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Need for a European Federal Union in a post-Keynesian Eurozone  
Center-Periphery Model**

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# Conflicting Claims in the Eurozone? Austerity's Myopic Logic and the Need for a European Federal Union in a post-Keynesian Eurozone Center-Periphery Model

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## Abstract

In this paper we analyze the role of the nowadays Eurozone institutional setup in fostering the ongoing peripheral Euro countries' sovereign debt crisis. According to the Modern Money Theory, we stress that the lack of a federal European government running anti-cyclical fiscal policy, the loss of monetary sovereignty by Euro Member States and the lack of a lender-of-last-resort central bank has significantly contributed to generate, amplify and protract the present crisis. In particular, we present a post-Keynesian Eurozone center-periphery model through which we show how, due to the incomplete nature of Eurozone institutions with respect to a full-fledged federal union, diverging trends and conflicting claims have emerged between center and peripheral Euro countries in the aftermath of the 2007-2008 financial meltdown. We emphasize two points. (i) Diverging trends and conflicting claims among Euro countries may represent a decisive obstacle to reform Eurozone towards a complete federal entity. However, they may prove to be self-defeating in the long run should financial turbulences seriously deepen also in large peripheral countries. (ii) Austerity packages alone do not address the core point of the Eurozone crisis. They could have sense only if included in a much wider reform agenda, whose final purpose is the creation of a federal European government which can run expansionary fiscal stances and of a government banker. In this sense, the unlimited bond-buying program recently launched by the European Central Banks is interpreted as a positive although mild step in the right direction out of the extreme monetarism which has so far shaped Eurozone institutions.

**Key words:** Eurozone debt crisis, Modern money theory, post-Keynesian center-periphery model

**JEL Classification:** E02, E12, H63

## 1. Conflicting interests in the Eurozone?

From mid 2010 on, most economists have devoted increasing effort to explain the causes of the current Eurozone crisis. Different opinions have emerged. Some economists identify EU Member States' fiscal profligacy as the roots of the crisis (Kosters, 2009; Panetta, 2011; Weidmann, 2012; ECB, 2012). Others stress the existence of a Balance-of-Payments problem

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among Eurozone countries (Hein, Trucker and van Treek, 2011; Perez-Caldentey and Vernengo 2012; Bilbow, 2012). Others, finally, emphasize that Eurozone is not an optimal currency area and that the existing crisis is nothing but the consequence of Eurozone difficulties to deal with asymmetric shocks (Krugman, 2012).

Inside this debate, a pretty transversal strand of thought describes the crisis of peripheral Euro economies as closely similar to the crises faced by several developing countries in the decades after 1982 (De Grauwe, 2011; Soros, 2012). According to this perspective, the creation of the monetary union has induced increasing financial flows to take place inside Europe. Once eliminated the exchange rate risk usually associated to allegedly unreliable Southern European countries, capitals have massively flown towards them (Waysard, Ross and de Guzman, 2010; Perez-Caldentey and Vernengo 2012; Lin and Treichel, 2012). Accordingly, interest rate differentials with respect to central economies have mostly disappeared. Center-periphery convergence has shown up.

The 2007-2008 financial meltdown has abruptly changed this picture. Economic recession has affected all EU Member States. Economic downturns, however, have been particularly severe in Spain and Ireland. Their national governments, examples of rigorous fiscal discipline until that point, have had to come in to bail out financial institutions and provide relief from mounting unemployment. Spanish and Irish fiscal deficits and public debts have soared. In the case of Greece (and partially Italy), the problems connected to high public debt stocks have started to obsess financial markets. Into this framework, capitals have suddenly changed direction selling risky periphery's bonds in search of center's Treasury Bills. Center-periphery convergence has left the stage to widening diversities. Interest rates have increased hugely in the periphery and economic activity has plumbed compared to the weak but positive performance of central economies.

Given this dismal scenario, which is the way out? The answer to this question mostly depends on the analysis of the causes of the crisis. In line with the idea that the crisis is consequence of past irresponsible fiscal policies, most international institutions identify fiscal consolidation as the only solution to Eurozone problems. Debtor countries must pay their debts. To do so, they have to implement tough austerity packages. To ease the accomplishment of this task, peripheral economies also have to launch structural reform programs. The privatization of inefficient public enterprises, the downsize of public bureaucracy and the liberalization of good and labor markets are the measures suggested to increase the efficiency of the overall economic system and unleash growth. In this view, there is any role for demand-side factors to play.

Several economists stress that productivity gaps and unit labor cost divergence are relevant causes of external account imbalances between central and peripheral Euro countries (De Grauwe, 2012). Whilst these disequilibria are somehow consequences of the process of monetary unification and financial integration, their solution seems to be hindered by the existence of the common Euro currency itself. Actually, in front of deep recessions, an exchange rate devaluation could help peripheral economies to bring back growth and to rebalance external disequilibria. The loss of monetary sovereignty, however, put further strain on their adjustment process. It is on the base of these arguments that an increasing number of experts, financial commentators and policy makers indicate the perhaps temporary exit of some Euro countries from the monetary union as the best, although costly, solution to the existing crisis (Roubini, 2011; Allen and Ngai, 2012; Miller and Skidelsky, 2012; Becker and Posner, 2012).

In this paper, we adopt an alternative perspective on the leading factors at the basis of the Eurozone crisis and on the most promising way to solve it. Following Kregel (2012), peripheral Euro countries are facing a severe sovereign debt crisis due to their incapability to easily access financial markets and refinance outstanding debts. Are such difficulties due to irresponsible fiscal policies? This could be the case of Greece, but not of Spain and Ireland, so that fiscal profligacy cannot be identified as the in-deep source of Eurozone problems (De Grauwe, 2010). Actually, the current Eurozone crisis seems to have been decisively favored by the very original Eurozone institutional setup and its *incomplete* nature with respect to a fully developed federal union. First, in the nowadays European Monetary Union (EMU), Eurozone countries are in the same position of US States but without any federal institution helping them in case of severe economic downturns. Second, Euro countries use the same currency and issue debt in a currency they do not control, so that they do not have monetary sovereignty any longer. EMU now works “much like a US with a FED, but with only individual state treasuries. It will be as if each EMU Member country were to attempt to operate fiscal policy in a foreign currency; deficit spending will require borrowing in that foreign currency according to the dictates of private markets (Wray, 1998, pp. 91-92)”.

According to the Modern Monetary Theory (MMT), such an institutional framework seriously exposes Member States to default (Papadimitriou and Wray, 2012), hence financial turbulences which would hardly take place in monetary sovereign economies (De Grauwe, 2011). More in general, all the above lacks in the original design of the European monetary union can create diverging trends and conflicting interests among Eurozone countries in presence of *common* (and not asymmetric), although with different intensity, adverse

economic shocks. Since the outbreak of the 2007-2008 financial crisis, Eurozone peripheral economies are suffering protracted financial instability whilst central economies, regardless of their effective financial solidity, are benefitting of never-before-seen low interest rates. Further, whilst the former are stuck in an endless hurry to implement austerity packages, the latter can safely pursue fiscal stabilization thanks to close-to-zero, or even negative, real interest rates. Finally, whilst peripheral economies likely need some expansionary, perhaps inflationist, monetary policy by the European Central Bank (ECB) and fiscal support from European institutions, central countries call for rigorous anti-inflationist monetary/fiscal policies to preserve their external competitiveness and their, let say, mercantilist-type export-led growth pattern.

It is easy to see that such differences can persuade economists and national policy makers from central economies that peripheral countries have to solve existing problems by their own. Further, the above divergences can work to delay any serious attempt to end the present crisis by reforming European institutions in the direction of a federal European fiscal union with a true lender-of-last-resort central bank. Nevertheless, reforming European institutions towards the creation of a complete monetary sovereign federal union is probably the decisive step ahead to solve the Eurozone crisis. Accordingly, all the euro-skeptic feelings which take strength from the above divergences likely represent the worst threat to the survival of the Euro project and may prove to be dramatically wrong in case of a collapse of the European monetary union.

In the following sections, we formally address this point through a Eurozone center-periphery model. In doing this, we will distinguish between a big center-*small* periphery context and a big center-*big* periphery framework.

## **2. The Model**

Consider two countries, a well-developed center and a relatively less-developed periphery. They share the same currency and have delegated monetary policy to a common central bank. Despite these common elements, the two countries maintain complete fiscal independence as to anti-cyclical measures and welfare policies. Fiscal deficits are financed by issuing national Treasury bonds denominated in the same Euro currency. According to the nowadays Eurozone framework, there is any federal fiscal authority which imposes taxes, makes expenditures and collects financial resources by issuing federal government bills.

Following Lavoie (2006), equations (1) and (2) define the growth rates of the center and the periphery as a function of autonomous demand injections:

$$g_C = f_C \left( G_C, EX_C, I_C \left( P_C^T(i_C(\sigma_C)), P_P^T(i_P(\sigma_P)) \right) \right) \quad (1)$$

$$g_P = f_P \left( G_P, EX_P, I_P \left( P_P^T(i_P(\sigma_P)), P_C^T(i_C(\sigma_C)) \right) \right) \quad (2)$$

Expression (1) tells us that current economic performance of the center economy ( $g_C$ ) positively depends on current domestic government expenditures ( $G_C$ ), current net exports ( $EX_C$ ) and total investment ( $I_C$ ).

