Core-periphery relations in the Eurozone

CORE-PERIPHERY RELATIONS IN THE EUROZONE

Paul De Grauwe
(London School of Economics)

Yuemei Ji
(University College London)

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1. Introduction

Sometimes a picture is worth 1,000 words. This is the case with Figure 1 which shows the 10-year government bond spreads of the countries that entered the Eurozone in 1999 (Greece in 2002). The spreads are defined as the difference between the 10-year government bond yields of a particular country and the German 10-year government bond yield.

We observe dramatic changes during 1999-2017. During the 1990s the spreads were large but declining as the date of the start of EMU approached. During that period these spreads reflected mainly devaluation risks. At the moment the countries entered the Eurozone, these spreads all but disappeared as the devaluation risks had dissipated.

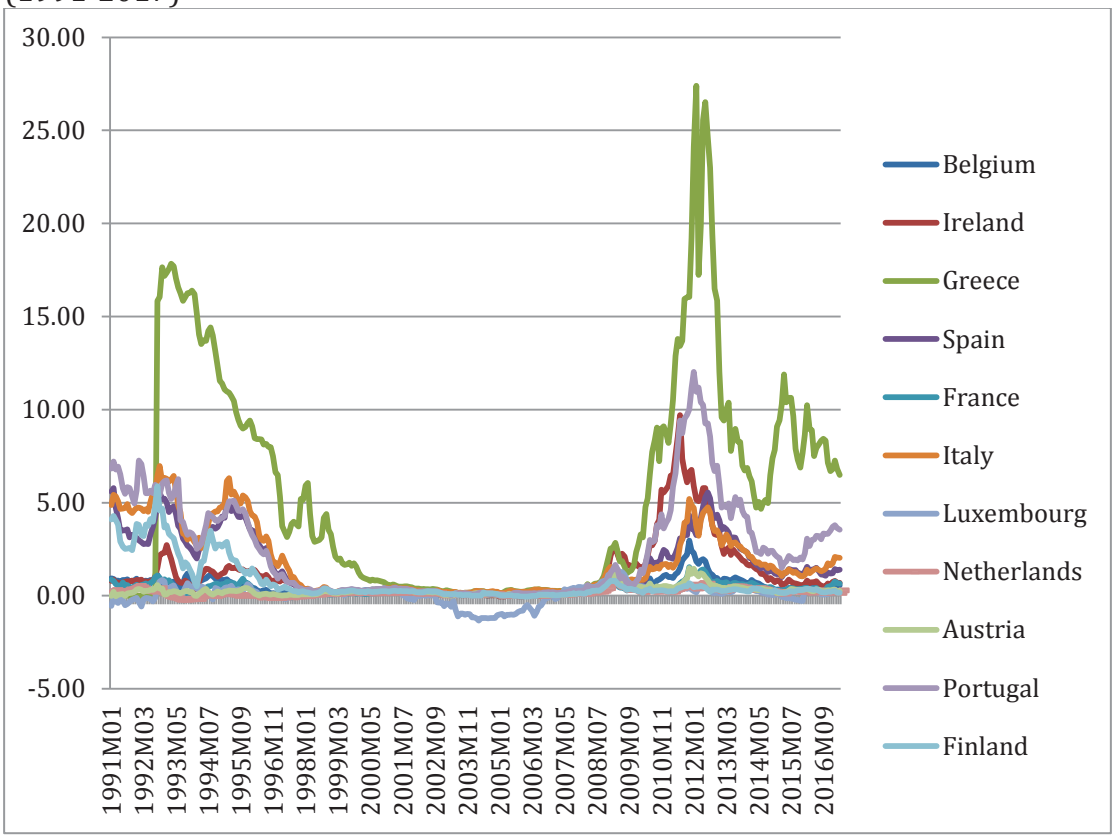
The financial crisis that erupted in 2008 was a wake-up call in the government bond markets of the Eurozone and led to large increases in the spreads. Suddenly the financial markets discovered that there were also liquidity and solvency risks attached to the holdings of sovereign bonds in the Eurozone. The spreads of a number of countries surged reflecting these risks that financial markets had forgotten about. These were the risks that the sovereigns in a monetary union can run out of cash and be driven into default.

It is immediately clear from Figure 1 that the countries whose currencies experienced devaluation risks in the 1990s were also the countries that experienced sovereign debt crises in 2010-12. The question we want to analyze here is the following. Are the devaluation risks of the 1990s good predictors of the sovereign debt risks that emerged during the Eurozone crisis of 2010-12?

This question can be phrased somewhat more provocatively as follows: did the sovereigns that got into trouble during the sovereign debt crisis of 2010-12 carry an "original sin"[1] that, during the 1990s, showed up in the form of frequent foreign exchange crises?

[1] The concept of "original sin" has been applied by Eichengreen, et al. (2002) to characterize the fragility of Latin-American sovereigns forced to issue debt in dollars.

Figure 1: Spreads of 10-year government bond yields (%) vis-à-vis Germany (1991-2017)



Source: Eurostat

In this paper we try to answer this question. The question is important because if the answer is positive there is a lot of determinism about the question of whether countries belong to the periphery and thus are likely to get in trouble in the future again. It is very difficult to escape an "original sin".

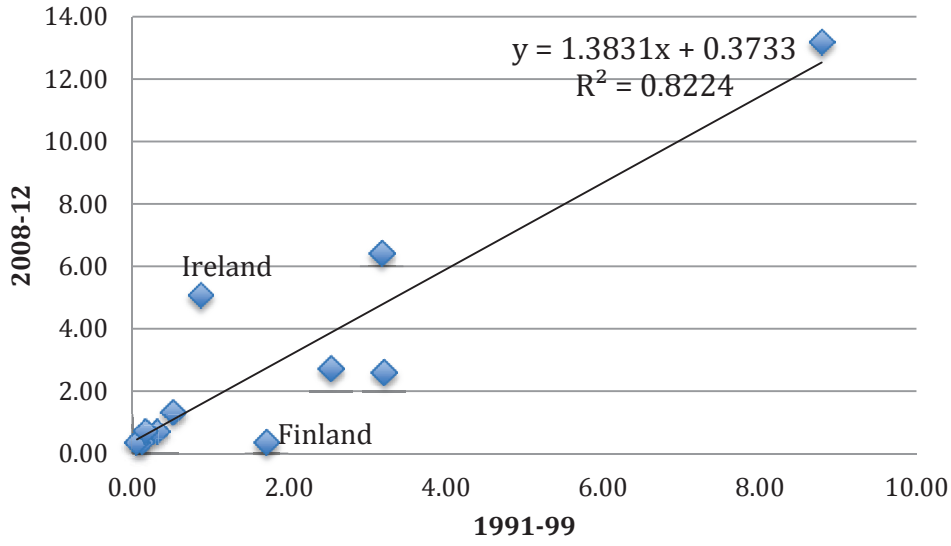
This analysis will lead us to study the fragility of the Eurozone and to discuss how the Eurozone can be stabilized.

