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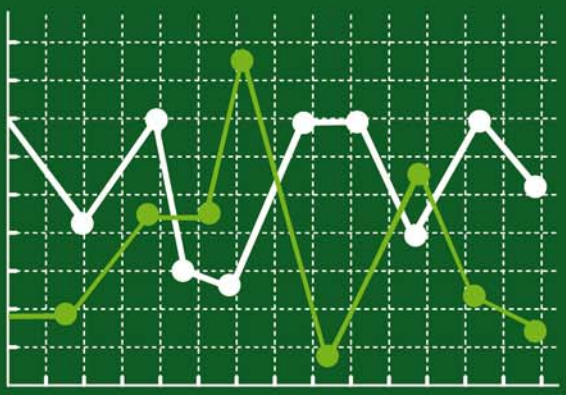

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UNHAPPY FAMILIES ARE ALL ALIKE: MINSKYAN CYCLES, KALDORIAN GROWTH, AND THE EUROZONE PERIPHERAL CRISES

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Abstract – It is frequently claimed that the economic and financial crises in the Eurozone peripheral countries depend on different, country-specific causes. In one case the crisis would depend on a real estate bubble (Ireland, Spain), in another on deceitful government manipulating the national accounts (Greece), in still another on corrupted government postponing essential reforms (Italy). While these claims can always be supported by anecdotal evidence, one may wonder whether a unified framework exists that provides a more consistent explanation of the most massive failure in macroeconomic management since 1929. In this paper we try to interpret the Eurozone peripheral crises in the light of the Minskyan cycle theory, and in particular of its recent applications to developing countries crises. A closer look at the pattern of the macroeconomic fundamentals shows that the different Eurozone crises are actually consistent with this unified framework, thereby providing some important lessons to European policy makers.

JEL Codes: E12, F36, G01, 052

1. Introduction

Four years after the onset of the Eurozone peripheral crisis, neither the scientific nor the public debate seem to have reached a consensus view about its causes. While in the academia the opinion slowly prevails that regional external imbalances were at the root of the crisis, as they led to the massive accumulation of net external liabilities from the private sector (Eichengreen, 2010, De Grauwe, 2010), in the Eurozone media the current (May 2012) fashionable interpretation puts the blame on fiscal profligacy from the peripheral government, leading to the accumulation of an unsustainable government debt. This shift in attitude between the two debates depends on many things, including the different political and distributional implications of the two explanations, and the difficulty in explaining to the general public what external debt is, as compared to public debt.

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Be it as it may, these debates seem to have reached an agreement on at least one point, namely, that every Eurozone peripheral country was hit by the crisis in its own way: Greece would have been destroyed by its government's "creative finance" and corruption, leading eventually to a solvency crisis, while Italian government would be "illiquid but not insolvent", Spain and Ireland would have experienced a real estate bubble (possibly fuelled by government neglect or profligacy), and so on. This is what I call the "Anna Karenina paradigm", from the well-known Tolstoj novel which begins: "Happy families are all alike; every unhappy family is unhappy in its own way". The "Anna Karenina" paradigm is a particular case of the "this time is different" attitude, criticised by Reinhart and Rogoff (2008), i.e. of the idea that each financial crisis would be the consequence of a series of unfortunate and mostly idiosyncratic events, that would make each crisis unpredictable and a case in its own, with no particular relation with other crisis episodes. This view is disproved by economic history, which instead tells us that some common features were present in most previous episodes of financial crisis. European economists however push the "this time is different" argument even further, by claiming that "this time *and in this place* it is different".

Analysing differences between different situations is no doubt a useful task. However, Occam's razor warns us against multiplying unnecessary explanations. Moreover, in this particular case I think that insisting on the synchronic and diachronic differences of the Eurozone peripheral crises leads to biased and perhaps unintended outcomes. On the one hand, by insisting on "differences" one runs the risk of dispersing the attention on anecdotal evidence: the leaves conceal the tree. On the other hand, insisting on the "novelty" of the present Eurozone predicament, amounts to denying the usefulness of any historical analysis. However, this is certainly not the first, and probably not the last time, that a country or a group of countries are crushed under the weight of too heavy a currency. Many cases have already been analysed, more or less in depth, in the economic literature, and it would be questionable, if not suspect, to suggest (even implicitly) that there is nothing to be learned from these experiences. Just to mention a few cases, consider Churchill's decision to re-enter the gold standard in 1925 at the pre-WWI gold parity (Keynes, 1931), which promoted a similar decision by Mussolini to reach the so-called "quota 90" (90 Italian liras for one pound), or, coming to more recent experiences, the dramatic experience of the so-called "credible EMS" between 1987 and 1992 (Frankel and Phillips, 1992). All these experiences occurred, at different points in time, in Europe, and they all ended up in the same way: the "strong currency policy", whatever its intended motivations, and whatever the global economic and political context, failed, and had to be abandoned.

Developing countries provide many more examples of what happens when a country decides (or is advised to decide) to adopt too strong a standard of value, in particular by pegging to the US dollar, be it through a "soft peg", such as the one implemented by some Asian countries before the 1997 financial crisis (Calvo and Reinhart, 2002), or through straight "dollarization", as was the case in the "currency boards" adopted in Latin America (Berg *et al.*, 2002). A particularly telling case for the Italian public is that of Argentina, which is well known in Italy both for the very close

cultural ties between the two countries,[1] and for the consequences of its 2001 default, which hurt a number of Italian small creditors. For this reason, in the last decade Argentina has been omnipresent in the Italian debate: initially as an example of the dangers that the euro would ward off (which is rather paradoxical in my view, if one consider the close analogy between tying the peso to the dollar, on the one hand, and the lira to the Deutsche mark, on the other); nowadays, as an example of how leaving the euro would rescue (or destroy) Italy, as well as other Eurozone peripheral economies.

In this paper I try to reverse the "Anna Karenina approach" to the Eurozone peripheral crises. What I would like to show is that, contrary to current convetional wisdom, these crises "are all alike": they reproduce, in their essence, the main features of Minsky's (1982) "boom and bust" cycle in developing countries, as described by Taylor (1998) and more recently by Frenkel and Rapetti (2009). In my opinion, this reversal of perspective, besides being supported by empirical evidence, provides many further useful insights. First, it allows us to identify the common roots of the apparently different crises and possibly to define common management or exit strategies, looking at the previous historical experiences; second, the adoption of a common framework allows us to gauge the effective relevance of country idiosyncratic features in the explanation of what is going on in the Eurozone.

In this respect, our analysis shows that as far as the two major peripheral countries are concerned, i.e. Italy and Spain, the "market-driven destabilization" mechanism described by Taylor (1998) has interacted with another well-known tenet of post-Keynesian development economics, the Verdoorn (1949) – Kaldor (1957) model of cumulative growth, as set-out by Thirlwall (2002) or León-Ledesma (2002). The basic intuition of Taylor (1998) is that in developing countries the Minskyan cycle is set off by an exogenous change of macroeconomic policy, which invariably comprises the adoption of a "credible" (i.e., fixed) nominal exchange rate. The post-Keynesian cumulative growth model implies that, besides its effects on the financial market, the shock determined by this nominal rigidity feeds back, through exports and output growth, on productivity, thereby inducing a further divergence in price competitiveness between the peripheral and core countries. This mechanism compounds its cumulative effects with the Minskyan cycle, leading to a particularly perverse situation where a country may see its net external liabilities grow, even if its real growth rate is not booming (as envisaged in the standard explanation by Frenkel and Rapetti, 2009).

The remainder of the paper is as follows. Section 2 briefly describes the two models taken as a starting point for our interpretation of the Eurozone peripheral crises. Section 3 discusses some features of these crises that are apparently at odds with the reference framework. Section 4 analyses the sectorial financial balances of selected Eurozone core and peripheral countries in order to investigate the responsibility of the private and public sectors in the evolution of the countries' net foreign assets. Section 5 presents in a standardized way the patterns of the macroeconomic fundamentals in Greece, Italy, Portugal and Spain, assessing their consistency with the Minskyan reference framework. Section 6 draws some conclusions and indicates directions for future research.

[1] Argentina hosted more than 26 million Italian migrants between 1876 and 1976, and Italy, in turn, was chosen by many Argentinians as a refuge in the years of the military dictatorship.

2. The reference frameworks: Minskyan cycles and Kaldorian growth

In this section we briefly set out the theoretical reference framework used in this paper to reconcile the apparently disparate evidence on the Eurozone peripheral crises (the "unhappy families"). This framework integrates two well-known models: the Minskyan boom-and-bust cycle, and the Verdoorn-Kaldor model of cumulative growth. We do not make any attempt to integrate these models at a formal level: we just single out their main implications in terms of observable variables and use them to interpret the main stylized facts of the Eurozone crisis.

2.1Minskyan cycles in peripheral countries

Since the outbreak of the crisis, references to Minsky's analysis of financial instability have become usual in the economic literature (see Seccareccia, 2010). The standard explanation of the Minskyan mechanisms emphasises the endogenous nature of the instability (for a survey and an analytical explanation see Charles, 2008), determined by the agents' changing risk perception in different stages of the economic cycle, coupled with the destabilizing role of financial innovation. Moreover, most of these explanations refer to closed economies, or, at least, do not assign a distinct role to foreign capital flows. For several reasons, these features are somehow unsatisfactory when it comes to the analysis of the developing countries' financial crises of last three decades. Consider for instance that in developing countries repressed financial markets and backward financial institutions do not provide a particularly favourable environment to (destabilizing) financial innovation; moreover, the huge literature on "current account reversals" (Bagnai and Manzocchi, 1999) or "sudden stops" (Calvo, 1998) stresses that financial crises in developing countries are always anticipated by massive inflows of foreign capital: therefore, the destabilizing role of *foreign* finance is an important stylized fact that must be taken into account.

This is done among others by Taylor (1998) and Frenkel and Rapetti (2009),who revise the standard model in two ways: first, they consider the trigger of the boom phase to be not an "endogenous" change in domestic agents' risk perception, but rather an exogenous macroeconomic policy change (usually required by foreign multilateral institutions); secondly, they explicitly take into account the role of international capital flows in the build-up of the crisis. Following Frenkel and Rapetti (2009), a typical "peripheral" country's crisis occurs through the following seven steps[2]:

1) Multilateral agencies "suggest" that the peripheral country considers a "structural reforms" package typically including:
    a. domestic financial market liberalization;
    b. international capital movement liberalization;
    c. adoption of a "credible" or fixed nominal exchange rate with respect to the "core" or "anchor" country.
2) By reducing the exchange rate risk and raising domestic interest rates this policy change brings about favourable arbitrage opportunities between

[2] This numbering of the different stages of the crisis is proposed here only to simplify future reference and does not feature in Frenkel and Rapetti's paper.

domestic and foreign financial assets. Domestic players issue foreign debt (bought by foreign creditors) to take advantage of these opportunities.

3) Capital inflows determine an increase in domestic liquidity, hence in domestic credit to the private sector, which in turn brings about:
    a. a fall in domestic interest rates (as well as in interest rate spreads);
    b. an increase in output and employment;
    c. an increase in prices.
4) The ensuing real exchange rate appreciation sets off a cumulative process through two channels:
    a. a financial one: capital inflows are fostered by the expectations of capital gains on domestic assets;
    b. a real one: a worsening of the trade balance leads to a current account deficit, hence to further capital inflows.
5) At a given point in time, some players realize that the fixed exchange rate is not credible anymore, and begin to undo their position in domestic assets, in order not to bear the risk of devaluation. This determines a "sudden stop" or even a "reversal" in foreign capital inflows.
6) The domestic central bank "defends" the exchange rate parity by raising interest rates, in order to attract foreign capital. This, however, usually worsens the financial position of the public sector, sending even more negative signals to the markets. Further rises in domestic interest rates are required, but the rise in interest spreads makes the markets increasingly nervous.
7) A "run" on the domestic central bank reserves follows, which usually forces the country very quickly out of its "credible" exchange rate rule. This leads to nominal devaluation and a "twin" (financial and balance-of-payments) crisis.

Some features of this cycle are worth noting.

First, in the early stage of the Minskyan cycle the peripheral economy does generally experience a real growth boom, fuelled by massive foreign capital inflows.

Secondly, the financial crisis does not originate in the public sector. On the contrary, real growth expansion in the early stages of the cycles generally ensures that the government budget balance and the public debt-to-GDP ratio improve. As a rule, the financial fragility in the peripheral economy is determined by an increasing financial exposure of the private sector.

Thirdly, the cycle is initially fostered by nominal divergence among the core and peripheral economies. In the early stages, it is the spread between domestic and "core" interest rates that sets off the mechanism by attracting foreign capitals to the periphery. The cumulative causation sets in through divergence between the peripheral and core inflation rates, which feeds back into the current account deficits (following a real exchange rate appreciation in the peripheral country), which in turn determines further capital inflows.

Fourthly, it is worth mentioning that the claim that the subprime crisis can be interpreted as a "Minsky moment" has been questioned by some post-Keynesians authors (e.g. Davidson, 2008). The subprime mortgage crisis has no doubt been the trigger of the Eurozone peripheral crises, contributing in particular to step 5 of the

mechanism set out above. As such, a reflection on its true origin is obviously relevant. However, in this paper I concentrate on a different issue. Rather than investigating whether the "classical" Minsky model explains what happened in the US in 2007 (which is the point raised by Davidson), I will focus on whether the "core-periphery" Minsky model developed by Taylor (1998) and Frenkel and Rapetti (2009) contributes to the explanation of what happened afterwards in the Eurozone.

2.2 Verdoorn-Kaldor cumulative growth model

In *The nature of economic growth* Tony Thirlwall (2002), building on his seminal work (Thirlwall, 1979), sets out a model of cumulative causation that explicitly recognizes the role of aggregate demand in determining a self-sustained increase in the rate of real growth. At the heart of the model lies the so-called Verdoorn law (from Verdoorn, 1949), also known as "Kaldor's second law of growth" (from Kaldor, 1966), stating that the rate of growth of productivity depends on the rate of growth of output (plus an autonomous productivity growth component). This empirical regularity has been subject to extensive empirical testing, and was generally found to be robust across countries and sectors. Its rationale lies in the presence of increasing returns and dynamic returns of scale. In Thirlwall's (2002) words, Verdoorn's law "opens up the possibility of a virtuous circle of export-led growth". This cumulative and circular causation develops along the following lines:

1) any shock that induces a faster export growth determines a faster output growth, through Hicks' (1950) open-economy supermultiplier (or any other export-led growth mechanism);
2) the increase in output growth brings about an acceleration in labour productivity, through Verdoorn's law;
3) the acceleration in productivity determines a fall in unit labour costs, hence an improvement of the country's price competitiveness;
4) this increase in price competitiveness feeds back on export growth, thus giving rise to a self-sustained increase in real growth.

This process however can also go the other way round: any shock that depresses the rate of growth of real exports can bring about a sustained decrease in the rate of growth of average labour productivity.

What are the bearings of this model to the Minskyan cycle described above? There are at least two points where the interactions between these two models are relevant to our analysis.

First, Verdoorn's law implies that any nominal shock that depresses the exports growth rate can exert a lasting effect on the growth rate of average labour productivity. Thus, a nominal revaluation, or, in a dynamic context, the adoption of a more rigid or even fixed exchange rate (which prevents the peripheral country from accommodating an adverse inflation differential) may exacerbate stages (3) and (4) of the Minskyan mechanism through its effects on labour productivity, and hence on price competitiveness. A previous attempt to integrate the two models in this respect has been done by Frenkel and Taylor (2006).

Secondly, central to Thirlwall's (1979, 2002) analysis is the concept of balance-of-payments constrained long-run growth rate, i.e. the rate of growth above which an economy incurs in a structural current account deficit. The BoP-constrained rate could also be defined as the (maximum) financially sustainable growth rate, namely the rate of growth that cannot be overcome without resorting to a net inflow of foreign financial resources. Thirlwall shows that under fairly general conditions a sustained real appreciation lowers this financially sustainable rate. Such a sustained real appreciation may be determined by a fall in the rate of growth of labour productivity, initiated by the adoption of a "credible" or "fixed" exchange rate. This implies that after an exogenous policy change such as the one considered at stage (1) of the Minskyan cycle, a country may start to accumulate net external liabilities even if its real growth rate is not booming by historical standards, simply because the shock determined by the policy change has lowered the country's financially sustainable growth rate in the first place.

These remarks will be useful when looking at the differences between the Eurozone peripheral crises.

