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Fiscal Policy, Eurobonds and Economic Recovery: Some Heterodox Policy Recipes against Financial Instability and Sovereign Debt Crisis.

Alberto Botta[♣]

Abstract

In this paper, we propose a simple post-Keynesian model on the linkages between the financial and real side of an economy. We show how, according to the Minskyan instability hypothesis, financial variables, credit availability and asset prices in particular, may feedback each other and affect economic activity, possibly giving rise to intrinsically unstable economic processes. Through these destabilizing mechanisms, we also explain why governments intervention in the aftermath of the 2007 financial meltdown has been largely useless to restore financial tranquility and economic growth, but transformed a private debt crisis into a sovereign debt one. The paper ends up by looking at the long run and to the interaction between long-term growth potential and public debt sustainability. We explicitly consider the European economic context and the difficulties several EU members currently face to simultaneously support economic recovery and consolidate fiscal imbalances. We stress that: (i) financial turbulences may trigger permanent reductions in long-term growth potential and unsustainable public debt dynamics; (ii) strong institutional discontinuity such as EU financial assistance to member countries may prove to be the only way to restore growth and ensure long-run public debt sustainability.

Keywords: post-Keynesian models, financial instability, debt sustainability, Eurobonds.
JEL code: E12, E44, H63

1. Introduction

From mid 2007 on, the sub-prime crisis has brought back to the center of common people and government thoughts economic problems such as deep and prolonged economic recession, widespread and rising unemployment, increasing life uncertainties. It was from 1929 Great Depression that these problems were not perceived as so urgent as they are today.

Since then, governments and monetary institutions of almost all developed and developing countries have been engaged in financial system rescue programs aiming to re-establish the normal functioning of financial markets and of the overall economy. In the meanwhile, the initial financial crisis has turned into a confidence crisis on the sustainability of public debt stocks. As a consequence, even if economic recovery still lacks or decelerates in most economies, the initial support to anti-cyclical measures has been replaced by the insistent call

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for restrictive fiscal policies and the rapid obtainment of public account equilibrium. In a pretty short time span, the alleged return to Keynesian policies have been forgotten; very standard IMF-type adjustment programs have come back to dominate economic theory and policy practice. This is particularly true in Europe, where the so-called PIIGS countries, i.e. Portugal, Ireland, Italy, Greece and Spain, find themselves stuck in a hurry to implement tight fiscal corrections to assure financial markets about public finance solidity.

In this paper, we aim at analyzing some of the economic forces leading to the present gloomy worldwide economic context. First, we want to enlighten some perhaps relevant mechanisms connecting the financial side to the real side of an economy, possibly showing how financial variables, let's say available credit and financial asset prices, may heavily influence economic performances. Second, we try to provide a formal description of the Minskian financial instability hypothesis, i.e. to analytically describe destabilizing processes that seem to naturally characterize nowadays financial systems. We emphasize the hard job economic policy institutions have to undertake to stabilize financial markets and show why public intervention after the 2007 sub-prime crisis have proved largely useless to re-establish financial order and eventually resulted in sovereign debt crises. Finally, we look at the long run and try to see how long-run growth potential and public debt evolution interact each other. In this sense, we explicitly take into account the European case insofar as we try to evaluate the usefulness of the EU member state rescue fund and of Eurobond issuances to support EU member countries efforts against financial instability and in favor of economic recovery.

We address the above topics by developing a simple post-Keynesian model. Our task is not to elaborate a complex stock-flow-consistent (SFC) analytical framework. In a sense, our goal is much more modest and narrower. It ends up in the formal description of a strict bunch of mechanisms at the base of the recent financial instability and of the ensuing economic downturn. Even though our work is based on a different methodology with respect to SFC models, it shares the same theoretical background. The present work heavily draws inspiration from some previous post-Keynesian contributions. Two articles from Lavoie (2006) and Fontana and Setterfield (2009), in particular, are the starting points on which to build up the present model.

According to Lavoie (2006) and to the post-Keynesian perspective on money (Bertocco, 2006 and 2009), we embrace the endogenous money theory. We model Central Bank behavior as setting discount rate on the base of a well-known Taylor rule (Taylor, 1993), while base money creation ultimately emerges from effective credit demand (Bertocco, 2009). With respect to the Lavoie 2006 model, we explicitly consider the role of financial operators, commercial banks in particular, and formally represent an effective credit demand function. Whilst these last points are already present in Fontana and Setterfield (2009), we try to go a step further by endogenizing the operational behavior of financial institutions and not to represent them as constant parametric aspects of the model. On the contrary, we describe their endogenous adjustments as potential sources of financial instability. Finally, following Lavoie (2006), we end up by looking at long-run issues such as the dynamics of potential growth. We integrate previous Lavoie analysis by considering the interaction between long-run growth potential and the evolution of public debt stock.

The paper is organized as follows. Section 2 introduces a simple post-Keynesian short-run macro model on connections between the financial system and the real side of an economy. Section 3 models the Minsky-type financial instability hypothesis and the effectiveness of government policies in the aftermath of the 2007 sub-prime crisis. Section 4 extends the analysis to the long run and to the interplay between long-term growth potential and public debt sustainability, in the European Union in particular. Section 5 concludes.

2. A simple post-Keynesian macro model

There is general consensus among economists, both from a mainstream perspective and from an heterodox approach, as to the behavior of monetary authorities. Using Romer (2000) own words, we can convincingly affirm that Central Banks, rather than pursuing money aggregate targets, now "follow a real interest rate rule; that is, they act to make the real interest rate behave in a certain way as a function of macroeconomic variables such as inflation and output (Romer, 2000, p. 154)". To this end, they (Central Banks) "focus on the interest rate on loans between banks in their short-run policy-making (and) use the nominal interbank rate as their short-term instrument (Romer, 2000, p. 155)".

From an analytical standpoint, such a behavior of monetary authorities is generally modeled through the well-known Taylor rule, which makes Central Banks' discount rate a function of some inflation and output targets (or, better, of the discrepancies between current inflation and economic performance with respect to their own corresponding targets). In this regard, the present work does not introduce any exception. Following Lavoie (2006), we assume equation (1) below to model Central Bank monetary policy:

$$i_{cb} = i_0 + \alpha(\pi - \pi^T) + \beta(g - g_n) \quad (1)$$

According to equation (1), Central Bank sets the discount rate i_{cb} on loans to financial institutions, commercial banks mostly, by taking into account several factors. First, Central Bank discount rate is a positive function of the gap between current inflation rate π and the inflation target π^T. Second, the discount rate i_{cb} also changes on the base of the existing output gap, here modeled as the difference between current economic growth g and potential growth g_n. In question (1), Parameters α and β stand for the sensitivity of the Central Bank reaction function to the inflation target and output target respectively. Finally, parameter i_0 stands for a sort of Wickselian long-run interest rate set by Central Bank once both the inflation and output target are met.

Central Bank decisions influence financial operator credit policies. According to the endogenous money theory, here we assume financial operators, commercial banks in particular, to set the interest rate i_L on loans by applying a mark-up rate m on the discount rate from the Central Bank. This is stated in equation (2). Equation (3), in turn, gives the "effective" or "credit-worthy" demand for loans L^P from private actors which will be accepted by financial institutions at the ruling interest rate i_L.

$$i_L = (1 + m)i_{cb} \quad (2)$$

$$L^P = \gamma - \delta(i_L - \pi^e) \quad (3)$$

As usual, we assume the effective demand for credit as a negative function of the real interest rate, here stated as the difference between the nominal interest rate on bank loans i_L and expected inflation π^e. In equation (3), parameter γ represents all those factors, let's say institutional factors independent from the interest rate, which influence economic agent access to credit. In this sense, note that, besides loans to non-financial institutions, households and firms basically, we include in L^P also inter-banks credits. Actually, whilst these kind of credits are neglected in most economic models due to the difficulties to formally describe or account for them in stock-flow-consistent exercises, we consider such flows fundamental to explain the ongoing behavior of financial institutions and the ensuing effects on the real sphere of the economy. We finally stress that in this part of the model we maintain the traditional assumption of constant values of the parameters defining the functioning of financial systems, parameters γ and m in particular. Such an assumption will be abandoned later on, when we will formally describe the destabilizing processes that more frequently distress worldwide financial systems.

