Flexibility Versus Stability:
A Difficult Tradeoff in the Eurozone

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Abstract

The optimal currency areas (OCA) theory has been influential in pushing euro-zone countries towards structural reforms to make product and labour markets more flexible. The underlying assumption of the OCA prescription for structural reform is that asymmetric shocks are permanent. However, when shocks are temporary it does not follow that more flexibility is the answer. When shocks are the result of business cycle movements, the way to deal with them is by stabilisation efforts. We provide empirical evidence that suggests that the biggest shocks in the eurozone were the result of business cycle movements. These were relatively well synchronised, except for their amplitude. We argue that efforts to stabilise the business cycles should be strengthened relative to the efforts that have been made to impose structural reforms, and consider the implications for the governance of the eurozone.

Flexibilität versus Stabilität:
Ein schwieriger Trade-off in der Eurozone

Zusammenfassung

Die Theorie optimaler Währungsräume („optimum currency areas", OCA) war sehr einflussreich bei der Durchsetzung struktureller Reformen in Mitgliedslän-dern der Eurozone, wie zum Beispiel der Flexibilisierung von Produktions- und Arbeitsmärkten. Dabei stützten sich die per OCA-Rezept verschriebenen Reform-vorschläge auf die Annahme, dass asymmetrische Schocks von dauerhafter Natur sind. Sind asymmetrische Schocks hingegen vorrübergehend, lässt sich an der Empfehlung einer höheren Flexibilität als Bestandteil von Strukturreformen

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nicht festhalten. Falls Schocks die Folge von Konjunkturzyklen sind, ist ihnen mit stabilisierenden Maßnahmen zu begegnen. Wir liefern empirische Evidenz dafür, dass die größten Schocks in der Eurozone eine Folge konjunktureller Schwankungen sind. Diese verlaufen überwiegend synchron, aber unterscheiden sich dabei in ihrer Stärke. Wir argumentieren, dass Bemühungen zur Stabilisierung des Konjunkturzyklus im Verhältnis zu den Anstrengungen zur Durchsetzung von Strukturreformen verstärkt werden sollten. Hieraus werden dann abschließend Implikationen für die Governance der Eurozone abgeleitet.

I. Introduction

Since the eruption of the sovereign debt crisis in the eurozone, substantial efforts have been made to create a new form of governance for the eurozone that will make the monetary union more robust in absorbing future economic and financial shocks. Much of the drive to adapt the governance of the eurozone has been influenced by the traditional theory of optimal currency areas (OCA), which stresses the need for flexibility in product and labour markets. As a result, the eurozone countries have been pushed towards structural reforms that aim to reduce the structural rigidities in product and labour markets, in the hope that this would lead to a more resilient monetary union capable of withstanding future asymmetric shocks.

Figure 1, which presents the OECD product market legislation index, shows that the eurozone countries have introduced structural reforms at a faster pace than the rest of the OECD countries. Figure 2, which presents the OECD index of employment protection, shows how the eurozone has significantly reduced its tight employment protection, especially since the sovereign debt crisis in 2010. It is interesting to note that since the early 1990s the non-eurozone OECD countries have followed a reverse trend of increasing employment protection.

In this paper we ask whether this movement towards structural reform as part of the push for new governance is really going in the right direction. We will argue that this is not the case. The main reason is that the nature of the shocks that have hit the eurozone does not correspond to the pattern of asymmetric shocks that has been identified by the OCA theory to require more flexibility. We will argue that what is needed in the eurozone is not more structural reforms but a better mechanism capable of dealing with the classical boom and bust dynamics that are inherent to capitalism.
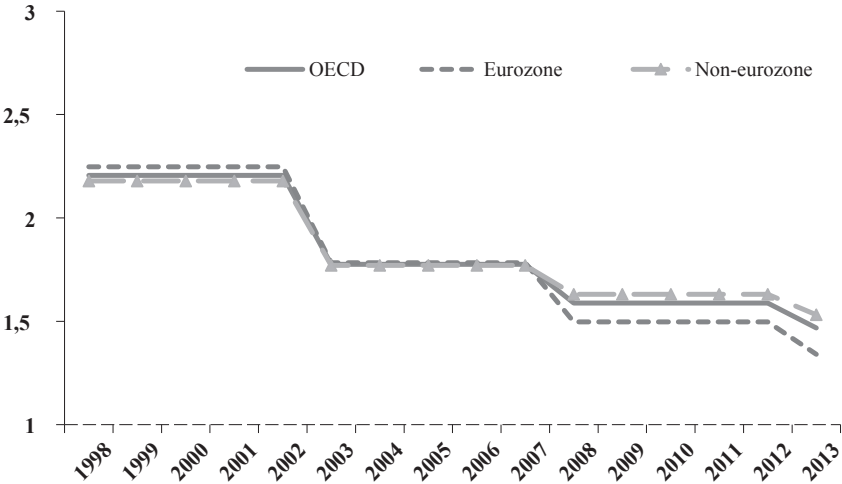
Figure 1: Product Market Legislation Index
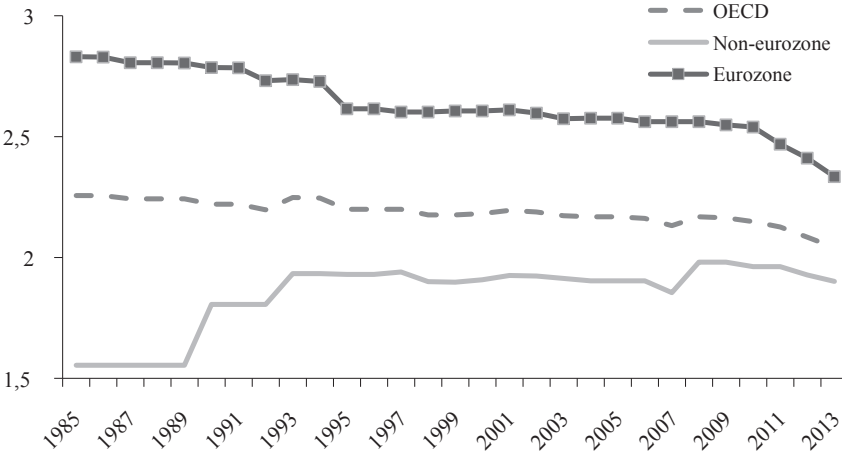
Figure 2: Employment Protection Legislation Index

Hyman *Minsky's* (1986) classic analysis of booms and busts in capitalist systems stresses the need for government stabilization mechanisms. We will ask whether the eurozone, which has moved towards more flexibility, provides for this stabilising mechanism.

In sections 2 and 3, we analyse what the OCA theory has to say about the need for flexibility and stabilisation in the face of asymmetric shocks. In section 4 we analyse empirically the nature of these shocks in the eurozone and in section 5 we study what this evidence means for the governance of the eurozone.

II. Standard OCA Theory and the Governance of the Eurozone

The theory of optimal currency areas (OCA) has created a set of ideas that has a significant influence on the governance of the eurozone and on views about how this governance should be strengthened in the future. The best way to make this clear is to present the core of the OCA theory, using a well-known graphical representation of this theory (*De Grauwe* (2014)). This is done in Figure 3. On the horizontal axis we set out the degree of flexibility in the labour and goods markets. This measures the degree to which wages and prices adjust freely to shocks and the degree to which workers are mobile. We assume that these different dimensions of flexibility can be represented by one index. On the vertical axis we set out the degree of symmetry between countries, i.e. the degree of co-movement (correlation) of macroeconomic variables such as output and employment. Thus, when there are a lot of asymmetric shocks we move downwards along the vertical axis. By contrast, when shocks become less asymmetric we move upwards along the vertical axis.