2.3An example: Italy in the "new EMS"

Developing countries provide uncountable examples of the Minskyan mechanism: an exhaustive list is presented by Frenkel and Rapetti (2009), who also examine five of them in detail (Chile 1982, Mexico 1988-1995, Thailand 1997, Korea 1997, Argentina 2001). It has gone unnoticed, as far as I know, how closely this mechanism explains some industrial countries crises, such as the 1992 EMS crisis in Italy. Table 1, following the same scheme as the Tables in Frenkel and Rapetti (2009), illustrates this point.

The exogenous policy shock that set off the cycle was the inception of the so-called "new EMS". This new regime was informally adopted after the DM-area revaluation occurred on January 1st 1987 and was characterized by two typical features: a move towards financial liberalization (of international capital flows in particular), and the decision to proceed to exchange rate realignment only under exceptional circumstances (Giavazzi and Spaventa, 1990; Frankel and Phillips, 1992). Moreover, since January 5th 1991, Italy entered the narrow band of oscillation around its central parity (±2.5% instead of the previous ±6%), thereby introducing a further nominal rigidity. This was part of a strategy inspired by Giavazzi and Pagano's (1986, 1988) analysis, according to which governments in peripheral countries would have benefited of large credibility gains by "tying their hands" with a stronger commitment towards the nominal anchor of the EMS (Germany), and this would have helped them in pursuing nominal convergence (i.e. deflationary policies).

As shown in Table 1, things went differently: the developments following this policy change adhered closely to the Minskyan scheme described in Section 2.1 above, rather than to the masochistic "advantages of tying one's hands" tale.

First, the adoption of a "credible" exchange rate rule determined a raise in foreign capital inflows, which increased steadily from 0.3 GDP points in 1986 to 3.8 GDP points in 1990 (stage (2) of the Minskyan cycle). Domestic liquidity increased, and domestic credit to the private sector rose steadily from 50 to 60 GDP points between 1987 and 1992. As a consequence, the interest rate spread corrected for the nominal devaluation first rose to 2.9 in 1988, then declined reaching 0.7 in 1991 (the year before the crisis). In the early stages of the cycle real growth was positively affected by the

increase in domestic liquidity, topping 4.2% in 1988 (also because of a buoyant world demand). Prices kept rising at a faster pace than in the "anchor" country: in other words, Italy got no clear advantage in terms of deflationary policies from having tied its hands to Germany (Acocella, 1998): on the contrary, the inflation, after a first decrease, rose slightly in 1990, despite a sharp fall in the real growth rate (stage (3) of the Minskyan cycle). After a moderate depreciation in 1988, the real exchange rate appreciated steadily. The trade balance turned to a moderate deficit. The much larger worsening of the current account was driven by a fall in net foreign income from abroad, because of interest payments on foreign capitals (stage (4)). The bell tolled in 1991. Until 1990 the capital inflows had more than compensated the current account deficit, resulting in an accumulation of official reserves. In 1991, when Italy entered the "narrow band", the trend of capital inflows was reversed (from 3.8 to 2.0 GDP points) and Italy experienced the first tensions in the currency market, as witnessed by a decrease in official reserves (stage (5)). The final stage took place in 1992, when the Italian lira, after a record of six growing current account deficits, underwent a massive speculative attack that pushed it out of the EMS. A massive run on Italy's official reserves ended up with a 20% nominal devaluation. Interestingly enough, the nominal devaluation not only reversed the trade balance, bringing it to 2.8 GDP points in 1993 after five years of moderate deficits, but it also reversed the sign of the productivity growth spread: in 1993 average labour productivity growth in Italy was 0.5 points above the value it took in Germany, after a minimum of -3.6 points reached in 1991 (the year in which Italy entered the "narrow band"). This pattern is fully consistent with the Kaldor-Verdoorn mechanism.

The only feature that distinguishes this case from those studied by Frenkel and Rapetti is the pattern of the government budget balance. In Italy the government balance was negative and almost constant around -11 GDP points. Real growth was not fast enough to determine any noticeable improvement. This was partly determined by the fact that since 1979 the EMS partnership had forced Italy to raise its interest rates in order to "defend" the central parity of the lira. This change in monetary policy was further strengthened by the so-called "divorce" of Italy's Central Bank from the Ministry of Treasury, i.e. by the decision of the central bank not to intervene anymore in the primary market for public debt securities. As a result, the average real government bond yield jumped by 10 points, from about -6% in 1980 to about 4% in 1982, and was on average equal to 6% afterwards, setting the public debt-to-GDP ratio on a dynamically unstable path and overburdening the Italian government budget with huge interest expenses.

3. Two optical "euroillusions"

Although the Minskyan framework seems to explain well what went on in Italy in 1992, does it provide any clue about what is going on twenty years later in the Eurozone peripheral countries?

If we believe the conventional interpretation of the current crisis, the answer must be negative. As a matter of fact, in the Minskyan framework the financial crisis originates in the private sector, in a context of buoyant real growth, and it is fuelled by nominal divergences (in interest and inflation rates) between the core and the peripheral economies. These three features are at odds with today's fashionable tale of the

Eurozone crisis, according to which the villain is the "sovereign" debt, the crisis developed in a context of stagnant growth (supposedly by lack of mostly unspecified "structural" reforms), and it was determined by the peripheral governments' inability to take advantage of the beneficial nominal convergence brought about by the euro, which had reduced the burden of the debt.

The view that the Minskyan framework is inappropriate in the current crisis is consistent with the "this time is different" principle (Reinhart and Rogoff, 2008), and after all, the idea that something may have changed in Europe since 1992 sounds plausible. But of course another possibility is still open: the conventional explanation of the crisis could be false. In this Section I explore this hypothesis, by analysing two statements that are often repeated in the public debate, namely that European peripheral countries would have benefited:

1) from low and converging inflation rates;
2) from low and converging (nominal) interest rates.

These statements, if true, would obviously contradict two important transmission mechanisms of the Minskyan cycle: convergence of the interest rates would imply the absence of any incentive for the "core" countries to lend to the "peripheral" ones (why lend to less trustworthy countries if the returns are the same?); convergence of the inflation rates would imply the absence of any real exchange rate appreciation in the peripheral countries, thus any further accumulation of net external liabilities (or, looking at the current account of the balance of payments, any persistent imbalance in trade flows).

I call these two sentences the "optical euroillusions", because while they may seem self-evident if one takes a glance at the (inappropriate) data, a more thorough analysis quickly unveils that their conventional wisdom is nothing but retrospective wishful thinking. In other words, a closer look at the data reveals that, unsurprisingly enough, nominal divergences of the kind stressed by Frenkel and Rapetti were at work in the peripheral countries before the present crisis, and were part of its mechanism.

3.1 Interest rates convergence

Figure 1 presents the government bond yields spreads between the peripheral countries and Germany (calculated using the IFS series XXX61...ZF..., where XXX is the three figures country code). The Figure is almost unreadable, but in economic terms this is so to speak an advantage rather than a disadvantage: the clutter in the middle of the graph depends on the fact that from Greece entry in the euro (2001) to the eve of the Lehman brothers crack (early 2008) the sovereign spreads of Eurozone members collapsed to nearly zero, becoming undistinguishable from each other. This is exactly what politicians and newspapers keep repeating, when they mention the so called "euro dividend", i.e. the reduction in the burden of sovereign debt, determined by the convergence of peripheral country interest rates to the German ones.

The conventional argument runs as follows: why were sovereign spreads higher before the onset of the euro? Because profligate peripheral governments lacked the "discipline" and "credibility" of the euro. So why did the spreads become higher after, when the euro was "disciplining" these governments? Because unfortunately profligate

governments were profligate governments: they spoilt the benefit determined by the euro dividend, by postponing the structural reforms, and markets lost confidence in them. It has already been noticed in the literature that this explanation is a bit tautological and self-contradictory (Acocella, 1998): in fact, if the euro had effectively enforced "discipline", by definition profligate governments could no longer have kept their "vicious" habits. The very fact that they did, demonstrates that there is no such thing as an externally enforced "discipline", and the Italian experience in the "new EMS" (see Section 2.3 above) offered some lessons in this respect.

But apart from the above, this explanation focuses on the wrong variables. If the crisis is presented as a sovereign debt crisis, sovereign interest rates spreads seem the right variables to look at, and there is no incentive to look any further. But let us have a look at the spreads on private debts: if we do this, we immediately get a completely different picture from the conventional one, a picture which is more consistent with both the Minskyan framework and the stylized facts of the crisis. Figures 2 to 6 report the interest rate spreads between the peripheral Eurozone countries and Germany, on the government bond yield as well as on four other categories of private debts: short-term (up to 1 year) loans to households, house purchase loans to households, short term loans to firms, loans to firms over one million euro. The data run from January 2003 to September 2010 and come from the IMF (2010)[3]. Table 2 summarizes the same information by taking the sample averages from 2003:1 to 2007:12. All in all, these data show that while the spread on government debt narrowed to almost zero, four years after the inception of the euro loans to the private sector provided still a lot of interesting arbitrage opportunities for the "core" countries creditors. This is evident in Greece, where all the "private" interest rates spread were above the "public" one. In the other countries the picture is mixed. For instance, in Portugal and Ireland the spread on corporation debt was positive, while in Spain it was the spread on house purchase loans to household. In other words, despite what Figure 1 suggests, there was enough nominal divergence in private sector interest rates to ignite stage (2) of the Minskyan cycle as described in Section 2.1 above.

Once you look at the right data, the virtuous convergence towards the German rates reveals itself to be an optical euroillusion.

3.2Inflation rates convergence

The same applies to inflation convergence, another supposed benefit of euro membership. Figure 7 reports the inflation rates in the Eurozone from 1980 to 2010. The time series patterns of the data display a remarkable convergence since the early Nineties. This evidence supports the often repeated claim that the inception of the euro would have offered to the member countries a period of beneficial stability, by bringing their inflation rates closer to that of the "virtuous" countries of the core. Figure 7, however, conceals more than it discloses. In fact, after the inception of the euro the inflation rates, while becoming lower, continued to be very persistent. Inflation differentials with respect to the nominal anchor of the system were consistently positive.

[3] The rates of interest on private debt are XXX60PHSZF... (short-term loans to households), XXX60PHNZF... (house purchase loans), XXX60PCSZF... (short-term loans to firms), XXX60PHSZF... (prime rate), where XXX is the country code. Comparable series of data are available only from January 2003.

As Table 3 shows, from 1999 to 2007 in all the Eurozone countries inflation was higher than in Germany (with the possible exception of Finland). In fact, over the larger sample from 1980 to 2010 we see that every (prospective) Eurozone member had had higher inflation than Germany (with the possible exception of Netherlands). This empirical regularity weakens in each post-crisis period. From 1993 to 1998 some core countries (in particular, Finland and France) were able to offset a (small) share of their cumulated inflation differential with Germany. After 2008 this happened in only two peripheral countries, Ireland and Portugal.

The persistence of such a wedge between the member countries' inflation rates means that these rates were not converging. The study by Busetti *et al*. (2006) shows that after a remarkable convergence effort in the Nineties, with the inception of the euro the Eurozone was split into three "inflation convergence" clubs: the virtuous countries of the ex-DEM area, Italy, and the other peripheral countries, each evolving along separate paths. It is worth noting that this is exactly what the Minskyan framework presented in Section 2 predicts, namely, that the exogenous policy change determined by the adoption of a "credible" exchange rate will foster nominal divergence (or at least impede nominal convergence). While Busetti *at al.* (2006) use sophisticated econometric methodologies, a rough picture of what is going on in Europe before the crisis can be obtained by looking at how often the inflation differentials between each member country and Germany changed sign. From 1999 to 2007 there were only 14 changes of sign (corresponding to 14% if the sample), all occurring within the "virtuous" club, except one (Italy managed to have a lower inflation than Germany in 2007). As Cesaratto and Stirati (2010-11) illustrate, this behaviour of inflation rates finds its historical roots in the explicit decision of the German elites to adopt an export-oriented growth model, by practising a real competitive devaluation against the European partners. Summing up, as for nominal interest rates, inflation convergence too qualifies itself as an optical euroillusion.

This has important consequences and raises many questions. As a matter of fact, while economic theory does not provide definite theoretical or empirical support to the idea that the optimal inflation rate is close to zero, as implicitly assumed in the current political debate (see e.g. Acocella *et al*., 2010; Khan and Senhadji, 2000), it is trivially true that the persistence of inflation differentials within a monetary union *must* lead to disruptions in trade flows, through a progressive deterioration of price competitiveness in the high-inflation countries which necessarily leads to the accumulation of net foreign liabilities in these countries (Fleming, 1971).

Why did this phenomenon go unnoticed for so many years? Why did inflation disappear from the political debate, despite the persistence of non-negligible inflation differentials, and despite the obvious threats that these differentials posed to the Eurozone stability? Since persistent inflation differentials necessarily lead to external imbalances, these questions are akin to another question: why did the Maastricht treaty and the Stability and Growth Pact neglect the monitoring of external imbalances? Why did they not set any quantitative reference parameter for them?

It is difficult to find a rational answer to these questions, especially if one considers that Article 3A of the Treaty on the European Union explicitly quotes a "sustainable balance of payments" among the "guiding principles" of the Member States, and Article 109j recalls that "the situation and development of the balances of

payments on current account" (i.e. net foreign indebtedness) shall be taken into account in the reports of the Commission and of the European Monetary Institute during the process towards the euro. The Treaty therefore expresses a clear awareness of the dangers determined by unsustainable external imbalances among member states.

The only rational motivation for ignoring them is as old as the world itself: these imbalances (and, before them, the underlying nominal divergences that fuelled them) were ignored for the very reason that (and as long as) they benefited the stronger partners of the Union, as Cesaratto and Stirati (2010-11) explain. This is best understood if we look at the sectorial financial balances of the member countries. We turn to this task in the next Section.

4. Which debt?

In the previous Section we showed that despite the boasted advantages of nominal "convergence", after the inception of the euro there were still enough nominal divergences between the core and peripheral economies of the Eurozone to ignite and sustain a Minskyan cycle through disrupting external imbalances and the associated international capital flows. In other words, this evidence is consistent with the view, nowadays shared by a large part of the economic profession, that the Eurozone crisis is in its essence a balance of payments crisis, or, in other words, an external debt sustainability crisis. Media and politicians across Europe keep repeating instead that the Eurozone crisis is a sovereign debt crisis. In principle, these two statements do not contradict each other: if a government borrows an "excessive" amount of money from foreign creditors, ending up in a default, the ensuing debt crisis will be *both* a sovereign debt crisis (because the debtor is the government) *and* an external debt crisis (to the extent that the creditors are non-resident entities). However, for this to happen, the country must have obeyed to the so-called "twin deficits" mechanism, namely, capital inflows (the current account deficit) must have been determined mostly by the government budget deficit. This is what happens in the Mundell-Fleming model with perfect capital mobility and fixed exchange rates: an expansionary fiscal policy (i.e. an increase in government deficit) raises the domestic interest rates, thus attracting capital from abroad, thereby determining an increase in the current account deficit. Unlike our reference framework, in the Mundell-Fleming model the nominal divergences that open to arbitrage possibilities, hence to the inflows of foreign capital, are caused by the behaviour of the public sector: it is the peripheral government, rather than the families and households, which start borrowing from the core creditors.

We will now move a little step further in our analysis of how closely the Minskyan paradigm adapts to the Eurozone crisis by addressing this question: which debt determined the crisis? Or, in other words, which sector was mainly responsible (if any) for the massive accumulation of net foreign liabilities? Was it the public one, or the private one? Before delving into the data, it is worth noting that at this point we have at least two indirect evidences that support the Minskyan hypothesis of a private debt-driven crisis.

First, the data on the interest rate spreads set out in Section 3.1 show that the government bond yield spread collapsed to zero in the years before the crisis, whereas the spreads on different kinds of private debt were positive: in principle, this suggests that foreign capitals were not attracted by expansionary fiscal policies (which would

have raised the government bond yield); at the same time, the persistence of positive spreads in some segments of the financial market indicates that creditors from the core countries had obvious incentives to lend money to private (rather than sovereign) debtors in the peripheral countries. Secondly, evidence on the "twin deficit" mechanism suggests that the relation between government and external deficit is rather tenuous. Panel studies such as Chinn and Prasad (2003) or Bartolini and Lahiri (2006) find very low coefficients (between 0.1 and 0.3), indicating that each euro of government deficit causes only 10 to 30 cents of current account deficit. Country specific studies like Bagnai (2006) show that in Italy, Spain and Portugal there is no long-run relation between the two deficits, while in Greece and Ireland a relation exists but weakens over time. In particular, contrary to what could be expected given the usual accounts of the Greek crisis, the government deficit loses its significance as an explanatory variable of the Greek current account at the end of the Eighties (on a sample ranging from 1960 to 2004). As we shall see in the next section, the data patterns are consistent with the stylized facts stressed by the empirical literature, rather than with the conventional wisdom about "government profligacy".