Financial institutions do not provide credits to private actors only. They also finance public deficit in exchange of T-bonds. In equation (4), L^G stands for total financial needs of domestic governments, which depend on two components: primary deficit Δ and interest payments on the stock of accumulated debt D.

$$L^G = \Delta(G, T, i_L, d) + i_L D = \nu(G, T, d) - \rho(i_L - \pi^e) + i_L D \quad (4)$$

In equation (4), primary deficit Δ obviously depends positively on government purchases G for both current expenditures and public investments, and negatively on taxation level T. Beside this, we also assume that policy makers may be induced to reduce primary deficit, and eventually run a surplus (i.e. in this paper a negative value of Δ), the higher is the prevailing interest rate i_L or the higher is public debt-to-GDP ratio (D/Y)=d.

Last but not least, equation (5) below describes the current growth rate of the economic system g. According to Lavoie (2006), it may represent a sort of IS curve expressed in growth terms. Following Fontana and Setterfield (2009), we assume g to depend positively on the amount of loans given by financial institutions to private actors L^P as well as on government primary deficit. Actually, the higher is financial support L^P given to private economic agents, the higher will likely be consumption and investment expenditures and therefore demand injections stimulating economic growth. Secondly, easy financing of public financial needs may allowed governments to run larger primary deficits and thus to scale up those expenditures, let say public investments, which may have direct positive effects on growth performances g.

$$g = f(L^P, \Delta) = \xi + \theta L^P + \lambda\Delta \quad (5)$$

From a mathematical point of view, substituting equations (3) and (4) in (5) and rearranging, it is easy to see the negative relationship that eventually links the prevailing interest rate i_L to current economic growth g. This is explicitly stated in equation (6):

$$g = \xi + \theta\gamma + \lambda v(G,T,d) - (\theta\delta + \lambda\rho)(i_L - \pi^e) = g_0(G,T,d) - \mu(i_L - \pi^e) \quad (6)$$

With $g_0 = \xi + \theta\gamma + \lambda v(G,T,d)$ and $\mu = \theta\delta + \lambda\rho$.

In the present model we have so far neglected inflation issues. As to price dynamics, let first assume that economic agents judge Central Bank behavior reliable and credible, so that $\pi^e = \pi^T$. Moreover, following Lavoie (2006), let assume that Central Bank is capable to properly set parameter i_0 in order to meet the inflation target in the long run when current economic growth is equal to potential growth. Substituting equation (4) in (6), putting $g=g_n$ and replacing the result in (1), we get:

$$i_0 = \frac{(g_0 - g_n) + \mu\pi^T}{\mu(1+m)} \quad (7)$$

In the short run, current inflation may obviously depart from its targeted long-run value. In this paper, we describe inflation dynamics as depending on the inter-play between demand and supply forces. We model this point through equation (8) below:

$$(\pi - \pi^T) = \psi(g - g_n) \quad (8)$$

Equation (8) is a sort of short-run Philips curve. According to it, current inflation accelerates and it is higher than long-run target inflation should current economic growth be higher than potential growth. On the contrary, inflation decelerates and it is temporary lower than π^T in case of current economic growth below potential. Parameter ψ stands for the sensitivity of current inflation to discrepancies between current economic growth and potential growth[1].

Above equations (1), (2), (3), (4), (6) and (8) form a system of 6 equations in 6 endogenous variables: i_{cb}, i_L, L^P, L^G, π and g. Substituting equation (8) in (1), putting the result in (2) and then in (6), we can find a clear expression for economic growth in the short run:

$$g = \frac{g_0 - \mu\{(1+m)[i_0 - (\beta + \alpha\psi)g_n - \pi^T]\}}{1 + \mu(1+m)(\beta + \alpha\psi)} \quad (9)$$

Equation (9) simply states that current economic growth is a positive function of g_0, and therefore of government purchases G for both current expenditures and public investment. On the contrary, g reacts negatively to heavier taxation T and to a higher public debt/GDP ratio d, which may persuade domestic policy-makers to reduce primary deficits. Easy credit market conditions, as represented by a low value of the mark-up rate parameter m and a high value of the intercept parameter γ in the effective credit demand function (3) favor growth. The possibility for economic agents to have easy access to credit facilities may induce them to increase consumption expenditures as well as implement higher and more numerous investment plans, thus raising aggregate demand and eventually aggregate production. Finally, current economic growth increases the higher is growth potential g_n and the less stringent is inflation target set by Central Bank (i.e. the higher is π^T).

[1] Equation (8) is logically equivalent to the description of inflation dynamics provided by Lavoie (2006).

3. The endogenous instability of financial systems.

In the short-run model above we have assumed operating conditions of financial systems to be given. In particular, we have imagined constant values of both the mark-up rate *m* and of parameter γ in the effective credit demand function. This is a standard assumption in most heterodox models and it sounds reasonable in times of financial stability and tranquility. However, it surely appears too restrictive in periods of strong financial turbulences like those emerged from the outbreak of the 2007 subprime crisis and, more in general, at odds with the intrinsic instability dynamics that, from decades, seem to affect financial systems (Minsky, 1989). Let us therefore depart a bit from the simple scenario introduced above and try to formally describe what Kregel (2007) defines as the "natural instability of financial markets".

According to Wray (2007), Brancaccio and Fontana (2010), several institutional changes and innovations have recently affected the functioning of financial systems. First of all, a long-run process of deregulation has been implemented from the seventies on. Segmentations of financial markets have been removed and barriers between commercial banks, investment banks and other financial institutions became weaker and weaker. As a consequence, commercial banks have been increasingly involved in a much wider range of financial activities including participation to long-term and speculative financial markets. Investment banks and speculative agents have had the opportunity to access short-term borrowing. Secondly, a deep process of securitization of existing loans has taken place inducing a "create and distribute" practice to replace previous "create and hold" behavior of financial institutions. Complex structured financial instruments such as collateralized-debt-obligations (CDO) have widespread on financial markets and composed a growing part in the balance sheet of most financial institutions worldwide.

While a favorable macroeconomic climate featuring low interest rates and easy money may perhaps have favored the diffusion of such financial innovations, deregulation and securitization processes themselves have probably contributed to expand credit and liquidity creation even further, to feed asset price booms, ultimately to set the conditions for instability to overtake financial systems[2]. Such destabilizing processes are formally described in equations (10) and (11) below.

Let assume that parameters γ and *m*, even though constant in the short run, may be subjected to revision by financial operators in the medium run. Let assume, moreover, that such adjustments depend on the prices of assets in the balance sheet of financial institutions and on perceived overall financial risks. More in details, we have:

$$\dot{\gamma} = f\left(P^P\left(L^P(\gamma, m)\right), P^G, r\right) = f(\gamma, m, P^G, r) \qquad (10)$$

With $\frac{\partial f}{\partial P^P} > 0, \frac{\partial f}{\partial P^G} > 0, \frac{\partial f}{\partial r} < 0$ and $\frac{\partial P^P}{\partial L^P} > 0$

[2] The expansion of mortgage markets, as due to the possibility of packaging and distributing worldwide conceded loans through collateralized debt obligations, undoubtedly played a leading role in feeding the US housing boom. High and growing house prices, in turn, have induced financial operators to assess CDO instruments as risk-free, thus raising their price and their diffusion in the balance sheet of financial institutions. Also due to the pro-cyclical mechanisms of the Basle II agreement, these facts have allowed to further expand credit facilities, to underestimate existing risks, to reduce prudential measures, ultimately to raise financial instability.

$$\dot{m} = z(P^P(L^P(\gamma, m)), P^G, r) = z(\gamma, m, P^G, r) \quad (11)$$

With $\frac{\partial z}{\partial P^P} < 0, \frac{\partial z}{\partial P^G} < 0, \frac{\partial z}{\partial r} > 0$

In equations (10) and (11), P^P represents the average price of asset-backed securities, i.e. collateralized debt obligations, increasingly included in the balance sheet of most financial operators, commercial banks as well. In equation (10), increasing prices of asset-backed securities induce financial operators to upscale parameter γ, to reduce conditions set on credit demands and ultimately to expand loans. In equation (11), on the contrary, increasing P^P values cause a downward adjustment and a reduction in the mark-up rate m charged on private loans. Moreover, following Kregel (2007)[3], let assume P^P to be a positive function of the total amount of loans L^P given to private agents and fuelling mortgage markets, consumption credit facilities ect…ect. Easy credit to households, firms or other financial business activities may boost their consumption, investment and "speculative" decisions, increase the price of mobile and immobile assets, eventually raise the price P^P of connected financial assets. On the base of this casual chain, it turns out to be clear that increasing values of γ feed back positively on its own adjustment process whilst tend to reduce m. On the contrary, higher m values may produce huge credit market contractions by leading to downward revise γ and further increase bank mark-up rate. These mechanisms are clearly destabilizing.

