cavallaro economics essay

[Economics](#)



**ASSIGN  
BUSTER**

## 1. Introduction

Recent experiences of emerging economies have called for developments in the theoretical and empirical analyses aiming at taking into account the financial determinants of currency crises. The growing literature on this topic stems from the awareness that such crises have disrupting real effects and world-wide propagative consequences, within the context of high capital mobility and globalisation of real and financial markets. As well known, over the time currency crises have been explained in terms of the so-called " first generation" and " second generation" models, in which emphasis was placed, respectively, on the impossibility to maintain the fixed exchange rate due to the monetary financing of excessive government deficits, and on the lack of exchange rate commitment credibility in the presence of conflicting policy objectives, possibly leading to self-fulfilling multiple equilibria. Recent crises have largely questioned these views, mainly due to the observed budget surpluses enjoyed by most of these countries, as well as the relatively low unemployment levels and well performing exports.[1]Several theoretical analyses have followed, generally referred to as a " third generation" class of models. Within this class, a number of interesting contributions have in common the emphasis on the role of financial factors. In particular, building on McKinnon-Pill (1996) and Krugman (1998), Corsetti-Pesenti-Roubini (1998) emphasise the role of moral-hazard problems in lending, whereas bank runs caused by a loss of confidence among investors are central in Chang-Velasco (1998) analysis of the financial-currency interaction in the emergence of crises. More recently, interest has been growing among scholars towards balance-sheet factors in explaining crises.

A common feature to this approach is the adaptation to open economies of the financial acceleration hypothesis of Bernanke-Gertler-Gilchrist (1999), which builds on the information approach literature. The essence of the aforesaid hypothesis is that imperfections in financial markets act as the propagating mechanism of real and/or financial disturbances. In particular, the presence of uncertainty which typically characterises credit markets might amplify the negative effects resulting from firms' deteriorated financial structure due to excess debt. Actually, the financial acceleration hypothesis emphasises the role played by the debt-equity ratio as an indicator of the degree of financial independence of firms and hence of firms' default risk. Accordingly, the financial structure of firms affects the availability of finance for the accumulation process. Within this perspective, a worsening in firms' cash flows due to a deteriorated financial structure exacerbates the negative effect on investment. This approach appears particularly interesting when applied to open emerging economies, which suffer heavily from information problems as well as from the so-called "original sin", that is the difficulty these countries face in attempting to borrow in their own currency.[2] Most models of the literature stress the role played by cash flows in attracting foreign capitals, cash flows which prove to be sensitive to changes in the real exchange rate, when most part of firms' debt is denominated in foreign currencies. An adverse shock that negatively impacts on the real exchange rate brings about an increase in the foreign currency debt repayment obligations of firms and consequently a fall in the net cash flows, and this feeds back to the amount of external finance accruing to firms, and to the level of investment and output. Within this perspective a financial collapse

may occur: Krugman (1999) stresses as leading factors in this story of crises high leverage ratios, a low marginal propensity to import and a large foreign currency debt relative to exports. Although following a different reasoning, Hausmann-Velasco (2002) reach analogue results arguing that in most emerging countries the positive effects on exports of a real devaluation are outweighed by the negative effects on cash flows, and as a result severe recessions may occur. Within an inter-temporal model Aghion-Bacchetta-Banerjee (2001) analyse the influence on the nominal exchange rate of deviations from the PPP due to real or expectations shocks. The cash flows impact of such changes may bring about a "currency crisis" equilibrium with low output. Overall, this literature assesses the possibility of a recessionary "bad" equilibrium due to balance sheet effects of variations in the real exchange rate, in the presence of foreign currency denominated debt. This recessionary situation may arise when the level of foreign debt is high, and hence the deterioration of firms' balance sheets brings about a curtailment in the flow of finance available for investment. Our contribution adds to the balance sheet approach just mentioned, by developing a macrodynamic growth model with the aim of giving an endogenous characterisation to the dynamics of foreign debt accumulation. Our analysis builds on the literature on financial macrodynamics,[3]where emphasis is placed on the endogenous determinants of the behaviour of the economy, as resulting from the interaction between the evolution of debt and the accumulation process. Drawing on Minsky's seminal contribution to the understanding of business fluctuations,[4]the above literature focuses on the financial fragility issue and highlights that during expansions firms find themselves with an