4.1 Sectorial balances in the Eurozone: unhappy families are all alike

In this Section we present the evolution of the sectorial balances in selected Eurozone countries from 1993 to 2007, i.e. from the last but one crisis to the eve of the present one, expressed as shares of GDP. The arithmetic of sectorial balances is expounded in the Appendix. It is worth remembering here that the sectorial balances are a mere accounting device, which provides a descriptive account of the data patterns. It would be wrong to infer from these patterns, which simply reflect the fact that *ex post* the national accounts identities *must* be satisfied, any "causal" explanation about the mechanism that triggered the crisis. Moreover, since the data are measured in GDP points, they obviously do not say anything about GDP growth, nor are intended to do so. As a matter of fact, this is not a limit of the analysis, because the sustainability of an agent financial position (hence, of its financial balance) depends on its ratio to the sector's revenues. For this reason, sustainability testing is mostly based on debt-to-GDP ratios (Chalk and Hemming, 2000). Summing up these remarks, in this Section we are only interested in assessing whether the accumulation of net foreign liabilities by peripheral countries has coexisted with growing public or private indebtedness.

We begin with Figure 8 that describes by means of simulated data the pattern of sectorial balances in a hypothetical country, "Twinsland", where the sectorial balances strictly quotes to a "twin deficits" mechanism. The Figure shows that in the presence of a moderate and stable private surplus (I-S^P, the solid line), the increasing borrowing requirements of the government (F, the dashed line) are satisfied by borrowing money from abroad, i.e. through a current account deficit (i.e. a foreign sector surplus, CA, the dotted line). It should be considered that owing to the way the balances are defined, the "twin" behaviour displays graphically as "mirror" behaviour. This pattern where a rising government deficit mirrors a falling current account balance is exactly what we would expect to find in the data if the conventional story on the Eurozone crisis was true: profligate governments increase their indebtedness by borrowing on foreign markets.

As a matter of fact, such a long-run pattern is never observed in any Eurozone country. Before going into the details, it is perhaps worth getting a general picture by

looking at Table 4, which reports some summary statistics on the sectorial balances: the sample correlations between the current account balance on the one hand, and either the private or the public deficit on the other hand, and the variations of the balances over the whole sample considered (1993-2007).[4] The Table is split into three panels: simulated economy, "unhappy families" and "happy families". In the simulated economy of Twinsland there is a perfect negative correlation between the government deficit and the current account balance (Fig. 8), and the increase in government deficit over the whole sample, equal to 13.63 GDP points, is almost perfectly mirrored by a worsening in the current account balance.

This does happens in any of the "unhappy families" considered, which include, along with the peripheral Eurozone countries, also Belgium (a former DEM-area country that ran into troubles during the crisis because of its fragile banking sector), and Iceland (a non-Eurozone country whose crisis anticipated that of many peripheral Eurozone countries). Let us look first at the sample correlation between the balances, reported in the leftmost part of the Table. In all these countries it is *private* rather than *public* deficit that displays a strong *negative* correlation with the current account balance (above 0.9 in absolute value in Greece, Iceland, Ireland, Portugal and Spain). This behaviour is also evident in Belgium and Italy, where the correlation is still large (above 0.7 in absolute value) and negative. On the other hand, in all these countries the government deficit displays a moderate to strong *positive* correlation with the current account balance, instead of a perfect negative correlation (as we would expect in the "twin deficits" case). This correlation is particularly strong in Iceland (0.93) and Spain (0.88), two countries that were experiencing a significant fiscal consolidation just before the outbreak of the crisis.

All in all, there is strong evidence that the growing external indebtedness is correlated with the excess of private sector expenditure over its revenues, while the correlation of the current account balance with government deficit is much weaker and positive. In the countries considered the steady increase in external indebtedness has gone hand in hand with an increase in the private sector borrowing requirement (or, more precisely, with a reduction of its net saving), in the presence of a falling public sector borrowing requirement. This hypothesis is supported by the variations of the balances, reported in the rightmost part of Table 4. In all the countries considered the current account balance worsened, from a minimum of -2.4 GDP points in Italy to a maximum of -16.44 GDP points in Iceland. At the same time, in all these countries the government deficit fell (instead of increasing), from a maximum of 9.85 GDP points in Iceland to a minimum of 2.4 GDP points in Italy. The simple, but inexorable, arithmetic of the balances implies therefore that the worsening of the current account balance reflects a reduction in the private sector net savings (an increase in the private sector deficit). In fact, $I\text{-}S^P$ has increased in all the unhappy families, with increases ranging from a maximum of 26.29 GDP points in Iceland to a minimum of 10.90 in Italy. The cross-country correlation between the increase in the private deficit and the current account balance is -0.90. Moreover, it is worth noting that in all the "unhappy families" the reduction in private net savings was larger (in absolute value) than the worsening in

[4] Since most balances are trending over the period considered, we find the change to be more informative than, say, sample averages.

the current account balance: the increase in the financing needs of the private sector was not completely reflected in an increase of foreign capital inflows because it was partly offset by an increase in government net saving (a reduction in government deficit). This evidence is completely at odds with the claim that the public sector has been the engine of the financial crisis: on the contrary, fiscal consolidation in *all* the "unhappy families" seems to have contributed to reining in the adverse trend of external indebtedness.

Going now into some detail, the pattern described is particularly evident in Spain (Figure 13), where the steady worsening of the current account, starting in 1997, was accompanied by a constant improvement of the government balance (that eventually went into surplus in 2005), more than offset by a steady increase in the private sector deficit. In this case it is quite apparent that the "twins" are the external and the private deficits, rather than the external and the public ones. Portugal (Figure 12) displays a similar pattern, although the development is more abrupt, with the increase in private deficit (and the reduction in public deficit) occurring in the first half of the sample, followed by a stabilization of the balances.

The picture in Greece is substantially similar in the long run, with some distinct episodes. Unlike Spain (and like Ireland and Italy), Greece slightly loosened up its fiscal discipline after its entry in the Eurozone. However, during that period (approximately from 2000 to 2004) the current account balance *improved* (hence, once more we do *not* find twin deficits), because the private deficit, which had improved by 15 GDP points from 1993 to 2000, fell by more than public deficit rose. On the contrary, the sharp worsening in external indebtedness in the three years before the onset of the crisis clearly depended on the sharp increase of private deficit. A similar pattern, much more pronounced, is observed in Ireland, where the government balance had reached in 2000 a 4.6 GDP points surplus (shown in Fig. 10 as a negative deficit, dashed line). This was partly reversed leading in two years to a "close to balance" position, followed by a new episode of fiscal consolidation up to the onset of the crisis. As in the previous cases, during the two fiscal consolidations (1993 to 2000 and 2002 to 2006) the current account balance kept worsening: once more, external indebtedness was mirrored by an increase in the private sector deficit.

In the case of Italy the picture is more complex (although the summary statistics in Table 4 show that in its essence the mechanisms at work were similar). After the 1992 devaluation an improvement in the current account balance was mirrored by a fall in the government deficit, with an almost stable private sector deficit: this typical "twin deficits" pattern lasted until 1996. By the end of 1996 Italy re-entered the EMS narrow band: the current account balance worsened, along with an improvement of the government deficit. From 1996 to 2000 it is the fall in private savings, rather than in government savings, that explained the fall in the current account balance. In the change-over year the government deficit improved sharply. This increase was partly mirrored by a decrease in the private deficit: as a result, the current account balance kept worsening (at a slow but steady rate). Starting in 2006, another structural change: the government tightened its fiscal stance, but at the same time the private sector net savings went to zero: as a result, the current account balance kept falling, even in the presence of a fiscal consolidation (which we found to be the typical pattern in all the "unhappy families"). All in all, Italy alternates episodes where the current account dynamics seems to be driven by the government deficit, with episodes in which the

private deficit takes the lead. The general picture, however, as summarized in Table 4, does not differ in the medium run from that of the other "unhappy families".

4.2 More on balances in the Eurozone: happy families are happy in their own way

What about the happy families, i.e. about the so-called French-German axis? A look at the bottom panel of Table 4, and at Figures 14 and 15, shows that they are happy (if ever) each in its own way.

Unlike the "unhappy families", France and Germany display a *negative* correlation between the current account balance and government deficit. This correlation in principle would signal a "twin deficits" behaviour: however, it is very weak (which is to be expected, given the existing evidence on the "twin deficits" behaviour recalled above), and almost inexistent in the case of Germany. In both cases, the pattern of the external balances is more correlated with the private deficit.

If we look at the variation of the balances over the sample considered, we realize that despite many claims, there is no such thing in the economic fundamentals as a "French-German" axis. True, the government deficit has improved in both countries by about the same amount (around 3.5 GDP points), but (i) the correlations show that the government deficit is not an important determinant of the external balance, and (ii) the behaviours of the current account balances, hence of the private deficits, differ widely between the "happy" countries. While from 1993 to 2007 the current account balance of Germany has improved by 8.4 GDP points, the current account balance of France worsened by -1.71. This figure actually conceals the real dimension of the phenomenon, because, as it is easily checked in Figure 15, the current account balance of France had reached a maximum of 3.15 GDP points in 1999, falling steadily thereafter by more than 4 GDP points. This steady fall can be divided into several episodes: in the first year after the inception of the euro (from 1999 to 2000) the current account worsens following a drop in private savings (an increase in the private deficit). From 2000 to 2003 the worsening is related to an increase in public deficit, matched only in part by an increase in private net savings (we have therefore a four year window of "twin deficits" behaviour). From 2004 until the eve of the crisis the situation is reversed again: the current account balance keeps falling, owing to the presence of fiscal austerity (a drop in F), we assist a sharp reduction in private net saving. If we enlarge the zoom, we see that the private balance has kept worsening along a relatively steady path, starting from a surplus position of about 7 GDP points ($I–S^P=–7$), and shrinking by more than five points (Table 4). This pattern is very similar to the one followed by the private sector balance in Italy, and also, *toute proportion gardée*, in Spain and Greece. The situation in Germany is completely different. A glance at Figure 14 shows that the take-off of the German current account balance occurs together with a strong increase in its private sector surplus (a drop in $I\text{-}S^P$) by more than 10 GDP points from 2000 to 2004, in the presence of rising government deficit (an increase in F). Unlike in France, in Germany the public and current account deficits become "twins" starting in 2004, in the presence of a stable and sizeable surplus (negative deficit) of the private sector.

4.3 Flows and stocks

Summing up the discussion so far, we have seen that all the "unhappy" families have witnessed a huge increase in the private sector deficit (a reduction in the private

sector net savings), in the presence of a falling government deficit, and of a worsening current account balance. This suggests that the financial distress in these countries has been caused by the accumulation of private, rather than public, external liabilities against foreign creditors. In other words, this evidence disproves the argument that the Eurozone peripheral crisis is an external debt crisis caused by fiscal profligacy.

As is to be expected, the behaviour of the stocks obeys that of the underlying flows. As Figure 16 shows, the four countries most hit by the crisis (Greece, Ireland, Portugal and Spain) experienced a dramatic worsening of their net international investment position from 1999 to 2007, ranging from -48 GDP points in Spain to -70 GDP points in Greece. In two out of these four countries the public debt was falling. In fact, the only sizeable increase in general government gross debt took place in Portugal, where the debt increased by 19 GDP points, reaching a still reasonable level of 68 GDP points in 2007. A worsening of the net external position, coupled with a reduction of public debt, features also in two other countries affected by the crisis: Italy and Belgium (where the crisis hit the banking sector, leading to the nationalisation of Dexia). As usual, Germany features a completely different pattern: instead of a reduction in public debt and a worsening in the NIIP, Germany displays a small increase in public debt and a sizeable improvement in the NIIP.

The same data are reported in Table 5 along with the change in domestic credit to the private sector. The change in the NIIP is almost uncorrelated with the change in public debt (the cross-country sample correlation is 0.03), while it is strongly correlated with the change in private debt (domestic credit to the private sector), with a negative coefficient equal to -0.70. While the correlation does not *per se* indicate causation, we stress that this stylized fact is perfectly consistent with the Minskyan framework (accumulation of net external liabilities by the private sector), while it does not match the "sovereign debt" explanation of the peripheral crises.

5. The patterns of macroeconomic fundamentals in the "unhappy families"

Summing up, the evidence presented so far shows that after the exogenous policy change determined by the adoption of the euro, the peripheral countries of the Eurozone experienced both a significant nominal divergence (in the private debt spreads, as well as in the inflation rates) and a private-sector-driven accumulation of net foreign liabilities. These two features, while contrasting the usual narrative of the crisis, are perfectly consistent with the Minskyan framework presented in Section 2. In this Section we further explore the analogy between the Minskyan cycle and the Eurozone crisis by looking at the patterns of the macroeconomic fundamentals in the period preceding the crisis, and checking whether they follow the steps described in Section 2.1 and 2.2 above. This is done in Tables 6 to 9, which are built following Frenkel and Rapetti (2009).

5.1 Step 1

We recall from Section 2.1 above that in step 1 the Minskyan cycle is set off by an exogenous shock, determined by the adoption of an exogenous macroeconomic policy package including financial liberalization (both domestic and external) and a "credible" exchange rate policy. Some remarks are needed. First, in the Eurozone financial liberalization had largely occurred before the adoption of the single currency: in other

words, a component of the exogenous shock (liberalization) had been "diluted" over the previous two decades. Secondly, the timing of the adoption of the "credible exchange rate" differ from one country to the next, because Greece entered the Eurozone two years later than the other peripheral countries (in 2001 instead of 1999), and also because the nominal exchange rate before the onset of the euro was managed differently in the different countries: just to give an example, Italy experienced a nominal revaluation by 8% in 1996, and afterwards pegged its exchange rate to the ECU, while Portugal and Spain in 1997 engineered a moderate devaluation.

5.2 Step 2

Taking these differences into account, it is fair to say that the institutional shock had the effects envisaged by the Minskyan framework (step 2 in Section 2.1): the *ex post* interest rate spreads (adjusted for the exchange rate variation) increased everywhere by about one point (see Table 6 to 9). For the reasons explained above (financial liberalization had already occurred), in the peripheral Eurozone countries this effect was determined mostly by the elimination of the exchange rate risk. Consider also that, due to data availability, the Tables consider the sovereign spread (spread on long term government bonds), but the detailed analysis in Section 3.1 shows that the spreads on the other segments of the credit market were in most cases higher.

5.3 Step 3

Be that as it may, this behaviour of the spreads seems to have prompted the effects described in step 3 (Section 2.1): first of all, capital inflows and an increase in domestic liquidity, as witnessed by the increase of domestic credit to the private sector. This pattern is evident in Fig. 17: the domestic credit-to-GDP ratio had been stable to declining in Italy and Spain, and moderately increasing in Portugal: in each case, there is a visible change of pace around 1999 (more apparent in Italy and Portugal). This increase in liquidity produced the effects envisaged by the Minskyan framework:

(i) the interest rates fell and the spreads reduced;
(ii) output increased;
(iii) prices increased.

As for the interest rates, in 2005 the *ex* post sovereign spread reached a minimum everywhere. This minimum was equal to zero in Spain, in coincidence with a positive government balance; the other sovereign spreads did not vanish (owing to the large debt stock in Greece and Italy, and to an insufficient fiscal consolidation in Portugal). A similar pattern applies also to some – but not all – segments of the private credit market, see Fig. 2 to 6.

As for output growth, its increase is especially evident in Italy (where growth jumped from 1.5% to 3.7%, in correspondence with a 5 point increase in the domestic credit-to-GDP ratio) and Spain (where growth reached 5.1% in 2000). Contrary to Portugal (that was badly hit by the recession in 2003), and to most core countries (like Belgium, Finland, and the Netherlands), and despite the global recession determined by the burst of the dotcom bubble in the US (which had occurred in 2000), the

Mediterranean countries experienced on average an increase in real growth in the 2000-2007 period, as compared to the 1993-1999 post-crisis and pre-euro period.