In equations (10) and (11), P^G stands for the market price of T-bonds acquired by financial operators in order to meet government financial needs. Again, a positive and negative relationship connects P^G to adjustments in parameters γ and m, respectively. Increasing T-bond prices, for instance, by improving financial operators balance sheets, may induce credit institutions to expand the set of acceptable credit demands and, at the same time, to reduce profit margins on conceded loans.

Finally, r represents a general indicator of risk and uncertainty as perceived by financial operators. In equations (10) and (11), we assume increasing risks and uncertainty, i.e. higher r values, to induce more conservative, prudent and restrictive credit policies. Parameter γ in the effective credit demand function would be easily cut and the mark-up rate m on loans increased.

In order to assess the stability properties of the two-equation dynamic system above we have to compute the corresponding Jacobian matrix of partial derivatives in the neighborhood of the steady state. According to the analysis above, we get:

$$J = \begin{bmatrix} \frac{\partial f}{\partial \gamma} & \frac{\partial f}{\partial m} \\ \frac{\partial z}{\partial \gamma} & \frac{\partial z}{\partial m} \end{bmatrix}$$

[3] Kregel (2007) describes the feedback circular mechanism between expanding bank loans and growing real estate and asset prices at the base of the financial euphoria preceding and then causing the 1929 Stock Exchange crash. These mechanisms are pretty much similar to those emerged in the most recent episodes of financial crises.

Two possible scenarios arise. A locally unstable equilibrium exists if *det.*(*J*)>0 and *Tr.*(*J*)>0. Whilst the matrix trace is surely positive, given that $Tr.(J) = (\partial f/\partial \gamma) + (\partial z/\partial m) > 0$, the first condition requires that $(\partial f/\partial \gamma)(\partial z/\partial m) - (\partial z/\partial \gamma)(\partial f/\partial m) > 0$, or, alternatively, $-\frac{\partial z/\partial m}{\partial z/\partial \gamma} > -\frac{\partial f/\partial m}{\partial f/\partial \gamma}$, i.e. the locus for constant values of *m* is positively sloped and steeper than the locus for constant values of γ in the (m,γ) space. On the contrary, if the determinant of matrix *J* turns out to be negative, an unstable saddle-path dynamics emerges. Graphically, this would apply should the locus for constant values of γ be steeper than the locus for constant values of *m* in the (m,γ) space, i.e. $-\frac{\partial z/\partial m}{\partial z/\partial \gamma} < -\frac{\partial f/\partial m}{\partial f/\partial \gamma}$. These two possibilities are graphically portrayed in charts 1 and 2 below: figure 1 reports the case for a locally unstable equilibrium and figure 2 represents the case for a saddle-path dynamics.

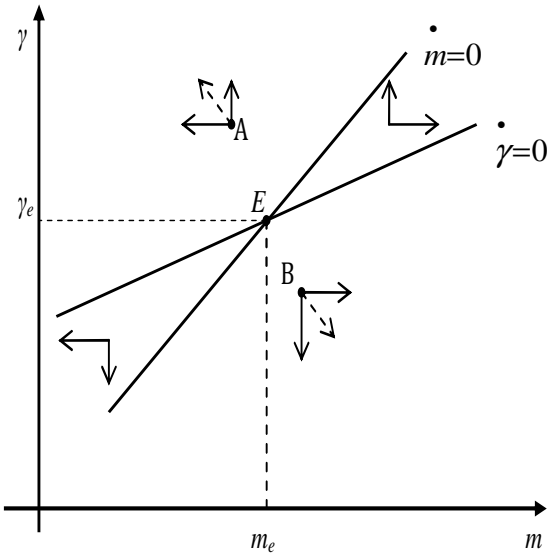

Figure 1 – Locally unstable dynamics on financial markets

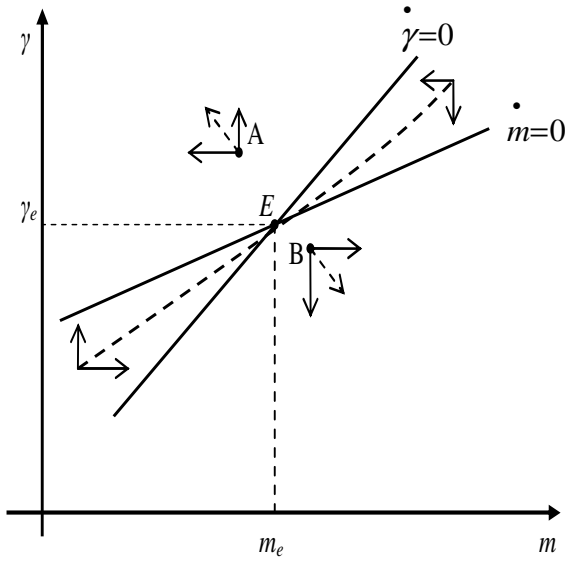

Figure 2 – Saddle-path unstable dynamics on financial markets

Perhaps more relevant than the technical aspects above, it is the intrinsic instability characterizing financial systems. Actually, financial systems are stable, i.e. they feature constant values of their own operational parameters γ and m, so long as they lie in the equilibrium point E. However, should any shock hit them, destabilizing mechanisms will be set in motion. Financial systems will easily give rise to either euphoric dynamics or financial collapses unless they would be moved, by chance, on the saddle-path bringing back to equilibrium (obviously, this possibility applies in case of figure 2 only). In point A, for instance, a process of irrational euphoria may take place. First, financial operators will tend to cut profit margins on loans and make credit cheaper. Second, effective credit demand will expand thanks to lower credit conditionalities, let's say the introduction of low-doc or no-doc procedures on mortgage market. As a result, credit flows increase hugely and liquidity floods financial markets. Asset prices likely increase giving rise to a new round of expansion of credit in an apparently endless process. In point B, on the contrary, all the conditions for a credit crunch are at work. Increasing mark-up rates on loans make interest rates increase vigorously. At the same time, credit conditionality becomes tighter and tighter. Credit lines are cut and credit market dried. Asset prices decrease, exacerbating capital losses in financial operators balance sheets and further search for liquidity. Without the strong intervention of public authorities, credit markets would probably stop to work at all[4].

Even worse, there are concrete possibilities that credit booms eventually set the conditions for subsequent contractions and leave the stage to credit crunches[5]. Actually, following Wray

[4] According to Brancaccio and Fontana (2011), this is what happened in July 2007, when French Bank BNP Paribas stopped to reimburse some of its institutional funds due to exposure to US sub-prime obligations, and, even worse, in September 2008 after the failure of Lehman Brothers Investment bank. These events induced interest rates to tremendously skyrocket on inter-bank credit markets and a dramatic halt in credit operations.

[5] According to Minsky itself, "there is, in the financial stability hypothesis, a theory of how a capitalist economy endogenously generates a financial structure which is susceptible to financial crises, and how the normal functioning of financial markets in the resulting boom economy trigger a financial crisis (Minsky, 1982, p.68)".

(2007), financial markets euphoria is usually associated to increasing leverage and risky positions[6]. Even if increasing risks may be temporally blurred by the complex technicalities of new financial instruments[7], soon or later they will emerge and be incorporated in financial operator decisions. In this model, according to equations (10) and (11), abrupt revisions in perceived systemic risks will provoke immediate increases in the mark-up rate on loans and a marked tightening of credit conditionality. Graphically, according to figure 3 below, both locus for constant values of m and γ will move upward, passing from $(\dot{m} = 0)$ and $(\dot{\gamma} = 0)$ to $(\dot{m}^1 = 0)$ and $(\dot{\gamma}^1 = 0)$, respectively. A credit boom, like that represented in point A, may be suddenly transformed in mounting financial markets distress.