The downward sloping OCA line represents the trade-off between symmetry and flexibility. Hence, when the degree of symmetry declines (there are more asymmetric shocks) countries in a monetary union need more flexibility to deal with these shocks. The OCA-line separates the space into two zones. The OCA-zone above the OCA-line contains the collection of points at which symmetry and flexibility are high enough to guarantee that the benefits of the monetary union exceed the costs. The points below the OCA-line are the points at which symmetry and flexibility are too low, i.e. countries located in that zone will find that the costs of the monetary union exceed the benefits. The OCA-line that separates the two zones can therefore also be defined as the collection of points for which the benefits and the costs of the monetary union are equal.
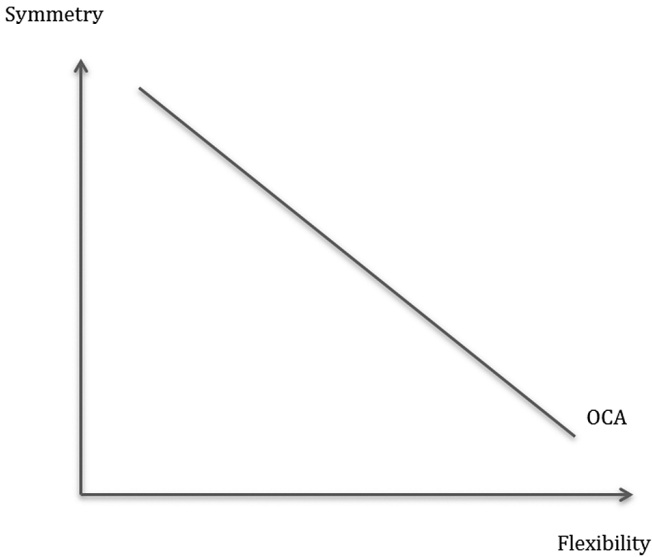
Symmetry

Flexibility

Figure 3: OCA Theory Tradeoff Between Symmetry and Flexibility

This theory has been very influential for the governance of the eurozone and continues to be so. It is at the core of the policy prescriptions that call for structural reforms so as to make the labour and goods markets more flexible. In fact, since the start of the sovereign debt crisis in 2010 member countries have been pressured by the European authorities to introduce a whole set of structural reforms. The member countries that turned to the eurozone for financial support (Greece, Ireland, and Portugal) were given this support conditional on introducing a series of structural reforms that would make labour and goods markets more flexible. The underlying rationale was the OCA theory that stresses the need for flexibility to deal with asymmetric shocks in a monetary union.

One of the underlying assumptions of this theory and its prescription for flexibility is that the asymmetric shocks are permanent. When shocks are permanent, e.g. a change in preferences that leads consumers in one country to buy more of the foreign than of the domestic good, or a productivity increase in one but not in another country, then there is really no other way in a monetary union to deal with such a shock other than changing relative prices (wages or product prices) or by a movement of labour and capital.

Things are very different, however, when shocks are temporary. In that case, it can be argued that flexibility is not necessary. In fact it can even be harmful. Take the case of business cycle movements. When these are asymmetric, i.e. when they are not synchronised, it makes little sense to adjust by relative price changes and/or by movements of labour and capital. Flexibility may in fact exacerbate the business cycle movements and its asymmetry. For example, if country A experiences a recession and country B a boom the movement of labour from A to B is likely to exacerbate the recession in country A and the boom in country B. Or take flexibility of wages. If during the recession country A is forced to reduce wages, the immediate effect of the wage cuts will be a decline in aggregate demand, which will make the recession in country A more severe.

From the preceding analysis it follows that temporary shocks, such as business cycle movements, should be dealt with differently, i.e. by stabilisation efforts that smooth consumption over time.

However, the OCA theory that focuses on the trade-off between flexibility and symmetry was developed on the assumption that asymmetric shocks are permanent. These shocks are also typically exogenous, like meteor impacts. There is nothing one can do about these. One is forced to adjust by making the system more flexible.

Business cycle shocks, by contrast, can be said to be endogenous. They are the result of endogenous movements in optimism and pessimism that lead to booms and busts. These movements have been endemic in capitalism and will continue to do their work also in a monetary union. They have been described by *Minsky* (1986) and *Kindleberger* (2001). To the extent that these movements are not synchronised, they do not call for more flexibility; rather they call for insurance mechanisms that allow countries experiencing a downturn to be compensated by countries that experience a boom, in such a way that when the fortunes of countries are reversed the transfers are reversed.

It has long been recognised that such an insurance mechanism requires some form of budgetary union. Thus, endogenous and asymmetric business cycle movements call for very different institutions in the union from the permanent and exogenous shocks that have been at the core of the OCA analysis.

III. Governance of a Monetary Union
in the Face of Temporary Shocks

In this section we consider what the nature of the institutions of a monetary union should be when the shocks are endogenous, temporary and asymmetric. We will focus on business cycle movements that are driven by 'animal spirits', i.e. movements of optimism and pessimism that lead to booms during periods of optimism and recessions during periods of pessimism. In this section we focus on the theory. In the next section we analyse the empirical question of the nature of the asymmetric shocks in the eurozone.

We start from a similar tradeoff to the one in Figure 3, but now we concentrate on the tradeoff between flexibility and budgetary union. A budgetary union should be seen as an insurance mechanism that allows countries experiencing bad economic times to be compensated by countries that fare well.

The way this tradeoff is constructed is as follows (Figure 4). On the vertical axis we set out the degree of budgetary union. The higher the degree of budgetary union the more we move upwards along the vertical line. On the horizontal axis we set out the same measure of flexibility as that used in figure 3. The OCAs line now measures the minimum combinations of budgetary union and flexibility needed to make a monetary union economically attractive (higher benefits than costs). It is negatively sloped for the following reason. When budgetary union increases, insurance against asymmetric shocks increases, making monetary union less costly. As a result, there is less need for flexibility. We move upward along the negatively sloped OCAs line.[1]

This is an important insight. Flexibility may sound great for many economists and central bankers, but it is costly for those people who are forced to be flexible. Flexibility means that these people may have to accept a wage cut or be forced to emigrate. We learn from Figure 4 that a movement towards budgetary union alleviates the (painful) need to be flexible. It may also make a monetary union more acceptable to large segments of the population.

We can use the insights of Figure 4 to analyse the importance of the nature of the asymmetric shocks. We have made the distinction between

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[1] We call this tradeoff the OCAs line because the idea of such a tradeoff comes from André Sapir (2015).
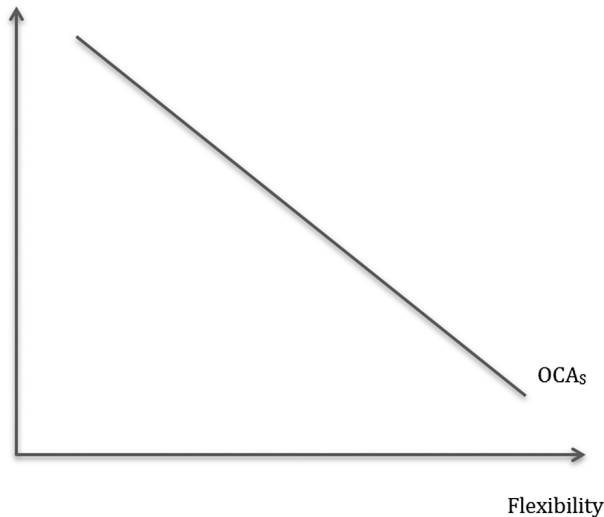
Budgetary union

Flexibility

Figure 4: Tradeoff Between Budgetary Union and Flexibility

asymmetric shocks that are exogenous and permanent, and asymmetric shocks that are temporary and endogenous. We have argued that when a permanent (exogenous) shock occurs flexibility is the only option to adjust to this shock. By contrast, when business cycle movements are desynchronised it is not optimal to use flexibility. In that case an insurance mechanism is the appropriate way to govern the monetary union. A budgetary union provides this.

It can now be shown that the nature of the shocks influences the slope of the tradeoff.[2] When the shocks are mainly of the permanent type, we obtain a steep tradeoff. We show this in Figure 5. We have also put the eurozone of 19 members below the OCAs-line, suggesting that the present eurozone is not an optimal currency area. The steep tradeoff implies that a small increase in flexibility leads us quicker into the OCA zone than a budgetary union. In the most extreme case, i.e. when all shocks are of a permanent nature, the tradeoff becomes vertical. In that case no

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[2] We are grateful to Frank Vandenbroucke for suggesting that the nature of the shocks affects the slope of the tradeoff.
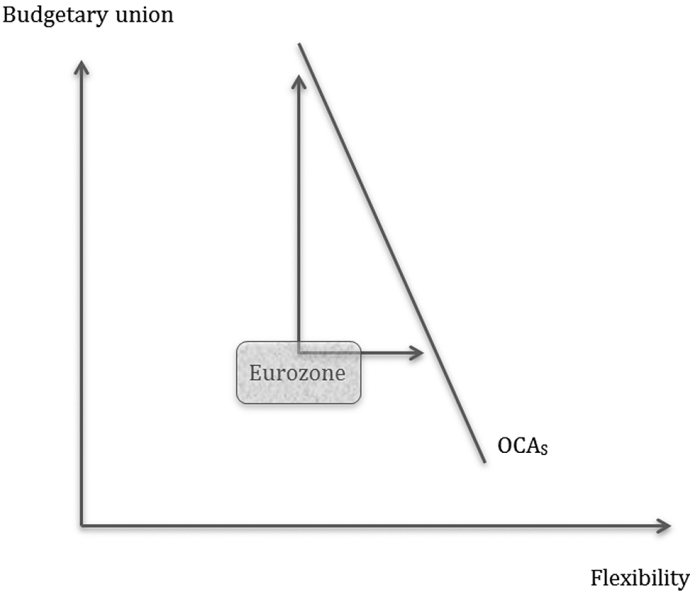
Budgetary union

Figure 5: How to Move the Eurozone Towards the OCA-Area
when Permanent Shocks Dominate?

amount of budgetary union will bring us into the OCA-zone. There is then no other way but to increase flexibility.