According to the endogenous monetary theory, investment does not come from savings. On the one hand, investment depends on entrepreneurs' animal spirits. On the other hand, investment is affected by banks' credit policies, which define the *effective* demand for credit on the basis of bank assets' soundness. Accordingly, equation (1) assumes that economic growth in the center is indirectly affected by the price of center government's bonds ( $P_C^T$ ) which, in turn, depends negatively on interest rate  $i_C$ . Changing prices of center government's bonds will alter the solidity of banks' balance sheets and therefore their credit policy. Investment demand will inevitably be affected by easing or, as is currently going on, tightening conditions on the credit market. Equation (1) emphasizes that periphery government's bonds may also influence banks' credit policy in the center. Indeed, before the outbreak of the crisis, central economy banks have largely provided loans to peripheral economies. They are now exposed to the risk of default in the periphery. This event may have significant effects on the functioning of the credit market in central Euro countries, in particular in case of financial turmoil in big peripheral economies<sup>2</sup>.

Equation (2) gives us the GDP growth rate in the periphery. Its economic meaning is exactly equivalent to that of equation (1). According to international financial data, peripheral Euro countries are net receivers of foreign capitals, in particular from central Euro countries, and net debtors on international financial markets. Yet, according to Waysard, Ross and de

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<sup>1</sup> In a more realistic discrete time model, define current output ( $Y_t$ ) as:  $Y_t = m(I_t + G_t + EX_t)$ . " $m$ " stands for the Keynesian multiplier. Reminding that  $Y_t = Y_{t-1}(1 + g_t)$ , we can write the growth rate of real GDP at time  $t$  as:  $g_t = m(\eta_I g_t^I + \eta_G g_t^G + \eta_{EX} g_t^{EX})$ . In our formulation,  $g_t^I$ ,  $g_t^G$  and  $g_t^{EX}$  are the growth rates of total investment ( $I$ ), public expenditures ( $G$ ) and economy's exports ( $EX$ );  $\eta_I$ ,  $\eta_G$  and  $\eta_{EX}$  are the corresponding shares on GDP. *Ceteris paribus*, the higher  $I_t$ ,  $G_t$  and/or  $EX_t$ , the better the growth performance of the economy as a whole.

<sup>2</sup> In equation (1),  $P_P^T$  stands for the market price of periphery government's bonds and  $i_P$  is the connected interest rate.

Guzman (2010), big peripheral economies such as Spain and Italy have also accumulated significant asset positions in the center. In light of these facts, in equation (2) we assume both peripheral and central bonds to be in the balance sheets of peripheral banks and therefore to influence, via banks' credit policy, domestic investment  $I_P$ .

In equations (1) and (2), interest rates  $i_C$  and  $i_P$  are influenced by parameters  $\sigma_C$  and  $\sigma_P$ , respectively. In our model, they stand for country-specific risk indicators which financial operators assign to assets issued by Eurozone countries. Parameter  $\sigma_C$  represents the risk perceived by financial markets in acquiring central economy government's bonds. Parameter  $\sigma_P$ , instead, grasps all the country-specific factors taken into account by financial investors when buying peripheral government's bonds. Such country-specific factors influence the remuneration gained on bonds' holdings. In particular, they determine the spread between the central(peripheral) economy government bonds' interest rate  $i_C(i_P)$  and the interest rate  $i^*$  associated to, say, a third-country riskless financial asset such as US government Treasury Bills. This point is modeled in equations (3) and (4):<sup>3</sup>

$$i_C = i^* + \sigma_C \quad (3)$$

$$i_P = i^* + \sigma_P \quad (4)$$

In this paper, we model inflation at country level in a standard accelerationist fashion:

$$\pi_C = \pi^T + \psi(g_C - g_C^n) \quad (5)$$

$$\pi_P = \pi^T + \chi(g_P - g_P^n) \quad (6)$$

Equation (5) tells us that the current inflation in the center  $\pi_C$  is equal to the inflation target  $\pi^T$  established by the European Central Bank in case current growth  $g_C$  is equal to the central economy full-employment growth rate  $g_C^n$ . Should  $g_C$  be higher(lower) than  $g_C^n$ , inflation in the center will be higher(lower) than the long-run average inflation rate pursued by European

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<sup>3</sup> For the sake of simplicity, we neglect the Euro-Dollar exchange rate risk in equations (3) and (4). We do this in order to stress the relevance of financial transactions among different Euro countries' bonds instead of capital flights from Eurozone assets towards third-countries' financial activities. In this sense, it is worth noting the pretty small devaluation of Euro with respect Dollar in spite of the considerable distress afflicting financial European markets since 2010.

<sup>4</sup> We define  $g^n$  as the growth rate of real GDP consistent with the full utilization of available resources, labor in particular, and given the growth rate of labor productivity. For more details on this point, see León-Ledesma and Thirwall (2002), Lavoie (2006).

monetary authorities. The same line of reasoning applies to equation (6), which gives us current inflation in the periphery  $\pi_P$ . In equation (6),  $g_P^n$  stands for potential growth in the periphery. Parameters  $\psi$  and  $\chi$  represent the sensitivity of inflation dynamics to output gap in the center and the periphery respectively.

Once defined  $g_C$ ,  $g_P$ ,  $i_C$ ,  $i_P$ ,  $\pi_C$  and  $\pi_P$  in equations (1)-(6), the dynamic side of the model is encapsulated in equations (7)-(10). In line with the aim of the paper, here we focus on, say, financial variables such as debt-to-GDP ratio and country-specific risk factor. Equations (7) and (8) give us the dynamics of the debt-to-GDP ratio  $d_C$ <sup>5</sup> and of the country-specific risk indicator  $\sigma_C$  in the center:

$$\dot{d}_C = d_C(\widehat{D}_C - \pi_C - g_C) = d_C \left[ \frac{\Omega_C(d_C)}{d_C} + i_C - \pi^T - (1 + \psi)g_C + \psi g_C^n \right] \quad (7)$$

$$\dot{\sigma}_C = \beta(d_C - \overline{d}_C(d_C^*(\sigma_C), \varepsilon_P)) \quad (8)$$

With  $\overline{d}_C = d_C^*$  if  $\varepsilon_P = 0$ ;  $\overline{d}_C > d_C^*$  if  $\varepsilon_P > 0$

Equation (7) reads that the time derivative of the central economy debt-to-GDP ratio  $\dot{d}_C$  is a positive function of the primary deficit-to-GDP ratio  $\Omega_C(d_C)$ . In this model, we assume  $\Omega_C$  to be a negative function of the debt-to-GDP ratio  $d_C$ . Actually, perhaps influenced by the apparently worldwide run against public debt, the higher  $d_C$ , the stronger political pressures to squeeze primary deficits, hence the negative relationship between  $\Omega_C$  and  $d_C$ . Public debt-to-GDP dynamics in the center is positively affected by the interest rate  $i_C$ . The higher  $i_C$ , the higher the service costs of outstanding debt and therefore new debt issuances.

In equation (7), the inflation target  $\pi^T$  set by the European Central Bank has a negative impact on the dynamics of the central economy debt-to-GDP ratio. Ceteris paribus, the higher  $\pi^T$ , the higher the inflation rate in the center and therefore its nominal GDP. Stabilization or reduction of the debt-to-GDP ratio would likely follow. Current growth rate  $g_C$  shows a similarly negative effect on  $d_C$ . Finally, the evolution of the debt-to-GDP ratio in the center is influenced positively by the potential growth rate  $g_C^n$ . Ceteris paribus, the higher  $g_C^n$  and the connected output gap, the lower will be domestic inflation or, even worse, the higher the risk of deflation. A Fisher-type debt-deflation process could take place, destabilizing the debt-to-GDP ratio.

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<sup>5</sup>  $d_C$  is defined as  $D_C/P_C Y_C$ .  $D_C$  stands for the stock of public debt in the center,  $P_C$  is the overall economy price level and  $Y_C$  central economy real GDP. In equation (7),  $\widehat{D}_C$  is the percentage variation in center economy's debt stock.



Equation (8) tries to model how financial operators may periodically update the financial risk indicator attached to the center. We assume the central economy risk indicator to be revised by confronting the outstanding debt-to-GDP ratio  $d_c$  with some benchmark level  $\bar{d}_c$ . According to equation (8), should  $d_c$  be higher(lower) than the benchmark level  $\bar{d}_c$ , financial operators will increase(reduce) the financial risk indicator  $\sigma_c$ , so that  $\dot{\sigma}_c > 0$  ( $\dot{\sigma}_c < 0$ ). Parameter  $\beta$  stands for the sensitivity of financial operators' feelings to any gap between current debt-to-GDP ratio and the benchmark level  $\bar{d}_c$ .

As to debt-to-GDP target  $\bar{d}_c$ , in this model we assume  $\bar{d}_c$  to depend positively on two factors:  $d_c^*$  and  $\varepsilon_P$ . First,  $d_c^*$  stands for the equilibrium level of the debt-to-GDP ratio consistent with the economy growing at full potential. Other way round,  $d_c^*$  represents a sort of long-run equilibrium level of the debt-to-GDP ratio once the economy has achieved its potential growth rate  $g_c^n$  and, consequently, primary deficit (or surplus) is at its structural level. The full-employment debt-to-GDP ratio may be defined according to the expression below:

$$d_c^* = \frac{\Omega_c^*}{(g_c^n + \pi^T - i^* - \sigma_c)}$$

Where  $\Omega_c^*$  is the primary deficit-to-GDP ratio at its structural level.