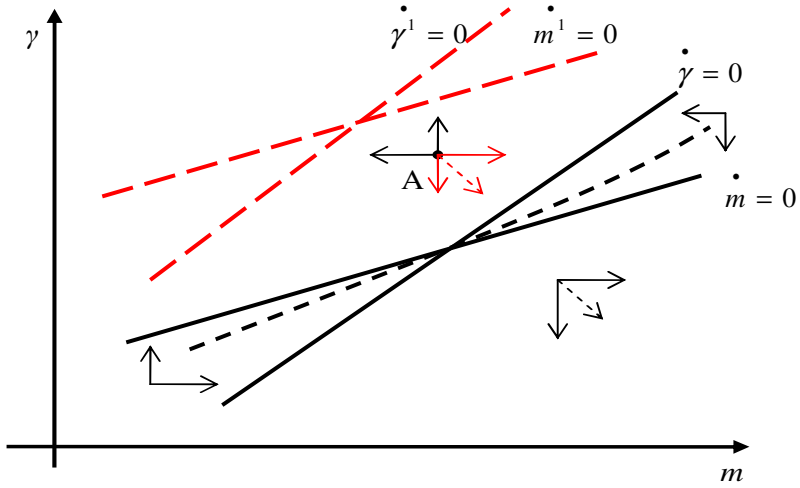

Figure 3 – Credit booms, increasing financial risks and the outbreak of financial crises

It goes without saying that the outbreak of financial crises may have disruptive consequences on the real side of the economy. According to the short-run analysis above, whilst credit booms favor real economy expansions, the contraction of the effective credit demand and increasing mark-up rate on loans and therefore higher interest rate simply cut growth and possibly induce economic recessions with the ensuing social costs.

[6] Randal Wray, in describing the mechanisms at the base of the 2007 sub-prime crisis, clearly states that "(financial) innovations expanded the supply of loans, fueled homebuying and drove up the value of real estate, which increased the size of loans required and justified rising leverage ratios [...] the combination of low interest rates and rising real estate prices encouraged a speculative frenzy (Wray, 2007, p. 11)". Ultimately, "the current crisis is a natural outcome of these processes – an unsustainable explosion of real estate prices, mortgage debt and leverage positions in collateralized securities (Wray, 2007, p. 2)"

[7] See again Brancaccio and Fontana (2011) on the apparently risk-reducing composition techniques characterizing asset-backed securities. Actually, in 2007, close to the 60 percent of new structured finance instruments got a triple A rating, i.e. the highest level of security.

3.1 Effectiveness of financial systems rescue programs and the ongoing sovereign debts crisis

"The most significant economic event of the era since World War II is something that has not happened: there has not been a deep and long-lasting depression (Minsky, 1982, introduction)". In 1982, Minsky used these words to express the capability of economic policy institutions to tame destabilizing financial processes and to maintain economies in equilibrium. According to Minsky, this was possible thanks to an institutional arrangement featuring a "Big Government", i.e. government authorities maintaining pretty stable economic dynamics and profit levels through expansionary fiscal stances and budget deficits, and a "Big Bank", i.e. Central Banks recurrently acting as lenders of last resort of a widening range of financial operators.

Something similar seems to have been in place since 2007. Actually, most governments worldwide have been involved into costly programs to rescue financial systems from failure and, in a lesser extent, to stimulate economic recovery. Several banks and financial institutions have been de-facto nationalized. At the same time, Central Banks have strongly reduced discount rates and provided extraordinary credit facilities to financial operators. Three years later the outbreak of the sub-prime crisis, however, there is a mounting debate on the effectiveness of these policies and institutional arrangements. Actually, several economic institutions now are compellingly asking for a fast departures from alleged expansionary Keynesian policies and for a quick implementation of restrictive deficit/debt reducing fiscal policies (IMF, 2010; European Commission, 2010)[8]. Proposals go as far ahead as to demand the introduction of a zero-deficit commitment into countries' constitutional papers.

Before analyzing some aspects of this debate, a conceptual premise is needed. Although the expansionary and deficit spending fiscal policies cited above are generally labeled as Keynesian, most of them actually are not. Financial system rescue packages, even though attempting to re-establish the normal functioning of financial markets and hence of the economy as a whole, do not directly provide demand injections counteracting the economic downturn. According to the European Commission (2009), public help to financial institutions was in the range of 5-10 percent of GDP in several member countries. According to a report of the Bank for International Settlements published in July 2009, numbers are extraordinary higher in countries like UK, where outlays have amounted to something like the 44 percent of national GDP. By mid 2009, on the contrary, discretional fiscal stimuli to economic recovery reached 1,8 percent of EU-27 GDP only. Typical anti-cyclical Keynesian measures such as huge public investment programs have been largely neglected with respect to other initiatives (European Commission, 2009). Actually, we think the surging rejection of Keynesian-type

[8] The IMF, in its World Economic Outlook published in October 2010 states: "Fiscal consolidation needs to start in earliest 2001. Of utmost importance are firm commitments to ambitious and credible strategies to lower fiscal deficits over the medium term […]This task is now more urgent than it was six months ago (IMF, 2010, p. 37)". Similarly, according to the European Commission (2010): "even in countries with lower government debt ratios a general consensus view has taken hold that large consolidations are now required to bring fiscal positions back on a sustainable path. Although the fiscal stimulus packages were not the main driving factor behind the deterioration in fiscal positions – and had probably only a relatively minor impact on fiscal positions - calls for a fiscal exit have become stronger (EU, 2010, p. 1)".

policies to be too premature and, above all, theoretically ungrounded. It should more carefully consider the real nature of most of the policies implemented after 2007.

Perhaps more importantly, the financial sector stabilization packages adopted so far have proved to be largely useless to restore tranquility on financial markets, as the ongoing sovereign debt crisis seems to witness. In a way, public intervention in favor of financial operators, although unavoidable and necessary, have transformed a prevalently private-agent financial dislocation in a public collective problem.

According to the analytical framework above, let assume that governments issue new T-bonds in an amount equal to N in exchange of toxic activities in the balance sheet of financial operators. Other way round, think new T-bonds issuances to be used to finance nationalization programs or public guaranties over risky financial assets. On the one hand, these measures can obviously improve balance sheets of financial operators by increasing the average market price P^P of their private assets and perhaps reducing a bit the perceived systemic risk r. On the other hand, however, government help also implies that the burden of private agents financial dislocation is now charged on the shoulders of the collectivity at the cost of higher public deficits and of an increasing debt/GDP ratio. In such a context, the price P^G of T-bonds may easily decrease should people start to fear about public finance solidity. T-bonds of some countries, let say PIIGS countries, may start to be downgraded to junk bonds and a sovereign debt problem develop, throwing back the financial system in a worrying condition of financial distress. The overall effect of public help on financial sector stability turns out to be largely unclear.

More formally, the first set of derivatives below tries to define the first positive effects that public help may produce on financial sector stability by alleviating financial institutions insolvencies on their private assets:

$$\frac{\partial \gamma}{\partial N}\Big|_{\dot{\gamma}=0} = -\frac{\frac{\partial f}{\partial P^P}\frac{\partial P^P}{\partial N}+\frac{\partial f}{\partial r}\frac{\partial r}{\partial N}}{\partial f/\partial \gamma} < 0$$

And

$$\frac{\partial \gamma}{\partial N}\Big|_{\dot{m}=0} = -\frac{\frac{\partial z}{\partial P^P}\frac{\partial P^P}{\partial N}+\frac{\partial z}{\partial r}\frac{\partial r}{\partial N}}{\partial z/\partial \gamma} < 0$$

With $\frac{\partial P^P}{\partial N} > 0, \frac{\partial r}{\partial N} < 0$

In figure 4, such a positive effect is represented by the simultaneous downward movement of the two loci for constant values of γ and m. Suppose the economy to rely in point A: the ongoing credit contraction is reverted and the basis for a new round of credit expansion and economic recovery may be established.