The dynamic of prices presents some interesting differences from one country to the next. Tables 6 to 9 report for each country the wage inflation and the productivity growth differential with respect to Germany (in the case of Portugal we report the consumer price inflation differential, owing to the lack of data). It is interesting to look at these data together with the dynamics of the nominal and real exchange rate. Table 10 displays the average productivity growth spreads between the peripheral countries and Germany. The productivity spreads are defined as the difference between the peripheral and the core rates of growth in the average productivity of labour. In the two major peripheral countries, as well as in Portugal, the productivity spread behaves exactly as predicted by the Kaldor-Verdoorn model: an adverse shock (revaluation) in the nominal exchange rate reduces the productivity growth rate through its effect on exports and output growth. It is worth noting that the only notable exception in this respect is Greece, where productivity growth increases with respect to Germany after the inception in the Eurozone (the result does not change significantly if one takes 1999 or, more correctly, 2001 as the inception date). The data therefore tells a completely different story from the one that is currently told in the media, according to which Greek people are paying for their laziness (and for the profligacy of their governments). As far as Italy is concerned, the fall in productivity is sizeable, but it becomes even larger if we split the sample not after 1999, but after 1995, i.e. when Italy did actually change its currency policy, by revaluating the lira against the ECU. With the only exception of Greece, the Kaldor-Verdoorn effect therefore seems to explain the dynamics of productivity in the three largest peripheral countries.

The behaviour of prices and of real exchange rate however differs from one country to the next. Italy displayed a reasonable degree of wage moderation. Its wage differential with Germany was on average negative up to 2002, averaging -0.9% in the first three years of the euro era. As a consequence, despite the drop in productivity, its average real appreciation was close to zero in the same period (Table 7).[5] In Spain there was less wage moderation relative to Germany (the average wage differential was positive at 0.6%); therefore, the real appreciation rate was higher (0.9% instead of 0.2%). By the way, this pattern is consistent with the fact that real growth in Spain was on average twice the real growth in Italy. Even in Portugal we observe the same dynamics: the productivity spread went from 1% in 2000 to -1.1% in 2002, the consumer price inflation differential from 1.5% to 2.3%, and the real appreciation rate from 1.7% to 2.1%. An interesting common feature to Italy and Spain (the two major peripheral countries) is that their wage inflation differential increases sharply in 2003 (going from -0.4% to 1.3% in Italy, and from 1.4% to 3.3% in Spain), with immediate effects on the real appreciation rate (which jumps from 4.6% to 11.3% in Italy and from 2.5% to 6.2% in Spain). A glance at the data shows that this jump in relative wage

[5] It should be stressed that the unit labour cost based measure of the real exchange rate takes into account all the trade partners, not only the Eurozone core ones. Therefore, its behaviour is influenced not only by the inflation differentials within the Eurozone, but also by the behaviour of the nominal exchange rates and wages in the other trade partners. By and large, trade with the Eurozone accounts for slightly more than a half of total trade in each peripheral country, while the United States are in general the second largest partner after the Eurozone, with a market share typically between 5% and 10%.

inflation was determined by a drop in the rate of growth of German nominal wages. Wage inflation, which had been close to 3% in Germany in the first four year of the euro era, dropped sharply to an average of 1.4% from 2003 to 2007, as a result of wage moderation introduced by the so called Hartz reforms of the labour market (ILO, 2012). As the International Labour Organisation puts it, at the European level this reforms package "has created conditions for a prolonged economic slump as other member countries increasingly see only even harsher wage deflation policies as a solution to their lack of competitiveness. This is all the more discomforting as it is unclear to what extent these wage deflation policies in Germany have contributed to higher employment levels, which in 2006 were barely higher than in 1991" (ILO, 2012, box 4). This aggressive mercantilist policy from the core country is a distinct feature of the Minskyan cycle in the Eurozone. It is worth stressing that it is precisely the feature one should legitimately expect not to find in a region that has decided to call itself an economic "union".

5.4 Step 4

Whatever the reasons, the accelerating real appreciation in the periphery brings us to step 4 of the crisis. The financial effects are especially evident in Spain, where capital inflows, which had been on average equal to 1.2 GDP points from 1996 to 2003, jump to an average of 7.1 from 2004 to 2007. The same applies to Italy, which up to 2001 had had a negative financial account balance (indicating that it was repaying the external debt accumulated during the "credible EMS" period). After 2003 the financial account balance jumps to an average of 1.3 GDP points, whereas it had been on average negative at -0.4 GDP points from 1996 to 2003. And the same applies also to the two minor peripheral countries, although with some minor differences in the time profile of the balances.

As widely acknowledged (Berger and Nitsch, 2010; De Grauwe, 2012), these capital inflows were largely devoted to the financing of the growing trade deficits towards the Eurozone countries. This effect is more apparent in the smaller economies, as is to be expected, since smaller economies are necessarily more open and more dependent on foreign trade than larger ones. Therefore, after 2003 the trade balance worsens both in Portugal (where it had already reached a minimum of -13 GDP points in 2000) and in Greece (where a minimum had also been reached in 2000 at -16 GDP points). In both countries however the current account balance, while being negative, is smaller in absolute value than the trade balance. This indicates that the balance on services and incomes is positive. In Italy instead the trade balance is positive (with the only exception of 2006), but it converges rather quickly to zero after 1999; at the same time, the current account balance decreases steadily, changing from positive to negative in 2000. This indicates a negative services and incomes balance. The situation of Spain is somewhat different: both the trade and the current account balances are negative, but up to 2005 the latter is smaller in absolute value than the former.

5.5 The crisis

Even keeping these differences into account, the situation described so far matches closely the framework outlined in Section 2. The next step is the beginning of the crisis, announced by a rise in the interest rate spreads (from 2008), as well as by a

reduction in capital inflows (measured by the financial account balance). Yet, owing to the existence of the single currency, the final stage of the Eurozone crisis, which is still not over, differs from the standard one: rather than a run on the peripheral country's central bank foreign exchange reserves, carried out by selling the peripheral country's currency on the foreign exchange market, in order to "force" it out of the peg, what we see today in the Eurozone looks rather like a run on the peripheral country's political sovereignty, welfare systems, and real assets, carried out by selling the peripheral country's government bonds, thus forcing up the spreads and inducing a huge turmoil in the peripheral stock markets. This pushes down the market value of both the government bonds and the equities of the periphery, and allows "technical" bodies like the ECB to intervene in a more and more pervasive way in the political process of the peripheral countries on behalf of the core countries, in order to impose meaningless fiscal austerity policies such as the so-called "fiscal compact" (EU, 2012).

If one looks at the last few years, fiscal austerity may seem the right answer. In fact, government debt has increased almost everywhere, as a result of automatic and discretional fiscal policies in response to the global recession. As it happens, the increase in public debt has been larger in the countries that were most severely hit by the crisis. However, public debt is an effect, rather than a cause, of the crisis: as a matter of fact, its increase is strongly correlated with the increase in private debt before the crisis (Fig. 18). The cross-country sample correlation between the increase in domestic credit to private sector from 1999 to 2007 (reported in Table 5) and the increase in general government gross debt from 2007 to 2011 (reported in Table 11) is equal to 0.74.[6] As an example, Ireland had the largest decrease in public debt among the crisis-hit countries (-23 GDP points, Table 5), together with the largest increase in private debt (98 GDP points, as in Spain, Table 5), and after the crisis it underwent the largest increase in public debt (80 GDP points), following the private banks "rescue plan" (Department of Finance, 2010).

In all evidence, public debt reduction strategies are aiming at the wrong target. By compressing the revenues of domestic households and companies, restrictive fiscal policies reduce their ability to reimburse their debts with the banking system. This increases the fragility of the banking system and prompts for further public or multilateral intervention to rescue it (at the time of writing – May 2012 – such a plan was being discussed in Spain). The "conditionality" clauses included in the multilateral intervention agreements make plain that not only the multilateral bodies (EC, IMF, ECB, the so-called "troika") are aiming at the wrong target, but they are deliberately doing so for ideological reasons. Take for instance the IMF memorandum on Greece (IMF, 2012b). The idea herein expressed by Prime Minister Papademos that "productivity-enhancing structural reforms" should "fundamentally reduce the footprint of government in the economy through bold structural fiscal reforms and by privatizing public assets" is completely at odd with the data summarized in Tables 5 and 9 as well as in Fig. 9. The "footprint of government" has little to do with the increase by 52 GDP points of domestic credit to the private sector, in the presence of a stable public debt-to-GDP ratio (Table 5), while the euro, for the reasons set out in this Section, has a lot to do with the fact that the liabilities to non-residents of the Greek banking system have

[6] The correlation is calculated among the eight countries considered in Table 11.

increased by 31 GDP points from 2001 to 2009, bringing the share of liabilities to non-residents from 16% to 56% of the total liabilities of the banking system.[7]

No matter how counterproductive they will be, austerity plans of this kind are now being proposed to all the crisis-hit countries, as they satisfy three needs of the core countries financial capitalism: in the short run, the need to socialize the losses by charging the taxpayers of the periphery with the burden of the peripheral banking systems external liabilities; in the medium run, the need to acquire real assets (in particular, public utilities and other strategic infrastructure) of the peripheral economies, which may constitute an interesting investment opportunity for the huge financial surpluses acquired by core countries in the first decade of the euro (this is what "privatization" is aimed at); in the long run, the need to repress the role of the government as a financial intermediary, in order to channel to the private financial market the flow of savings which are now being intermediated by the State, both through its public debt and through the welfare systems. In other words, the solutions that are now being proposed aim at accelerating the transformation of the Eurozone into a "coupon-pool capitalist system" as described by Froud *et al*. (2001) in their interesting and somehow overlooked paper, where the stock market is given a dominant role, bringing higher dynamic instability and rising income inequality.

6. Conclusions

It is now time to draw some lessons, define some policy options, and indicate some avenues for future research.

The long collection of stylized facts presented in this paper confirms the usefulness of the developing countries version of the Minskyan boom-and-bust cycle as a tool for interpreting the Eurozone peripheral crises. This prompts a question: why does a theoretical framework elaborated with reference to developing countries fit so well the stylized facts of the Eurozone peripheral crises?

The answer is relatively simple: this evidence confirms De Grauwe's (2011) statement that Eurozone membership has transformed member countries into "developing" countries from a financial point of view. By entering the Eurozone, the countries lose control over the currency in which their debt is issued. As a consequence, the markets can force their governments to default. As Frenkel and Rapetti (2009) put it, the key difference between a developed and a developing country is that in the latter "the set of risky assets includes public bonds and domestic corporate debt, which are all subject to country risk". But this is precisely what is happening in the Eurozone peripheral countries now, and with precisely the same consequences as outlined by Frenkel and Rapetti: the occurrence of a crisis triggers capital outflows, as a result of domestic and foreign investors "flight to quality". As shown by De Grauwe (2011), nominal exchange rate flexibility would provide a useful stabilizing mechanism: besides its obvious medium-run effects on price competitiveness, a large enough nominal depreciation has the immediate financial effect of inducing foreign investors to buy the currency of the crisis-hit country, which would therefore not experience a massive

[7] The data come from the consolidated depository corporation balance sheets reported by IMF (2010).

capital outflow and liquidity crisis. As a consequence, this country keeps control over its interest rate and can finance easily expansionary fiscal policies.

It is worth stressing that the working of an equilibrium mechanism is impeded in the Eurozone by *two* facts: a technical one, and a political or ideological one. The technical fact is of course the adoption of a single currency, which by definition rules out the possibility of a nominal devaluation. But this would not be enough without the political fact: the decision to treat external imbalances in an asymmetric way, with surpluses being praised as a sign of virtue, and deficits being despised as a sign of vice. This moralistic attitude implies that the burden of the adjustment is put on the deficit countries, where the rise in interest rates makes it increasingly difficult to re-equilibrate the government and the current account balance. At the same time the surplus countries, that can finance their public debt at a negative real interest rate (as a consequence of the "flight to quality"), refrain from practising expansionary policies (that would help the rebalancing of the whole area, by inducing a real appreciation in surplus countries), claiming that it is the peripheral countries' responsibility to become more "competitive", i.e. to implement an "internal" real devaluation through structural reforms. This approach misses a very simple point: since the largest share of the Eurozone trade occurs between member countries, the deficit of the periphery *are*, to a large extent, the surpluses of the core. In fact, our descriptive analysis shows how these deficits were engineered by European institutions dominated by core countries governments, through a well-known mechanism (well-tested in developing countries), whose aim is to provide favourable arbitrage opportunities to the core financial institutions, and an outlet to the core industrial production.

At an even more general level, nobody seems to notice how this approach contradicts the rhetoric of the European "Union". A glance at periphery newspapers shows that most people trace the origin of the periphery problems back to insufficient price competitiveness towards Germany, and they seem to believe that these countries should accept Germany's suggestions on how to successfully compete against Germany itself. These people are missing the point that it would be extremely irrational of the German government to give suggestions of this kind to its partner countries (possibly through the institutions it largely controls, like the ECB)! As argued above, the unconfessed goal of the structural reform packages seems to be rather that of socializing the losses of the private banks from the core, and of paving the way to a massive acquisition of periphery real assets from the core-countries capitalists. But setting aside these obvious considerations, nobody seems to grasp that the rationale of a Union should be cooperation through coordination of policies, not fratricidal competition among members. Union through competition has another name: annexation (Anschluss in German). The cessions of sovereignty that have been asked in the last year (including the "fiscal compact") give worrying signals in this respect.

Be that as it may, this experience has useful lessons at the theoretical and political level.

First and foremost, our descriptive analysis confirms that there is no such thing as an "endogenous" currency area. The idea that an exogenous institutional change, such as the adoption of a single currency, may induce the condition for its sustainability, either by synchronizing the member countries' business cycle through the promotion of trade, as advocated by Rose (2000, 2001), or by facilitating nominal convergence

through the credibility gains, as claimed by Giavazzi and Pagano (1986), proved false. The effects of the exogenous institutional change, rather than stabilising, as in the "endogenous OCA" theories, were clearly destabilising, as anticipated by the Minskyan model and described in this paper. The decision of the European policy makers to dictate the agenda of European integration by ignoring the warnings issued by many qualified economists (for a survey see Jonung and Drea, 2010), even if taken in good faith, was disastrous. An inescapable, even though painful, consequence of this fact is that undoing the single currency in some way will necessarily be part of the solution of the Eurozone crisis, the only alternative being that of waiting for a disorderly break-up.

Secondly, the crisis demonstrates that "market fundamentalism", as expressed in many European treaties, as well as in the "rescue" packages that are now being proposed, has failed (and keeps failing, as the case of Greece demonstrates). The financial distress we are now facing disproves the optimistic views expressed by Blanchard and Giavazzi (2002), according to which external imbalances in the Eurozone were the result of a catching-up process favoured by financial market integration. What seems here at stake is the neoclassical idea that international factor movements are intrinsically stabilizing, because they obey the law of diminishing returns. The recent wave of financial crises, first outside, then within the Eurozone, seems much more consistent with the Minskyan framework, and with the Keynesian intuition that markets ruled by the "liquidity" principle will necessarily fail to allocate saving in an efficient way, as they will inevitably and legitimately look at short-term capital gains, rather than at the long-term returns of investments. This massive market failure is clearly inscribed in the data. The countries that ran into difficulties are those that experienced the largest foreign capital inflows, and where private (not public) debt experienced the largest increases. What attracted foreign capital in the peripheral economies was the "Ponzi game" logic of the financial bubble capitalism, rather than a prudent appreciation of the long-term returns possibly provided by the relatively undercapitalized economies of the periphery. It is unjust and even racist to put the blame of this massive diversion of financial resources on the peripheral countries microeconomic units (households, firms). Why should a family that lives in a thriving economy refuse to borrow money at a convenient interest rate in order to, say, live in a better house? In a capitalist economy, the banking system has the task of assessing the merit and monitoring the development of investment projects. The banking system of the Eurozone failed in accomplishing this task and it needs to be reformed in such a way as to avoid in the future the moral hazard problems underlying its failure. A part of this reform will certainly be the (re)nationalisation of a part of the banking system, the split of the banks that are "too big to fail", and the introduction in Europe of the separation between commercial and investment banks (as envisaged by the Glass-Steagall act in the United States).

But even before that, the Eurozone political institutions failed to recognize a simple truth: too much is too much. If on the one hand debt sustainability remains a controversial field (see Chalk and Hemmings, 2000), on the other hand empirical studies such as Manasse and Roubini (2005) provide clear indications about what variables to monitor in order to prevent a sovereign debt crisis. Interestingly enough, the most important variable in their analysis turns out to be the total (i.e. public *and* private) net external debt-to-GDP ratio: a result fully consistent with the Minskyan framework.