Things are very different when the shocks are temporary, driven by business cycle movements. In that case the tradeoff is flat (Figure 6). As a result, much flexibility is needed to move the eurozone into the OCA area compared to budgetary union. A relatively small increase in budgetary union will bring us into the OCA-zone. In the most extreme case, i.e. when all shocks are of a temporary nature,, the tradeoff is horizontal. In that case no amount of flexibility will succeed in bringing the eurozone into the OCA-zone. The only way to achieve optimality will be through a budgetary union.

One complication that arises here has to do with hysteresis. Sometimes temporary shocks can lead to hysteresis effects. For example, a recession typically leads to plant closures and dismissal of workers. To the extent that these workers have developed firm specific skills that are lost when the firm disappears, the workers lose part of their human capital making it difficult to find another (comparable) job. Unemployment can then be-
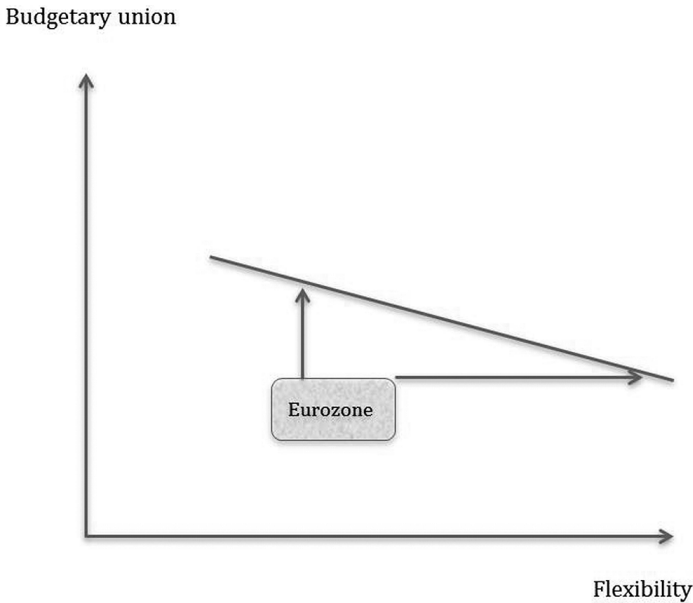
Budgetary union

Eurozone

Flexibility

Figure 6: How to Move the Eurozone Towards the OCA-Area when Business Cycle Movements Dominate?

come protracted. Another example relates to the nature of the boom. If, as was the case in Ireland and Spain, the boom is concentrated in the housing market, many workers are attracted to this sector during the boom. After the crash they are dismissed. They may find it difficult to use their skills acquired in the housing market in other sectors of the economy. There is a large literature on sources of hysteresis (*Blanchard*, et al. (1986), *Ball* (2009), *Fatas* and *Summers* (2015)).

The existence of hysteresis has implications for our discussion. It implies that if a business cycle shock occurs it matters a great deal to try to use stabilization so as to avoid hysteresis effects. If temporary business cycle shocks have permanent effects the need to set up schemes that will mitigate the impact of these shocks becomes even more important.

Figures 5 and 6 lead to another interesting insight. Flexibility in labour markets is something national governments can do. There is no need for further integration to increase flexibility. Budgetary union, however, is of a different nature. It requires political integration. In other words, while flexibility is in the realm of national governments, budgetary union is a European affair (*Sapir* (2015)). Thus, when shocks are permanent

they have to be dealt with at the national level while when shocks are temporary the response should be at the level of the eurozone.

IV. The Nature of Shocks in the Eurozone: Empirical Evidence
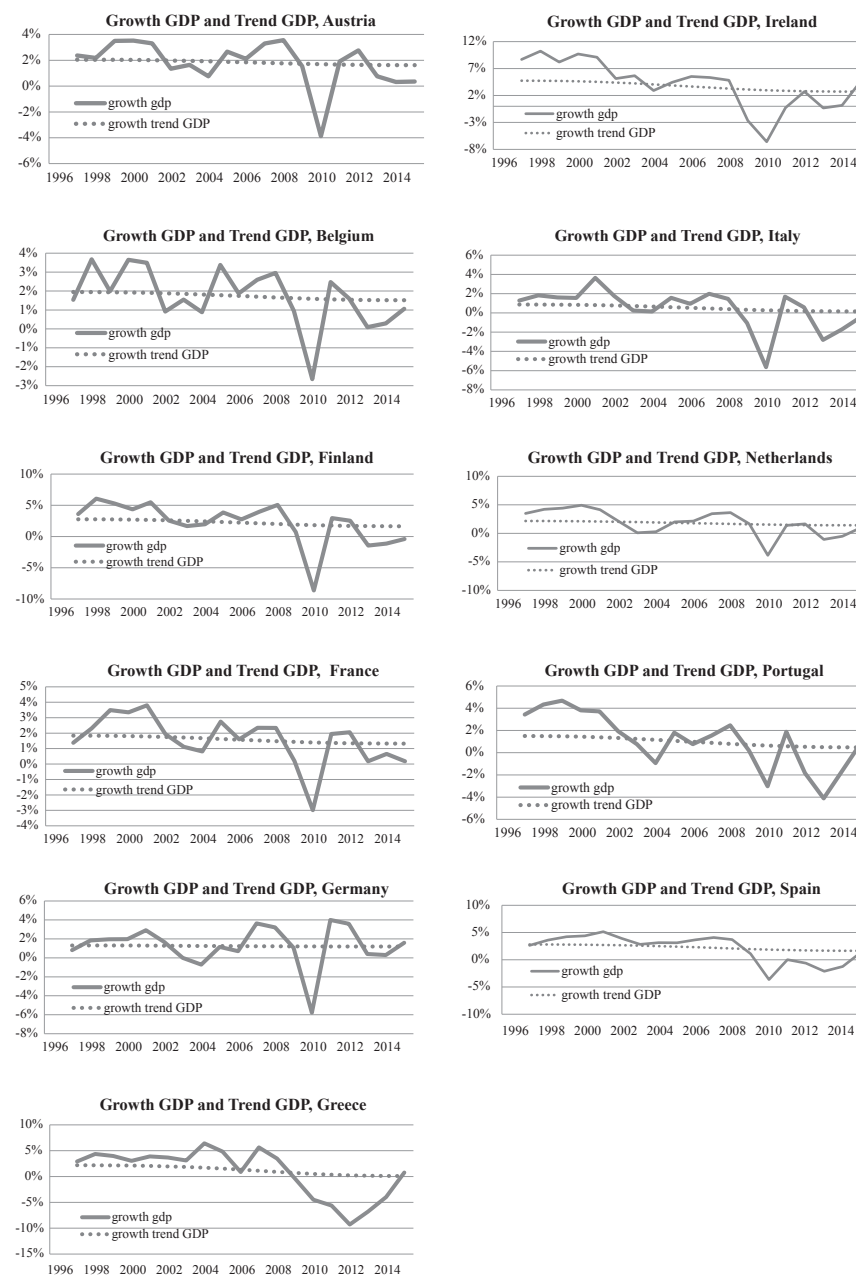
It is not always easy to separate permanent from temporary shocks in economic time series. Here we use a Hodrick-Prescott filter (HP) that allows us to estimate the long-term trend component in GDP. The cyclical component is obtained by subtracting the trend component from the observed GDP[3] (for more detail, see appendix, where we also analyse the robustness of the results for changes in the smoothness parameter lambda in the HP filter).

The results of this exercise are shown in Figure 7. We present, for each eurozone country,[4] trend growth and the observed growth rates (the cyclical component is obtained by subtracting the observed from the trend growth). Two results stand out. First, we observe for all eurozone countries (except for Germany) a decline in the long-term growth rate of GDP. This decline is particularly significant in Greece, Ireland, Finland, Spain, Portugal and Italy. Second, there is great variability in the business cycle (temporary) component of GDP growth. In order to gauge the relative importance of cyclical and trend components in GDP growth we compare the mean (absolute)[5] cyclical growth of GDP with the (absolute) mean trend growth of GDP for each country. We show the results in Table 1. We observe that for the core countries (Austria, Belgium, Germany, and the Netherlands) the cyclical growth and trend growth components are of similar magnitudes, although the cyclical component is systematically larger than the trend component. In the countries of the periphery (Spain, Portugal, Ireland, Italy, and Greece) this is very different. We observe that for these countries the cyclical growth component is much larger than the trend growth component (the most extreme case being observed for Greece). Thus, in the peripheral countries the GDP growth rates have been dominated by cyclical movements in economic activity of the boom-bust type.