The two derivatives below, on the contrary, stand for the perverse effects of public intervention on financial market stability via excessive public deficits and decreasing T-bond prices P^G.

$$\left.\frac{\partial \gamma}{\partial N}\right|_{\dot{\gamma}=0} = -\frac{\frac{\partial f}{\partial P^G}\frac{\partial P^G}{\partial N}}{\partial f/\partial \gamma} > 0$$

And

$$\left.\frac{\partial m}{\partial N}\right|_{\dot{m}=0} = -\frac{\frac{\partial z}{\partial P^G}\frac{\partial P^G}{\partial N}}{\partial z/\partial \gamma} > 0$$

With $\frac{\partial P^G}{\partial N} < 0$.

On the base of equations (10) and (11), lower P^G values will move the loci for constant values of γ and m up. If these movements are sufficiently strong, i.e. financial operators become highly skeptical about public debt solidity, the causes of financial instability will not be removed. At the end, the initial positive effect of government intervention to rescue financial institutions may be likely displaced and compensated by the negative consequences of an emerging public debt crisis.

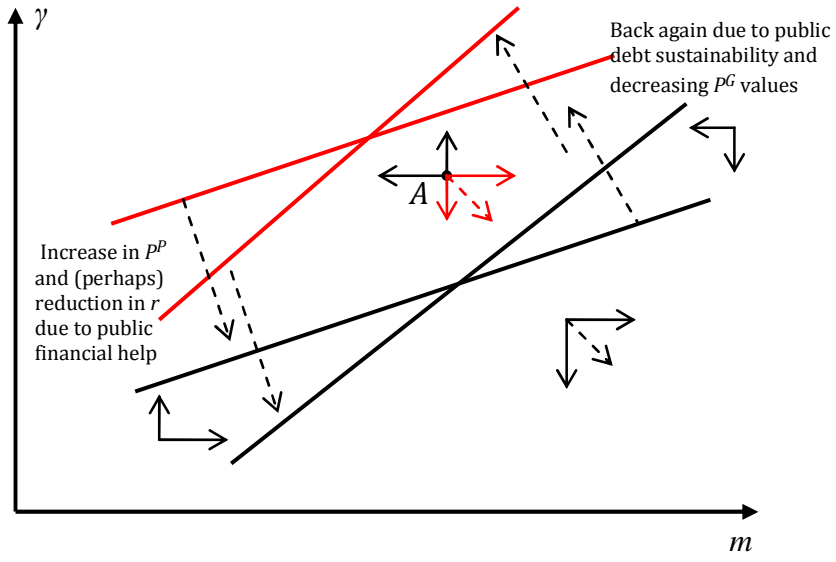

Figure 4 – Positive and negative effects of financial system rescue fiscal packages

4. A look at the long run: potential growth, public debt sustainability and the effects of EU assistance to member countries.

The present worldwide economic context is probably the worst scenario policy-makers have to tackle with since the 1929 Great Depression. This seems to be particularly true inside the European Union, in which several member states appear to be incapable to simultaneously deal with the long-lasting consequences of the 2007 sub-prime crisis and the

surging sovereign debt crisis[9]. On the one side, due to persisting disappointing economic performances, most EU member state governments would like to adopt expansionary fiscal policies to stimulate aggregate demand and boost economic growth. Such measures, however, can hardly be implemented due to the current high concern about public debt sustainability. Actually, increasing financial tensions may even worsen the economic environment and make any anti-cyclical deficit spending attempt ineffective. On the other side, financial turbulences have induced highly indebted EU countries to quickly move from expansionary fiscal stances to public balance consolidation in order to restore their own financial credibility. Fiscal restrictions, however, likely produce contractionary effects on economic activity and the economy may enter in a perverse cycle: economic recovery may stall and set additional strain on public balance solidity; a new round of restrictive measures is considered; ultimately, economic activity stagnates and decreases even further.

What we have just described looks like a dramatic no-way-out trap. In such a context, the only exit strategy is probably a profound institutional discontinuity. Actually, when economic mechanisms prove to be incapable to self-stabilize, changes are to introduce in the institutional framework surrounding market processes, in the set of policies implementable by economic authorities and in the range of tools at their disposal[10]. In the last months, several proposals have been advanced and some concrete actions already launched. As to the proposals, a fierce debate is emerging on the political feasibility and economic usefulness of Eurobond issuances financing anti-cyclical fiscal policies in some EU member countries[11]. In the meanwhile, a EU member state rescue fund has already been created to help countries to meet their debt payment needs and, possibly, avoid default.

In this paper, we don't want to see in details the technicalities and the institutional-financial architecture of possible future Eurobond issuances[12] nor the existing features of the EU member state rescue fund. Rather, we would like to asses in a simple, rough but intuitive way the possible macroeconomic consequences of these strategies, perhaps comparing their effects on the sustainability of a EU member state public debt and its own growth potential. In order to do this, let consider a single EU member state, say one of the so-called PIIGS countries. Further, imagine that the two-equation dynamic system below describes the long-run evolution of its growth rate potential g_n and debt-to-GDP ratio d.

$$\dot{g_n} = \chi(g(g_n, d) - g_n) \tag{12}$$

With $\frac{\partial g}{\partial d} < 0$

[9] These difficulties appear particularly relevant for some countries in the European Monetary Union, due to the fact they have lost control of monetary policy and do not manage any longer the currency their T-bonds are denominated in. According to De Grauwe (2011a), this fact actually put these countries in the same uncomfortable situation characterizing several emerging economies in the past.

[10] According to Mayer (2009), it is interesting to note that most advances and progresses in the EU building process were realized during periods of deep economic instability and/or political tensions.

[11] See Rodriguez (2010) on the proposal for Eurobond-financed "long-term key investments needed to promote the transition to a more low-carbon, knowledge-intensive and inclusive growth model (Rodriguez, 2010, p. 7)".

[12] See Favero and Missale (2010) on this point and for a discussion of competing proposals as that proposed by De Grauwe and Moesen (2009).

$$\dot{d} = \frac{L^G}{D} - g = \frac{\Delta(d)+i_L D}{D} - g = \frac{\Delta/Y}{D/Y} + i_L - g = \frac{\Omega(d)}{d} + i_L - g(g_n, d) \quad (13)$$

With $\Omega = \left(\frac{\Delta}{Y}\right)$; $\frac{\partial \Omega}{\partial d} < 0$ and $\lim_{d\to 0}(\partial(\Omega/d)/\partial d) = \lim_{d\to 0} \frac{(\partial\Omega/\partial d)d-\Omega}{d^2} = -\infty$ [13]

$$\lim_{d\to\infty}(\partial(\Omega/d)/\partial d) = \lim_{d\to\infty} \frac{(\partial\Omega/\partial d)d-\Omega}{d^2} = 0$$

Equation (12) describes the dynamics of long-run growth potential. It is identical to a previous formalization by Lavoie (2006) and is grounded on a growing body of literature on the endogenous nature of long-run growth potential (Flaschel, 2000; Leon-Ledesma and Thirlwall, 2002). Actually, following Leon-Ledesma and Thirlwall (2002), a positive relationship seems to connect current economic growth g to the natural growth rate g_n. In a way, it seems that "growth creates its own resources in the form of increased labor force availability and higher productivity of the labor force (Leon-Ledesma and Thirlwall, 2002, p. 452)". Accordingly, in equation (12) we assume long-run growth potential to increase should current economic growth be higher than potential growth itself, therefore promoting innovations and labor productivity-enhancing technological progress. On the opposite, long-run growth potential will likely stagnate and decrease should the economy work below its full-employment possibilities.

In equation (12), we assume the debt-to-GDP ratio d to play a role in affecting long-run growth dynamics. Actually, we have already stressed that high debt-to-GDP ratios may somehow induce reductions in fiscal primary deficits by persuading policy-makers not to increase public debt stock (in percentage of GDP) even further. These effects, by curtailing demand injections (the difference (*G-T*) in standard national accounting) may easily dampen economic growth. Besides this, high debt-to-GDP ratios may discourage current economic growth through several other channels such as increasing country risk premium due to uncertain public debt solidity or negative household and firms expectations about future rises in taxation and reductions in disposable income. In general, a negative relationship between d, g and therefore potential growth dynamics may stand out. This is exactly what we assume.