unutilised margin of borrowing capacity and an increase in the degree of leverage which is perceived as "acceptable". Consequently, an expansion of debt-supported investment follows, leading over time to a deterioration of the financial structure and to an increase in the systemic risk. Such a worsening starts up a negative real-financial feed-back mechanism which is characterised by shrinking liquidity, falling accumulation and output. In this perspective, instability appears an unavoidable feature of intrinsically fragile economies. Our model extends this analytical framework to the analysis of open emerging economies, where, as said above, borrowing is only in foreign currencies while financial fragility and information problems appear as typical features. On this ground, we investigate the real-financial interactions that over time lead an emerging economy to accumulate dangerously high levels of debt and, eventually, to be vulnerable to macroeconomic instability. Building on an IS-LM framework, we develop a small open economy macrodynamic model, fully interdependent, where investment is financed through foreign borrowing, the latter - net of interest outflows - being the only source of liquidity in the economy. Following the financial fragility literature, the evolution of external financing is linked to the performance of the economy, which is captured by firms' cash-flow and degree of leverage. We thus explore the nonlinear real and financial interaction at work, with the endogenously generated liquidity feeding back dynamically to firms' investment, the level of output, the interest rate and the expected rate of return; these variables, in turn, affect the evolution of external financing itself. The analysis is carried out by first determining the temporary equilibrium values of the interest rate and output, as functions of the

economy's stock of debt and "state of confidence". We then give the laws of motion of the latter and investigate the dynamic behaviour of the system, by performing the local stability analysis of the long run equilibrium. We find that the model may exhibit different behaviours depending on the assumptions regarding the various reaction functions, which basically reflect the effects of the degree of leverage and expected net profitability on firms' investment decisions and borrowing, and on the "state of confidence". In particular, the system may display stability in the presence of a strong impact of the level of debt on investment and borrowing, coupled with a limited feed-back effect of expected profitability. On the contrary, a relatively minor weight assigned to the degree of leverage together with a relatively strong influence of the evolution of expected profitability may lead to an overborrowing process, and over time the worsening firms' balance sheets may turn into financial fragility and impair the economy's future borrowing capacity. Were this circumstance to occur, the system would be characterised by falling output and external lending, which would drive the economy towards a prolonged recession, possibly putting the fixed exchange rate at risk. Hence, a financial crisis turns into a currency crisis.

## **2. The temporary equilibrium**

The short-run analysis builds on a small open economy IS-LM model, where prices and the exchange rate are assumed to be fixed. There are two types of agents, the workers and the capitalists and, following Kalecki (1954), it is assumed that workers consume all their income, in the form of wages, whereas capitalists save a constant fraction of their income, in the form of net profits, and make investment decisions. Investment is based both on

internal finance, which comes from firms' net profits, and on external financing, which is procured on international markets. Since domestic financial markets are assumed to be rather undeveloped and therefore unable to supply the necessary financing, they play no role in the analysis. In the real side of the model there are the consumption and the investment functions, being assumed for simplicity that both the government budget and the trade balance are always in equilibrium. The assumption on the trade balance is made in order to place emphasis on the financial features of the international relationships, that is the financial account of the balance of payments and the debt service section of the current account. Because of the assumption of fixed exchange rate and prices, competitiveness factors are ruled out, so that the above simplifying hypothesis can be made without relevant loss of generality. Real income, wages, and net profits are linked by the following identities: where  $Y$  is real disposable income,  $W$  real wages, gross profits,  $w$  the nominal wage rate,  $p$  the price level,  $N$  employment,  $\pi$  net profits,  $L$  the stock of debt and  $i$  the interest rate (interest payments are assumed to be instantaneous). The consumption function is thus [1] and the investment function is given by [2] where, following Kalecki (1937),  $\phi$  is a function that measures the effect on firms' accumulation of the difference between the anticipated net profit rate  $r_e$  and the interest rate  $i$ . As in Taylor-O'Connell (1989) and Franke-Semmler (1989), the anticipated net profit rate may be reformulated as the sum of the current net profit rate  $r$  and its expected change  $\Delta r$ , that is:  $r_e = r + \Delta r$ . In turn, the gross profit rate may be expressed as  $r = \alpha \frac{Y}{L}$ , where  $(1 - \alpha)$  denotes the share of total income accruing to capitalists. As our analysis will be carried out in dynamical terms, it is