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[3] There is a literature based on *Blanchard* and *Quah* (1989) that is based on estimating a VAR and, after imposing identifying restrictions, is able to estimate the temporary and the permanent component in output shocks. We discuss this literature in section 5.

[4] We only include the original eurozone countries. The new eurozone countries entered too late to provide a sufficiently long time series.

[5] As the cyclical component alternates between positive and negative numbers we have to take the absolute values.

Growth GDP and Trend GDP, Austria

Growth GDP and Trend GDP, Ireland

Growth GDP and Trend GDP, Belgium

Growth GDP and Trend GDP, Italy

Growth GDP and Trend GDP, Finland

Growth GDP and Trend GDP, Netherlands

Growth GDP and Trend GDP, France

Growth GDP and Trend GDP, Portugal

Growth GDP and Trend GDP, Germany

Growth GDP and Trend GDP, Spain

Growth GDP and Trend GDP, Greece

Sources: Eurostat and own calculations.

Figure 7: Cyclical and Trend Components in GDP Growth (1999–2014)

Mean (Absolute) Trend Growth and Mean (Absolute) Business Cycle Change in GDP (in Percent) During 1999-2014

	Mean cycle	Mean trend	ratio
Austria	1,79%	1,77%	1,01
Belgium	1,72%	1,67%	1,03
Germany	1,55%	1,23%	1,26
France	2,15%	1,49%	1,44
Netherlands	2,66%	1,66%	1,60
Finland	4,35%	2,02%	2,15
Spain	4,58%	2,07%	2,21
Ireland	8,01%	3,35%	2,39
Portugal	3,67%	0,81%	4,53
Italy	2,86%	0,41%	7,05
Greece	9,09%	0,90%	10,11

Source: Computations based on data from Eurostat.

What are the implications of these results? First, since the start of the eurozone, cyclical (temporary) movements have been the dominant factor behind growth variations in GDP. This is especially the case in those peripheral countries where cyclical movements in economic growth are many times higher than the long-term growth rates. Thus, as mentioned earlier, booms and bust in economic activity seems to be the overwhelming characteristic of movements in GDP in the countries of the periphery.

Second, it appears that the cyclical movements of GDP are highly correlated in the eurozone. This is made clear by Table 2, which shows the correlations in the cyclical components of GDP growth across the eurozone. We observe high correlation coefficients of bilateral cyclical components of GDP growth, typically 0.8 or more. It is interesting to note that the country with the lowest correlation coefficients is Germany (although the German correlation coefficients are all positive). Thus, one can conclude that the business cycles of the eurozone countries were highly correlated. Germany stands out as the country with the lowest (positive) correlations of its business cycle with the rest of the eurozone.

Thus, the asymmetry between the eurozone countries is to be found not so much in a lack of correlation in business cycle movements but in the intensity of the boom-bust dynamics of growth rates. Put differently, eu-
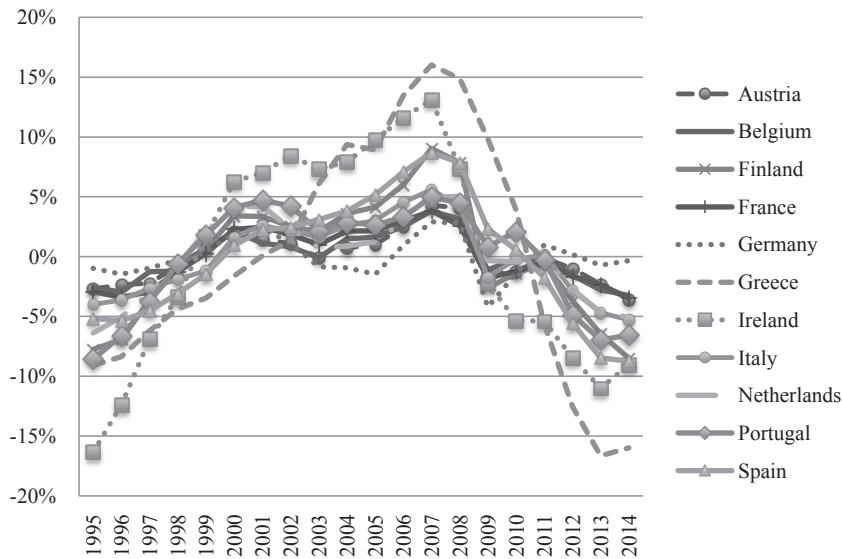
Table 2

Correlation Coefficients of Cyclical Components of GDP Growth

	Austria	Belgium	Finland	France	Germany	Greece	Ireland	Italy	Netherl	Portugal	Spain
Austria	1,00										
Belgium	0,97	1,00									
Finland	0,97	0,98	1,00								
France	0,93	0,95	0,97	1,00							
Germany	0,69	0,57	0,55	0,59	1,00						
Greece	0,73	0,82	0,84	0,74	0,09	1,00					
Ireland	0,85	0,89	0,92	0,95	0,41	0,81	1,00				
Italy	0,91	0,96	0,98	0,96	0,50	0,86	0,93	1,00			
Netherlands	0,93	0,94	0,93	0,91	0,60	0,75	0,86	0,90	1,00		
Portugal	0,98	0,89	0,89	0,87	0,37	0,82	0,87	0,90	0,94	1,00	
Spain	0,85	0,91	0,94	0,87	0,27	0,97	0,90	0,95	0,86	0,90	1,00

Source: Own calculations based on Eurostat.

rozone countries' business cycles seem to have been relatively well correlated. The difference between these countries was that some (mainly in the periphery) experienced much higher variance in business-cycle fluctuations than others (in the core). As a result, the asymmetry between member countries is to be found in the variance of the business cycles. This feature is striking in Figure 8, which shows the movements of the business-cycle components in the different eurozone countries. These appear to move together but are of very different amplitude. Some countries like Ireland and Spain experience a very strong boom and later bust, while countries like Belgium, Austria and Germany experience similar cycles but of much less amplitude.

In order to obtain a more precise estimate of the asymmetry in the amplitudes of the business cycles, we regressed each country's domestic cyclical component on the eurozone common cyclical component. The estimated slope coefficients reveal the extent to which the domestic cycles are smaller or lower in amplitude than the common cycle. The estimated slope coefficients are presented in Table 3. It is striking to find how different these slope coefficients are. Germany, Belgium, Austria and France have slope coefficients that are significantly lower than 1, suggesting cycles of significantly lower amplitude than the euro-cycle. Conversely, Finland, Spain, and especially Ireland and Greece, have slope coefficients significantly higher than 1. This suggests that these
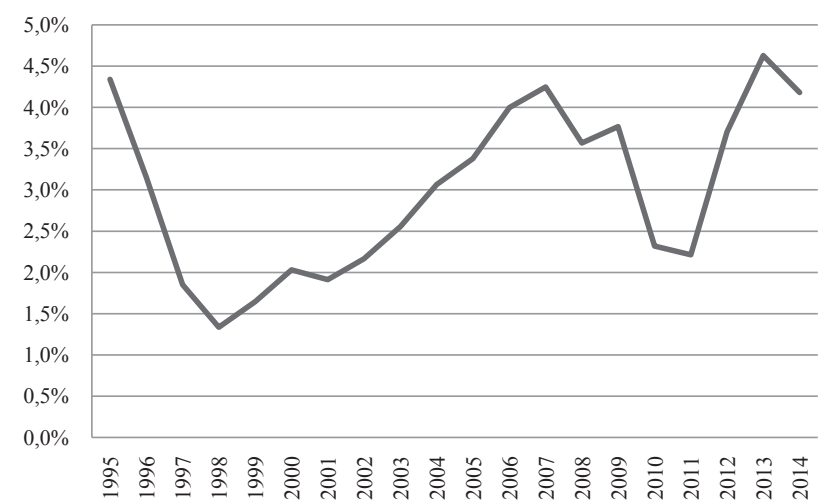
Figure 8: Business Cycle Component of GDP Growth

countries experienced much higher amplitudes in their business cycles than the common euro-cycle.

Table 3

Slope of Regression Domestic Cycle on Euro-cycle

	slope
Germany	0,21
Belgium	0,48
Austria	0,49
France	0,55
Italy	0,77
Netherlands	0,80
Portugal	1,02
Finland	1,21
Spain	1,22
Ireland	2,07
Greece	2,18

Figure 9: Standard Deviation Cyclical Component

Figure 9 shows another aspect of this asymmetry. We present the standard deviations (across countries) of the cyclical components of GDP growth and observe a striking pattern. During the boom years 1999-2007 the standard deviation increases significantly. At the start of the financial crisis in 2008 the standard deviations decline but pick up again in 2011. This evidence suggests that during the boom years between 1999 and 2007 the asymmetry in the amplitude of the business cycle increased significantly until the crash, when it declined dramatically. In other words, the crash was almost as intensive again. Things changed with the sovereign debt crisis, which had the effect of introducing an increasing divergence in the amplitude of the cycle. This result is also confirmed by *Allard*, et al. (2013), who find that growth divergence has continued to be high and in fact increased during the second half of the 2000s.