As to the evolution of the debt-to-GDP ratio, equation (13) simply states that the growth rate of the debt-to-GDP ratio is nothing but the difference between the growth rate of public debt stock (L^G/D) and the current economic growth rate g. From an economic point of view, equation (13) says that debt-to-GDP ratio dynamics depends on both growth potential g_n and the debt-to-GDP ratio d itself. The relationship between g_n and $\dot{d}$ is negative. A higher long-run growth potential g_n, by feeding current economic expansion g via equation (9), will tend to reduce the debt-to-GDP ratio across time. The effects of the debt-to-GDP ratio on its own dynamics, on the contrary, turn out to be uncertain. In equation (13), we assume a high level of public debt-to-GDP ratio to induce economic authorities to reduce primary deficit Δ (or to run primary budget surpluses) and therefore to lower the primary deficit-to-GDP ratio Ω as well. This fact implies that a stabilizing and negative effect of outstanding debt (as a percentage of GDP) on its own dynamics exists. At the same time, however, higher public debt

[13] Here we assume the primary deficit Δ = (*G-T*) to be generally positive at pretty low values of public debt stock d, so that the primary deficit-to-GDP ratio Ω turns out to be positive as well.

levels curtail current economic growth, this way alimenting explosive forces. The two derivatives below help us to mathematically address this problem.

$$\left.\frac{\partial g_n}{\partial d}\right|_{\dot{g}_n=0} = -\frac{\partial g/\partial d}{\frac{\partial g}{\partial g_n}-1} = \frac{\partial g/\partial d}{\left[1-\frac{\mu(1+m)(\beta+\alpha\psi)}{1+\mu(1+m)(\beta+\alpha\psi)}\right]} = [1+\mu(1+m)(\beta+\alpha\psi)](\frac{\partial g}{\partial d}) \quad (14)$$

$$\left.\frac{\partial g_n}{\partial d}\right|_{\dot{d}=0} = -\frac{[(\partial(\Omega/d)/\partial d)-(\partial g/\partial d))]}{-(\partial g/\partial g_n)} = \frac{1+\mu(1+m)(\beta+\alpha\psi)}{\mu(1+m)(\beta+\alpha\psi)}[(\partial(\Omega/d)/\partial d)-(\partial g/\partial d))] \quad (15)$$

Equation (14) defines the slope of the locus for constant values of potential growth g_n. The sign of equation (14) turns out to be undoubtedly negative, given that $(\partial g/\partial d) < 0$.

Equation (15) gives the slope of the locus for constant values of the debt-to-GDP ratio. As said, its sign is not clear. However, we may generally believe it to be negative at low levels of *d*: the first stabilizing effect will outstrips the explosive one[14]. At higher values of *d*, however, the initial negative sign of equation (15) likely turns into positive. The first stabilizing effects will lose relevance when applied to a considerable public debt stock and the second destabilizing one, i.e. $(\partial g/\partial d)$, prevail. Eventually, what emerges is a U-shaped locus for constant values of the debt-to-GDP ratio.

Chart 5 below portrays these two loci and the ensuing long-run equilibria when they intersect each other:

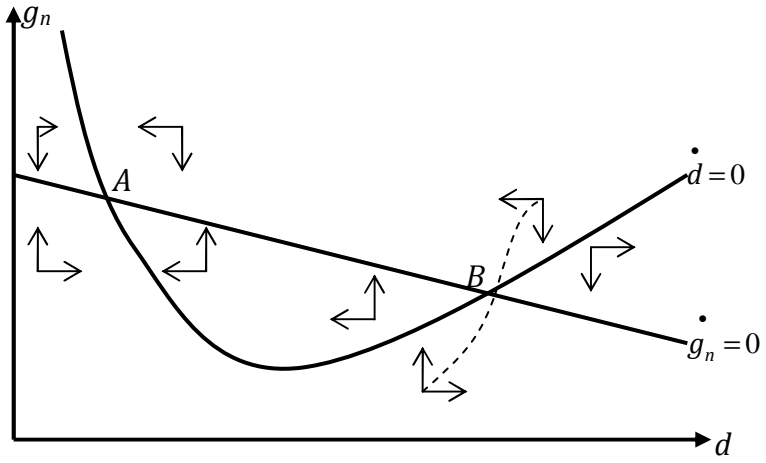

Figure 5 – Multiple long-run equilibria

According to the analysis above, let assume the loci for constant values of *g* and *d* intersect twice. In this case, two long-run equilibria emerge. Equilibrium *A* is a "virtuous" locally stable equilibrium, in which the economic system presents a high long-run growth potential and features a stable low value of the public debt-to-GDP ratio. We can say exactly the opposite about the perverse equilibrium *B*, which is characterized by lower long-run growth potential and a much higher public debt (as a percentage of GDP). Beside this, equilibrium *B* shows a

[14] Actually, when *d* is pretty small, slightly higher values of *d* will reduce *Ω* and therefore induce a remarkable drop in the growth rate of the public debt stock *Ω/d*.

risky unstable saddle-path dynamics. Economic shocks that would temporally bring the economy to the right of equilibrium *B* will likely give rise to disastrous economic processes in which declining long-run growth potential and mounting public debt feedback each other and lead, soon or later, to dramatic public default episodes.

On the base of the dynamic system above, it is possible to assess the long-run consequences of the financial turbulences described in section 3. Actually, it is easy to see that reductions in the effective credit demand (i.e. lower values of parameter γ) and increases of the mark-up rate on loans (i.e. rising values of m) may produce disruptive consequences on the whole economy. First, we already know that credit crunch and higher m values weaken current economic growth and therefore, via equation (12), reduces the long-run growth potential. At the same time, through equation (13), they also induce the debt-to-GDP ratio to increase. Second, we also remark that the higher is m, the higher will be the interest rate i_L on loans and the costlier the be debt service (see equation (13)). It is all but a rare phenomenon to see increasing interest payments on outstanding debt to trigger a dramatic self-feeding process towards default.

From a graphical perspective, see figure 6, all these mechanisms move the locus for constant values of d upward. At the same time, the locus for constant values of g_n will move down. If sufficiently strong, and this may be the case of financial market panic and "flight to safety" sentiments, these movements may induce the two loci not to intersect any longer. Long-run equilibria disappear.

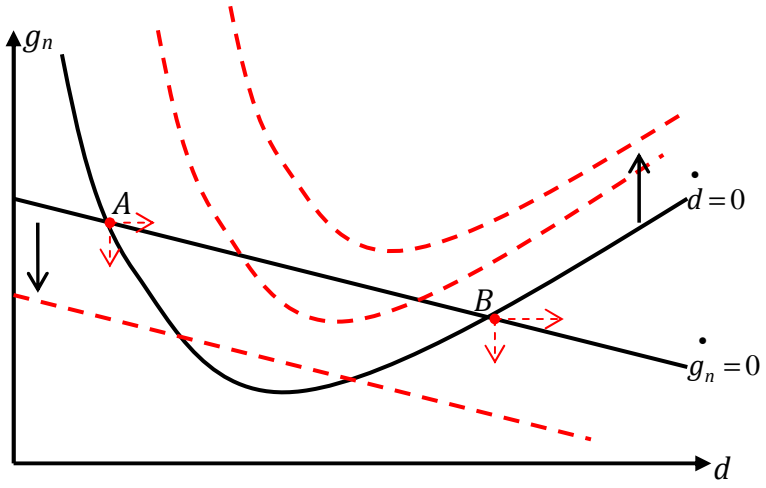

Figure 6 – Long-run consequences of financial panic

Perhaps more interesting, regardless from the initial positions the economy is, a market-led run to economic disaster will take place (see arrows associated to points *A* and *B*). Actually, the financial turbulences of the sub-prime crisis can easily produce destabilizing forces in already weak EU member states like Greece. If we assume Greece to be originally located in point *B*, small "complications" on financial markets can be well enough to lead the economy towards public debt default and long-run economic stagnation. The same story, however, may also take place in much stronger and apparently solid countries like Spain and Ireland. Indeed, before the 2007 crisis, both countries were pretty uniformly considered as virtuous countries with sound macroeconomic fundamentals, at least as far as public balance

is concerned (De Grauwe, 2011b; Hein et al., 2011). In terms of our model, we would have said such economies to be placed in a "safe" position like point A. As current events vividly show, however, the 2007 financial shock has severely affected Spanish and Irish economic activity, and now threaten to lead also these countries toward a worrying debt default scenario. This is exactly the situation described in figure 6.