convenient since now to express all variables in unit of capital. Having reformulated equation [2] as , from the goods' market equilibrium condition, it follows[3]where , , while denotes all exogenous components of aggregate demand, and the parameter  $s$  the marginal propensity to save. As to the monetary side of the model, it is assumed that the monetary base is generated exclusively through the foreign channel, and therefore the money supply[5]consists of the stock of liquidity generated through the external financing of the economy, net of the interest outflows. The money supply is thus linked to the balance of payments' dynamics, that is, having assumed equilibrium in the trade balance, it is the outcome of the cumulated financial account's balances, net of the debt service. Given the above assumptions, the total stock of money coincides with the country's foreign reserves;[6]this implies that there is no room for domestic monetary policy. The analytical framework here developed broadly reflects the actual working of both an economy with a currency board and an economy choosing to replace its own currency with a foreign one (i. e. dollarisation). In the model there is perfect capital mobility. The interest parity condition is assumed to hold but for a risk premium, which reflects the overall conditions on the domestic financial markets. At a given point of time, the net stock of money, , consists of the liquidity generated through the cumulated external financing to domestic firms net of debt service. Firms invest when the expected profitability exceeds the cost of finance; they borrow on international markets the excess of the desired expenditure over their cash flow. On the other hand, lenders when providing finance are mainly concerned that firms' proceeds will generate a sufficient margin over the interest rate to avoid bankruptcy.



Following the information approach to credit markets, we assume that the borrowing of firms is essentially determined by credit constraints of lenders; the net amount of finance thus generated adds to the existing stock of debt and the equilibrium between the demand and supply of the overall means of payments is achieved through the adjustment of the interest rate. A given increase in the perceived riskness of borrowers will induce a tightening in credit constraints, resulting in a contraction in the supply of money which, given the demand, will bring about an increase in the interest rate.

Therefore, the positive difference with respect to the international rate reflects just the aforesaid degree of riskness. At a given point of time, the money market equilibrium condition may thus be stated in the following terms [4] where, as said above, the money supply,  $M$ , actually represents the country's foreign reserves and  $m$  is a standard money demand function. The temporary equilibrium of the model is given by the solution to equations [3] and [4], which is of the form  $(i, M)$ . Thus, at each point of time the temporary equilibrium values  $i$  and  $M$  are determined for given values of  $l$ ,  $a$ . The latter are considered exogenous in the temporary equilibrium analysis, since they are inherited from the past. In particular, as already said,  $F$  being the amount of borrowing of the economy. The time paths of  $l$  and  $M$  will be examined in the next section. [7] In the course of the analysis we consider both equations [3] and [4] as always satisfied along the dynamic path of the economy. Accordingly, we assume that the temporary equilibrium is dynamically stable. Analytically, the above corresponds to imposing restrictions on the slopes of the curves corresponding to the goods market and the money market equations, the IS and LL curves, respectively. As to

the goods market, it is easy to verify, by totally differentiating equation [3], that the slope is always negative, being equal to [5] As to the money market, the slope may be either positive or negative, being equal to [6] Since , the LL will slope downwards if the denominator is negative, that is . It is worth noting that the slope of the two curves depend on the level of  $i$ : the slope of the LL becomes steeper and the one of the IS shallower with increasing values of  $i$ . The temporary equilibrium displays dynamic stability conditions similar to the ones obtained in standard IS-LM models, that is . [8] To get further insights on the structure and the functioning of the economy under consideration, it may be useful to highlight the stock-flow linkages among the relevant variables of the model, by means of the following simplified prospect of the economy, where the columns give the budget constraints of the private, monetary and foreign sectors, respectively. The rows give the accounting balance of the overall demand and supply in each market.