2. Is there an original sin?

In order to answer this question we correlate the spreads observed during the 1990s and those observed during the financial crisis. We plot the results in Figure 2. On the horizontal axis we show the mean spreads during 1991-99 and on the vertical axis the mean spreads during the period 2010-12. We find a

strong correlation, i.e. the spreads observed in the 1990s are good predictors of the spreads observed during the sovereign debt crisis in the Eurozone. Thus, countries that got into trouble during the foreign exchange crises in the 1990s are broadly the same as those that got into trouble during sovereign debt crisis. In addition, the intensity of the foreign exchange crises is highly correlated with the intensity of the subsequent sovereign debt crisis. This is quite remarkable because it took 10 years for this correlation to appear. Everybody seems to have been sleeping unaware of these simmering risks.

Figure 2: Bond spreads 1991-99 and 2010-12 (percent)



Note: Own calculations using Eurostat data

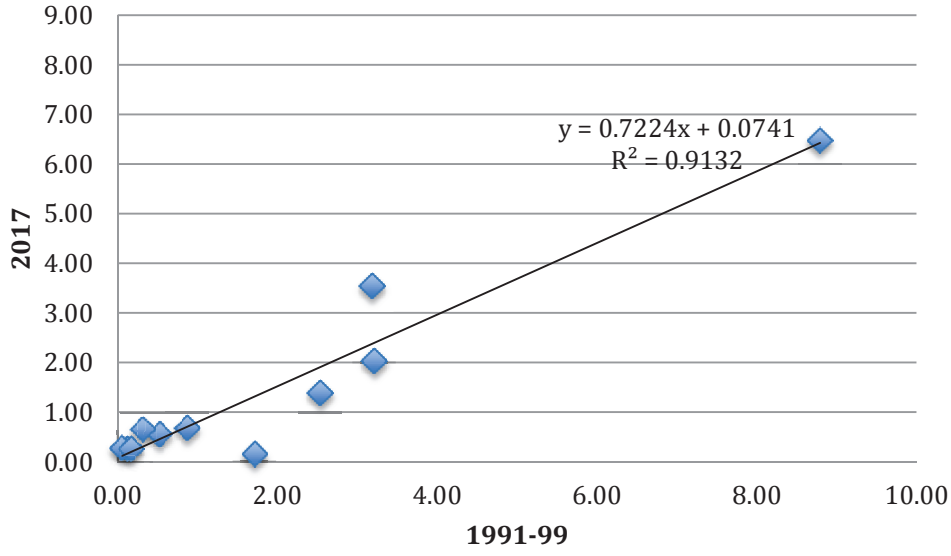
Thus, from the preceding analysis it appears that the "periphery" countries that appear both in the group of countries experiencing devaluation risks in the 1990s and in the group of countries hit by sovereign debt crises carry the burden of some "original sin". The latter appears to drive them into foreign exchange crises when they have a fixed exchange rate and into sovereign debt crises when they are in a monetary union.

Before analyzing the nature of this "original sin" it is worth asking the question of whether there are exceptions to this correlation of foreign exchange and sovereign debt crises. The answer is, yes, there are. We show the cases of Ireland

and Finland in Figure 2. Ireland was not among the group of countries experiencing foreign exchange crises in the 1990s, yet it was drawn into a severe sovereign debt crisis in 2010. Thus in a way Ireland got drawn into a sovereign debt crisis, without having "sinned originally". The reverse is true for Finland. Despite foreign exchange crises in the 1990s Finland did not experience a sovereign debt crisis. It looks like Finland escaped from the "original sin". We conclude that one should not apply the Calvinistic theory of "predestination" here: countries with an original sin can find redemption; countries without original sin can be punished by a sovereign debt crisis. We come back to this issue when we ask the question ho strong this original sin is.

Did the original sin continue to do its work after 2012, the year when the ECB saved the Eurozone with its OMT-program? We give an answer in Figure 3. This shows the same spreads during the 1990s on the horizontal axis and the average spreads in 2017, five years after the end of the sovereign debt crisis. It is now clear from this figure that the correlation is at least as strong as in Figure 2. Thus it appears that on average countries that in some distant past have committed sins continue to be punished for a long time. What then is the nature of this original sin? We turn to this question in the next section.

Figure 3: Bond spreads 1991-99 and 2017



Note: Own calculations using Eurostat data

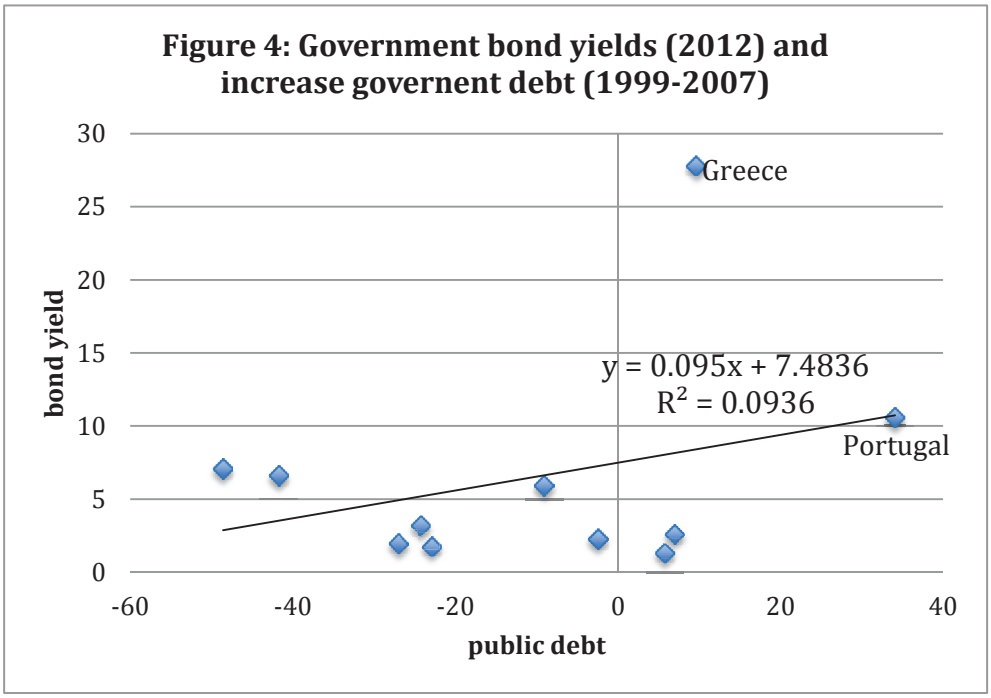
3. The nature of the original sin: the German School