V. Comparison with Other Empirical Results

How do our results compare with other empirical studies analysing the nature of asymmetric shocks in the eurozone? The empirical research on asymmetric shocks has been very much influenced by *Bayoumi* and *Eichengreen* (1993). These authors applied the *Blanchard* and *Quah* (1989) procedure that extracts demand and supply shocks from structur-

al VARs. This procedure is applied to every eurozone country. These national demand and supply shocks are then correlated with the other countries' demand and supply shocks, or with an estimate of the eurozone-wide demand and supply shocks. The latter procedure was applied by *Fidrmuc* and *Korhonen* (2002). We show their results in Table 3. It is striking to find how low the correlation coefficients are. In fact they are so low that most are not significantly different from zero.

Table 4

Correlation of Demand Shocks

Austria	0,08
Belgium	0
Finland	0,06
France	0,3
Germany	0,18
Greece	−0,01
Ireland	0,13
Italy	0,57
Netherlands	0,04
Portugal	0,09
Spain	0,16

Source: Fidrmuc and *Korhonen* (2002).

Such a result should not really be surprising. In the *Blanchard & Quah* (1989) procedure a structural VAR is used on macroeconomic variables such as output and prices. This means that in the first step all endogenous relations between these variables is taken out. What is left over is the exogenous noise (the exogenous chocks) in these variables. By introducing identifying restrictions this procedure then finally allows us to interpret part of this exogenous noise to come from aggregate demand and part from aggregate supply. This exogenous noise appears to be rather small compared to the movements generated by the endogenous dynamics of booms and busts. It is therefore not really surprising that this procedure leads to low and mostly insignificant correlations across countries.

The *Bayoumi* and *Eichengreen* (1993) approach (which is based on the *Blanchard & Quah* (1989) procedure is very much influenced by the standard OCA literature. As argued earlier, the latter has focused on ex-

ogenous shocks and how these are correlated across countries. It is clear that by eliminating the endogenous boom and bust cycles from the statistical analysis one obtains a very shallow view on the nature of the asymmetry of shocks in the eurozone[6]. Our procedure does not have this drawback and allows us to obtain a better view on how intensely the eurozone business cycles are connected.

To conclude this and the previous section we would like to stress two limitations of our empirical analysis. First, our analysis has been based on the first 15 years the eurozone. This period saw massive boom-bust dynamics. The boom in a number of peripheral countries can be said to have been influenced by the start of the eurozone, which led to strong declines in the real interest rates in these countries. Surely, the future will look different. Yet, as capitalism has been a story of booms and busts, one should expect that these dynamics will come back, albeit triggered by other events.

Second, the fact that we find overwhelming evidence for the existence of temporary business cycle movements does not make the classical OCA shocks irrelevant. These will also occur regularly. The case of Finland illustrates this. This country recently experienced a classical OCA shock, necessitating an internal devaluation. When these shocks occur there will be a need for flexibility.

VI. Implications for the Governance of the Eurozone

The findings reported in the previous sections put the need for stabilisation in the eurozone in a new light. We analyse two implications that involve steps towards fiscal integration.

First, the finding of the overwhelming importance of the cyclical and temporary component of output growth should lead to the conclusion that efforts to stabilise the business cycle should be strengthened relative to the efforts that have been made to impose structural reforms. In terms of our theoretical analysis this means that Figure 6 is probably the relevant one. Again, this does not mean that flexibility can be disposed of.

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[6] In De Grauwe and Ji (2016) we analyze how booms and busts can get correlated internationally through a propagation of "animal spirits" across countries.

1. Common Unemployment Insurance

A second implication of our empirical results relates to the many proposals made to create a fiscal space at the eurozone level in the form of a common unemployment insurance system (see e.g. *Van Rompuy*, et al. (2012), the so-called "Four Presidents report" (*Enderlein*, et al. (2012), *Beblavy*, et al. (2015)). The proposals for such an insurance system have very much been influenced by the standard assumption made in the OCA-theory that shocks are asymmetric, i.e. that 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 smoothes the business cycles in the two countries. Technically and politically such a system encounters relatively few problems.

Problems may arise when, as we have found, business cycles are relatively well synchronised 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; in some countries the recession will be mild but in others 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 improves welfare. 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.

Another way to formulate the previous insights is the following. The traditional proposals for a eurozone unemployment insurance mechanism are predicated on the view that there is a need to smooth differences in unemployment changes across countries. That is, it is assumed that some countries experience increases others declines in unemployment. The insurance mechanism then smoothes these inter-country differences. We have noted, however, that this is not a typical eurozone asymmetry. What we found is that most countries are likely to experience a boom and a recession at about the same time, with different intensities and amplitudes. There is therefore relatively little need for inter-country smoothing of business cycle movements. The more pressing need is to smooth volatilities over time.

The previous analysis suggests that common unemployment insurance schemes should put emphasis on smoothing over time and not so much on inter-country smoothing. 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. *Beblavy* and *Maselli* (2014) have performed interesting simulations of several schemes that impose such a fiscal rule. In general it appears from these simulations that such an insurance mechanism can be implemented. Such a rule would make it possible to automatically balance the need for inter-country and inter-temporal smoothing.

2. *National Stabilisation?*

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 of 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 spill over into financial markets when countries that are hit very hard by a downward movement in output are subjected to sudden stops and liquidity crises (*De Grauwe* (2011)). This is likely to force them to switch off the automatic stabilisers in their national budgets (*De Grauwe* and *Ji* (2012). As we argued there this can push countries into a bad equilibrium.

Put differently, in the absence of a budgetary union, large differences in the amplitude of the business cycles are likely to hit the countries experiencing the more severe recession by "sudden stops", i.e. by large liquidity outflows that force them to abandon any ambition to stabilise the business cycle shocks. In addition, these liquidity outflows are inflows in some other countries in the monetary union, typically those that are least hit by the recession.[7] Their economic conditions improve at the expense of the others. The stabilisation of common business shocks with different amplitudes at the national level makes the system unstable.

In this respect the research of *Alcidi* and *Thirion* (2015) is relevant. These authors find that while the core eurozone countries have been able to stabilise part (about 50 %) of the business-cycle shocks at the national

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

level since the eruption of the debt crisis in 2010, the peripheral countries have been unable to do so, and also unable to profit from insurance mechanisms at the level of the eurozone. As a result, most (90 %) of the business-cycle shocks had to be absorbed by drops in consumption (and therefore in employment).

National stabilisation efforts do not work but introduce an element of instability into a monetary union, mainly because they leave the countries most hit by the business-cycle shocks unable to stabilise. Thus, when business-cycle shocks dominate (as we have shown in the previous section) it will be necessary to follow a common approach to the stabilisation of the business cycles. This can only be provided by a budgetary union. By centralising 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 destabilising flows of liquidity between countries disappear, and the common budgetary authority can allow the automatic stabilisers 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 stabilising features of the common budget most. As a result, a common budget provided the most effective way to stabilise the business cycle.

It is clear, however, that a budgetary union in which a significant part of national taxation and spending is transferred to a European government and parliament is far off. It cannot, therefore, be invoked today to solve the lack of stabilisation at the European level.

In addition, the common insurance mechanisms now being proposed (*Beblavy* and *Maselli* (2014)) have a relatively small inter-temporal smoothing component, amounting to no more than 0.1 % to 0.2 % of GDP over the business cycle, certainly insufficient to produce a significant inter-temporal smoothing at the EU-level. Fortunately, there are possibilities to enhance stabilisation at the eurozone level that do not require a full budgetary union.

3. A Stabilisation Fund

Here is a scheme that can provide some stabilisation at the eurozone level. A stabilisation fund would be set up. This could in fact be the existing European Stability Mechanism (ESM). During recessions, the ESM would buy national government bonds and issue an equivalent amount of

ESM-bonds (Eurobonds) backed by the participating member-countries. During booms the EMS would do the opposite, i.e. buy back the ESM-bonds and sell the national bonds into the bond markets. In doing so, there would be no net accumulation of ESM-bonds over the business cycle.