Private Sector   Monetary Authorities   Foreign Sector   Goods and Services

## **I-S-iL**

-

X-M-iL0 Monetary Base

-

0 Foreign Currency

-

0 Loans

-

0000The prospect emphasises the specific feature of the model in which the private sector may finance the excess of investment and debt service spending over its savings either through a change in its endowment of H (monetary base) or by issuing new liabilities, and, as said above, the creation of monetary base takes place totally through the foreign channel.

### **3. Dynamic analysis and long-run equilibrium**

When moving to the dynamic analysis of the model we specify the equations that give the laws of motion of the variables we considered as exogenous in the temporary equilibrium analysis:  $I$  and  $L$ . In the dynamic analysis they are made endogenous and their time path is determined by the solution of the complete dynamic model, together with the time paths of the variables which depend on them,  $y$  and  $i$ . The law of motion of  $I$  is given by the corresponding laws of motion of  $L$  and  $K$ , being  $\dot{L} = \dots$ . The dynamics of (net) borrowing is governed by the following function which fundamentally describes lenders' behaviour[7]As explained earlier, in the international financial market information problems may arise which make it difficult for lenders to assess borrowers' worthiness. Indeed, finance accrues not so much on the basis of its price, but on the perceived riskness of the borrower. In order to capture such a behaviour, the first argument of equation [7] states that the supply of funds is positively related to the difference between borrowers' expected cash flow and the rate of interest, while the second argument captures the negative effect on the attitude to lend of a deteriorating firms' liability structure, as measured by the stock of debt per unit of capital,  $I$ . As to the stock of capital, it grows according to the

investment equation [2]. Equations [2] and [7] together give the law of motion of the stock of debt  $I$  [8]. The second law of motion is related to the expectations regarding future profits,  $\mu$ , which represents the state of confidence of the economy. We assume that its time path is related to the general state of the economy and one way of taking into account such a relationship [9] is to assume that  $\mu$  increases with an improvement in the liquidity position of firms,  $r - i$ , and it decreases with the degree of indebtedness, which is considered as a measure of debt default risk. It then follows [9]. Given the initial conditions for each differential equation, the system described by equations [3], [4], [8] and [9] generates the time paths for the four endogenous variables of the model,  $y$ ,  $i$ ,  $I$  and  $\mu$ . The working of the model is as follows. At each point of time, given the levels of the stock of debt  $I$  and the state of confidence as inherited from the past, equations [3] and [4] determine the temporary equilibrium values of  $y$  and  $i$  that instantaneously clear the goods and the money market. Market equilibria being established, a change in  $I$  and  $\mu$  will take place according to the laws of motion [8] and [9], which in turn will bring about a subsequent change in  $y$  and  $i$ . Thus, at each point of time, the equilibrium achieved may in general be non-stationary, and the system would then be characterised by the debt-capital ratio, the output-capital ratio, the state of confidence and the rate of interest changing over time. In a steady-state situation these variables are at the constant equilibrium level, and the system moves at the "natural rate",  $n$ , that is the growth rate of the population. Accordingly, in a steady state the stock of debt as well as output grow at a rate equal to the growth rate of the stock of capital, the latter being  $n$  in a steady state. Moreover, the money