It times of financial stability, without bad news from the center and from the periphery (i.e.  $\varepsilon_P=0$ ), we assume financial operators to set the benchmark level  $\bar{d}_c$  equal to the full-employment debt-to-GDP ratio  $d_c^*$ . Financial operators will thus upward revise the risk indicator  $\sigma_c$  only in case current debt-to-GDP ratio in the center should be higher than its long-run expected value  $d_c^*$ .

The most recent experience tells us that financial operators do not only take into account domestic factors to evaluate financial risk in the center. In times of financial distress, also external factors may come to play a leading role. Actually, the Eurozone crisis clearly witnesses that bad news from the periphery can strongly influence investment portfolio decisions and induce capitals to suddenly leave the periphery in search for a safe haven in the center. Such capital flights can often be seen as irrational and de-linked from the effective financial solidity of allegedly safe central Euro countries<sup>6</sup>. Nonetheless, they are at the basis of the surge in interest rate spreads between central government bonds and peripheral Treasury Bills. In equation (8), term  $\varepsilon_P$  aims to get this point. In particular, if we imagine some

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<sup>6</sup> According to data from IMF, in 2011, the Spanish debt-to-GDP ratio was equal to 68.5%. It was much lower than the same data from Belgium, Germany or even UK, and very close to the value associated to Netherland.

bad news coming from the periphery, i.e. a deeper economic recession than elsewhere or low space for anti-cyclical policies due to already high debt-to-GDP ratios, term  $\varepsilon_P$  will assume positive values. This will lead financial operators to increase the benchmark level  $\bar{d}_C$ . Regardless from the effective gap between  $d_C$  and  $d_C^*$ , financial markets will move capitals away from the periphery and towards the center and possibly reduce the financial risk factor  $\sigma_C$  associated to central economy bonds.

Equations (9) and (10) correspond to equations (7) and (8), now referred to the periphery:

$$\dot{d}_P = d_P(\widehat{D}_P - \pi_P - g_P) = d_P \left[ \frac{\Omega_P(d_P)}{d_P} + i_P - \pi^T - (1 + \chi)g_P + \psi g_P^n \right] \quad (9)$$

$$\dot{\sigma}_P = \delta(d_P - \bar{d}_P(d_P^*(\sigma_P), \varepsilon_P)) \quad (10)$$

With  $\bar{d}_P = d_P^*$  if  $\varepsilon_P = 0$ ;  $\bar{d}_P < d_P^*$  if  $\varepsilon_P > 0$

Equations (9) and (10) describe the dynamics of the debt-to-GDP ratio  $d_P$  and of the country risk factor  $\sigma_P$  in the periphery along similar lines to those assumed in the center. Note, however, a fundamental asymmetry with respect to financial risk dynamics in the center. Actually, adverse shocks hitting peripheral economies (i.e.  $\varepsilon_P > 0$ ) will be immediately passed through a value of  $\bar{d}_P$  lower than  $d_P^*$ . Accordingly, huge capital outflows will take place and the peripheral economy financial risk indicator  $\sigma_P$  will be revised upward.

Equations (7)-(8) and (9)-(10), if considered all together, give rise to a highly complex four-equation dynamic system, whose stability should be assessed by considering all possible real-side and financial links between central and peripheral countries. In order to keep the analysis of the model as simple as possible, for the time being we prefer considering the sets of equations (7)-(8) and (9)-(10) as independent. In particular, we now assume equations (7)-(8) and (9)-(10) to be somehow connected only by the asymmetric response of financial markets to bad news in the periphery (i.e. factor  $\varepsilon_P$  in equations (8) and (10)). Actually, we will return to the full-extended four-by-four dynamic system later on, when analyzing center-periphery dynamics in case of a large and economically influential peripheral economy. Moreover, we now focus on the central economy dynamic system only<sup>7</sup> and analyze the connected Jacobian matrix  $J_C$  (evaluated at the steady state). We get:

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<sup>7</sup> Stability analysis of equations (9) and (10) is qualitatively equivalent to that of equations (7) and (8). In the main text, we describe the center economy case only.

$$J_c = \begin{bmatrix} \frac{\partial \dot{d}_c}{\partial d_c} & \frac{\partial \dot{d}_c}{\partial \sigma_c} \\ \frac{\partial \dot{\sigma}_c}{\partial d_c} & \frac{\partial \dot{\sigma}_c}{\partial \sigma_c} \end{bmatrix} = \begin{bmatrix} d_c \left[ \frac{\left( \frac{\partial \Omega_c}{\partial d_c} \right) d_c - \Omega_c}{d_c^2} - (1 + \psi) \frac{\partial g_c}{\partial d_c} \right] & -d_c(1 + \psi) \frac{\partial g_c}{\partial \sigma_c} \\ -/+ & + \\ \beta & -\beta \frac{\partial \bar{d}_c}{\partial d_c^*} \frac{\partial d_c^*}{\partial \sigma_c} \\ + & - \end{bmatrix}$$

As to the partial derivative  $(\partial \dot{d}_c / \partial d_c)$ , its sign is likely to be negative for low values of the debt-to-GDP ratio  $d_c$ . In this case, a slight increase in  $d_c$  may induce policy makers to cut primary deficit  $\Omega_c$ . At the same time, a bit higher value of  $d_c$  would probably have any effect on current growth (i.e.  $\frac{\partial g_c}{\partial d_c} = 0$ ). Things may radically change at much higher values of the debt-to-GDP ratio. First, when  $d_c$  is too high, reductions in primary deficits may prove to be too small and insufficient to stabilize public debt dynamics. Second, perhaps in presence of widespread fear about public debt sustainability, economic performance may deteriorate and growth decline, so that  $\frac{\partial g_c}{\partial d_c} < 0$ . An unstable dynamics may thus emerge, possibly leading to increasing debt-to-GDP ratios.

As to derivatives  $(\frac{\partial \dot{d}_c}{\partial \sigma_c})$  and  $(\frac{\partial \dot{\sigma}_c}{\partial d_c})$ , there are no doubts about their positive signs. In particular, a higher financial risk  $\sigma_c$  will complicate public debt management given that it will increase debt service costs and hamper current economic growth through the interest rate-investment nexus.

In the Jacobian matrix above, partial derivative  $(\frac{\partial \dot{\sigma}_c}{\partial \sigma_c})$  will have a negative sign. Ceteris paribus, an increase in the risk factor  $\sigma_c$  will raise the long-run full-employment value of the debt-to-GDP ratio  $d_c^*$ , which in turn will induce to revise downward  $\sigma_c$ . In a way, we may interpret this point as a self-stabilizing force in the dynamics of the country risk factor. The higher  $\sigma_c$ , the more difficult is it will newly increase next time.

Graphically, the dynamic system above and the set of equations describing how central economy works (but the same applies to the periphery) can be represented through the four-panel figure 1 below.

The top-right panel portrays the two loci for constant values of the debt-to-GDP ratio  $d_c$  and country risk factor  $\sigma_c$ . The  $(\dot{d}_c = 0)$  locus is represented by an inverted U-shaped curve. The  $(\dot{\sigma}_c = 0)$  locus is an upward sloping curve with an horizontal asymptote when  $\bar{d}_c = d_c^* = \frac{\Omega_c^*}{(g_c^n + \pi^T - i^* - \sigma_c)} = \infty$ . Further, we assume it to have an horizontal segment, with  $\sigma_c=0$ , when  $d_c$

is lower than  $d_{C(\sigma_C=0)}^* = \frac{\Omega_C^*}{(g_C^n + \pi^T - i^*)}$ . Note two intersection points, hence the possibility for multiple equilibria to exist. Equilibrium *A* features a lower debt-to-GDP ratio  $d_C^l$ , a lower country-specific risk indicator  $\sigma_C^l$  and a higher growth rate  $g_C^l$  than the records associated to equilibrium *B*. Further, whilst point *A* shows a stable dynamics in its neighborhoods, equilibrium *B* is unstable. In our mind, equilibrium *B* represents a sort of risky economic environment, the pre-crisis Greek context for instance, in which a temporary economic shock may well be enough to generate explosive dynamics in the debt-to-GDP ratio. For the sake of simplicity, in figure 1 we do not explicitly introduce any upper bound to the evolution of  $d_C$ . Such a ceiling is however a concrete possibility in the case of Euro Member countries given the present European institutional framework<sup>8</sup>. It thus makes sense to believe that a destabilizing right-to-left dynamics in figure 1 cannot continue indefinitely and that an upper limit will eventually bind, beyond which public debt will not be rolled over any longer and default take place.

Moving counter-clockwise in figure 1, the remaining panels describe the economic mechanisms connecting  $d_C$  to  $g_C$ . In the top-left panel we portray equation (3), whilst in the bottom-left panel we draw equation (1). In the bottom-right panel we explicitly match each other debt-to-GDP ratios and GDP growth rates associated to the long-run equilibria reported in the top-right quadrant.

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<sup>8</sup> The apparently endless increase in Japan's debt-to-GDP ratio may confirm that "Sovereigns do not default (Kregel, 2012)". However, we all know how far Euro countries are from being fully sovereign States in the present Eurozone framework.