On the other hand, the two variables considered by the Maastricht treaty seem to have little or no empirical relevance for the forecast of a sovereign default: the public debt-to-GDP ratio ranks 48th for predictive power, and the general government balance-to-GDP ratio has no clear predictive power. The "financial indicators dashboard" inscribed in the Maastricht Treaty has been very poorly designed (as clearly anticipated by Buiter *et al*., 1993). Interestingly enough, looking at the right variables would have given the right signals. Manasse and Roubini show that the total external debt-to-GDP ratio reaches 54.7% in the year before the outbreak of a crisis. In the Eurozone this attention level was overcome by Greece and Portugal in 2002 and by Spain in 2004. Something could have been done. But the European policy makers were blinded by their dull ideological hatred for the "government footprint" in the economy (to borrow IMF's words). This explains their decision to put an upper limit to government, but not to external debt: in fact, putting a limit on government debt amounts to repressing the role of the State, while putting a limit on external debt would mean repressing the role of international financial markets. Even though the empirical evidence shows that too much private finance can harm an economy (Arcand *et al*., 2011), while public debt is less harmful to growth than usually believed (Panizza and Presbitero, 2012), European policy makers have fought the battle they were asked to fight by the markets: a battle against the State, which eventually turned out to be a battle against prosperity and peace in the European continent.

Several issues raised in this paper deserve further investigation. To mention a few: it would be interesting to formalize the Minskyan framework proposed in Section 2 and to integrate it with the export-led post-Keynesian model; the causality relationship between private and external deficits, implied by the Minskyan framework and suggested by the data, should be investigated formally through causality tests; but over and above that, the most urgent question is to design viable and feasible scenarios of an orderly dismantling of the euro area. Only by escaping the "golden cage" of the euro will the peripheral economies recover their full sovereignty and their status of advanced economies. It would be a gross mistake to label this aspiration as short-sighted and dangerous nationalism. The experience of the Eurozone has shown instead that a political "vision" which does not reckon with the facts is an avenue to unmitigated economic and political turmoil. And the facts tell us that the Eurozone is not a optimal currency area.

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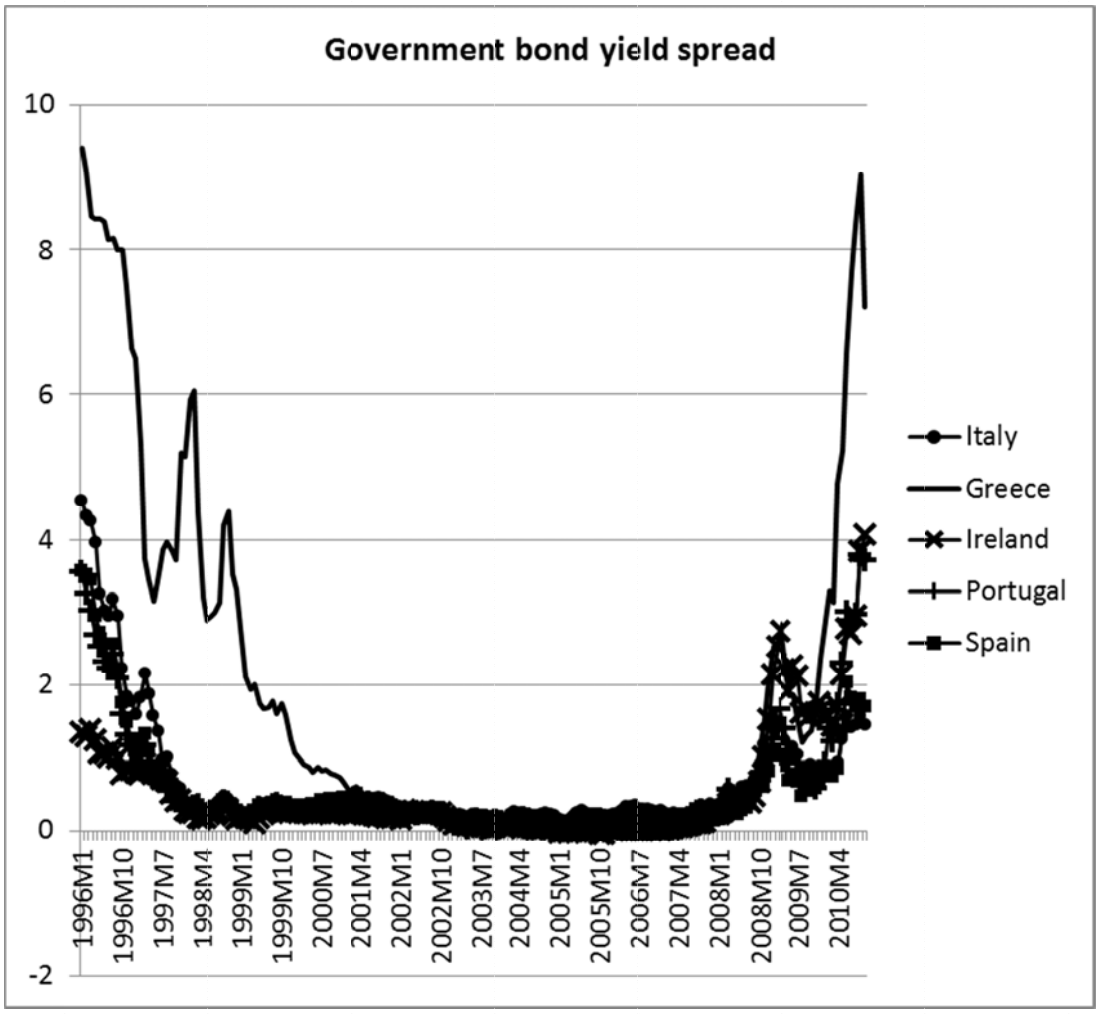
Figures



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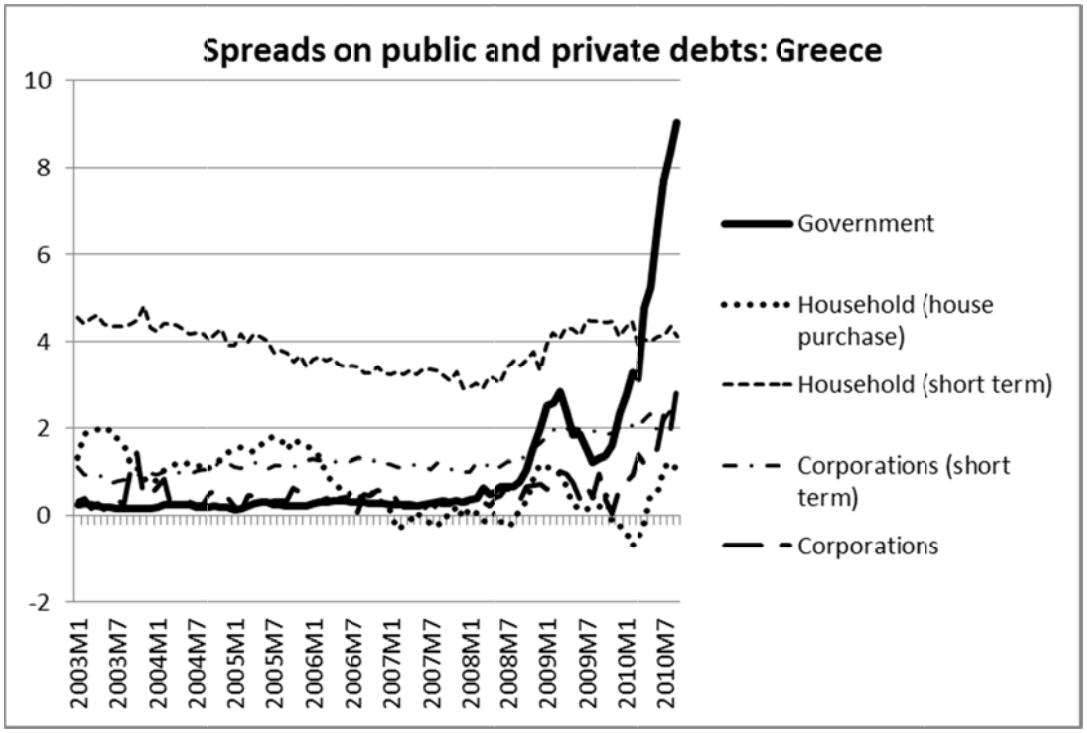

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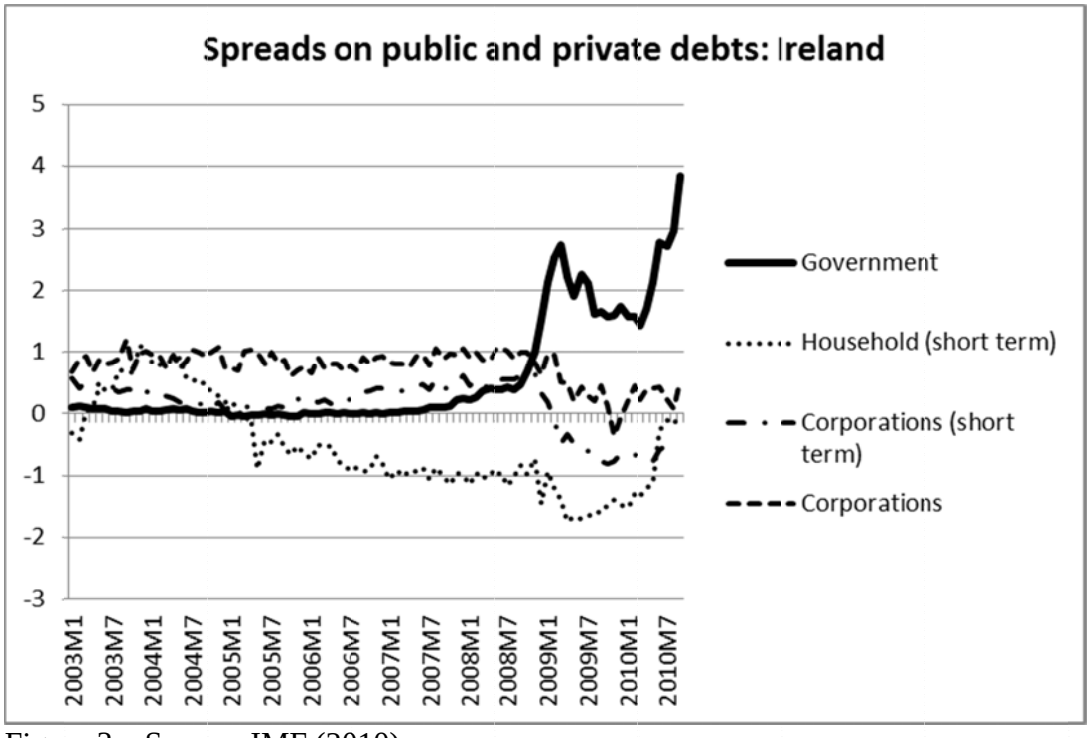

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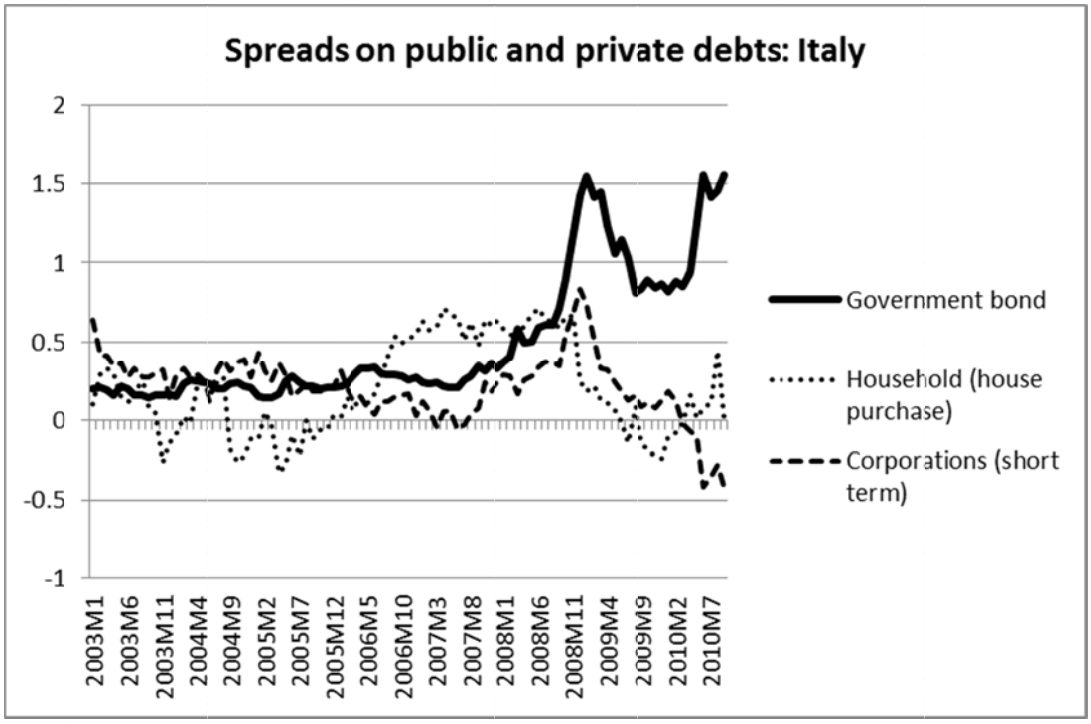

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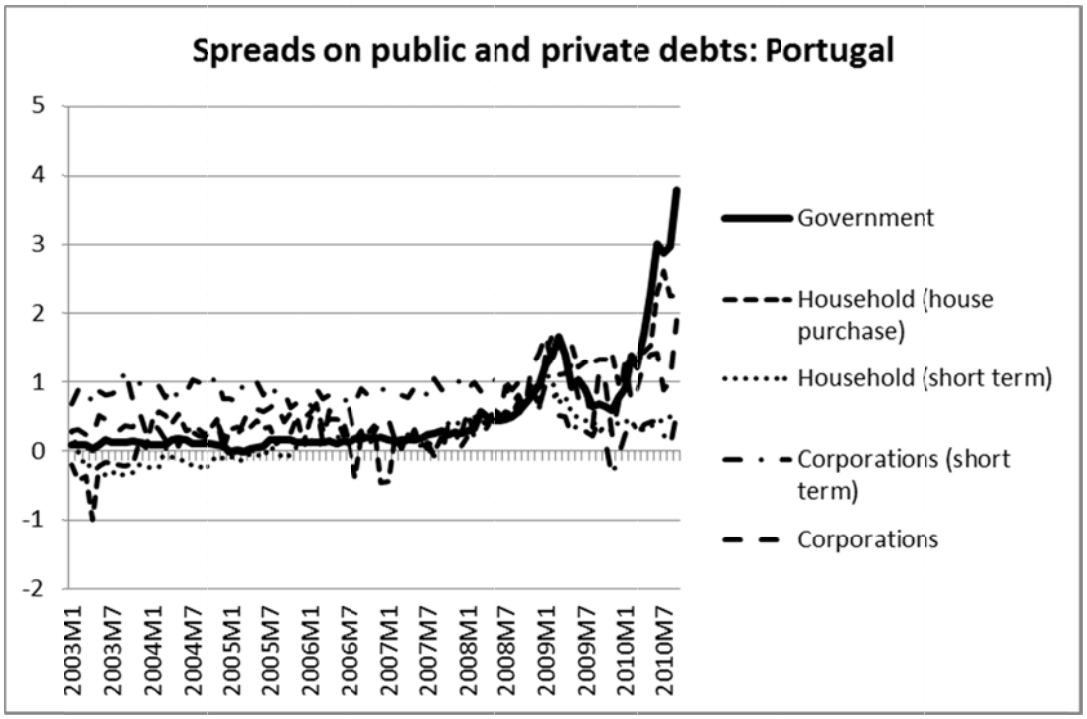