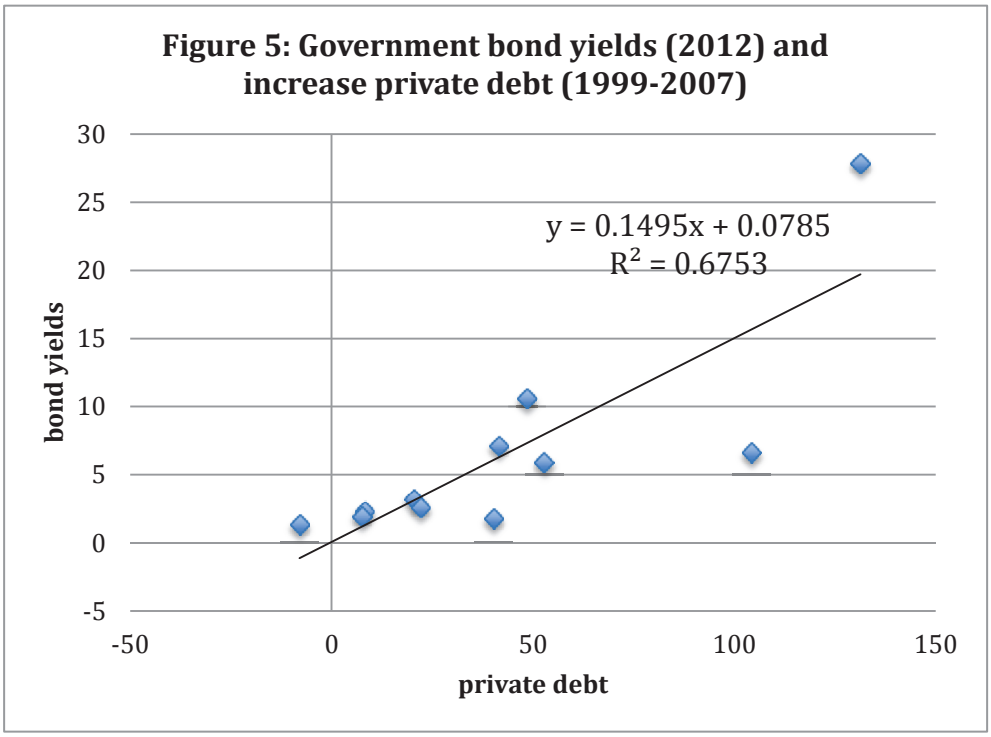
Why do some countries appear to carry the burden of the original sin for so long? Here is the German answer. When political and legal institutions are weak it is difficult to maintain fiscal discipline. That in turn leads to macroeconomic and monetary instability, characterized by large government deficits and increasing government debt. When countries with weak governance issue their own money, this will typically lead to high and variable inflation, leading to depreciating currencies. When these countries peg their exchange rates, as many EU-countries did in the 1980s and 1990s, this leads to frequent speculative crises followed by devaluations. Finally, when these countries join a monetary union without strengthening their political institutions, the pressure will be mainly on the government finance. Ultimately, this will lead to a sovereign debt crisis. In this view; the crises have the same source: weak governance.

This German view has provided the analytical framework for the Stability and Growth Pact that is deemed to be essential in disciplining national governments in a monetary union. It is probably the most influential analysis of the question of why some countries end up in the periphery, and others in the core. But is it really convincing? It it is, we would expect that Eurozone countries that accumulated a lot of government debt prior to the sovereign debt crisis also were hit most by this crisis when it erupted in 2010. In other words, we should find that the public debt accumulation is a good predictor of the subsequent sovereign debt crisis. In Figure 4 we show some evidence. On the horizontal axis we set out the change in public debt (in percent of GDP) of member countries during 1999-2007, the period preceding the financial crisis. We observe that most of the Eurozone countries saw their public debt decline prior to the crisis. On the vertical axis we set out the government bond yields of the same countries in 2012, when the sovereign debt crisis was at its peak. It is our measure of the intensity of the sovereign debt crisis. We observe that the public debt accumulation prior to the crisis is a weak predictor of the subsequent sovereign debt crisis.

Next we asked the question of whether private debt accumulation prior to the crisis is a better predictor of the sovereign debt crisis. The answer is given in

Figure 5. On the horizontal axis we show the change in private debt prior to the crisis (as a percent of GDP); on the vertical axis we present the same measure of the intensity of the sovereign debt crisis, i.e. the yields on 10-year government bonds in 2017. We note that contrary to the public debt, the private debt increased significantly before the eruption of the crisis.





Source: Eurostat

We find quite surprisingly that private debt accumulation before the financial crisis is a good predictor of the sovereign debt crisis, i.e. those countries that tended to accumulate more *private* debt before the crisis were more likely to experience a *public* debt crisis later. That does not seem to give much support to the German discipline school. Only the cases of Greece and Portugal seem to be consistent with this school of thought. We observe that in these two countries both private and public debt increased significantly (in both cases, however, private debt increased faster than public debt).

From the preceding we conclude that, with the possible exception of Greece and Portugal, the "low-discipline-original-sin" may explain the foreign exchange crises of the 1990s but fails to explain the sovereign debt crises that emerged in 2010. The latter may have little to do with an original sin condemning periphery countries to be hit by a sovereign debt crisis[2].

How can we make sense of this? We attempt to answer this question in some detail in the next section, but here is the bottom line. The financial crisis that erupted in 2008 was a classical case of a boom-bust that capitalism has produced quite often in history. These classical boom-bust episodes have been analysed by, among others, Kindleberger(1978) and Minsky(1986). During the boom phase optimism and euphoria dominate, blinding consumers and investors in perceiving risks. As a result, consumption and investment soar, made possible by excessive bank credit granted by equally euphoric bankers. This typically leads to bubbles in asset markets, until the crash hits. Then many consumers and firms (including banks) are saddled with unsustainable debt. A process of deleveraging is set in motion leading to a deep recession. That's when governments have to step in in order to save the market system. Banks and firms have to be rescued, unemployed have to be paid, leading governments to issue debt. The countries that have experienced the most intense booms and bubbles also experience the deepest crashes, forcing the governments of these countries to issue an unsustainable level of public debt. In a monetary union such a boom-bust

[2] In De Grauwe and Ji(2012) we provide econometric evidence supporting the hypothesis that fundamental budgetary variables, such as the government debt ratios perform poorly in explaining the dramatic increases of the government bond yields during 2010-12

scenario leads to additional problems to which we now turn. We keep in mind though that maybe something else is going on than an original sin determining the fate of periphery countries in the Eurozone.