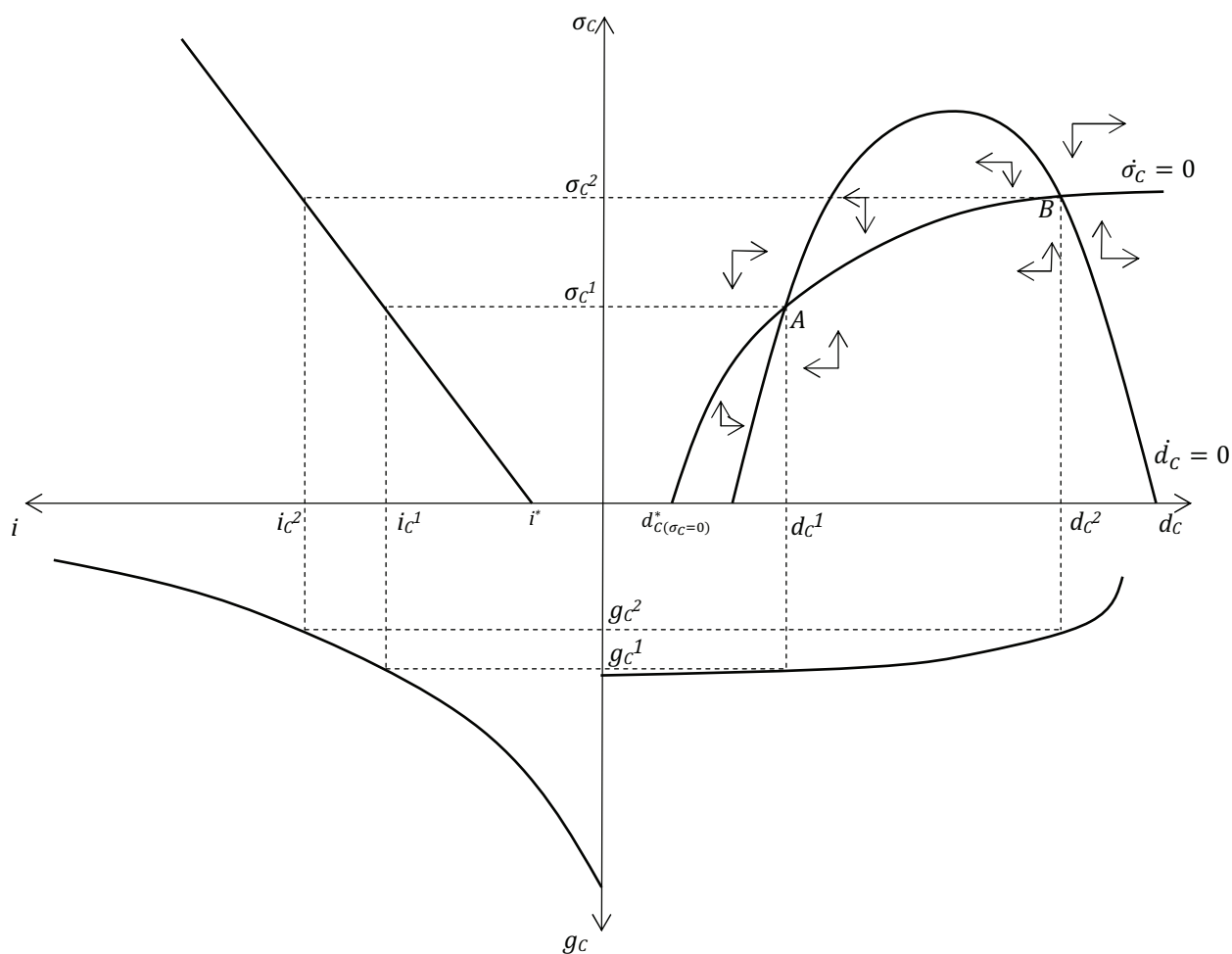


Figure 1 – The case for multiple long-run equilibria

### 3. Center-periphery divergence in the aftermath of the 2007-2008 financial meltdown

Equations (7)-(8) and (9)-(10) describe debt-to-GDP ratios and country-specific risk factors to follow broadly similar adjustment rules in the center and in the periphery. Yet, important asymmetries exist in the way the two countries can face common economic shocks. We have already discussed the role of factor  $\varepsilon_P$  in equations (8) and (10). Some more points are worth stressing here.

First, remarkable economic performances in most peripheral Euro countries in the first half of the 2000s were largely fed by mounting housing bubbles. Since 2007, the housing sector has been in the eye of the storm. On the one hand, this has implied longer and sometimes deeper economic downturns in peripheral countries than elsewhere. On the other hand, peripheral

governments have had to massively intervene to avoid the collapse of the financial system and provide safety net against widespread unemployment, with the ensuing higher-than-abroad burden on public finances.

Second, several peripheral countries still present relatively underdeveloped productive systems, at least with respect to the center. This is clear in the case of Greece and Portugal. Further, these economies are poorly integrated on international markets and show a pretty low propensity to export. This fact can be interpreted as a sign of lack of competitiveness of their productive patterns and provide an explanation for their difficulties to bring back growth soon by exploiting world recovery.

Third, peripheral and central Euro countries show opposite positions on international financial markets. Since the beginning of 2000s, peripheral Euro countries have recorded significant Balance-of-Payments current account deficits and increasing net external debt stocks. On the contrary, most central Euro countries have registered large trade and current account surpluses. By the end of 2010, their foreign assets outstripped by far foreign liabilities. As a consequence of these facts, peripheral countries are now highly exposed to capital flights and sudden stops, which can easily trigger off liquidity and insolvency crises. This is particularly true inside EMU, in which liquidity can safely dry up in the periphery and move to the center without bearing any exchange rate risk. Central Euro countries, on the contrary, appear as safe heaven to financial investors and their financial markets are plenty of liquidity with positive consequences in terms of financial stimuli to economic recovery.

Let try to see more formally the long-run consequences of such asymmetries both into a big center-*small* periphery setting and into a big center-*big* periphery context in the aftermath of the 2007-2008 financial meltdown.

### 3.1 The big centre-*small* periphery case

Imagine to deal with a large central economy, let say Germany, and a *small* peripheral country, Greece or Portugal for instance. On the basis of the above simplifications, imagine that economic links between the two countries are pretty weak. First, center exports to the periphery amount to a negligible proportion of total central economy exports, so that we can assume  $\left(\frac{\partial g_C}{\partial EX_C} \frac{\partial EX_C}{\partial EX_{C \rightarrow SP}} = 0\right)$ <sup>9</sup>. Even though the opposite might be true in the periphery in a general center-periphery model, inside the Eurozone small peripheral countries do not have tight trade relationships with central economies. Accordingly, let apply the above assumption

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<sup>9</sup>  $EX_{C \rightarrow SP}$  stands for export of the center towards the *small* peripheral Euro country.

also in the case of the periphery. Second, even though overall financial markets' response to bad news in the periphery and center-periphery capital flights can have significant economic consequences, imagine *direct reciprocal* center-periphery financial links to be negligible in case of a small peripheral country. On the one hand, assume center economy foreign assets in the periphery not to have much weight in center financial institutions' balance sheets, so that  $\left(\frac{\partial g_C}{\partial I_C}\right)\left(\frac{\partial I_C}{\partial P_P^T}\right) = 0$ <sup>10</sup>. On the other hand, apply this line of reasoning also to equation (2) and to small periphery' asset holdings in the center. Accordingly, we assume  $\left(\frac{\partial g_P}{\partial I_P}\right)\left(\frac{\partial I_P}{\partial P_C^T}\right) = 0$ .

Into this framework, assume that a common negative economic shock occurs, curtailing growth and increasing public deficits in both economies. However, economic downturn in the periphery is deeper and lasts longer compared to recession in the center. Moreover, peripheral public finances register deeper imbalances than abroad and fiscal deficits skyrocket. In terms of a two-country version of figure 1, such events induce both loci ( $\dot{d}_C = 0$ ) and ( $\dot{d}_P = 0$ ) in the center and in the periphery to move downward. However, the extent of these movements will be different. Deeper recession and wider public balance deficits in the periphery than in the center will move the locus for stable  $d_P$  values far more down than the corresponding locus for a constant debt-to-GDP ratio in the center will do. We portray these facts in figure 2. Figure 2.a focuses on the periphery, while figure 2.b plots changing dynamics in the center.

Stimulated by these same events, capital markets will not react neutrally to economic recessions and increasing debts in the periphery and in the center. Apparently worsen conditions in the periphery will suddenly induce capitals to leave the country and give rise to a "run to quality". The center, maybe thanks to its better capability to restore growth soon, will provide the right assets on which safely put money. In equations (8) and (19), factor  $\varepsilon_P$  will assume a positive value and lead financial operators to revise country-specific risks. In the periphery, an upward revision of factor  $\sigma_P$  will take place. Central economy bonds, on the contrary, will get higher ratings and the country-risk factor  $\sigma_C$  will decrease. Graphically speaking, asymmetric behaviors of financial markets are portrayed through opposite

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<sup>10</sup> By September 2011, according to the Bank of International Settlements, more than 80 percent of French banks' foreign assets in peripheral Euro countries were concentrated in Italy and Spain. In the case of German banks, their exposure towards Italy and Spain amounted to 67 percent of overall German security holdings in peripheral Euro Member States. In light of this evidence, the above assumptions must be seen in a comparative perspective as a way to remark differences between a *soft* crisis scenario, in which small peripheral countries only risk default, and a much more worrisome crisis in which financial turbulences dramatically increase also in big peripheral economies.

movements in the loci for  $(\dot{\sigma}_P = 0)$  and  $(\dot{\sigma}_C = 0)$ . In figure 2.a, the locus for constant values of  $\sigma_P$  will move to the left. In figure 2.b, the locus for  $(\dot{\sigma}_C = 0)$  will shift to the right.