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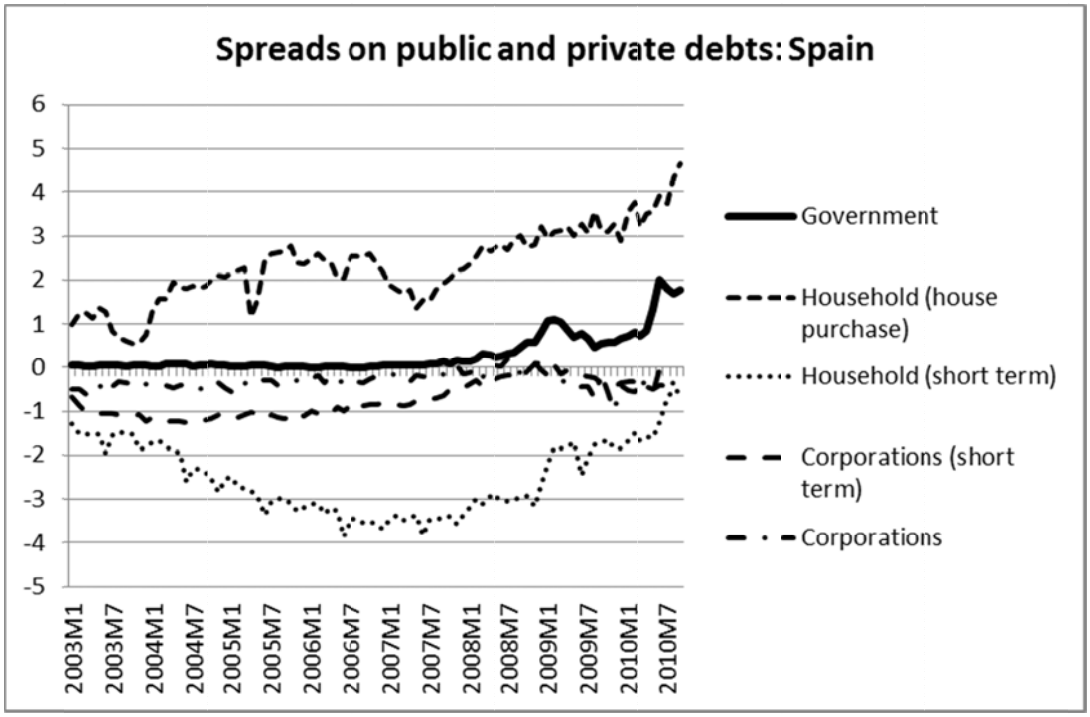

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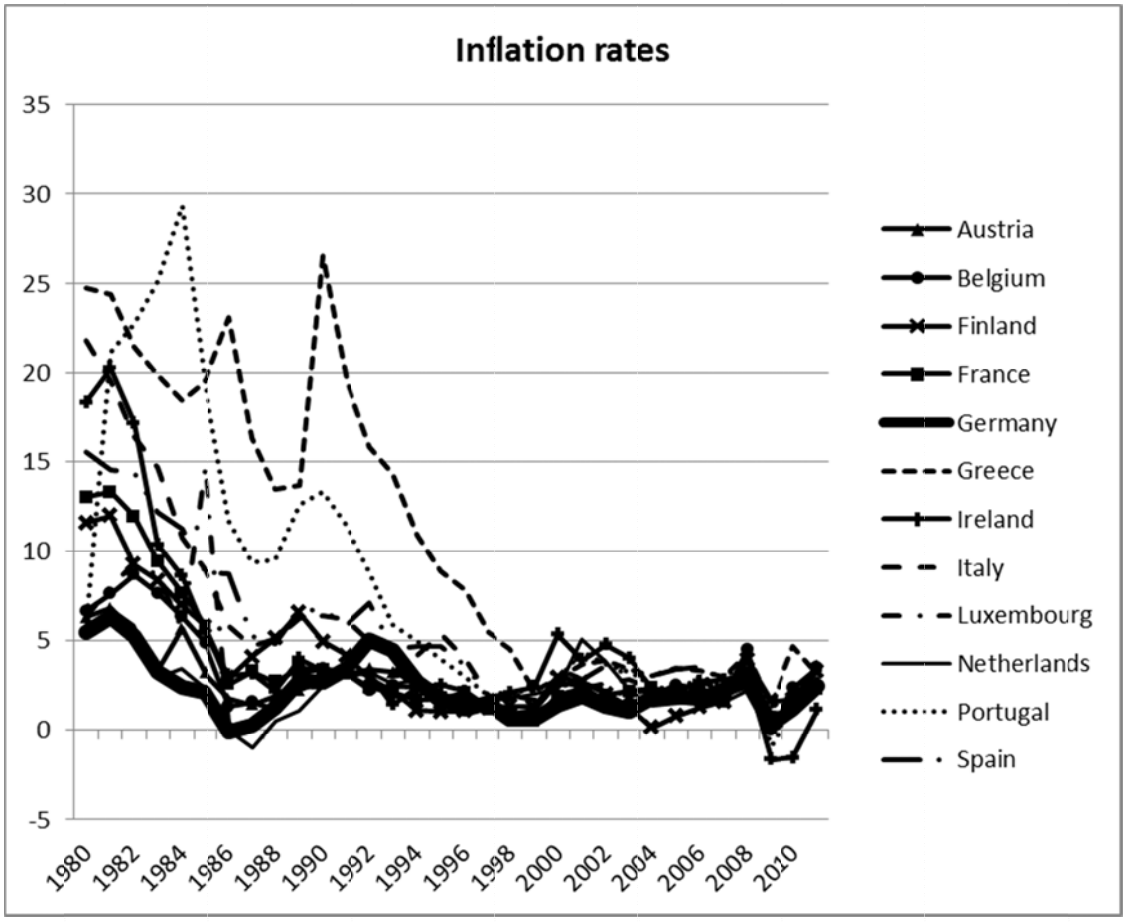

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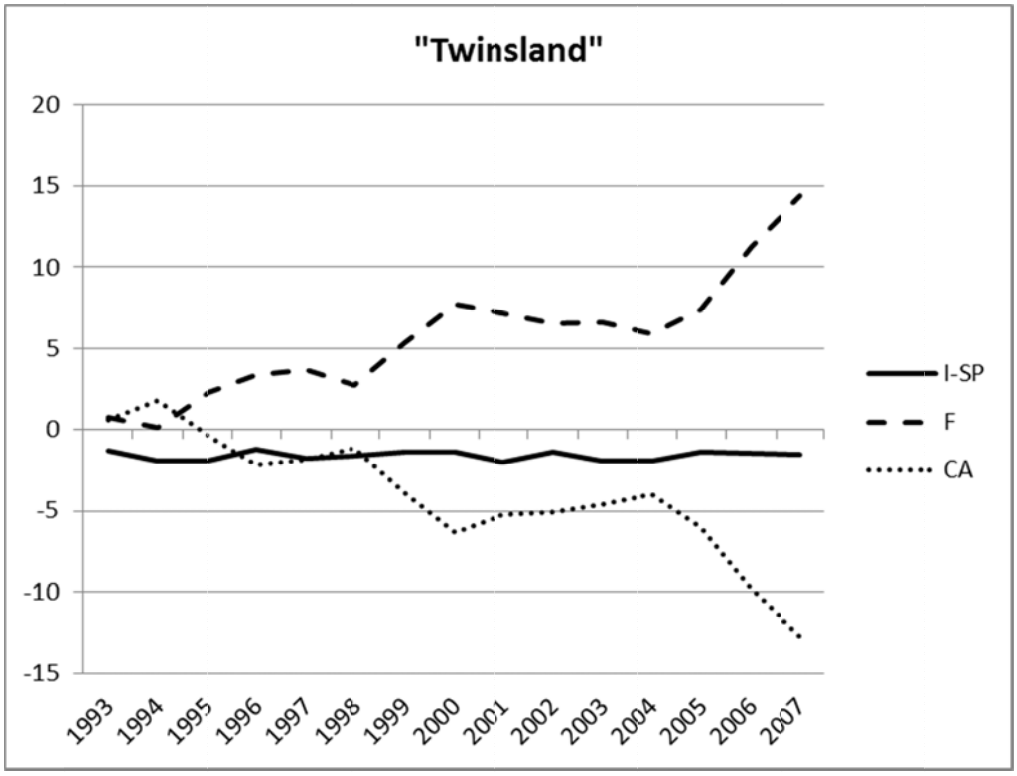
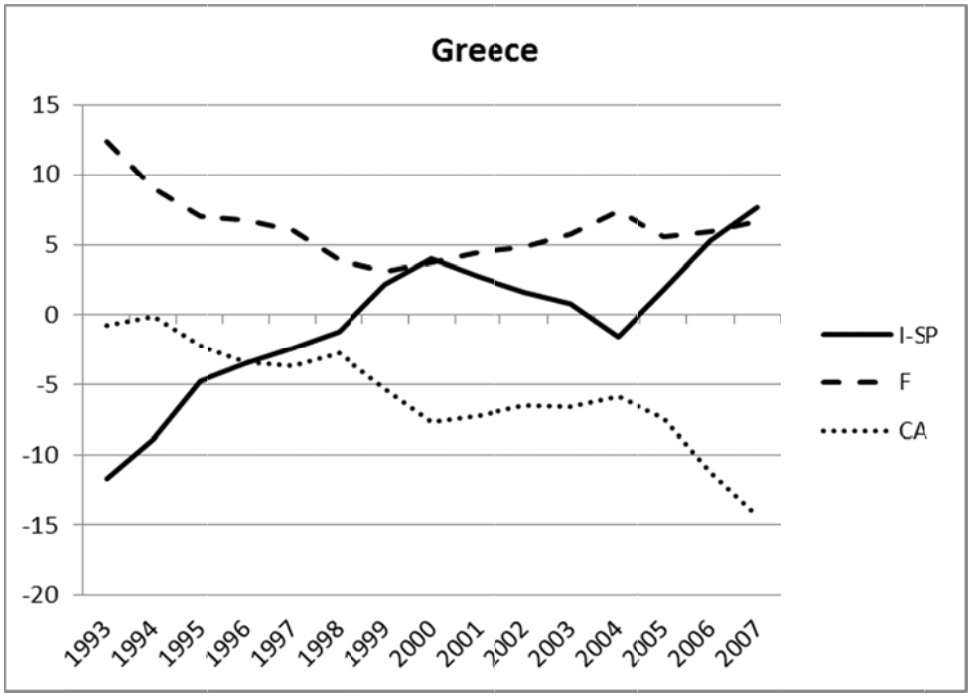


Figure 8



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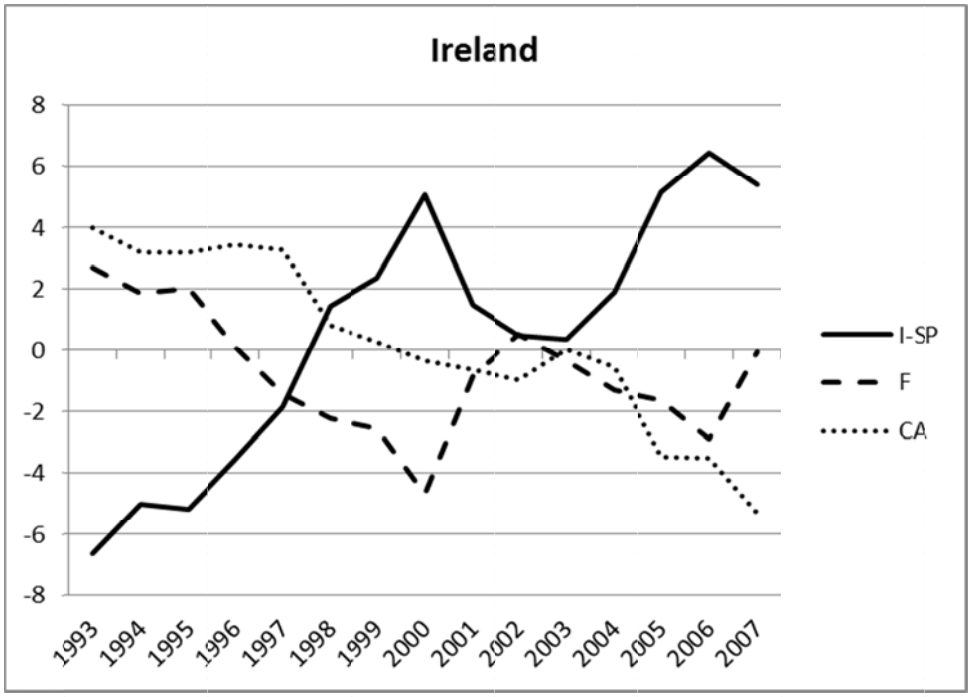

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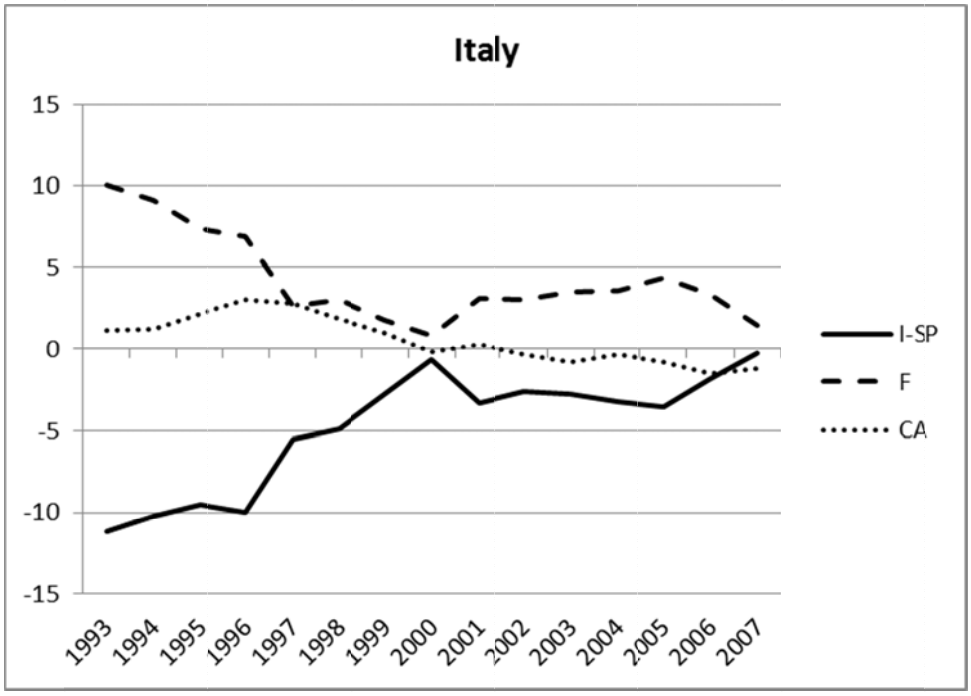

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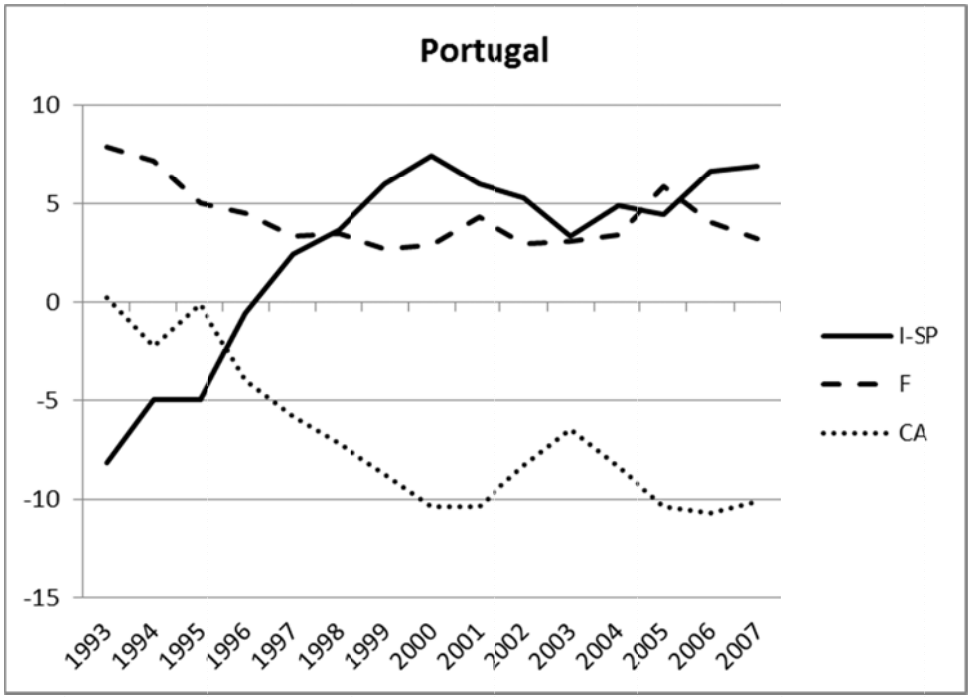
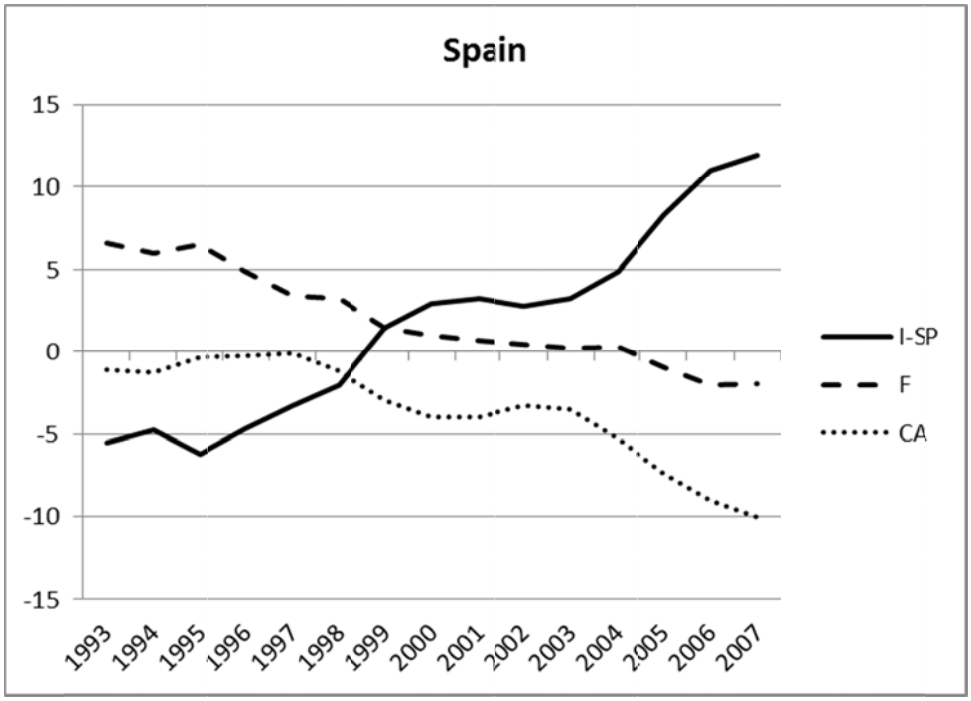