supply and consequently the stock of foreign reserves also grow at the same constant rate  $n$ . To explain the above argument, consider that in a steady state the output-capital ratio and the interest rate are constant and hence the money demand function is constant too. It follows that the money supply,  $M$ , should as well be constant. As a result, by taking the logarithmic differentiation with respect to time of the left hand side of equation [4] and setting it equal to zero we get and, as in steady-state equilibrium the interest rate is constant,  $r$ . In order to have information about the "local" behaviour of the system we carry out a linearisation of the system of equations [8]-[9] around the equilibrium point. First, recalling that the temporary equilibrium solution may be expressed in the form and  $k$ , the stationary solution of the model is given by the pair  $(k^*, r^*)$ , which solves the following system. In compact form we have [A. 1] [A. 2]. By adequately restricting the admissible values of the parameters and by imposing the dynamic stability condition of each temporary equilibrium always to hold, we assume that an economically meaningful solution to system [A] exists. After linearisation of system [A] around the equilibrium point  $(k^*, r^*)$  we evaluate the Jacobian where  $F_i$  denote the partial derivative of  $F_i$  defined in [A], which are evaluated at the long-run equilibrium point. Their value is where, assuming a positively sloped LL,  $F_1, F_2, F_3, F_4$ . The signs of the depend on the values of the parameters of the model: if the (negative) value of  $\alpha$  is sufficiently high - the solution to system [A] requires  $r > r^*$ ; if the (negative) value of  $\beta$  is sufficiently high; and  $\gamma$  and  $\delta$  are likely positive and negative, respectively. The Routh-Hurwitz conditions for stable roots are  $\Delta < 0$  and  $\Delta_1 < 0$ . It appears that for the negativeness of the trace, an important role is played by the value of  $\alpha$ , which refers to lenders' attitude towards default risk in

financing firms, and by  $\beta$ , which measures the effect of a change in  $\beta$  on the equilibrium interest rate. A high value of  $\beta$  denotes that lenders attribute a greater importance to firms' financial ratios, in particular to the stock of debt per unit of capital,  $I$ , than to firms' profitability ratios  $\pi$ ; accordingly, a relatively small value of  $\beta$  contributes to a negative trace. In turn, a high level of  $\beta$  helps in containing the dynamics of  $y$  induced by changes in the state of confidence over time. The above arguments also apply for the positiveness of the determinant. In addition, relatively small values of  $\beta$  and  $\beta$ , and a high value of  $\beta$  contribute to a positive determinant. As  $\beta$  measures the effect of changes in the state of confidence on the equilibrium level of  $y$ , and the influence of the difference on the time path of  $y$ , low levels of their values retain the dynamics of  $y$ . Analogously,  $\beta$  measures the negative effect of deteriorating balance sheets on the evolution of the state of confidence.

#### 4. The dynamic behaviour of the model

We characterise the steady state by two curves.[10]The first is a vertical line at the steady-state output-capital ratio identifying the value of  $y$  at which the accumulation rate is "consistent" with the natural rate of growth  $n$ . To get  $y$ , consider that in a steady state the dynamic equilibrium between the flows of savings and investment, per unit of capital, implies  $s = i$  and, taking into account that  $s = \beta y$ , we get  $y = i/\beta$ . Thus, the steady-state value is independent of  $i$ . The second steady-state curve, denoted by  $KK$ , gives the set of all points  $y$  and  $i$  at which the desired accumulation of firms, according to equation [b], is consistent with the steady-state growth rate  $n$ , that is[10]It is easy to prove that the goods' market equilibrium locus and the  $KK$  curve intersect at  $(y^*, i^*)$ . Every time a temporary equilibrium occurs at a combination which is below the  $KK$  curve,

accumulation is proceeding faster than the steady-state rate  $n$ . This happens because the rate of interest is lower than the one required for the system to be in dynamic equilibrium, at that level of the output-capital ratio. For a diagrammatic representation,[11] consider a plane where we plot two loci for the temporary equilibrium and the two curves that characterise the steady state.  $y_i y^* K K L L I S E$  Fig. 1 As argued above with reference to the dynamic stability of the temporary equilibrium, the case of a downward sloping LL may be one of unstable equilibrium, and even with a downward sloping IS, instability might occur for values of  $\lambda$ . Since the slope of the LL depends on the value of  $I$ , which in a non stationary equilibrium is changing over time, it may happen that an upward sloping LL becomes downward sloping and the temporary equilibrium becomes unstable. The assumptions of the model impose to neglect such a circumstance. The IS-LL-KK curves are plotted for given values of the exogenous variables, at a point in time. The curves shift following "jumps" (i. e. once-and-for-all changes) in the exogenous variables. In particular, the KK shifts upwards following a (positive) jump in  $\lambda$ , since, for accumulation to keep proceeding at the natural rate, a higher level of the interest rate is required at each level of  $y$ . Moreover, the KK shifts downwards following a positive jump in  $I$  since it negatively affects firms' net profitability, thus reducing the incentive to accumulate. The IS shifts to the right following a positive jump in the state of confidence and to the left for a positive jump in  $I$ . As to the LL, a once-and-for-all change in  $I$  determines a rightwards shift. In order to understand the mechanisms that govern the dynamics of the model, we consider the behaviour of the system off the steady-state equilibrium, according to equations [3], [4], [8] and [9].