The final outcomes of these movements depend on their relative intensity. In figure 2 we provide a pretty extreme result, which nevertheless seems to well reflect the existing opposite dynamics between central and peripheral economies. In figure 2.a, higher public deficits, economic recession and financial turbulences all induce substantial increases in the debt-to-GDP ratio  $d_P$  and in the risk indicator  $\sigma_P$  in the periphery. As a consequence of the initial temporary economic shock, the periphery seriously risks to permanently move from equilibrium  $A$  to the new equilibrium  $C$ , in which much higher interest rates will go hand-in-hand with far lower growth rates compared to the before-crisis period. Even worst, should the periphery be initially located in the unstable equilibrium  $B$ , perhaps the case of Greece, the above events could easily set in motion destabilizing dynamics and eventually lead the country to bankruptcy. Note that this could also happen in apparently safer countries such as Spain and Ireland in case financial markets' reactions to the crisis would be so strong to lead the two loci for  $(\dot{\sigma}_P = 0)$  and  $(\dot{d}_P = 0)$  not to intersect any longer.

In the center, a radically different picture emerges. The crisis-driven downward movement in the locus for  $(\dot{d}_C = 0)$  can induce debt-to-GDP ratio to increase. However, financial markets' reactions to the crisis in the periphery and the ensuing capital flights to the center may tame such trend. Actually, a slightly increasing debt-to-GDP ratio may paradoxically combine with a lower country risk factor, easing conditions on credit markets and rebounding growth. Should the reactions of financial markets be sufficiently strong, the debt-to-GDP ratio may even decrease along with a country risk factor close to zero. This is the picture we portray in figure 2.b. It may resemble pretty well what is going on in a large central Euro country such as Germany. Actually, thanks to never-before-seen low interest rates and considerable economic recovery in 2010 and 2011, German debt-to-GDP ratio has started to decrease since 2010 and it is expected to further do so in 2012.



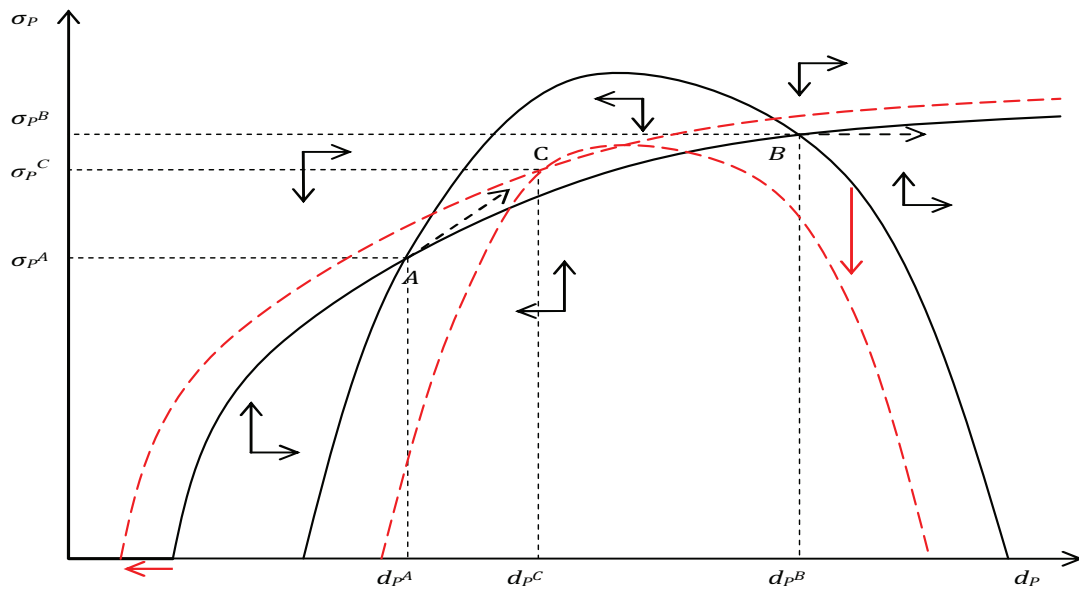


Figure 2.a – Long-run dynamics in the periphery in the aftermath of the 2007-2008 financial meltdown.

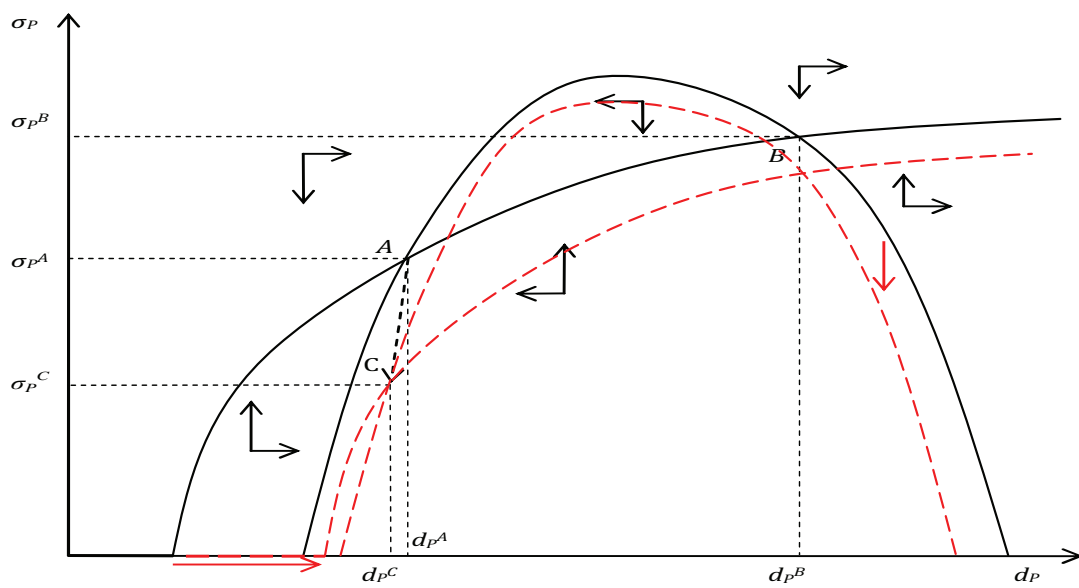


Figure 2.b – Long-run dynamics in the center in the aftermath of the 2007-2008 financial meltdown

### 3.2 The big center-*big* periphery case.

Things radically change and get much more complex in case we consider a *big* peripheral economy. First, trade relationships between a big center and a big periphery are likely stronger than in case of a small periphery. Economic recession in Italy, for instance, will likely have significant negative effects on economic dynamics in Germany, both directly, via Germany-Italy trade relations, and indirectly, i.e. by influencing economic activity in a third country trade partner, let say France. In terms of our model, this implies that  $\left(\frac{\partial g_C}{\partial EX_C} \frac{\partial EX_C}{\partial EX_{C \rightarrow BP}} > 0\right)^{11}$  and vice versa. Second, central economy asset holdings in big peripheral countries are much more substantial than those in small economies. It is thus pretty hard to believe that, center's financial system will be immune to a mounting crisis in the periphery. Actually, the intertwined financial structure of central Euro countries and big peripheral economies would easily give rise to a perverse cycle between bankruptcies in the periphery and financial dislocation in the center. Accordingly, more stringent conditionalities on credit markets may jeopardize investment both in the center and in the periphery, so that  $\left(\frac{\partial g_C}{\partial I_C}\right) \left(\frac{\partial I_C}{\partial P_P^T}\right) > 0$  and  $\left(\frac{\partial g_P}{\partial I_P}\right) \left(\frac{\partial I_P}{\partial P_C^T}\right) > 0$ .

In order to formally analyze center-periphery dynamics in case of big economies, consider the full-extended dynamic system composed by equations (7)-(10) and assess its stability through the four-by-four Jacobian matrix  $J_{C/BP}$ .

$$J_{C/BP} = \begin{bmatrix} \frac{\partial \dot{d}_C}{\partial d_C} & \frac{\partial \dot{d}_C}{\partial \sigma_C} & \frac{\partial \dot{d}_C}{\partial d_P} & \frac{\partial \dot{d}_C}{\partial \sigma_P} \\ \frac{\partial \dot{\sigma}_C}{\partial d_C} & \frac{\partial \dot{\sigma}_C}{\partial \sigma_C} & \frac{\partial \dot{\sigma}_C}{\partial d_P} & \frac{\partial \dot{\sigma}_C}{\partial \sigma_P} \\ \frac{\partial \dot{d}_P}{\partial d_C} & \frac{\partial \dot{d}_P}{\partial \sigma_C} & \frac{\partial \dot{d}_P}{\partial d_P} & \frac{\partial \dot{d}_P}{\partial \sigma_P} \\ \frac{\partial \dot{\sigma}_P}{\partial d_C} & \frac{\partial \dot{\sigma}_P}{\partial \sigma_C} & \frac{\partial \dot{\sigma}_P}{\partial d_P} & \frac{\partial \dot{\sigma}_P}{\partial \sigma_P} \end{bmatrix}$$