How does this scheme contribute to stabilisation at the eurozone level? During recessions national budget deficits increase automatically. Put differently, national governments have to issue new government bonds. We have argued that this process is likely to lead to destabilising capital flows, as some countries' recessions are deeper than others. This leads to more bond issues in the countries hit by the deepest recessions than in the countries experiencing mild recessions. The bond-buying operations by the ESM would then tend to support the government bond markets in the eurozone in general, but at the same time the support would be strongest in the government bond markets of the countries experiencing the deepest recessions. As a result, the EMS-buying operations would tend to unify the government bond markets and would reduce the scope for destabilising capital flows within the eurozone. This would be a significant achievement.[8]

There are many technical issues to be solved here. In particular, in order to avoid a net accumulation of EMS-bonds over the business cycle, the EMS would only be allowed to buy bonds corresponding to the cyclical component of the government budget. This makes the computation of reliable structural government balances imperative.

VII. EMU and Long-term Growth

We argued that there are too few institutions in the eurozone to perform the necessary stabilisation responsibilities of a monetary union. It is clear from our previous analysis that there is also a long-term growth problem in the eurozone. This is made obvious in Table 5. This shows the estimated long-term growth rates in 1995 and in 2014 in the eurozone countries. These are obtained from the same Hodrick-Prescott procedure used in the previous sections. We observe that there has been a signifi-

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[8] The proposed stabilisation fund resembles the proposal made by *Drèze* and *Durré* (2012). The *Drèze & Durré* proposal, however, is a pure inter-country insurance mechanism insisting that the fund balance its books at each moment in time. Note also that the scheme proposed here is very different from the OMT-programme of the ECB that is intended to be used in times of crisis. In addition, OMT is conditional on austerity programmes and tends to be procyclical.

cant decline of the trend growth in all countries. Note that this has been observed in most developed countries (*Summers* (2014) and *Teugels* and *Baldwin* (2014)).

Conventional policy-maker wisdom in the EU is that the low and declining long-term growth in the eurozone is due to a lack of flexibility in product and labour markets. As a result of this wisdom, countries have been pushed towards introducing structural reform programmes. We showed the evidence in Figures 1 and 2. Yet all the enthusiasm for introducing flexibility in product and labour markets has borne little fruit in terms of boosting economic growth in the eurozone. In fact, declining long-term economic growth has been correlated with increasing flexibility. In Appendix II we present an econometric analysis of the relation between long-term economic growth and flexibility of labour and product markets. We conclude from that analysis that the evidence of a positive correlation between growth and flexibility is weak (IMF (2015)).

Table 5

Estimates of Long-term Growth Rates in Eurozone in 1995 and 2014

	Trend 1995	Trend 2014	Change
Austria	2,05 %	1,62 %	–0,42 %
Belgium	1,95 %	1,52 %	–0,43 %
Finland	2,76 %	1,64 %	–1,12 %
France	1,84 %	1,32 %	–0,52 %
Germany	1,31 %	1,20 %	–0,12 %
Greece	2,19 %	0,10 %	–2,09 %
Ireland	4,74 %	2,71 %	–2,03 %
Italy	0,87 %	0,15 %	–0,72 %
Netherlands	2,17 %	1,42 %	–0,75 %
Portugal	1,50 %	0,47 %	–1,03 %
Spain	2,81 %	1,65 %	–1,15 %

Source: Calculations based on Eurostat.

VIII. Conclusion

Since the sovereign debt crisis in the eurozone, member countries have been pushed towards introducing more flexibility into labour and product markets. This drive towards structural reforms was very much influ-

enced by the traditional theory of optimal currency areas (OCA). This theory stresses that in the face of asymmetric shocks member countries should have a sufficient degree of labour and product market flexibility to adjust to these shocks. Without such flexibility adjustment will be impossible, thereby undermining the sustainability of the monetary union.

The underlying assumption of the OCA prescription for structural reform is that asymmetric shocks are permanent (e.g. permanent changes in preferences or productivity shocks). When the shocks are temporary it does not follow that more flexibility is the answer. More specifically, when the shocks are the result of unsynchronised business cycle movements, the way to deal with them is by stabilisation efforts.

In this paper we have provided empirical evidence to suggest that the most significant shocks in the eurozone have been the result of boom and bust, driven by waves of optimism and pessimism. These business-cycle movements have been relatively well-synchronised. What was not synchronised was the amplitude of these business-cycle movements, where some countries experienced much greater amplitude in business cycles than others.

In principle, these business-cycle movements could be stabilised at the national level without the need for budgetary union. However, as the amplitude of these movements is so different, countries experiencing the deepest recession are likely to be hit by 'sudden stops', i.e. liquidity outflows triggered by fear and panic, which forces them to switch off the automatic stabilisers in the budget, preventing them from conducting any stabilisation.

We argued that the best possible way to deal with the business-cycle movements whose amplitude is unsynchronised is by introducing a budgetary union. By centralising part of the national budgets into a common budget managed by a common political authority, the various increases in budget deficits following from a (common) recession translate into a budget deficit at the union level. As a result, the destabilising flows of liquidity between countries during the recession disappear, and the common budgetary authority can allow the automatic stabiliser in the common budget to perform its role in smoothing the business cycle.

It is highly unlikely that the governance of the eurozone will move in the direction of creating institutions capable of providing the necessary stabilisation of booms and busts that national governments are no longer able to provide. The willingness to move in this direction is minimal.

Thus, one has to look for schemes that introduce some stabilisation at the eurozone level without going all the way towards budgetary union.

We discussed two schemes that have a potential for stabilisation at the eurozone level. One is a common unemployment insurance scheme that puts more emphasis on inter-temporal insurance and less on inter-country insurance. The second scheme consists of using the ESM as a stabiliser of national government bond markets. It would buy national government bonds and issue ESM bonds during recession and do the opposite during an economic boom, making sure that over the business cycle there would be no net issue of ESM bonds. We argued that this would make it possible to stabilise the government bond markets during a recession, thereby avoiding a destabilisation of capital flows within the eurozone.

We also argued that the new governance of the eurozone that is based on imposing structural reforms does not solve the stabilisation problem that arises from the fact that most asymmetric shocks in the eurozone originate in booms and busts in economic activity.

This new governance focus on structural reforms is also unlikely to boost long-term growth. As we have shown in this paper, structural reforms have an negligible effect on long-term growth. The paradox is that the austerity programmes followed in the eurozone have reduced public investment dramatically and have thereby eliminated one of the most important channels to long-term economic growth.

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APPENDIX 1

As suggested in the main text, the choice of the smoothing parameter (lamda) in the Hodrick-Prescott (HP) filter has a significant influence on the estimate of the cyclical and permanent components of GDP-growth. In this appendix we illustrate this by comparing estimates, using a high and a low lamda. The high lamda is the same as the one used in the text and was set equal to 1200; the low lamda was set equal to 100. We compare the results in Figure A1. It is immediately evident that in the low lamda estimates the long-term growth line follows the observed output growth line more closely. As a result, the cyclical component is on average smaller than in the high lamda case. This is made clear in Table A1, which shows the mean absolute changes in the trend and cyclical components. Even in the case of a low lamda we find that the peripheral countries have been subjected to larger cyclical than permanent movements in output.

Table A2 presents the correlation coefficients of the cyclical components of GDP growth for low lamda. It should be compared with Table 2 in the text. We observe that in the low lamda estimates the correlation coefficients are of a similar order of magnitude as in the high lamda case. Thus, one of our main conclusions, i.e. that business cycles have been highly correlated, is maintained. This is also made clear in Figure A2 that shows the evolution of the business cycle component in the two estimates. Obviously, in the low lamda estimate the business cycle components are generally lower than in the high lamda estimate. In both cases, though, we observe similarly correlated booms and busts in the eurozone. And, as Figure A3 indicates, the divergence in the amplitude of the business cycles across countries tends to increase during the boom years prior to the crisis. This is also what we found using estimates with a high lamda. Thus, one of our major empirical conclusions still stands, even when one uses a low lamda. This is that the asymmetry in the business cycles of the eurozone countries is to be found in

the divergence in the amplitude of the business cycle. The business cycles themselves tended to be highly correlated.