Suppose that a positive shock to the international liquidity occurs, so that, everything else being equal, the flow of finance that now foreign lenders are willing to provide to the economy is greater than the steady-state level. This amounts to considering a positive once-and-for-all jump in  $I$ , which determines a rightwards shift in LL. At the same time, the KK moves downwards,[12] whereas the IS leftwards.[13] According to the equations of the model, the new IS-LL intersection takes place at a level of  $y$ , and  $i$ , that is below the KK curve (point A).  $y_i^* KLLISEALL1IS1$  Fig. 2 At point A, the increase in the excess of expected net profitability over the interest rate induces firms to increase the rate of accumulation and lenders to provide additional finance to firms. As accumulation and the flow of finance both proceed at a higher rate than the steady-state rate, the LL1 curve starts shifting over time. This can be verified by considering the logarithmic differentiation with respect to time of the LL curve for a fixed value of  $y$  and then by solving it for  $i$ [11] As long as the LL curve keeps shifting, rightwards if the sign of the expression in brackets is positive or leftwards if it is negative: the LL equilibrium condition requires decreasing or increasing values of the interest rate over time. At point A, the stock of debt may be growing at a rate which is greater or smaller than the accumulation rate, depending on the relative magnitude of the parameters of equation [3], that is  $\alpha$  and  $\beta$ . The former measures the difference in lenders and firms sensibility to a given excess of (net) profitability over the interest rate; the latter indicates the effect of deteriorating balance sheets on lenders willingness to provide finance. As long as the first effect dominates, the LL keeps shifting to the right. The change in  $I$  over time also affects the IS and the KK curves, which



tend to move leftwards and downwards respectively. However, at point A there is an improvement in the state of confidence, and if this effect dominates, the IS shifts rightwards and the KK upwards, as can be verified from the two dynamic equilibrium conditions[12][13]From equation [4] it appears that the dynamic path of is influenced by  $(r - i)$  and by  $I$ . At point A both variables are greater than their steady-state values, and given the values of the respective elasticities, the first effect dominates, so that is positive and greater than . As long as the above conditions are satisfied the interest rate has to increase in order for the goods' market equilibrium to hold and for accumulation to proceed at the natural rate.

yy\*IS3LLIS2ELL2AKKLL3B

•

•

C

•

ISFigure 3As indicated in figure 3, in the course of the adjustment process the system moves towards subsequent intersections of the IS and the LL which are still below the KK, with the interest rate first decreasing, if the rightwards shift of the LL is pronounced, and then increasing. At point B both the increase of the stock of debt and the accumulation rate exceed their steady-state level, but the former falls short of the latter so that the debt per unit of capital  $I$  starts decreasing, and the LL starts shifting leftwards.

Actually, if the economy keeps accumulating debt per unit of capital - with the interest rate falling and falling - it may happen that the (temporary

equilibrium) stability condition level of  $I$  is violated; therefore, it is necessary that the values of the parameters of equations [3] and [4] drive the system towards point B. Here, if and in equation [4] imply that at the given  $r - i$  and  $I$  the state of confidence is still non-decreasing, the IS keeps shifting rightwards, so that the system moves towards point C. This circumstance may indeed occur if deteriorating balance sheets, that is a high value of  $I$ , have a relatively weak impact on the state of confidence dynamics, whereas the latter is relatively more affected by the liquidity position of firms,  $r - i$ .