The list of equations below explicitly states partial derivatives (evaluated at the steady state) contained in matrix  $J_{C/BP}$  and the corresponding signs:

$$\frac{\partial \dot{d}_C}{\partial d_C} = d_C \left[ \frac{\left(\frac{\partial \Omega_C}{\partial d_C}\right) d_C - \Omega_C}{d_C^2} - (1 + \psi) \frac{\partial g_C}{\partial d_C} \right] \text{ with } \frac{\partial \dot{d}_C}{\partial d_C} < 0 \text{ when } d_C \rightarrow 0 \text{ and } \frac{\partial \dot{d}_C}{\partial d_C} > 0 \text{ when } d_C \rightarrow \infty.$$

<sup>11</sup>  $E_{C \rightarrow BP}$  stands for center exports towards the big peripheral economy.  $E_{BP \rightarrow C}$  represents big peripheral economy's exports to the center.

$$\frac{\partial \dot{d}_C}{\partial \sigma_C} = -d_C(1 + \psi) \frac{\partial g_C}{\partial \sigma_C} > 0$$

$$\frac{\partial \dot{d}_C}{\partial d_P} = -d_C(1 + \psi) \frac{\partial g_C}{\partial EX_C} \frac{\partial EX_C}{\partial EX_{C \rightarrow BP}} \frac{\partial EX_{C \rightarrow BP}}{\partial g_P} \frac{\partial g_P}{\partial d_P} \geq 0$$

$$\frac{\partial \dot{d}_P}{\partial \sigma_P} = -d_C(1 + \psi) \frac{\partial g_C}{\partial P_P^T} \frac{\partial P_P^T}{\partial i_P} \frac{\partial i_P}{\partial \sigma_P} > 0$$

$$\frac{\partial \dot{\sigma}_C}{\partial d_C} = \beta > 0$$

$$\frac{\partial \dot{\sigma}_C}{\partial \sigma_C} = -\beta \frac{\partial \bar{d}_C}{\partial d_C^*} \frac{\partial d_C^*}{\partial \sigma_C} < 0$$

$$\frac{\partial \dot{\sigma}_C}{\partial d_P} = 0$$

$$\frac{\partial \dot{\sigma}_C}{\partial \sigma_P} = 0$$

$$\frac{\partial \dot{d}_P}{\partial d_C} = -d_P(1 + \chi) \frac{\partial g_P}{\partial EX_P} \frac{\partial EX_P}{\partial EX_{BP \rightarrow C}} \frac{\partial EX_{BP \rightarrow C}}{\partial g_C} \frac{\partial g_C}{\partial d_C} \geq 0$$

$$\frac{\partial \dot{d}_P}{\partial \sigma_C} = -d_P(1 + \chi) \frac{\partial g_P}{\partial P_C^T} \frac{\partial P_C^T}{\partial i_C} \frac{\partial i_C}{\partial \sigma_C} \geq 0$$

$$\frac{\partial d_P}{\partial d_P} = d_P \left[ \frac{\left( \frac{\partial \Omega_P}{\partial d_P} \right) d_P - \Omega_P}{d_P^2} - (1 + \chi) \frac{\partial g_P}{\partial d_P} \right] \text{ with } \frac{\partial d_P}{\partial d_P} < 0 \text{ when } d_P \rightarrow 0 \text{ and } \frac{\partial d_P}{\partial d_P} > 0 \text{ when } d_P \rightarrow \infty.$$

$$\frac{\partial \dot{\sigma}_P}{\partial d_C} = 0$$

$$\frac{\partial \dot{\sigma}_P}{\partial \sigma_C} = 0$$

$$\frac{\partial \dot{\sigma}_P}{\partial d_P} = \delta > 0$$

$$\frac{\partial \dot{\sigma}_P}{\partial \sigma_P} = -\delta \frac{\partial \bar{d}_P}{\partial d_P^*} \frac{\partial d_P^*}{\partial \sigma_P} < 0$$

According to partial derivatives' signs, we deal with a Metzlerian matrix. Following Gandolfo (1996), a necessary and sufficient condition for stability thus requires upper-left minor principals of matrix  $J_{C/BP}$  to alternate in sign starting with a minus sign associated to  $(\partial \dot{d}_C / \partial d_C)$ . Depending on the various signs that part of the above derivatives may assume, several stability scenarios exist. It is easy to see that stability condition will be immediately violated in case of a pretty high debt-to-GDP ratio in the center such that  $(\partial \dot{d}_C / \partial d_C) > 0$ . Let thus consider the simplest and, say, safest scenario possible in which both the center and the big peripheral country present low values of their own debt-to-GDP ratios, so that:  $(\partial \dot{d}_C / \partial d_C) < 0$ ;  $(\partial \dot{d}_P / \partial d_P) < 0$ ;  $(\partial \dot{d}_C / \partial d_P) = 0$  and  $(\partial \dot{d}_P / \partial d_C) = 0$ . In this context, it is immediate to verify that:

$$|J_{C/BP}^1| = |\partial \dot{d}_C / \partial d_C| < 0$$

$$|J_{C/BP}^2| = |J_C| > 0$$

$$|J_{C/BP}^3| = (\partial \dot{d}_P / \partial d_P) |J_C| < 0$$

Once satisfied the above three sub-conditions, local stability also requires  $|J_{C/BP}| > 0$ . After a quite considerable amount of algebra, it is possible to show that:

$$|J_{C/BP}| = \frac{\partial \dot{d}_C}{\partial d_C} \frac{\partial \dot{\sigma}_C}{\partial \sigma_C} \begin{vmatrix} \frac{\partial \dot{d}_P}{\partial d_P} & \frac{\partial \dot{d}_P}{\partial \sigma_P} \\ \frac{\partial \dot{\sigma}_P}{\partial d_P} & \frac{\partial \dot{\sigma}_P}{\partial \sigma_P} \end{vmatrix} - \frac{\partial \dot{\sigma}_C}{\partial d_C} \left\{ \frac{\partial \dot{d}_C}{\partial \sigma_C} \begin{vmatrix} \frac{\partial \dot{d}_P}{\partial d_P} & \frac{\partial \dot{d}_P}{\partial \sigma_P} \\ \frac{\partial \dot{\sigma}_P}{\partial d_P} & \frac{\partial \dot{\sigma}_P}{\partial \sigma_P} \end{vmatrix} - \frac{\partial \dot{d}_P}{\partial \sigma_C} \left( -\frac{\partial \dot{\sigma}_P}{\partial d_P} \frac{\partial \dot{d}_C}{\partial \sigma_P} \right) \right\}$$

That is:

$$|J_{C/BP}| = |J_C| |J_P| - \beta \delta \left( \frac{\partial \dot{d}_P}{\partial \sigma_C} \frac{\partial \dot{d}_C}{\partial \sigma_P} \right) \geq 0 \quad (11)$$

From expression (11), the sign of  $|J_{C/BP}|$  can be either positive or negative. In the first case, the four-by-four dynamic system is locally stable. Otherwise, instability arises. In a big center-big periphery context, stability cannot be assured even in the safest scenario possible assuming low initial values of debt-to-GDP ratios in both economies. Note that in such a context both systems would be stable if considered individually. Instability, however, may emerge due to the financial links connecting them (see cross-country factors  $(\partial \dot{d}_C / \partial \sigma_P)$  and  $(\partial \dot{d}_P / \partial \sigma_C)$ ). The more financially integrated countries are and the more exposed single-country credit institutions are to financial turbulences in the partner country, the higher the likelihood that financial instability in a big peripheral economy will extend to the center and give rise to generalized Eurozone instability. Of course, instability would get even worse should the periphery be in a more precarious position characterized by a high debt-to-GDP ratio. In such a case, also a temporary and small shock may generate explosive dynamics with negative effects on both peripheral and central economic activity.

In order to figure out the point in a perhaps clearer way, try to modify figure 2 according to the new assumptions introduced. We do this in figure 3. In figure 3, the onset of the crisis follows the same lines seen in case of a small peripheral country. However, possible center-periphery initial diverging trends may now be replaced by cross-country similar dynamics when degrading financial conditions in the periphery will impinge financial institutions' solidity in the center. In figures 3.a and 3.b, this event is represented by a sequence of downward movements in the two loci for  $(\dot{d}_C = 0)$  and  $(\dot{d}_P = 0)$ , which will now feed back each other and spread financial and economic crisis in the overall Eurozone. It is now easy to see that in case such a perverse cycle would effectively take place, no center-periphery diverging trends will exist any longer. Quite the opposite, the breakdown of the overall Eurozone will appear as more than a concrete possibility.