A note of warning is in place here. The preceding does not mean that some countries of the periphery may not have deep-seated governance problems. They have. It means that these governance problems are not good predictors of the sovereign debt crises that erupted in 2010.

4. Booms and busts in the Eurozone

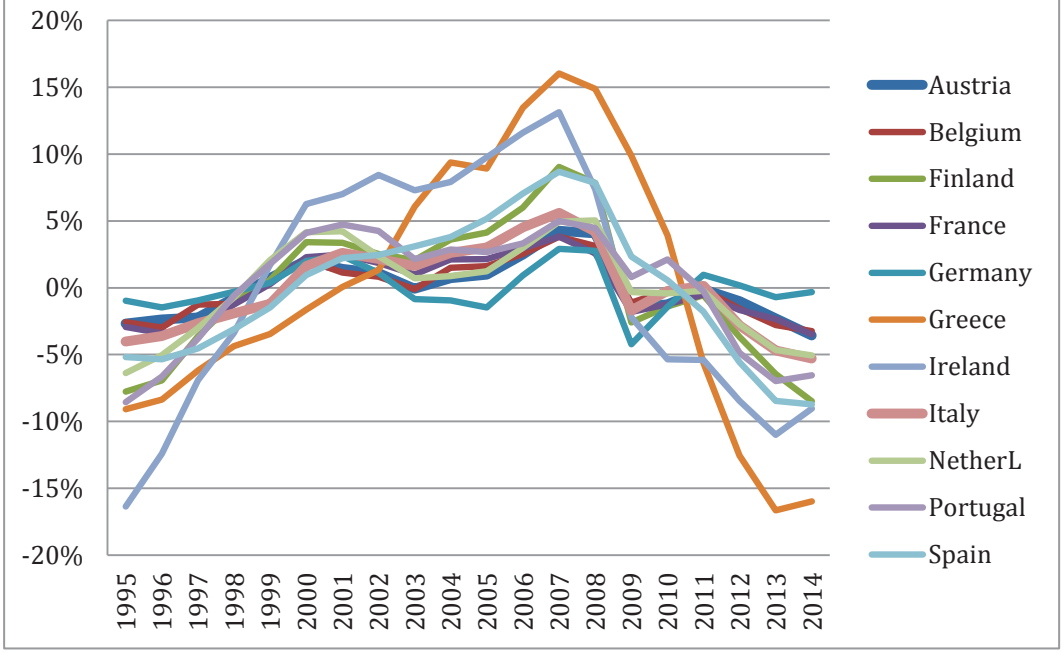
It is well-known that monetary unions cannot easily deal with asymmetric shocks (Mundell(1961)). The surprising thing is that the nature of the asymmetric shocks that hit the Eurozone has been quite different from the traditional asymmetric shocks analyzed in the OCA-literature. In fact business cycles in the Eurozone have been relatively well synchronized. This is shown in Figure 6.

We observe that most Eurozone countries were booming in the period 2000-07 and experienced a downturn since then. If there was asymmetry it was in the amplitudes of the same cycle. Some countries (Ireland, Spain, Greece) experienced a very strong boom and later a deep and protracted recession. Other countries (Belgium, Germany, France, Italy, Netherlands) experienced a much more modest period of booming conditions followed by less intense recessions. Germany stands out as having experienced booms and busts with the lowest amplitude.

If there is asymmetry in the business cycle movements in the Eurozone it is in the amplitude of these cycles. This asymmetry led to a situation in which countries in the group experiencing the highest amplitudes first experienced an unsustainable boom, often accompanied by asset price bubbles and when the crash came, were hit very hard with deep recessions, leading to an explosion of government debt.

The problem with the monetary union lies in the fact that it had great difficulties in dealing with the asymmetric occurrence of these boom-bust scenarios, for two reasons.

Figure 6: Business cycle component of GDP



Source: Eurostat

Note: the business component is obtained by applying a HP-filter to observed GDP.

First, the European monetary union lacks a mechanism that can deal with boom-bust scenarios with different amplitudes. These lead to divergent developments with large external imbalances, which crystallize in the fact that some countries built up current account deficits and other current account surpluses.

When these imbalances had to be redressed, it appeared that the mechanisms to redress these in the Eurozone ("internal devaluations") are very costly in terms of growth and employment, leading to social and political upheavals. Countries that have their own currency and that are faced with such imbalances can devalue or revalue their currencies. In a monetary union, countries facing external deficits are forced into intense expenditure reducing policies that inevitably lead to rising unemployment and much hardship to million of people.

This problem has been recognized by the economists that pioneered the theory of optimal currency areas (Mundell(1961), McKinnon(1963), Kenen(1969)).

In Figures 7 and 8 we show one dimension of these imbalances. Figure 7 shows the evolution of the relative unit labour costs in the periphery countries. It shows how these countries experienced a massive reduction in competitiveness (increase in relative unit labour costs) produced by unsustainable booms that tended to raise prices and wages relative to other member countries. After the crash they were forced to adjust with large internal devaluations. These introduced strong deflationary forces leading to deep recessions and large increases in unemployment. From Figure 8 we observe that the core countries did not lose competiveness during the boom years. After the crash they also did not reflate their economies which would have led to internal revaluations. As a result, the whole of the adjustment costs was borne by the periphery (deficit) countries.

That's when the second problem of the Eurozone stepped in. As stressed by De Grauwe (2011) the fragility of the Eurozone arises from the fact that member countries of the monetary union issue debt in a currency they have no control over. As a result, the governments of these countries can no longer guarantee that the cash will always be available to roll over the government debt. This lack of guarantee provided by Eurozone governments in turn can trigger self-fulfilling liquidity crises (a sudden stop) that can degenerate into solvency problems. When this occurs it leads to a massive outflow of liquidity from the problem countries, making it impossible for the governments of these countries to fund the rollover of their debt at reasonable interest rate.