Figure 12



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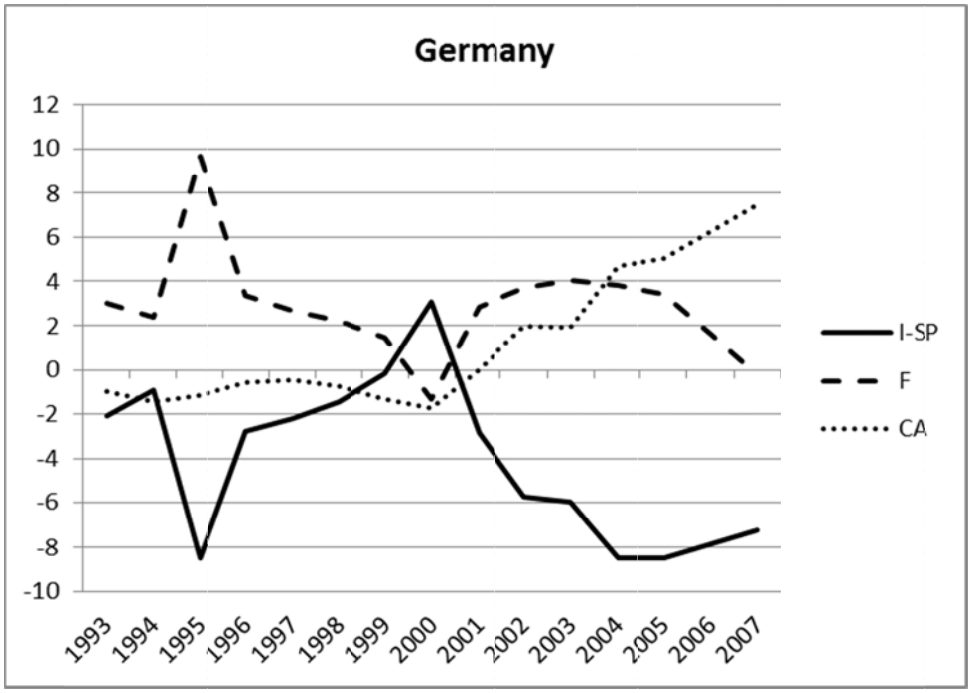

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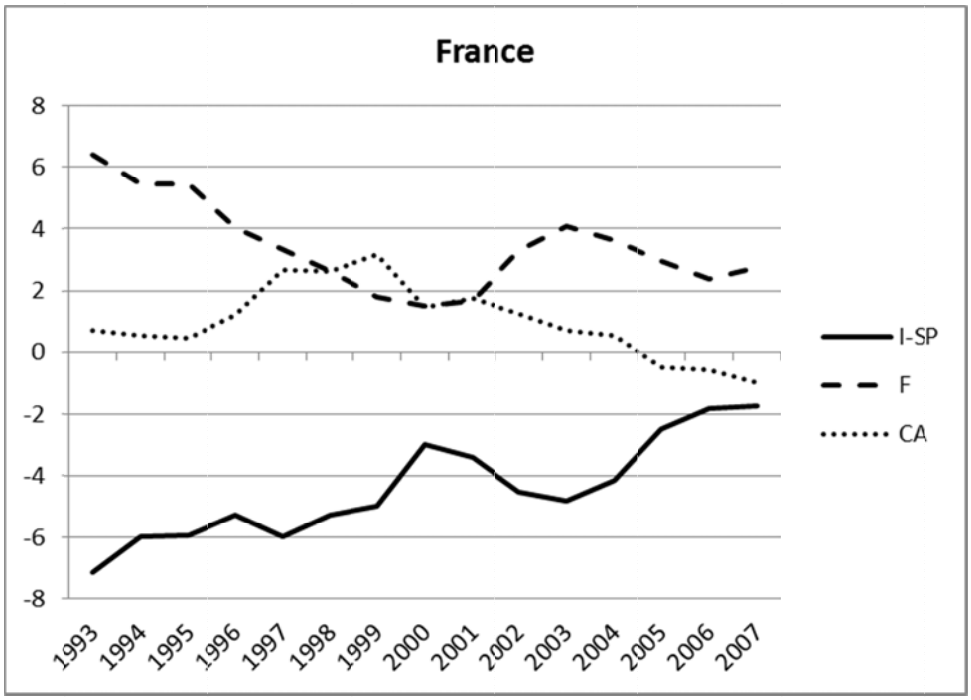

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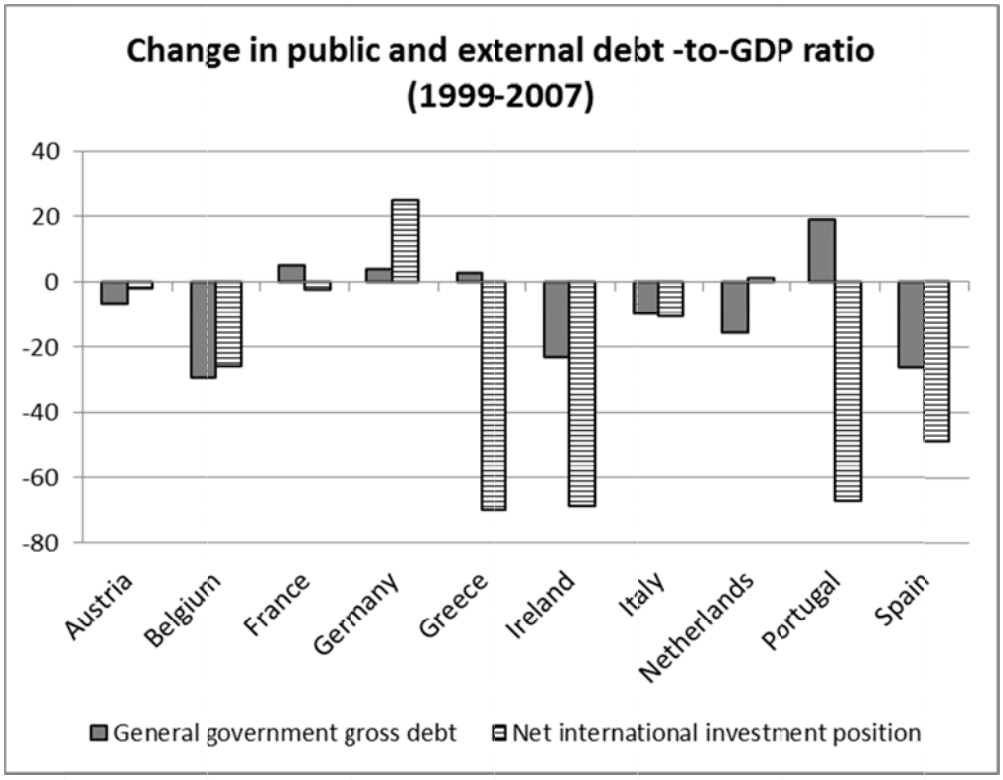

Figure 16 – Source: general government gross debt comes from IMF (2012b); net international investment position from IMF (2010).

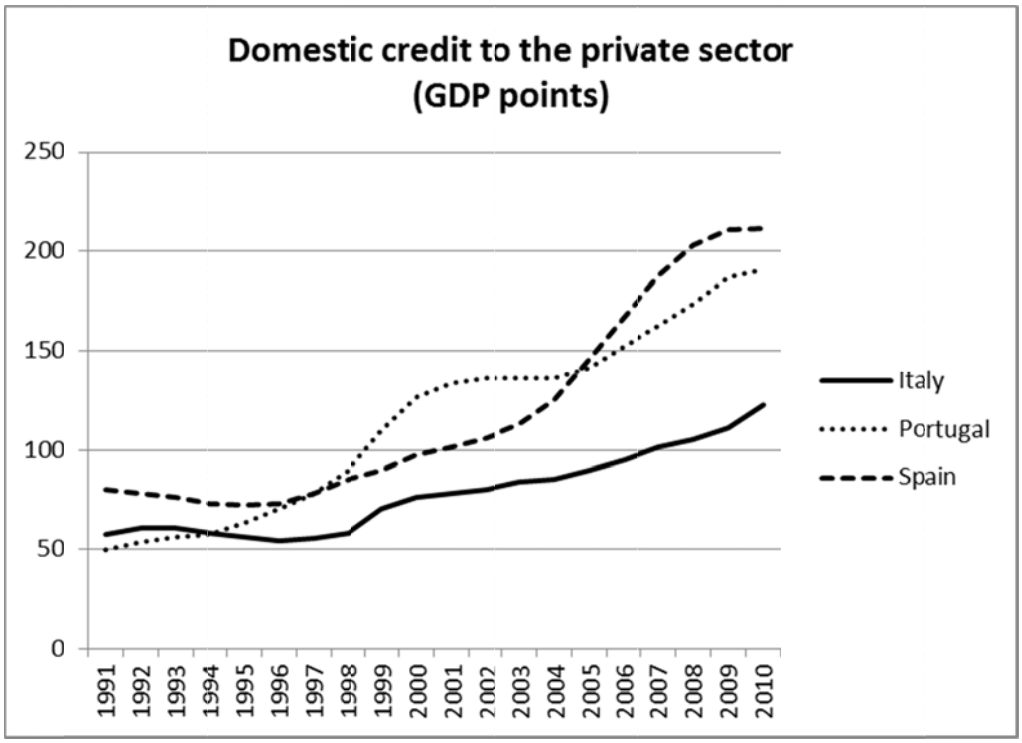

Fig 17 – Source: World Bank (2012).

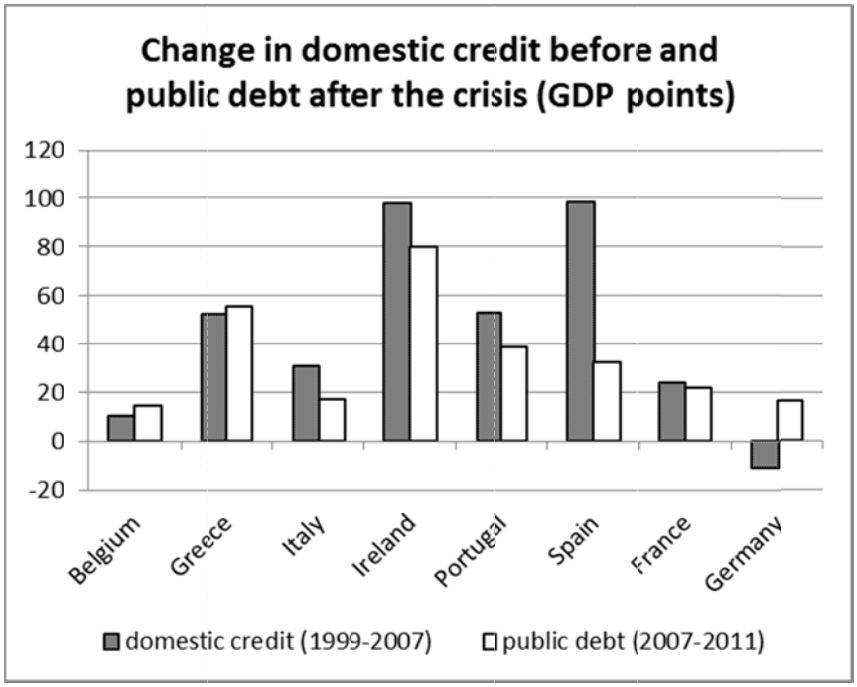

Fig. 18 – Source: domestic credit comes from World Bank (2012), public debt from IFS (2012a).

Tables

Table 1. Italy: selected macroeconomic variables, 1986-1993

	1986	1987	1988	1989	1990	1991	**1992**	1993
Real growth	2.9	3.2	4.2	3.4	2.1	1.5	**0.8**	-0.9
Trade balance (% GDP)	0.8	0.0	-0.1	-0.2	-0.1	-0.2	**0.0**	2.8
Current account balance (% GDP)	0.4	-0.3	-0.8	-1.4	-1.5	-2.0	**-2.3**	0.8
Financial account balance (% GDP)	0.3	1.1	1.9	2.8	3.8	2.0	**0.9**	0.5
Change in official reserves (MM USD)	2348	5470	8417	11358	11623	-6718	**-23992**	-3135
Domestic credit to private sector	49.5	50.1	52.3	52.5	54.9	57.4	**60.4**	60.6
Government bond yield (Italy)	11.5	10.6	10.9	12.8	13.5	13.3	**13.3**	11.2
Lending rate (Germany)	8.8	8.4	8.3	9.9	11.6	12.5	**13.6**	12.9
ITL/DEM exchange rate (% change)	1.7	6.2	-0.3	2.1	0.5	0.1	**20.6**	7.9
Interest rate spread	1.0	-4.0	2.9	0.8	1.4	0.7	**-20.9**	-9.5
productivity growth spread (% points)	0.3	0.5	0.4	0.0	-2.4	-3.6	**-1.2**	0.5
inflation differential	-5.9	-4.5	-3.8	-3.5	-3.7	-2.7	**0.0**	0.0
% change of the reer	4.2	2.1	-1.2	4.3	4.5	1.5	**-2.1**	-14.6
External debt (GDP points)	-7.2	-6.4	-6.4	-8.8	-11.0	-12.1	**-10.8**	-10.6
Government budget balance (% GDP)	-11.2	-10.9	-11.0	-11.4	-11.4	-11.4	**-10.4**	-10.0

Data sources: the main data source is IMF (2010). Real growth, inflation rates, and government budget balance come from IMF (2012b). Domestic credit to the private sector comes from World Bank (2012). Average labour productivity comes from OECD (2012). External debt data come from Lane and Milesi-Ferretti (2007).

Table 2. Interest rate spreads between peripheral countries and Germany on public and private debts (average, 2003:1-2007:12)

	Government bond yield	Household (house purchase)	Household (short term)	Corporations (short term)	Corporations
Greece	0.25	0.98	3.85	1.10	0.38
Ireland	0.03		-0.22	0.29	0.86
Italy	0.23	0.19	-0.99	0.22	-0.28
Portugal	0.13	0.15	-0.01	0.86	0.33
Spain	0.05	1.85	-2.73	-0.99	-0.33

Data sources: see footnote 3 in the text.

Table 3. Inflation differentials with Germany, sample averages.

	1980-2010	1980-1992	1993-1998	1999-2007	2008-2010
Austria	0.29	0.55	-0.15	0.18	0.39
Belgium	0.72	1.36	-0.32	0.42	0.89
Finland	1.40	3.43	-0.72	-0.01	1.03
France	1.36	3.24	-0.45	0.22	0.29
Greece	8.95	16.67	6.62	1.64	2.05
Ireland	2.38	4.78	-0.07	1.82	-1.42
Italy	3.53	7.04	1.61	0.74	0.59
Luxembourg	1.14	2.13	-0.13	0.73	0.64
Netherlands	-0.07	-0.73	-0.02	0.84	-0.01
Portugal	5.85	12.33	1.61	1.37	-0.33
Spain	3.45	6.32	1.49	1.55	0.60

Data source : IMF (2012a).