There is reason to believe that the low lamda estimates bias the business cycle components downwards and thus the long-term growth component upwards (in absolute value). This is made clear from Table A3, which compares the estimates of long-term growth in 1995 and 2014 in the two lamda scenarios. We find that in the low lamda estimates the decline in long-term growth in a number of periphery countries is implausibly high. In the cases of Ireland and Greece long-term growth declines by more than 7 percentage points. (The corresponding declines in the high lamda case is 2 %.)
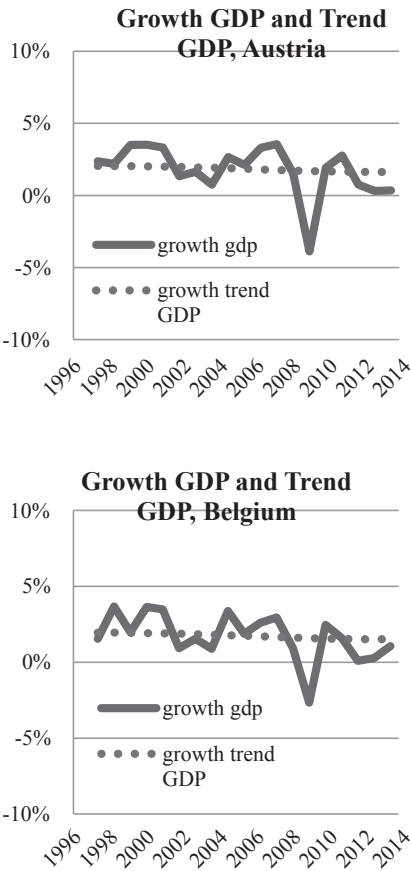
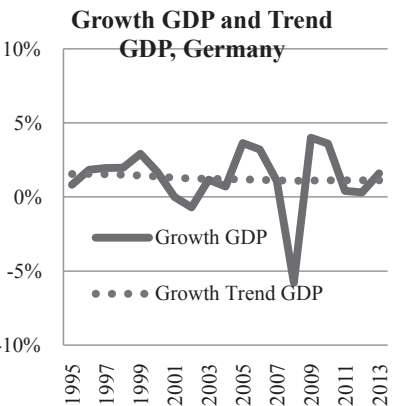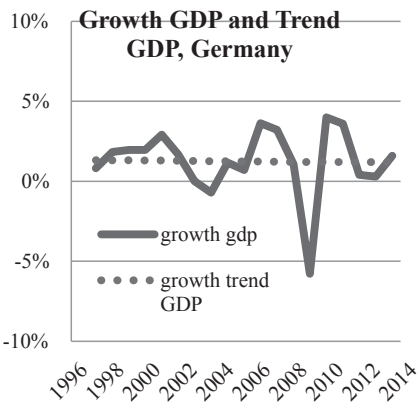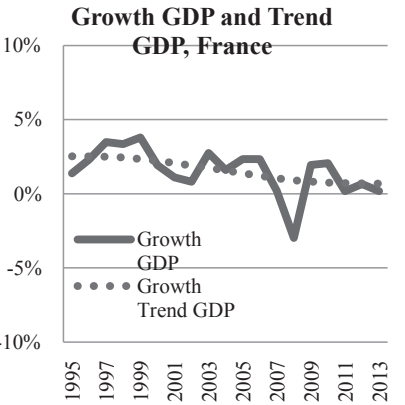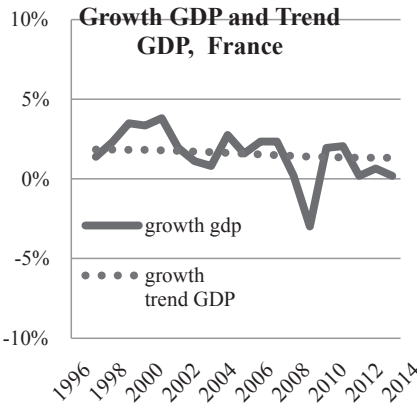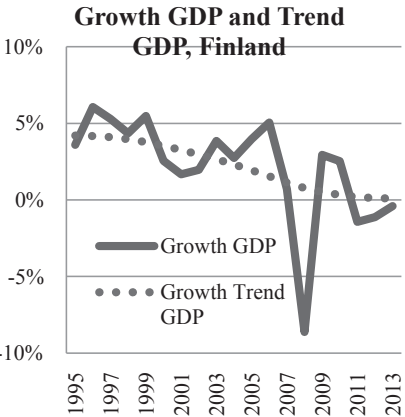*High lamda*   *Low lamda*
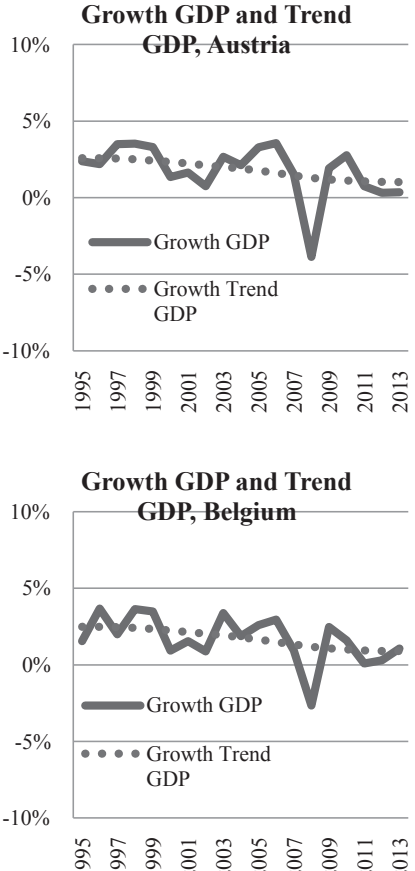
Figure A1: Observed and Trend Growth of GDP

High lamda

Low lamda

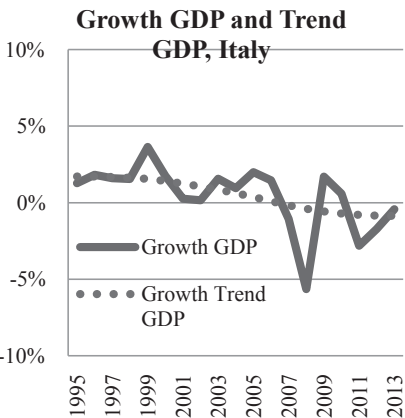**Growth GDP and Trend GDP, Finland**

Growth GDP and Trend GDP, Finland

Growth GDP and Trend GDP, France

Growth GDP and Trend GDP, France

Growth GDP and Trend GDP, Germany

Growth GDP and Trend GDP, Germany

(Continued next page)

High lamda

Growth GDP and Trend GDP, Greece

Low lamda

Growth GDP and Trend GDP, Greece

Growth GDP and Trend GDP, Ireland

Growth GDP and Trend GDP, Ireland
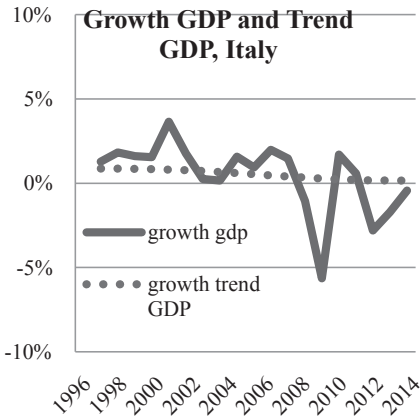

Growth GDP and Trend GDP, Italy

Growth GDP and Trend GDP, Italy
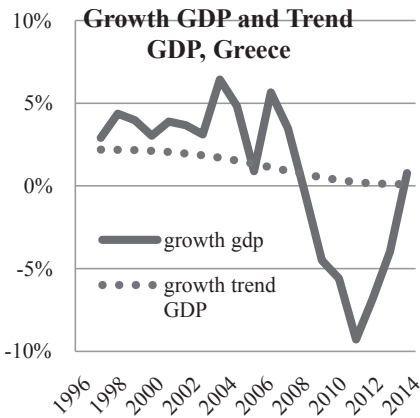
(Continued next page)

High lamda

Low lamda

Growth GDP and Trend GDP, Netherlands

Growth GDP and Trend GDP, Netherlands

Growth GDP and Trend GDP, Portugal

Growth GDP and Trend GDP, Portugal

Growth GDP and Trend GDP, Spain

Growth GDP and Trend GDP, Spain
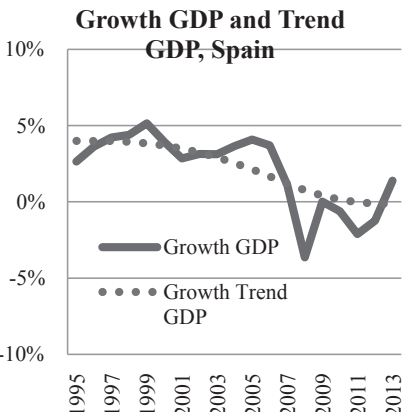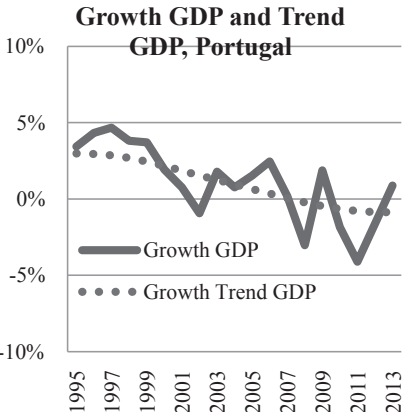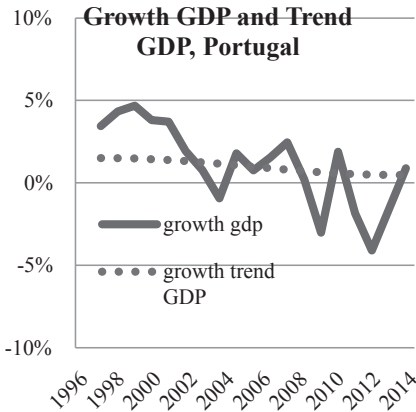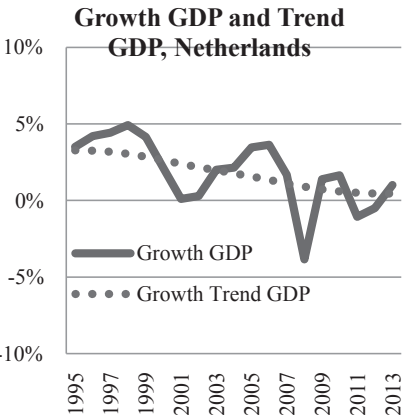
Table A1