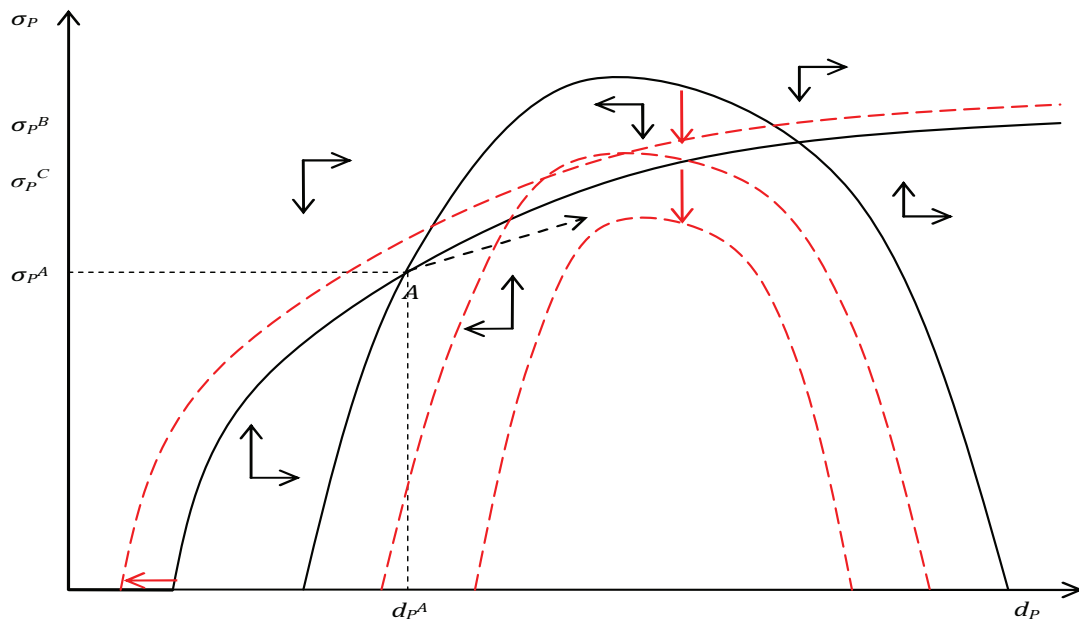


Figure 3.a - Periphery financial instability in the center-*big* periphery case

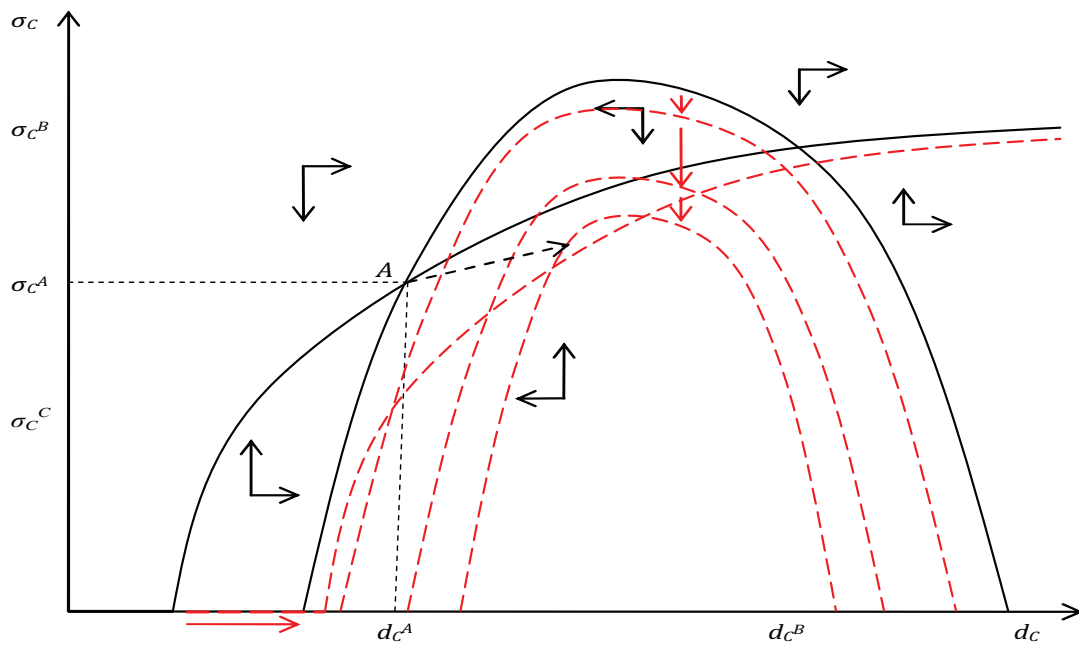


Figure 3.b - Center financial instability in the center-*big* periphery case.

#### 4. The Myopic Logic of Fiscal Austerity and the Need for a Monetary Sovereign European Federal Government

According to the analysis above, center-periphery diverging trends and conflicting claims may disappear in case default risks will deepen in big peripheral economies and spread also in central Member States. It is thus straightforward to wonder which kind of common response Euro Member States could adopt, if ever, to avoid the risk of a dramatic Euro-system breakdown. Do Member countries have to continue on the way of fiscal austerity and rigorously adhere to the so-called Fiscal Compact? Alternatively, do we have to hope in a reform of the Euro system towards the creation of a fully sovereign federal European Union admitting more space for a federal expansionary fiscal policy?

As to the fiscal austerity-based strategy, the Fiscal Compact does not add much to the already operative Stability and Growth Pact (SGP) nor it excludes, a priori, expansionary fiscal stances to be adopted in case of extraordinary events. Nevertheless, it remarks even more strongly than before the balanced budget principle as the general rule Euro Member States have to follow. First, such rule must be enforced through Member States' laws, better if constitutional laws. Second, fiscal deficits must be temporary and short-lived. Euro Member States are demanded to put in place automatic mechanisms to rapidly downsize fiscal deficit deviations from their medium-term targets, even in case of temporary deviations justified by extraordinary circumstances. The general philosophy of the fiscal compact is such that fiscal policy should be hardly available as stabilization tool and that Euro Member countries should be prohibited to run considerable fiscal deficits in the same ways sovereign States like US, UK and Japan have done since 2007.

According to our analysis, such kind of tighter Euro country coordination does not address the core point of Eurozone difficulties. Indeed, all the perverse center-(big) periphery mechanisms that can deepen economic recession and spread it in the overall Eurozone are still at work even in presence of the Fiscal Compact. To see this, assume that, under the provisions of the Fiscal Compact, the two loci for  $(\dot{\sigma}_c = 0)$  and  $(\dot{\sigma}_p = 0)$  are pretty steep and start from the origin of the axes in the farthest left position possible<sup>12</sup>. Assume also that both the center and the periphery have initial debt-to-GDP ratios in line with the corresponding

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<sup>12</sup> The Fiscal Compact imposes Euro countries to have a structural public balance deficit no higher than 0.5 percent of GDP (1 percent in case of Euro countries with a debt-to-GDP ratio lower than 60 percent). In terms of our model, this would imply a surplus or, at least, balance equilibrium in the primary public budget, hence  $\Omega_{C(P)}^* \leq 0$  and  $d_{C(P)}^* \leq 0$ . For simplicity, here we assume such inequalities to hold with strict equality signs.

long-run values  $d_C^*$  and  $d_P^*$  implied by the Fiscal Compact and therefore equal to zero. We portray these scenarios in figures 4.a and 4.b.