•

•

C

•

IS

•

•

FDFigure 4In Figure 4 we show the case where the parameters' configuration is such that the system overshoots its steady-state value of  $y^*$  in the course of the adjustment process. At point C, although the stock  $I$  is decreasing towards  $I^*$ , the interest rate is growing, so that  $r - i$  starts decreasing over time, negatively affecting the state of confidence. Accordingly, the IS starts moving backwards. Subsequent IS-LL intersections may lead the system towards point D and F. Here, the three curves intersect in correspondence

with , but the adjustment process is not completed. Although the <https://assignbuster.com/a-macrodynamic-model-of-financial-fragility-eleonora-cavallaro-economics-essay/>

accumulation is proceeding at the natural rate,[14]which means that is at its stationary level, the interest rate as well as and  $I$  are not: indeed, even though the dynamic path of the system from  $C$  to  $F$  is characterised by and  $I$  both decreasing, they still exceeds their long-run equilibrium level. It is worth noting that contrary to standard IS-LM frameworks, at point  $F$  we have  $r$ , as well as  $i$ , and this may be explained in terms of the variations in the slope of the LL curve associated with the change in  $I$  over time, which imply that the LL curve at  $F$  is steeper than the steady-state LL passing through point  $E$ . Hence, from point  $F$  both the LL and the IS curves keep moving leftwards and therefore subsequent IS-LL intersections occur above the KK curve. Given stability, the direction of movement is reversed when enough time has passed for the stabilising effect of a sufficiently low  $I$ , indicating restored opportunities for financing the economy, to dominate the destabilising effect of a low net profitability. Thus the system moves towards point  $E$ . Actually, the dynamic path of the system may be the one depicted by the arrows in Figure 5 through points  $G$ ,  $H$  and  $J$ .

•

•

C

•

IS

•

•

FD

<https://assignbuster.com/a-macrodynamic-model-of-financial-fragility-eleonora-cavallaro-economics-essay/>

- 

- 

- 

IS6IS7GHJFigure 5This circumstance may indeed occur if improving balance sheets conditions, that is a low value of  $I$ , have a relatively weaker impact on the state of confidence dynamics than on the accumulation of  $I$ , that is , whereas  $r - i$  affects relatively more the state of confidence than the dynamics of  $I$ . In this case, for a while the IS curve still keeps shifting to the left when the LL is reversing its movement. The system is thus characterised by decreasing  $i$  and  $I$  and, depending on the parameters' configuration of the model, the convergence towards the long-run equilibrium could be an oscillatory one, as illustrated in Figure 6. In these cases, the system does not converge towards point E, but alternates periods of booms and recessions, so that the " shape" describing the solution to the system [3]-[4] repeats itself over time, i. e. a limit cycle may exist. In particular, the economy may follow the path  $x$  instead of path  $z$ , the former being characterised by a more prolonged slump before the recovery takes place, if the reversal in the direction of the IS curve from G is further delayed. In the former case, the effect of the profitability ratio on the evolution of the state of confidence is relatively stronger, whereas the influence of the default risk indicator is relatively weaker.  $yiy*LLAKKB$

- 

- 

C

- 

IS

- 

- 

FD

- 

- 

- 

GHJEzxFigure 6

## **5. External debt and macroeconomic instability: some concluding remarks**

The graphical representations of the previous section help in sketching the mechanisms that govern the dynamics of the model by means of the "relative" shifts of the LL and IS curves over time. A basic insight emerging from the model is the role played by lenders' and capitalists' behaviour towards balance sheets positions and profitability ratios, as well as the role of the aforesaid variables on the evolution of the state of confidence, in determining the various possible scenarios. The specific parameters' configuration reflecting such attitudes drives the adjustment process, by determining both the amount of debt being accumulated over time - that is the degree of "financial euphoria" - and its effect on the evolution of the "state of affairs". It appears clearly how, in our model, the external liquidity creation process is fundamentally endogenous: the evolution of external

finance and hence debt accumulation are closely linked to the performance

<https://assignbuster.com/a-macrodynamic-model-of-financial-fragility-eleonora-cavallaro-economics-essay/>