Table 4. A descriptive analysis of financial balances in selected European countries

	Sample correlations (1993-07)		Variation (2007 over 1993)		
	CA, I-S^P	CA, F	I-S^P	F	CA
Simulated economy					
Twinsland	-0.22	-1.00	-0.27	13.63	-13.36
Unhappy families					
Belgium	-0.71	0.35	10.43	-6.98	-3.45
Greece	-0.91	0.40	19.36	-5.73	-13.63
Iceland	-0.99	0.93	26.29	-9.85	-16.44
Italy	-0.73	0.43	10.90	-8.50	-2.40
Ireland	-0.91	0.47	12.06	-2.75	-9.30
Portugal	-0.97	0.64	15.01	-4.66	-10.35
Spain	-0.97	0.88	17.39	-8.46	-8.92
Happy families					
France	-0.51	-0.26	5.38	-3.67	-1.71
Germany	-0.75	-0.16	-5.12	-3.28	8.40

Data source: IMF (2012a).

Table 5. The change in private, public and external debt from 1999 to 2007 (GDP ratios)

	Austria	Belgium	France	Germany	Greece	Ireland	Italy	Netherlands	Portugal	Spain
Domestic credit to private sector	16.1	10.4	23.9	-11.1	52.4	98.0	30.5	62.7	53.1	98.2
General government gross debt	-6.6	-29.5	5.3	3.9	2.9	-23.2	-9.9	-15.8	18.8	-26.1
Net international investment position	-2.1	-25.8	-2.4	24.8	-69.8	-68.4	-10.4	1.3	-66.9	-48.7

Data source: domestic credit comes from World Bank (2012); general government gross debt from IMF (2012a); net international investment position from IMF (2010).

Table 6. Spain: selected macroeconomic variables. 1996-2009

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Real growth	2.4	3.9	4.5	4.7	5.1	3.6	2.7	3.1	3.3	3.6	4.1	3.5	0.9	-3.7
Trade balance (GDP points)	-2.6	-2.5	-3.6	-5.1	-6.4	-5.7	-5.0	-5.1	-6.4	-7.5	-8.5	-8.7	-8.0	-4.3
Current account balance (GDP points)	-0.4	-0.1	-1.2	-2.9	-4.0	-3.9	-3.2	-3.5	-5.2	-7.4	-9.0	-10.0	-9.8	-5.5
Financial account balance (GDP points)	3.5	1.6	-2.2	-1.7	2.6	3.0	2.6	0.5	3.5	6.5	8.7	9.6	9.5	5.9
Change in official reserves (USD millions)	24280	11755	-14354	-22795	-2880	-1341	3690	-15490	-6412	-1920	578	215	688	5970
Domestic credit to private sector	73.2	78.3	85.2	89.6	97.7	101.1	105.7	113.2	124.9	145.7	167.2	187.8	202.8	210.9
Long-term interest rate	8.7	6.4	4.8	4.7	5.5	5.1	5.0	4.1	4.1	3.4	3.8	4.3	4.4	4.0
Long-term interest rate (Germany)	6.2	5.7	4.6	4.5	5.3	4.8	4.8	4.1	4.0	3.4	3.8	4.2	4.0	3.2
% change of the ESP/ECU exchange rate (+=devaluation)	1.7	4.3	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Interest rate spread (corrected for the devaluation)	0.8	-3.5	-1.0	0.2	0.3	0.3	0.2	0.1	0.1	0.0	0.0	0.1	0.4	0.8
productivity growth spread (% points)	-1.1	-2.1	-1.2	-0.8	-2.7	-2.4	-0.9	-0.2	-0.3	-0.6	-2.8	-0.2	0.9	5.3
wage inflation differential	0.7	2.3	0.7	-0.2	-0.5	0.9	1.4	3.3	2.1	2.1	3.0	2.6	1.7	2.4
% change of the reer (+=appreciation)	2.6	-1.7	-0.2	-2.7	-0.9	1.1	2.5	6.2	4.1	3.5	2.9	4.8	5.1	3.1
External debt (GDP points)	-17.1	-15.4	-19.6	-23.5	-24.3	-27.9	-36.8	-43.3	-48.0	-46.0	-71.6	-85.1	-75.1	-96.1
Government budget balance (GDP points)	-4.9	-3.4	-3.2	-1.4	-1.0	-0.7	-0.5	-0.2	-0.3	1.0	2.0	1.9	-4.2	-11.2

Data sources: the main data source is IMF (2010). Real growth, inflation rates, and government budget balance come from IMF (2012b). Domestic credit to the private sector comes from World Bank (2012). Long-term interest rates as well as average labor productivity come from OECD (2012). External debt data before 1999 come from Lane and Milesi-Ferretti (2007).

Table 7. Italy: selected macroeconomic variables, 1996-2009

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Real growth	1.1	1.9	1.4	1.5	3.7	1.9	0.5	0.0	1.7	0.9	2.2	1.7	-1.2	-5.5
Trade balance (GDP points)	4.3	3.3	2.9	1.9	0.9	1.4	1.1	0.8	0.6	0.0	-0.7	0.2	0.0	0.2
Current account balance (GDP points)	3.2	2.7	1.6	0.7	-0.5	-0.1	-0.8	-1.3	-0.9	-1.7	-2.6	-2.4	-3.4	-3.1
Financial account balance (GDP points)	-0.6	-0.6	-1.5	-1.4	0.7	-0.3	0.9	1.3	0.5	1.4	1.7	1.8	3.5	1.4
Change in official reserves (USD millions)	11907	13150	-21472	-8051	3247	-588	3169	1115	-2844	-1030	-566	1893	8204	9003
Domestic credit to private sector	54.6	55.3	57.9	70.6	76.0	77.9	80.0	83.6	85.2	89.4	95.0	101.1	105.2	111.0
Long-term interest rate	9.4	6.9	4.9	4.7	5.6	5.2	5.0	4.3	4.3	3.6	4.0	4.5	4.7	4.3
Long-term interest rate (Germany)	6.2	5.7	4.6	4.5	5.3	4.8	4.8	4.1	4.0	3.4	3.8	4.2	4.0	3.2
% change of the ITL/ECU exchange rate (+=devaluation)	-8.1	-1.5	0.7	-0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Interest rate spread (corrected for the devaluation)	11.3	2.7	-0.4	0.6	0.3	0.4	0.3	0.2	0.2	0.2	0.3	0.3	0.7	1.1
productivity growth spread (% points)	-2.4	-0.2	-1.5	-0.4	-0.2	-1.7	-2.0	-2.1	0.2	-0.7	-3.3	-1.6	-0.6	0.5
wage inflation differential	-1.5	1.8	0.7	-0.4	-0.9	-1.6	-0.4	1.3	1.4	1.7	1.9	1.2	-0.7	-0.1
% change of the reer (+=appreciation)	13.9	3.6	0.3	0.1	-5.4	1.4	4.6	11.3	5.4	2.5	1.3	3.6	6.9	5.9
External debt (GDP points)	-5.6	-6.4	-11.2	-12.6	-13.2	-9.7	-15.2	-16.8	-17.8	-14.8	-21.5	-22.9	-20.2	-20.5
Government budget balance (GDP points)	-6.9	-2.7	-3.1	-1.8	-0.9	-3.1	-3.0	-3.5	-3.5	-4.4	-3.3	-1.5	-2.7	-5.4

Data sources: the main data source is IMF (2010). Real growth, inflation rates, and government budget balance come from IMF (2012b). Domestic credit to the private sector comes from World Bank (2012). Long-term interest rates as well as average labor productivity come from OECD (2012). External debt data before 1999 come from Lane and Milesi-Ferretti (2007).

Table 8. Portugal: selected macroeconomic variables, 1996-2009

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Real growth	3.6	4.4	5.1	4.1	3.9	2.0	0.8	-0.9	1.6	0.8	1.4	2.4	0.0	-2.9
Trade balance (GDP points)	-8.1	-9.1	-10.5	-11.4	-12.9	-12.4	-10.5	-9.4	-11.0	-11.8	-11.4	-11.4	-13.3	-10.4
Current account balance (GDP points)	-4.0	-5.7	-6.8	-8.1	-10.4	-10.3	-8.2	-6.5	-8.3	-10.3	-10.7	-10.1	-12.6	-10.2
Financial account balance (GDP points)	3.7	4.9	4.6	7.1	9.8	9.9	7.4	0.4	5.7	8.2	8.3	8.2	11.1	9.6
Change in official reserves (USD millions)	723	1245	508	216	371	853	1017	-6455	-1863	-1741	-2357	-962	115	1095
Domestic credit to private sector	70.3	78.1	89.5	109.4	126.6	133.7	136.3	135.8	136.4	141.2	152.5	162.5	173.7	186.7
Long-term interest rate	8.6	6.4	4.9	4.8	5.6	5.2	5.0	4.2	4.1	3.4	3.9	4.4	4.5	4.2
Long-term interest rate (Germany)	6.2	5.7	4.6	4.5	5.3	4.8	4.8	4.1	4.0	3.4	3.8	4.2	4.0	3.2
% change of the ITL/ECU exchange rate (+=devaluation)	-0.5	2.5	2.0	-0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Interest rate spread (corrected for the devaluation)	2.8	-1.8	-1.7	1.0	0.3	0.4	0.2	0.1	0.1	0.1	0.2	0.2	0.5	1.0
productivity growth spread (% points)	2.6	1.5	1.8	1.0	1.8	-2.6	-1.1	0.2	-0.4	0.5	-3.0	2.5	-1.3	4.1
inflation differential	1.7	0.4	1.6	1.5	1.4	2.5	2.3	2.2	0.7	0.2	1.3	0.1	-0.1	-1.1
% change of the reer (+=appreciation)	-2.1	-1.9	2.9	1.7	-2.2	0.0	2.1	2.5	2.5	2.4	1.8	-2.1	1.3	-1.9
External debt (GDP points)	-11.3	-16.4	-27.1	-28.5	-38.3	-44.8	-60.2	-65.0	-69.1	-63.8	-82.7	-95.4	-90.8	-112.7
Government budget balance (GDP points)	-4.5	-3.4	-3.5	-2.7	-2.9	-4.3	-2.9	-3.1	-3.4	-5.9	-4.1	-3.2	-3.7	-10.2

Data sources: the main data source is IMF (2010). Real growth, inflation rates, and government budget balance come from IMF (2012b). Domestic credit to the private sector comes from World Bank (2012). Long-term interest rates as well as average labor productivity come from OECD (2012). External debt data before 1999 come from Lane and Milesi-Ferretti (2007).

Table 9. Greece: selected macroeconomic variables, 1996-2009

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Real growth	2.4	3.6	3.4	3.4	4.5	4.2	3.4	5.9	4.4	2.3	4.6	3.0	-0.1	-3.3
Trade balance (GDP points)	-11.4	-11.5	n.a.	-13.0	-15.9	-14.6	-14.5	-13.1	-13.7	-14.1	-16.7	-18.3	-18.7	-13.1
Current account balance (GDP points)	-3.3	-3.7	n.a.	-5.3	-7.7	-7.2	-6.5	-6.6	-5.9	-7.5	-11.1	-14.3	-14.7	-11.0
Financial account balance (GDP points)	6.4	0.1	n.a.	5.4	8.5	0.4	7.8	3.3	3.0	6.4	9.7	12.2	12.7	10.7
Change in official reserves (USD millions)	4215	-4515	n.a.	2435	2573	-5699	1863	-4723	-3277	-104	279	457	39	1213
Domestic credit to private sector	31.3	32.4	34.4	41.7	47.4	57.4	61.0	64.8	70.8	79.6	85.1	94.1	97.5	94.1
Long-term interest rate		9.8	8.5	6.3	6.1	5.3	5.1	4.3	4.3	3.6	4.1	4.5	4.8	5.2
Long-term interest rate (Germany)	6.2	5.7	4.6	4.5	5.3	4.8	4.8	4.1	4.0	3.4	3.8	4.2	4.0	3.2
% change of the ITL/ECU exchange rate (+=devaluation)	0.6	2.3	7.5	-1.7	3.3	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Interest rate spread (corrected for the devaluation)		1.8	-3.6	3.5	-2.5	-0.7	0.3	0.2	0.2	0.2	0.3	0.3	0.8	2.0
productivity growth spread (% points)	1.9	3.6	-1.7	0.3	1.2	1.6	0.3	4.1	2.1	0.1	1.5	1.0	-1.3	2.2
wage inflation differential	6.7	3.9	3.9	1.5	0.3	-1.9	1.3	16.2	3.2	0.3	0.8	1.8	-0.4	2.1
% change of the reer (+=appreciation)	3.6	7.5	-4.2	-3.3	-5.3	-0.8	19.8	2.3	0.0	-4.0	3.6	2.0	-5.9	5.8
External debt (GDP points)	-6.7	-16.6	-20.7	-31.6	-38.8	-45.8	-58.8	-65.8	-73.4	-72.5	-88.4	-101.4	-71.5	-88.2
Government budget balance (GDP points)	-6.8	-6.0	-3.9	-3.1	-3.7	-4.4	-4.8	-5.7	-7.4	-5.6	-6.0	-6.7	-9.7	-15.6

Data sources: the main data source is IMF (2010). Real growth, inflation rates, and government budget balance come from IMF (2012b). Domestic credit to the private sector comes from World Bank (2012). Long-term interest rates as well as average labor productivity come from OECD (2012). External debt data before 1999 come from Lane and Milesi-Ferretti (2007).

Table 10. Average productivity growth spread

	Greece	Italy	Portugal	Spain
1993-1999	-0,3	-0,3	0,3	-0,4
2000-2007	1,5	-1,4	-0,3	-1,3
change	1,8	-1,1	-0,6	-0,9
1993-2001	-0,1			
2002-2007	1,5			
change	1,7			
1993-1995		0,9		
1996-2007		-1,3		
change		-2,2		

Data sources: OECD (2012).

Table 11. Flows and stocks in the Eurozone crisis

	Cumulated balances (2007-2011)			Variation in stocks (2011 over 2007)		
	$I\text{-}S^p$	F	CA	Domestic credit	Public debt	NIIP
Belgium	-15,5	15,8	-0,4	3,9	14,4	45,8
Greece	7,9	51,8	-59,7	21,9	55,4	28,3
Italy	-5,0	18,0	-13,0	21,4	17,0	5,6
Ireland	-49,3	62,6	-13,3	10,7	80,1	-74,5
Portugal	19,1	30,9	-50,1	28,3	38,5	-13,7
Spain	-16,6	11,2	5,4	23,8	32,2	-2,1
France	-17,9	26,1	-8,2	8,9	22,1	-9,1
Germany	-39,8	8,4	31,4	2,5	16,3	4,8

Data source: the sectorial balances come from IMF (2012a); domestic credit from World Bank (2012); public debt from IMF (2012a); net international investment position from IMF (2010).

Appendix: the arithmetic of sectorial balances

The sectorial balance analysis starts from the GNP identity:

$$Y^N = C + G + I + X - M + NFI \quad (1)$$

where Y^N is GNP, *NFI* are the net foreign incomes from abroad, and the other variables have their usual meaning. By defining the current account balance as:

$$CA = X - M + NFI \quad (2)$$

and national savings as:

$$S^N = Y^N - C - G \quad (3)$$

and substituting these definitions in Eq. (1) we get the well-known relation:

$$CA = S^N - I \quad (4)$$

Equation (4) shows that the current account balance corresponds to the excess of national savings over domestic investment: if a country's savings exceeds its investment, *ex post* this difference will be lent abroad, while if a country's savings fall short of investment, the country will need to borrow from abroad. By adding and subtracting net direct taxes from Eq. (3) we get:

$$S^N = Y^N - T - C + T - G = S^P + S^G \quad (5)$$

where S^P is private saving (national income less taxes less private consumption) and S^G is government saving (government revenues less government expenditure).

Finally, by substituting Eq. (5) into Eq. (4) and rearranging terms we get:

$$I - S^N + F + CA = 0 \quad (6)$$

where $F = -S^G$ is the government *deficit*. Eq. (6) expresses the three sectorial balances as deficits (excess of expenditure over revenues): $I - S^N$ is the private sector deficit, *F* the government deficit, *CA* the foreign sector deficit.[8] A positive value indicates the borrowing requirement of the corresponding sector, while a negative value indicates its lending capability (surplus). Eq. (6) shows that the three sectors cannot be all in deficit: if a sector is in deficit (positive value), at least another *must* be in surplus (negative value). It is worth noting that Eq. (6) expounds a mere accounting fact that *must* be verified *ex post* and as such it does not endorse a particular causal explanation of any

[8] It should be noted that $CA>0$ implies that the reporting country's exports exceeds its imports (i.e. the reporting country has an external surplus), which of course implies that the rest-of-the-world exports fall short of its imports (i.e. the rest of the world runs an external deficit).

kind. It is instead a descriptive tool, which is in principle compatible with any possible causal mechanisms.