4.1. Macroeconomic implications of EU assistance to member states

Once shown the gloomy scenario that may characterize some EU member countries, let's now move to the possible institutional responses. One response, we know, has already been implemented and takes the form of the EU member state rescue fund. An alternative perhaps additional response is still a possibility and consists in Eurobond issuances.

As said above, here we do not want to focus on technical and institutional details. Rather, we want to analyze the possible macroeconomic outcomes of these two initiatives on the base of their different scopes. In this sense, let define the EU-funded member state rescue package as an exogenous flow of funds a single member state may dispose of to meet payment commitments on the accumulated debt stock. In a way, think at these funds as transfers through which debt service costs may be reduced, but which are not directly designed to support expansionary fiscal policies. Quite the contrary, assume Eurobonds as financial liabilities, perhaps issued by an European Debt Authority and collectively guaranteed by all EU member states, in order to help recovery efforts of national governments and finance, say, ambitious competitiveness-enhancing public investment programs (Rodriguez, 2010)[15]. In this case, attention is thus on the need to feed economic growth without posing additional strain on the EU country-specific fiscal position. In both cases, we take the perspective of the single EU member state receiving support by EU institutions, whilst we treat EU help as an exogenous variable. Actually, we are well aware that it might be interesting to explicitly consider EU into the model through a two-region SFC framework. For the time being however, we prefer taking the easier and more immediate way described above, perhaps leaving these points to future developments of the present work.

Let consider the EU member state rescue fund first. Imagine a given amount of resources "H_F" are channeled from EU institutions towards a EU member state to alleviate its debt service costs. From equation (13), the immediate effect of such a help on the member state public debt dynamics is pretty clear: the positive entry i_L in equation (13) now assumes a lower value equal to ($i_L - H_F/D$). Public debt management becomes obviously easier and possibly moves towards a lower debt-to-GDP ratio. Ceteris paribus, from a graphical point of view, such a change means the ($\dot{d} = 0$) locus to move downward. Beside this, an additional positive effect may emerge, should EU financial help ensure financial markets that the

[15] It is Keynes himself in chapters 12 and 24 of the *General Theory* to stress investment as the crucial variable anti-cyclical fiscal policies should focus on: "For my own part I am now somewhat skeptical on the success of a merely monetary policy directed towards influencing the rate of interest [and therefore investment]. I expect to see the State [...] taking an even greater responsibility for directly organizing investment". Even further: "it seems unlikely that the influence of banking policy on the rate of interest will be sufficient by itself to determine an optimal level of investment. I conceive, therefore, that a somewhat comprehensive socialization of investment will prove the only means of securing an approximation to full employment". See also Seccareccia (1995) for further details on this issue.

supported member state will not go to bankruptcy and payment commitments will be respected. This effect may likely emerge in the form of a reduction in the interest rate from i_L to i_L^H (with $i_L^H < i_L$). Again, the locus for constant values of d will move down.

Finally, it is pretty hard to define any effect the EU financial support may induce on the economic dynamics of the helped member state. Actually, the EU member state rescue package does not provide any fund to finance anti-cyclical policies. Quite the opposite, EU funds are conceded provided that restrictive fiscal measures are implemented and, possibly, primary surpluses achieved. Moreover, the final EU funds transfer from debtor, i.e. the EU member state, to creditors may stimulate debtor country's growth only if these same funds are re-spent, for consumption or investment purposes, into the debtor country economy. Should the member country creditors mostly be foreign banks, such a demand stimulus would likely be very scarce if nil. In this paper, for the sake of simplicity, we assume EU member state rescue funds not to have any effect on the helped country current economic activity. Accordingly, we will not observe any further movement in the locus for constant values of d nor in the locus for constant values of g_n.

The overall picture emerging from such a scenario is portrayed in figure 7.

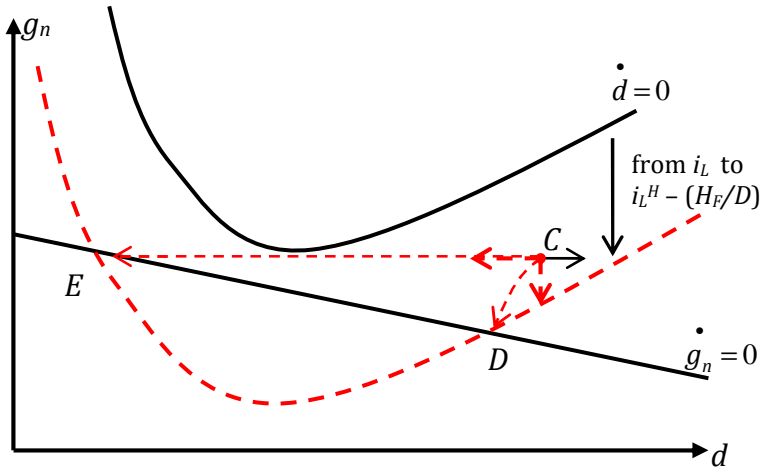

Figure 7 – EU country's rescue package and long-run dynamics in the assisted economy.

Should a EU member state be in serious troubles as represented by point C, the EU financial assistance may be decisive to invert an apparently inexorable run towards public debt default. If sufficiently strong, the EU financial help may contribute to stabilize the member state debt-to-GDP ratio. The member state economy may move from point C to point D, or, even better, to point E. In this regard, however, remember that here we do not consider any effect of the EU rescue program on the economic dynamics of the supported country. Indeed, neglecting pro-growth anti-cyclical policies is the main shortcoming of the stabilization measure portrayed in figure 7. The debt-to-GDP ratio may well be stabilized and public finance balance put in safety. Nevertheless, long-run growth potential will stagnate or even decrease along the adjustment process from point C to point E or D, respectively. The situation may be even worse if fiscal consolidation conditions should throw the supported economy in a deep recession and, this

way, make fiscal stabilization efforts harder. In our mind, this seems to be the case of some EU member states like Greece or Portugal.

Now come to the Eurobond alternative. As suggested above, let simply assume Eurobonds as liabilities which are jointly guaranteed by all EU member states and through which resources may be channeled towards a specific EU member country to implement pro-growth anti-cyclical policies. Define as "H_E" the amount of Eurobond-raised resources.

In our model, such an exogenous help would probably have a double impact on the dynamic system at hand. First, current economic growth may recover, this way biding up the long-run growth potential of the helped member state. Second, while the effect above will also ease public debt management, a further positive effect will emerge due, possibly, to the stabilization of financial systems. Actually, Eurobond issuances may help financial institutions to acquire a deeper sense of tranquility and believe the Euro project as solid. As a consequence, the interest rate i_L may decrease and help the assisted country to lower the debt-to-GDP ratio without adopting draconian and socially costly restrictive fiscal stances.

More formally, the first expansionary effect above may be represented by a positive relationship between Eurobond-raised resources "H_E" and parameter g_0 in equation (9). Accordingly, equation (12) will be positively affected and the locus for constant values of g_n move up. This emerges clearly from the derivative below:

$$\left.\frac{\partial g_n}{\partial H_E}\right|_{\dot{g}_n=0} = -\frac{\partial g/\partial H_E}{\frac{\partial g}{\partial g_n}-1} = \frac{\partial g/\partial H_E}{\left[1-\frac{\mu(1+m)(\beta+\alpha\psi)}{1+\mu(1+m)(\beta+\alpha\psi)}\right]} = [1+\mu(1+m)(\beta+\alpha\psi)]\left(\frac{\partial g}{\partial H_E}\right) > 0$$

With $\frac{\partial g}{\partial H_E} > 0$.