of the economy which, in turn, depends on the availability of finance itself. The intrinsic interrelation between the real and financial variables dynamics explains why periods of expanding economic activity are fostered by the liquidity creation process which supports accumulation and enhances growth; at the same time the performance of the so called " fundamentals" feeds back to lenders' behaviour and therefore to their willingness to finance the economy. However, the working of the system is such that the expanding itself of the economy creates the condition for the reversal of the process. In fact, as emphasised by the " financial fragility" literature, in the course of an upswing the real aggregates expansion is coupled with an accentuated growth of the financial aggregates, so that the resulting stock of outstanding debt becomes dangerously high and the economy becomes financially fragile. This circumstance drives the reversal of the process, with shrinking finance and consequent dropping output and, hence, profitability. The aforesaid real and financial feed-back mechanisms are strengthened by the fact that, in the presence of uncertainty and coordination failures, profitability ratios and financial ratios take the place of the standard price mechanism in explaining lenders' behaviour. Thus, the adjustment process off the steady state may prove to be characterised by relatively pronounced oscillations, if not instability, which may thus be considered a " systemic" feature of intrinsically fragile financial structures. With reference to the model, it is worth noting that, even in the case of stability, the sequence of temporary equilibria displaying recessionary conditions may be rather long. The system may thus be locked in, with both output and external lending falling, one enhancing the other; the reversal of the process might thus occur

only after a prolonged period of slump, as shown by path x in Figure 6.

Taking into account that the model refers to a small open economy, one may argue that such a prolonged slump may affect the "environment", that is, in our analysis, fixed exchange rates and prices. In an economy like the one modelled, which broadly reflects a currency board or a dollarised economy, a situation of curtailing external financing actually implies shrinking of the overall liquidity, as foreign reserves are the only domestic means of payments. In such a situation, in the case of a currency board, keeping the exchange rate regime might prove to be unsustainable, and a financial crisis probably turns into a currency crisis. On the other hand, in the case of a dollarised economy, as emphasised by Goldfajn and Olivares (2001) "... the elimination of currency risk does not preclude default risk or the high volatility of sovereign spreads"; net profitability is thus unavoidably curtailed and if the consequent fall in accumulation turns out to be longstanding systemic instability may occur. Although in our model there is no room for monetary policies, since the creation of monetary base takes place exclusively through the foreign channel, the qualitative results of our analysis would not change substantially if we allowed for a more generalised framework with the possibility of a domestic channel of monetary base. In the case of shrinking external finance and worsening balance of payments, if the monetary authorities implement an expansionary monetary policy aiming at providing domestic finance, the only result would be the curtailing of foreign reserves, which would probably impair the maintenance of the exchange rate over time. Instead, if the authorities tries to carry out a contractionary monetary policy aiming at providing external finance by

increasing the domestic interest rate, their policy may prove to be ineffective in attracting liquidity, if not even dangerous. In fact, in our model the willingness to provide external finance is assumed to depend on the expected net profitability, which is negatively affected by increasing interest rates. On the contrary, it is generally agreed on that, in standard models where price mechanisms do govern financial markets, tightening monetary policies are effective in attracting external liquidity. Here, instead, the only effect of a monetary contraction would be to foster the economic slowdown, which itself negatively feeds back to financial inflows. The above argument may explain why high interest rates failed to arrest the decline in exchange rates in East Asia, whereas "... the adverse effects of rising interest rates were particularly significant". (Stiglitz, 1999, p. 72). In such a recessionary situation, the economy would probably meet with a binding foreign reserve constraint, which may lead to a currency crisis. Again, a financial crisis may become a currency crisis. Having we assumed in our analysis trade balance equilibrium over time, we have neglected the possibility of its contribution to the accumulation of foreign reserves and the creation of liquidity. Obviously, a country enjoying booming exports may "tolerate" higher levels of foreign debt, as the liquidity created through the trade channel adds to external borrowing and contains the increase in the interest rate. The ability to manage a higher level of debt improves the overall conditions on the domestic financial markets, thus lowering the perceived degree of riskness. [15]Such an interesting extension should be considered in a more general model, as well as the possibility of domestically generated liquidity and thus monetary policy.