This dynamics can force countries into a bad equilibrium characterized by increasing interest rates that trigger excessive austerity measures, which in turn lead to a deflationary spiral that aggravates the fiscal crisis (see De Grauwe(2011) and De Grauwe and Ji(2012)). This is exactly what happened during the sovereign debt crisis in 2010-12. Markets singled out these countries, leading to massive capital outflows from the first group of countries to the second one. The whole of the Eurozone was destabilized. This problem risks popping up each time the Eurozone is pushed into a recession. Each time some

countries will be hit more than others. As a result, large internal capital flows risk further destabilizing the system.

Figure 7: Relative unit labour costs in periphery Eurozone (2000=100)

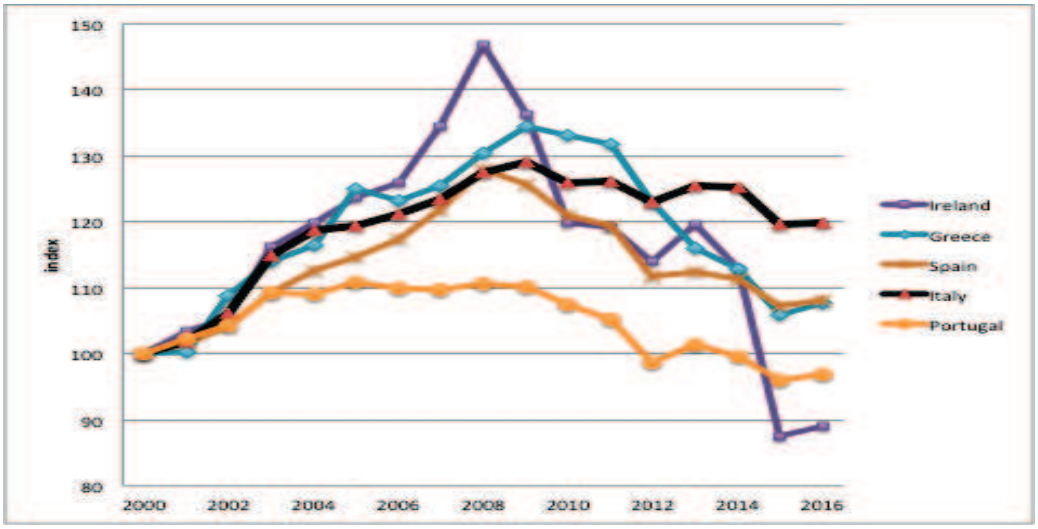
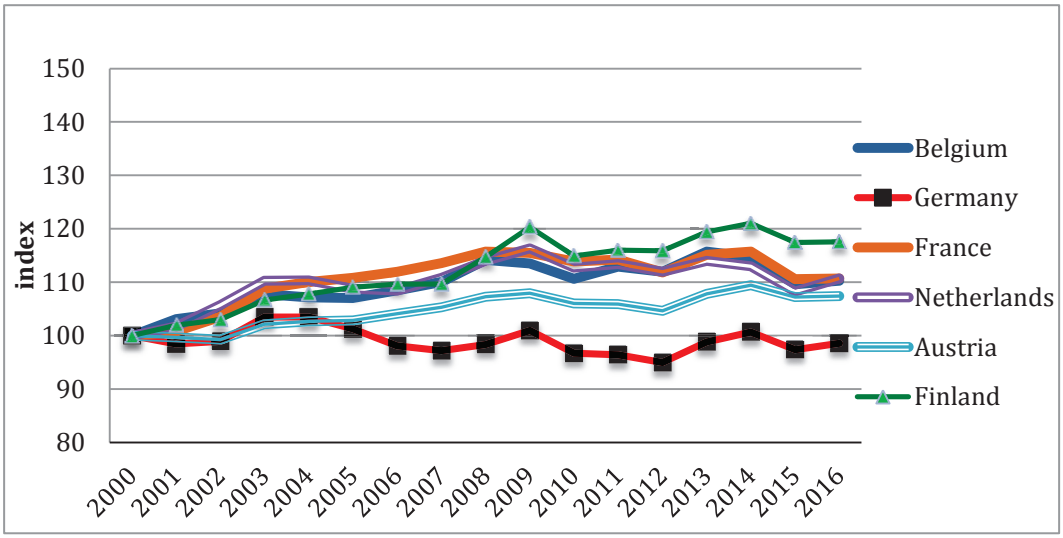


Figure 8: Relative unit labour costs in core Eurozone (2000=100)



Source: European Commission, AMECO

This episode also illustrated how unstable government bond markets in a monetary union can become in the absence of a backstop provided by a central bank. This is illustrated by the surge in the spreads in those countries that had been hit most severely by the crash.

The absence of a backstop for the sovereign in a monetary union also creates the possibility of generating a "deadly embrace" between the sovereign and the banking sector. When the sovereign is pushed into a bad equilibrium it becomes very likely that the domestic banks will experience solvency problems because they are the major holders of the sovereign bonds. A hellish doom loop is set in motion where the sovereign debt crisis engenders a banking crisis. The reverse causality is equally possible, as the Irish crisis has demonstrated: a domestic banking crisis forces the sovereign to step in to save the banking system. This typically requires the government to take on more debt thereby creating a risk of insolvency.

From the preceding discussion we conclude that, with the possible exception of Greece and Portugal, the countries that were hit by the sovereign debt crisis in 2010 did not carry a burden of some "original sin" produced by weak political institutions that made it impossible for them to avoid the crisis in the Eurozone.

5. There is no original sin

The next question then is why we found the high correlation between the foreign exchange crises of the 1990s and the sovereign debt crises of 2010-12. A possible answer runs as follows. The countries that experienced foreign exchange crises in the 1990s were indeed countries with a history of high and variable domestic inflations. This also had led to high real interest rates, that incorporated a high risk premium. When these countries were selected to enter the Eurozone, real interest rates started a process of steep declines. Such a decline did not occur in the countries with low inflation. As a result, at the start of the Eurozone a major asymmetric shock occurred. Countries of the periphery (high inflation countries) were hit by a large decline in real interest rates. The latter had the effect of boosting their economies. In some of these countries this created an unsustainable boom, leading to a crash with all the consequences discussed earlier. This shock did not occur in the core countries.

Thus, in a way the correlation we observed in Figure 2 and 3 is to a large extent a spurious one. The missing variable is the asymmetric shock in the real interest

rate that had the effect of pushing the periphery countries into an extreme boom-bust dynamics and forced the governments of these countries to increase their debts so as to save the market system in these countries. There is no need to invoke some dark force coming from weak governance and that condemned these countries onto a path of sovereign default once in the monetary union.

The preceding discussion makes clear that there is no deterministic law that ensures that the periphery countries will always be in the periphery and that the core countries are safely nested in the core. There are no "original sins". Capitalism will continue to produce booms and busts and the impact of these booms and busts will continue to be different. We do not know which country will be on the right side of the fence in the next boom-bust phase. It could very well be some core countries that turn out to become periphery countries.