At the same time, whilst better growth performances improve by themselves public budget solidity, restored financial market tranquility will reduce the interest rate i_L. Here, we capture this point through a negative relationship between Eurobond–raised funds H_E and the interest rate i_L. Both forces obviously tend to reduce the variation of the debt-to-GDP ratio, possibly making it negative. Accordingly, the $(\dot{d}=0)$ locus will shift downward as indicated by the following derivative:

$$\left.\frac{\partial g_n}{\partial H_E}\right|_{\dot{d}=0} = -\frac{[(\partial i_L/\partial H_E)-(\partial g/\partial H_E))]}{-(\partial g/\partial g_n)} = \frac{1+\mu(1+m)(\beta+\alpha\psi)}{\mu(1+m)(\beta+\alpha\psi)}[(\partial i_L/\partial H_E)-(\partial g/\partial H_E))] \; <0$$

With $\frac{\partial i_L}{\partial H_E} < 0$.

The final picture emerging from the Eurobond novelty is reported in figure 8. As in the previous case, also the Eurobond solution may bring to the stabilization of the debt-to-GDP ratio of the supported country. This is represented by the passage from point C to point F in figure 8. Beside this, however, in figure 8 it is also clear the positive impact on long-run economic dynamics of the Eurobond-funded investment-based fiscal stimulus. Actually, in our model the economic recovery-to-public finance stabilization causal link is the core point addressed by Eurobonds. In a way, in the Eurobond scenario, public debt sustainability comes and is mainly achieved by means of public stimuli to current economic activity and long-run growth potential rather than immediately reducing the burden of debt service costs.

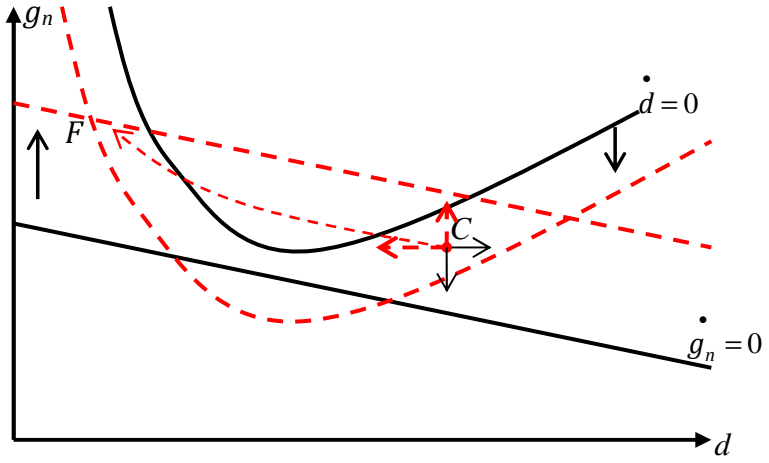

Figure 8 – Eurobonds and long-run dynamics in the assisted country

On the base of these considerations, is the Eurobond solution to prefer with respect to the EU member state rescue package? The answer, unfortunately, is not that obvious. On the one hand, anti-cyclical Eurobond-funded investment projects are powerful measures to support economic recovery and, this way, stabilize public finances. On the other hand, the positive effects of such policies may take time to emerge. In periods of high financial stress, economic agents and financial operators in particular seem never have time enough to wait for these positive outcomes to come. Actually, they show a very short-run perspective, so that restoring financial tranquility is the first and most urgent problem to solve. In such a context, some sort of EU-funded state member bail-out may be necessary to calm wild spirits on financial markets and impede the financial and economic disaster portrayed in figure 6.

The best solution would probably be a mix of both strategies. A immediate EU financial help to meet upcoming debt payments may be the early measure to adopt in order to reduce tensions on financial markets. This help may be well conceded under the conditions of fiscal consolidations in the supported country. Fiscal stabilization, however, may hardly come should fiscal consolidation requirements lead the country in a deep recession. To avoid this, Eurobonds are the next step. Eurobond-raised resources given to the member country may actually be decisive to finance public investment programs, to provide demand injections, ultimately to support economic growth. This initiative appears fundamental if we want to combine, in the long run, fiscal stabilization with improved growth potential.

5. Conclusions

There is no doubt that the economic scenario several economies currently deal with is the worst possible since the 1929 Great Depression. Economic activity has barely recovered from the 2007 sub-prime meltdown and it is now dramatically jeopardized by mounting financial tensions about sovereign debt sustainability. In particular, several EU member states are now dangerously swaying between the need of fiscal stimuli to support economic activity and

severe fiscal corrections to ensure financial markets about their own public account solidity. Problems are so deep as to threaten the existence of the European Monetary Union.

In this paper we address these hot issues through a post-Keynesian model. Our work heavily hinges on some previous post-Keynesian contributions, two papers from Lavoie (2006) and Fontana and Setterfield (2009) in particular. Compared to them, here we go a step further by analyzing in a dynamic context, in which financial markets beliefs may suddenly change, how financial variables, i.e. credit supply and asset prices, endogenously interact each other and affect real economy activity. This way, we try to provide a simple formal description of the Minskyan financial instability hypothesis. Moreover, we also show why public intervention in the aftermath of the 2007 crisis has been largely useless to restore financial tranquility and it has transformed a prevalently private debt crisis into a public debt one.

We conclude our analysis with a look at the long-run. We stress that, in the present context, the above financial instability may produce long-lasting economic "dramas" such as permanent drops in growth potential and public debt default. In the last months, such a scenario has become dramatically concrete in some EU countries, the so-called PIIGS. To avoid this awful events to take place, a deep institutional discontinuity is probably needed. A first institutional response has already been taken. It consists in a EU member state rescue fund providing resources to maintain payment commitments and avoid possible EU countries default. An alternative/additional option is the introduction of Eurobonds.

Both strategies are controversial and present lights and shadows. The EU-funded member state rescue program may be preferred as immediate instruments to reduce panic on financial markets. The introduction of Eurobonds, in turn, may help to implement Keynesian-type expansionary measures, which in the long run are probably the most promising way to support economic growth and stabilize helped member countries' debt-to-GDP ratios. Moreover, concern exists as to the moral hazard problems EU financial assistance to member countries may create by inducing them to forget fiscal discipline and share ensuing bail-out costs with other more virtuous member states. In this sense, critics argue, the Stability and Growth Treaty (SG) would be irremediably violated by not respecting the no-bail-out clause. The Euro-zone would definitely lose its credibility as a stable and sound economic area and its political legitimacy weakened[16].

This argument has obviously some ground and it is to consider carefully when elaborating the institutional and regulatory framework that will discipline future EU financial help to member states. Nevertheless, here we would like to stress to points about the need of a deeper EU financial and fiscal integration. First, it is to recognize that a EU member country default does not represent a national event any longer, but it will entail communitywide negative spill-over at the financial and real-economy level. Such an event, that someone would justify and permit by blindly recalling the need to respect existing rules, may eventually trigger global consequences much worse that the costs of a EU-funded assistance initiative. Beside this, both the EU country rescue package and Eurobonds may strengthen fiscal

[16] See Issing (2009) and Kosters (2009) on this point. According to Kosters (2009): "how could the German government explain to its citizens that they have to pay for the mismanagement of the governments of other EMU countries contrary to the treaties? How will the spending of that money be democratically controlled? Bilaterally or by a European institution? (…) the danger of quarrels leading to political tensions is large (Kosters, 2009, p. 137)".

stability of the supported member states. The macroeconomic soundness of each EU country is in turn at the base of the credibility of Eurobond issuances and reduces the risks of new EU-driven bail-out intervention in the future. In a way, the creation of a "European safety net" against member states' financial troubles may give rise to a self-sustaining virtuous process and autonomously eliminate the fear for global instability. Second, it is also to remember that, except of Greece, the ongoing crisis is largely due to the 2007 financial meltdown and the ensuing financial system rescue packages approved in several EU countries, not to fiscal profligacy. Ireland and Spain, for instance, were considered virtuous countries running fiscal surpluses and reducing their debt-to-GDP ratios before 2007. Now they are in the eye of the storm: a common European response to such unforeseen possibility is to consider. Actually, the possible macroeconomic outcomes of such an intervention may be far more desirable than any rigorous adequacy to existing rules.

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