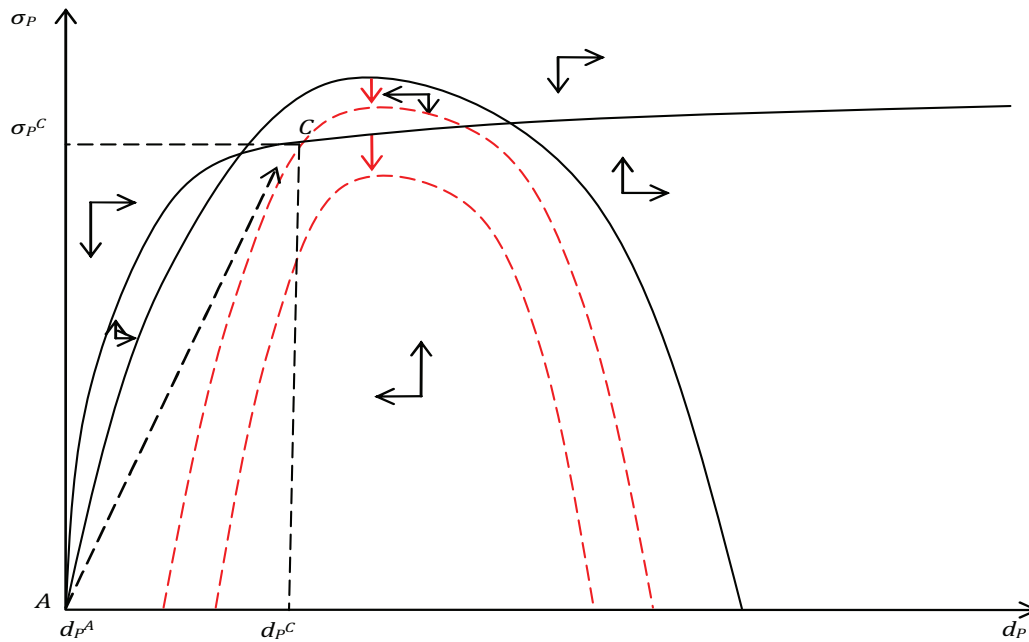


Figure 4.a – Periphery financial instability in presence of the Fiscal Compact

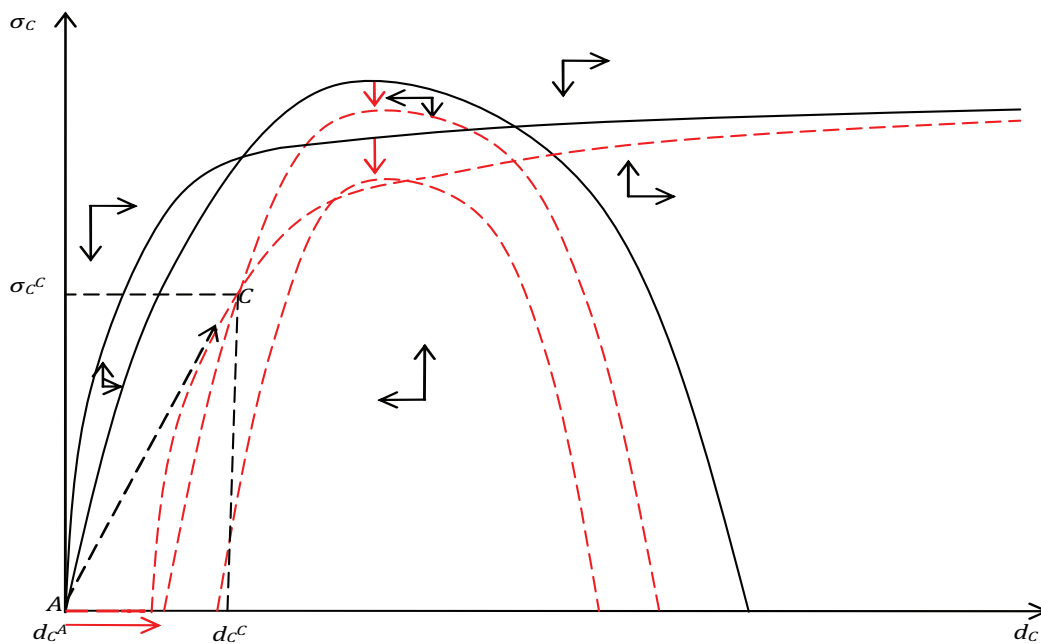


Figure 4.b – Center financial instability in presence of the Fiscal Compact

Now imagine that a global recession like the 2007-2008 crisis hurts. Accordingly, the two loci for  $(\dot{d}_C = 0)$  and  $(\dot{d}_P = 0)$  move downwards. Again, despite of capital flights from the



periphery to the center, Euro countries' risk factors may increase in both economies and trigger off the downward spiral we already seen above. Further, the automatic fiscal correction mechanisms envisaged by the Fiscal Compact may even destabilize debt-to-GDP ratios in Euro Member countries. First, restrictive national fiscal stances may exacerbate economic recessions in their own countries and, this way, hinder fiscal consolidation itself. Second, a fallacy of composition problem may arise. Actually, in presence of a systemic recession, all Euro Member countries will have to simultaneously implement fiscal corrections regardless of the effective solidity of their public balances. Fiscal austerity in the big periphery will thus jeopardize growth and economic recovery in the center, which, in turn, due to its own fiscal stabilization package, will reduce economic activity in the periphery. Eventually, the obsession for fiscal austerity may result in a Eurozone center-periphery lose-lose game.

Reforms in the European governance and in the coordination of Member States economic policies should aim at strengthening Euro countries' fiscal solidity and, at the same time, providing enough room for expansionary counter-cyclical policies. Austerity packages alone do not help growth and eventually risk to endanger public balance stability. Fiscal consolidation and the balanced budget rule foreseen by the Fiscal Compact may somehow be useful in case they should be part of a much wider reform agenda. The final achievement of such agenda should be the creation of a full-fledged European Federal Union. According to the analysis above, such political entity should rely on two main features.

1. Due to financial market distress, Euro Member States and in particular peripheral countries are de facto impeded to run expansionary fiscal policies. Fiscal policies should therefore be implemented by European authorities. In institutional terms, this amounts to say that nowadays Eurozone should be transformed in a federal union with a federal government charged to run fiscal policies eventually financed by issuing European Treasure Bills. More in detail, a fully developed European federal government should have the right to levy federal taxes on European citizens and to dispose of a federal budget. The European government should take care of providing some social services connected, for instance, to the pension system and unemployment safety net. Last but not least, the federal European government should implement an European industrial policy whose aim, among several, is to progressively eliminate structural differences among Euro countries and to level off regional inequalities. Actually, diverging trends among central and peripheral Euro countries also depend on their asymmetric productive structures. The ensuing Eurozone imbalances and Member countries different capabilities to deal with economic recessions

can be hardly eliminated through painful macroeconomic adjustments and internal devaluations aiming to improve cost competitiveness only. Long-term industrial and development policies can do this. The process of market integration and the European competition policy limit the possibility of national governments to run industrial and regional policies by their own. These kind of policies must thus be implemented at European level.

2. The future European federal Union must have full monetary sovereignty. In this sense, the ECB should be transformed in the central bank of the European federal union and should be empowered of a lender-of-last-resort function. According to the MMT, this passage is fundamental to stop financial speculation and avoid any possible fear about European federal government financial soundness. Moreover, such a change does not threat central bank independence from the political sphere. Actually, it is useful to keep clear in mind the difference between an independent central bank and a detached central bank (Palley, 2011). In the first case, central bank is absolutely free from external influences in its decision making and can freely decide to buy or not to buy government bonds according to the objectives of the monetary policy. In the second case, central bank is explicitly prohibited to buy government bonds or any other public institution liability. Whilst this last case corresponds to the nowadays ECB, the US Federal Reserve and the Bank of England are examples of independent-but-not-detached central banks. Future developments of the ECB should move it towards such an Anglo-Saxon model in order to provide the European federal union with the complete prerogatives and financial credibility of sovereign states.

Which would be the consequences of these institutional changes in our center-periphery model? First, thanks to the existence of a European federal government, the costs of anti-cyclical measures will largely move from national public balances to the European federal budget. Accordingly, whilst Member States may safely pursue some balanced budget rule without hampering economic activity, growth can be supported and brought back soon by counter-cyclical policies adopted by the federal government<sup>13</sup>. In terms of the graphical representations above, both loci for stable debt-to-GDP ratios in the center and in the periphery will barely move downward or remain in the same original positions. Second, and perhaps more relevantly, financial markets will not react nervously to the outbreak of the crisis and they will not give rise to center-periphery capital flights. Actually, fiscal stimuli to economic activity and financial system's rescue programs will not burden national

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<sup>13</sup> See Auerbach (2008) and National Conference of State Legislature (2010) on such kind of institutional arrangement in the US.

government balances, so that no fear of national government insolvency will upset financial markets. Speculative forces will not get strength; liquidity will not dry in the periphery and move to the center. Accordingly, no asymmetric movements in the two loci for stable values of  $\sigma_C$  and  $\sigma_P$  will take place and Euro Members' country-risk factors will not be revised upward. In this much safer context, it is easy to see that all the feedback mechanisms giving rise to a race to hell and to a perverse spiral between increasing debt service costs, fiscal correction and deepening crisis will likely be broken.

Of course, pretty relevant fiscal deficits may now emerge at federal level, with the federal European government financing expenditures by issuing Eurobonds. However, Eurobonds will be hardly subjected to speculative attacks, since that financial markets will perfectly know that the European government has full monetary sovereignty and that the ECB will back it in case financial turbulences should emerge. Actually, Eurobonds may appear as safe assets and temporarily represent the best options for portfolio investment insofar as recession is over, economic activity recovers and private assets return in the preferences of financial operators. This seems to be what is going on in sovereign States such as US, UK or Japan, where Treasury Bills' interest rates are at never-before-seen low levels despite of remarkable fiscal deficits, actually higher than those recorded on average in the Eurozone, and fast increasing debt-to-GDP ratios (De Grauwe, 2011; 2012).

## 5. Conclusions

In this paper, we argue that, in the aftermath of the 2007-2008 crisis, the *incomplete* nature of the Euro system as compared to a fully developed federal union has created the proper environment for diverging trends to emerge between central and peripheral Member States. Such divergences and the ensuing conflicting claims can now seriously feed peripheral country' crisis. Even worse, they may eventually spread instability all around Europe and, paradoxically, eliminate any center-periphery dichotomy should financial turmoil deepen also large peripheral economies.

The strategy adopted so far to end the crisis has been generalized fiscal austerity. However, the results have been disappointing since the crisis is still on and may even worsen. In our view, a more general reform agenda, whose final purpose is the introduction of a federal European government together with a lender-of-last resort government banker is the decisive step to end the crisis.

We are well aware that the creation of a fully operative Eurozone federal government is a far-reaching objective which will be ferociously disputed and cannot realistically provide immediate relief from existing difficulties. Accordingly, which are some initial and perhaps narrower steps to be taken in the short run to stop the crisis? In the most recent period, economic chronicles have put emphasis on new monetary measures established by the ECB. Attention is on the ECB Board announcement of an unlimited Euro country bond-buying program aiming to strike speculation, reduce interest rates and debt service costs, favor fiscal consolidation in peripheral economies. We all know that these measures are the result of intensive political bargaining among Euro countries' Heads, the ECB and the European institutions. Further, they do not get the support of all the authorities involved in the decision process (see the opposition of the Deutsche Bundesbank) and their adoption is conditional to the launch of austerity programs and structural reforms in the helped countries. Despite all these limits, there are no doubts the ECB unlimited bond-buying program stands out as the most reasonable initiative policy makers could take to tame the crisis in the short term. It probably represents the first measure emending the strict monetarist paradigm inspiring the ECB statute. This monetary measure is not enough. Actually, sustained growth and full recovery from the recession will hardly take place without considerable expansionary fiscal stances. Nevertheless, it will be much easier to find room for expansionary stances, at national level and at European level, in presence of an interventionist monetary policy which contrasts financial speculation and ensures financial markets that the "Euro is irreversible (Mario Draghi, ECB Press Conference, September 6<sup>th</sup> 2012)".

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