What the previous discussion also makes clear is how unprepared the Eurozone was, and still is, to deal with boom-bust scenarios with different amplitudes. How should the Eurozone be reformed to ensure it is better able to withstand such a dynamics?

6. Redesigning the Eurozone

We identified two problems of the Eurozone. The first one arises from the fact that it has poor instruments to deal with asymmetric shocks. We will call this the OCA-problem. The second problem arises from the instability of the government bond markets in the Eurozone.

6.1. How to deal with the OCA problem?

The standard response derived from the theory of optimal currency areas is that member countries of a monetary union should do structural reforms so as to make their labour and product markets more flexible. By increasing flexibility through structural reforms the costs of adjustments to asymmetric shocks can be reduced and the Eurozone can become an optimal currency area. This has been a very influential idea and has led Eurozone countries into programs of structural reforms.

It is often forgotten that although the theoretical arguments in favour of flexibility are strong the fine print of flexibility is often harsh. It implies wage cuts, less unemployment benefits, lower minimum wages, easier firing. Many people hit by structural reforms, resist and turn to parties that promise another way to deal with the problem, including an exit from the Eurozone. From an economic point of view flexibility is the solution. From a social and political point of view flexibility can become a problem. Stressing flexibility too often as the way out of the conundrum risks creating enemies of the monetary union that as time moves on leads to an increasing political momentum favoring an exit from the union.

The traditional OCA-analysis is based on the assumption that asymmetric shocks are typically permanent and structural in nature (a change in preferences, a supply shock). We have found, however, that most of the shocks hitting the Eurozone have been temporary and the result of a boom-bust scenario. They are also typically demand shocks. In De Grauwe and Ji(2016) we provided further evidence that business cycle shocks, albeit with different amplitudes, have been the dominant forces.

The implications for the governance of the Eurozone from the finding of the overwhelming importance of the cyclical and temporary component of output growth is that efforts at stabilizing the business cycle should be strengthened relative to the efforts that have been made to impose structural reforms. We are not implying that structural reforms are unnecessary, but rather that efforts at creating mechanisms aiming at stabilizing the Eurozone business cycles should be strengthened.

Inter-country versus inter-temporal smoothing

There have been many proposals made to create a fiscal space at the Eurozone level in the form of a common unemployment insurance system (see e.g. the Four Presidents report(2012), Enderlein, et al. (2012), Beblavy, et al.(2015), Alcidi and Thirion(2015), Benassy-Quéré, A., et al. (2018))[3].

[3] There is an older literature making similar proposals. See e.g. Italianer and Vanheukelen(1992), Hammond and von Hagen(1993) and Mélitz and Vori(1993).

Such an insurance system has both an inter-country and an inter-temporal insurance dimension. The inter-country dimension is easier to deal with. It is also the one that has received most of the attention in the past. When one country experiences a recession, and thus increasing unemployment, the other country experiences a boom, and declining unemployment. This facilitates the workings of the common unemployment insurance system. The booming country transfers resources to the country in a recession and thereby smoothens the business cycles in the two countries. Technically and politically such a system encounters relatively few problems.

Problems arise when business cycles are relatively well synchronized but of very different amplitude in the different member countries. In that case most countries will tend to experience a recession at about the same time, but in some countries the recession will be mild in other very intense. This creates both an economic and a political problem. First, countries with a mild recession are asked to transfer resources to countries experiencing a stronger recession. This tends to reduce the intensity of the recession in the latter country at the expense of making it more intense in the former country. It is not clear that this is welfare improving. Second, it is likely to create important political problems in the former country that is asked to transfer resources when the economy is not doing well.

The previous analysis suggests that common unemployment insurance schemes should put sufficient emphasis on smoothing over time. This can be achieved by allowing the common unemployment insurance scheme to accumulate deficits and surpluses over time. The fiscal rule that could be imposed is that the insurance scheme balances over the business cycle.

In principle, inter-temporal smoothing could be done at the national level, by allowing the national budgets to do the job. However, the large differences in the amplitude in the business cycle movements makes such a purely national approach problematic, as it leads to large differences in the budget deficits and debt accumulation between countries. These differences quickly spillover into financial markets when countries that are hit very hard by a downward movement in output are subjected by sudden stops and liquidity crises. This is

likely to force them to switch off the automatic stabilizers in their national budgets (De Grauwe and Ji(2017)). In addition, these liquidity outflows are inflows in some other countries in the monetary union, typically those that are hit least by the recession[4]. Their economic conditions improve at the expense of the others. Stabilization of common business shocks with different amplitudes at the national level makes the system unstable.

National stabilization efforts do not work and introduce an element of instability in a monetary union, mainly because it leaves the countries most hit by the business cycle shocks unable to stabilize. Thus when business cycle shocks dominate it will be necessary to follow a common approach to the stabilization of the business cycles. A budgetary union can provide this. By centralizing part of the national budgets into a common budget managed by a common political authority, the different increases in budget deficits following from a (common) recession translate into a budget deficit at the union level. As a result, the destabilizing flows of liquidity between countries disappear, and the common budgetary authority can allow the automatic stabilizers in the budget to do their role in smoothing the business cycle. In fact, because a common budget also generates implicit inter-country transfers the countries with the deepest recession will profit from the automatic stabilizing features of the common budget most. As a result, a common budget provides the most effective way to stabilize the business cycle.

The previous discussion illustrates that there is an interaction between what we have called the OCA-problem and the fragility problem. It is because the government bond markets lack a backstop that they become unstable during recessions. This makes it impossible to use the automatic stabilizers at the national level, forcing the monetary union to provide stabilization at the union level.

[4] This is confirmed by the empirical work of Furceriand Zdzienicka (2013) and Hoffmann and Nitschka (2012) who find that during recessions risk sharing through financial markets declines dramatically.

6.2 How to deal with the instability of the government bond markets?

Let us now turn to the question of how to deal with the second problem of the Eurozone, the instability of the government bond markets.

The ECB has a central role to play here. By promising to provide unlimited support in the government bond markets in times of crisis, it can stop liquidity crises that are likely to emerge each time the Eurozone experiences a recession; liquidity crises that destabilize the system leading to large capital outflows from some country to other countries in the same monetary union.

The ECB recognized this problem when it started its OMT-program in 2012. This certainly helped to pacify financial markets at that time and avoided the collapse of the Eurozone. We can clearly see from Figure 1 that when the OMT-program was announced the yields in the government bond markets of the periphery countries started a steep descent. The beauty of that announcement was that the ECB did not have to buy one euro in the government bond markets.

The issue arises of how credible the OMT-program is for future use. The credibility problem arises from the fact that when using the OMT program the ECB will have to decide whether the crisis it is facing is due to a liquidity or a solvency problem. If it determines it is a liquidity problem it should step in; if it decides it is a solvency problem it should not. In the latter case the other governments should decide whether or not to support the troubled government.

This creates political problems that the ECB cannot take on. It is generally very difficult to determine in real time whether the problem is due to lack of liquidity or to insolvency. The uncertainty surrounding liquidity versus solvency problems makes it difficult for the ECB to step in without creating political controversy. In the Greek crisis of 2015 the ECB decided that the Greek problem was one of insolvency of the Greek government and therefore it refused to support the Greek government bond market, precipitating the crisis and leading to intense political conflicts in the Eurozone.

All this will lead to doubts about the willingness of the ECB to provide liquidity to future governments in times of crisis. As a result, the credibility of OMT is

limited, which means that it is not a foolproof insurance mechanism that will stabilize the markets in future crises.

This problem does not exist in standalone countries. The commitment of the central bank to support the sovereign of a standalone country in times of crises is unconditional mainly because in times of crisis the sovereign prevails over bureaucrats at the central bank. This may come at a price though, because it also implies that the credibility of the central banks' commitment to price stability is less than 100%. Paradoxically, one may argue that the commitment of the ECB towards price stability is stronger than in standalone countries precisely because the commitment of the ECB towards the support of the 19 different national governments is weak.

The only way to solve the lack of credibility of the ECB as lender of last resort in the government bond market is by creating a budgetary union that includes the consolidation of a significant part of the national debts into one Eurozone debt. This could be achieved by the issuance of Eurobonds that are backed by a joint liability of the issuing governments (see Delpla and von Weizsäcker (2010), De Grauwe and Moesen(2010)). Such a consolidation mimics the relation between the central bank and the government that exists in standalone countries. It makes the credibility of liquidity support of the sovereign watertight and eliminates the danger of destabilizing capital flows within the union. Clearly such a consolidation can only occur if it is embedded in a political union, characterized by a central government that has the democratic power to tax and to spend. These are very intrusive, if not revolutionary transformations of the Eurozone, for which there is little appetite today in official circles. These have now taken for granted that a further significant budgetary union together with a political union in which the budgetary union must be embedded is out of reach for the foreseeable future (which undoubtedly is true). As a result, they tend to embrace technical solutions that can solve the problem while avoiding the need to create a budgetary and political union.

One such technical solution is to create a "safe asset". This was proposed recently by the ESRB(2018) based on research done by Brunnermeier, et al. (2016). It

was also one of the proposals made by the French-German group of economists (see Benassy-Quéré, A., et al. (2018); see also Pisani-Ferry(2013)).

The essence of these proposals consists in the issuance of a new asset that would be backed by a portfolio of national government bonds. Each government, however, would remain fully responsible for the bonds it has issued. Thus there would be no joint liability as is the case with Eurobonds. This new "safe asset" would consist of two tranches, a senior and a junior tranche. The senior tranche (70% of the total issue) would be safe; the junior tranche (the remaining 30%) would carry a risk of sovereign default. Thus, if one or more governments default on their bonds the holders of the junior tranche would take the hit. The holders of the senior tranche would be safeguarded as long as the total of the defaults does not exceed more than 30% of the nationally issued bonds.

How likely is it that these SBBSs will help to stabilize the Eurozone? Note that in the way we formulate the question we do not dispute that in normal times the creation of a safe asset may not increase the efficiency of the financial system in the Eurozone. It probably will do so by supplying a new type of asset that can provide for a better diversification of normal risks. The issue is whether the safe asset will be an instrument for dealing with systemic risks in times of crisis? Our answer is negative for the following reasons.

First, the creation of a safe asset does not eliminate the national government bond markets. This is recognized by the proponents of a safe asset (see ESRB(2018) and Brunnermeier, et al.(2016)). In fact these proponents have made the continuing existence of national sovereign bond markets a key component of their proposal. According to the ESRB "the SBBS issuance requires price formation in sovereign bond markets to continue to be efficient" (p.33). The markets for sovereign bonds must remain large enough so as to maintain their liquidity. That is also why the ESRB proposes to limit the total SBBS issuance to at most 33% of the total outstanding stock of sovereign bonds.

This constraint on the issue of SSBS implies that national sovereign bond markets will be "alive and kicking". As a result, the major problem that we identified earlier, i.e. the potential for destabilizing capital flows across the borders of the monetary union will still be present. However, since the markets

of sovereign bonds will have shrunk the yields are likely to be more volatile during crisis periods.

Second, we observe that during crises, the correlation pattern of yields changes dramatically. During normal times all yields are highly positively correlated. During crisis times, as investors are looking for safe havens, the yields in the safe assets tend to decline sharply and become negatively correlated with the high risk yields. This pattern was very pronounced during the sovereign debt crisis of 2010-12. In their simulations of the risks involved in SBBSs Brunnermeier, et al.(2016) do take into account the fact that risks can be correlated. However, this correlation pattern is fixed, while during crisis periods correlation patterns change dramatically. We show this feature in Table 1 in appendix. We find that during the sovereign debt crisis of 2010-12, the government bond yields of the periphery countries were negatively correlated with the yields of the core (safe) countries like (Germany, Finland, France, Netherlands).

The implication is that during crises it is very unlikely that the senior tranche in the SBBS can maintain its status of safe asset. It will consist of bonds investors dump and "safe-haven" bonds. The senior tranche will continue to depend on the cash flow generated by bonds that panicking investors deem to be extremely risky. The perception that this senior tranche is equally safe as the safe-haven sovereign bonds (e.g. German bonds) is very unlikely when markets are in panic mode. As a result, it is also likely that investors will flee the senior tranches of the SBBS to invest in the "real thing", i.e. super safe sovereign national bonds.

6.3 A banking union

In order to cut the doom loop between the sovereign and the domestic banking sector it is now generally accepted that it is necessary to create a banking union in the Eurozone. This will make it possible to resolve banking crises at the union level thereby insulating the sovereign from the consequences of banking crises and also to eliminate the reverse link between sovereign and banking sector.

Significant progress has been made in creating a banking union. Such a banking union consists of three components: common supervision, common resolution,

and common deposit insurance. The first component is a reality; the second one is partially realized; the third one is completely absent. The lack of progress in the second and third leg of the banking union is essentially due to the same factor as the lack of progress towards a budgetary union. These require a willingness to allow taxpayers of one country to take on commitments to help other countries. At this moment of history this willingness does not seem to be present.

We can conclude that we are still far removed from a full banking union. The result of all this is that the Eurozone is still unprepared to face a major banking crisis.

7. Conclusion

We started this paper by observing that the countries that were hit by a sovereign debt crisis during 2010-12 were also the countries that during the 19990s experienced foreign exchange crises. This led us to ask the question whether these countries (that we call periphery countries) carry the burden of some "original sin" that leads them into financial turbulences whether they are in the monetary union or not. We analyzed the potential nature of this original sin. We argued, however, that the case for the existence of an "original sin", and thus some deterministic force that condemns countries in the periphery to stay in the periphery indefinitely, is weak. We concluded that countries that are in the periphery today can become part of the core and vice versa. There is nothing deterministic about the question of which countries can be hit by crises.

We analyzed how the Eurozone problems should be dealt with. We argued that the long run success of the Eurozone depends on a continuing process of political unification. Political unification is needed because the Eurozone has dramatically weakened the power and legitimacy of nation states without creating a nation at the European level. This is particularly true in the field of stabilization

Real stabilization of the Eurozone goes through two mechanisms. The first one is the willingness of the ECB to provide liquidity in the sovereign bond markets of the Eurozone during times of crisis. The ECB has set up its OMT-program to do

this. However, OMT is far from credible and is loaded with austerity conditions, which will be counterproductive when used during recessions (which is when crises generally occur). That is why a second mechanism is necessary. This consists in creating Eurobonds that are based on joint liability of the participating national governments. Without such joint liability it will not be possible to create a common sovereign bond market. The creation of such a common bond market is the *conditio sine qua non* for long-term stability of the Eurozone.

The political willingness to go in this direction, however, is non-existent today. There is no willingness to provide a common insurance mechanism that would put taxpayers in one country at risk of having to transfer money to other countries. Under those conditions the sovereign bond markets in the Eurozone will continue to be prone to instability.

Recently, proposals were made to use financial engineering as a tool to stabilize the Eurozone. Although some of these proposals, e.g. the "safe asset" proposal can be useful in contributing to more market efficiency in normal times, we argued that they will not contribute significantly in making the Eurozone more stable. The danger of these proposals is that they allow policymakers to believe that the objective of stability can be achieved by some technical wizardry without having to pay the price of a further transfer of sovereignty.

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Appendix

Table 1. Correlation of yields before crisis (2000M1-2009M12)

	Germany	Finland	Netherlands	Austria	France	Belgium	Italy	Spain	Ireland	Portugal	Greece
Germany	**1.00**										
Finland	**0.97**	**1.00**									
Netherlands	**0.97**	**1.00**	**1.00**								
Austria	**0.94**	**0.99**	**0.99**	**1.00**							
France	**0.98**	**1.00**	**1.00**	**0.99**	**1.00**						
Belgium	**0.95**	**1.00**	**0.99**	**1.00**	**0.99**	**1.00**					
Italy	**0.89**	**0.97**	**0.96**	**0.99**	**0.96**	**0.98**	**1.00**				
Spain	**0.94**	**0.99**	**0.99**	**1.00**	**0.98**	**1.00**	**0.99**	**1.00**			
Ireland	**0.61**	**0.78**	**0.76**	**0.83**	**0.74**	**0.81**	**0.88**	**0.83**	**1.00**		
Portugal	**0.90**	**0.98**	**0.97**	**0.99**	**0.96**	**0.99**	**0.99**	**0.99**	**0.87**	**1.00**	
Greece	**0.68**	**0.83**	**0.82**	**0.87**	**0.80**	**0.86**	**0.92**	**0.88**	**0.96**	**0.91**	**1.00**

Table 2. Correlation of yields during crisis (2010M1-2012M09)

	Germany	Finland	Netherlands	Austria	France	Belgium	Italy	Spain	Ireland	Portugal	Greece
Germany	**1.00**										
Finland	**0.98**	**1.00**									
Netherlands	**0.99**	**0.99**	**1.00**								
Austria	**0.89**	**0.93**	**0.91**	**1.00**							
France	**0.83**	**0.89**	**0.87**	**0.98**	**1.00**						
Belgium	**0.45**	**0.58**	**0.54**	**0.74**	**0.80**	**1.00**					
Italy	**-0.66**	**-0.57**	**-0.58**	**-0.34**	**-0.21**	**0.28**	**1.00**				
Spain	**-0.62**	**-0.60**	**-0.55**	**-0.48**	**-0.34**	**0.02**	**0.81**	**1.00**			
Ireland	**0.16**	**0.24**	**0.24**	**0.28**	**0.38**	**0.68**	**0.38**	**0.44**	**1.00**		
Portugal	**-0.62**	**-0.52**	**-0.54**	**-0.32**	**-0.19**	**0.29**	**0.88**	**0.73**	**0.54**	**1.00**	
Greece	**-0.82**	**-0.79**	**-0.78**	**-0.62**	**-0.50**	**-0.13**	**0.81**	**0.81**	**0.23**	**0.85**	**1.00**

Table 3. Correlation of yields after crisis (2012M10-2017M12)

	Germany	Finland	Netherlands	Austria	France	Belgium	Italy	Spain	Ireland	Portugal	Greece
Germany	**1.00**										
Finland	**1.00**	**1.00**									
Netherlands	**1.00**	**1.00**	**1.00**								
Austria	**1.00**	**0.99**	**1.00**	**1.00**							
France	**0.99**	**0.99**	**0.99**	**0.99**	**1.00**						
Belgium	**0.99**	**0.99**	**0.99**	**0.99**	**0.99**	**1.00**					
Italy	**0.92**	**0.91**	**0.92**	**0.93**	**0.95**	**0.95**	**1.00**				
Spain	**0.90**	**0.90**	**0.90**	**0.92**	**0.92**	**0.94**	**0.97**	**1.00**			
Ireland	**0.93**	**0.93**	**0.93**	**0.95**	**0.95**	**0.96**	**0.97**	**0.99**	**1.00**		
Portugal	**0.78**	**0.78**	**0.79**	**0.82**	**0.83**	**0.85**	**0.93**	**0.93**	**0.92**	**1.00**	
Greece	**0.31**	**0.31**	**0.31**	**0.35**	**0.34**	**0.38**	**0.45**	**0.58**	**0.55**	**0.57**	**1.00**

Source: European Central Bank and authors' own calculation
Note: The yields are yields on 10-year government bonds