Low Lamda and High Lamda

Low lamda

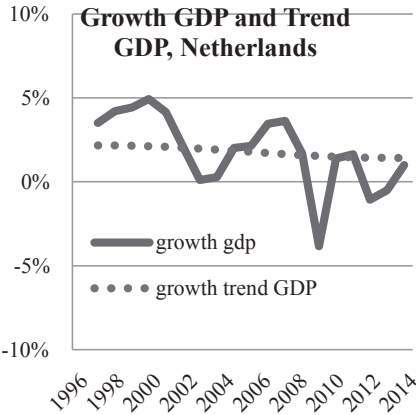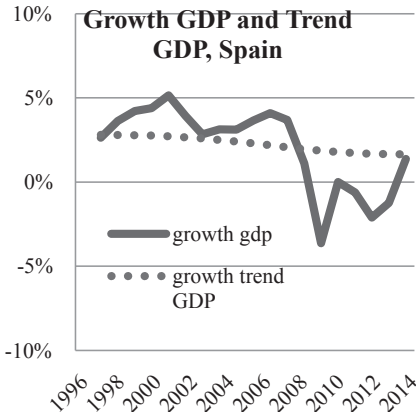|	Mean cycle	Mean trend	ratio
Belgium	0,97 %	1,47 %	0,66
Austria	1,18 %	1,58 %	0,75
Spain	1,69 %	2,22 %	0,76
France	1,04 %	1,27 %	0,82
Portugal	1,63 %	1,40 %	1,16
Netherlands	1,61 %	1,33 %	1,21
Germany	1,49 %	1,18 %	1,27
Ireland	3,26 %	2,48 %	1,31
Finland	2,08 %	1,53 %	1,36
Italy	1,37 %	0,96 %	1,42
Greece	4,50 %	2,85 %	1,58

High lamda

	Mean cycle	Mean trend	ratio
Austria	1,79 %	1,77 %	1,01
Belgium	1,72 %	1,67 %	1,03
Germany	1,55 %	1,23 %	1,26
France	2,15 %	1,49 %	1,44
Netherlands	2,66 %	1,66 %	1,60
Finland	4,35 %	2,02 %	2,15
Spain	4,58 %	2,07 %	2,21
Ireland	8,01 %	3,35 %	2,39
Portugal	3,67 %	0,81 %	4,53
Italy	2,86 %	0,41 %	7,05
Greece	9,09 %	0,90 %	10,11

Table A2

Correlation Coefficients of Business Components of GDP Growth Low Lamda

	Austria	Belgium	Finland	France	Germany	Greece	Ireland	Italy	Netherl	Port
Austria										
Belgium	0,95									
Finland	0,96	0,96								
France	0,91	0,91	0,93							
Germany	0,86	0,77	0,79	0,84						
Greece	0,37	0,48	0,51	0,27	−0,01					
Ireland	0,73	0,75	0,79	0,85	0,59	0,45				
Italy	0,84	0,89	0,94	0,90	0,74	0,53	0,78			
Nether-lands	0,88	0,86	0,84	0,79	0,78	0,36	0,64	0,74		
Portugal	0,92	0,71	0,65	0,58	0,51	0,46	0,50	0,65	0,85	
Spain	0,68	0,75	0,79	0,62	0,37	0,90	0,70	0,82	0,64	0,65
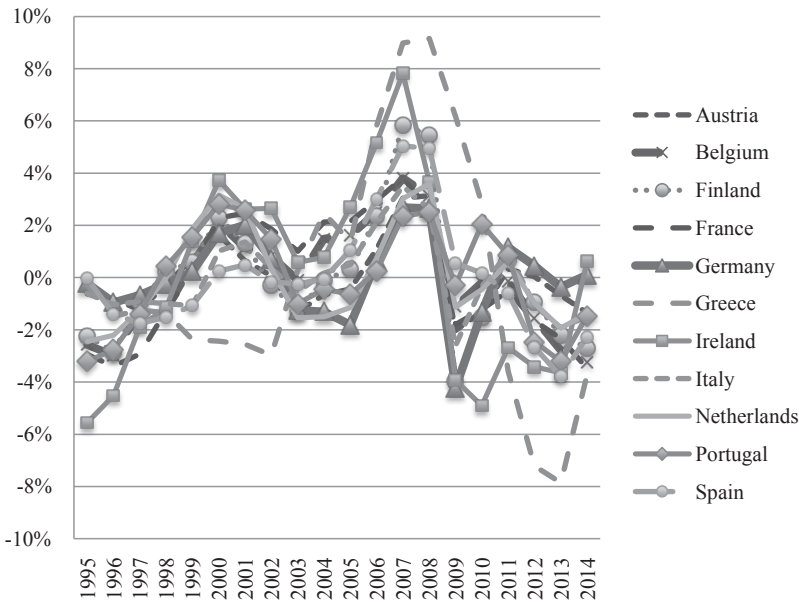
Low Lamda

Figure A2: Business Cycle Component of GDP Growth
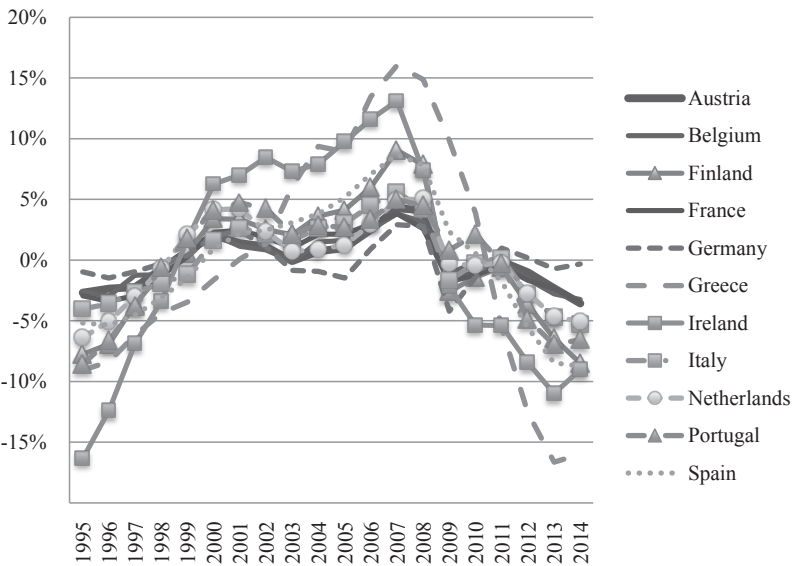
High Lamda

Figure A2: Business Cycle Component of GDP Growth

Low Lamda

Figure A3: Standard Deviation Cyclical Component

Table A3

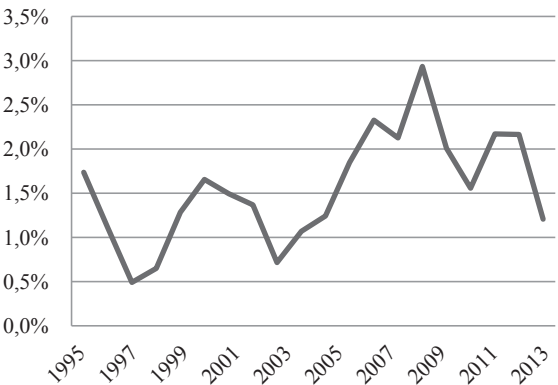**Estimates of Long Term Growth in 1995 and 2014**

Low lamda

	Trend 1995	Trend 2014	Change
Austria	2,58 %	1,02 %	−1,56 %
Belgium	2,49 %	0,90 %	−1,59 %
Finland	4,20 %	0,09 %	−4,11 %
France	2,53 %	0,69 %	−1,84 %
Germany	1,55 %	1,11 %	−0,43 %
Greece	4,12 %	−3,37 %	−7,49 %
Ireland	7,66 %	0,41 %	−7,26 %
Italy	1,71 %	−0,86 %	−2,57 %
Netherlands	3,27 %	0,45 %	−2,83 %
Portugal	2,98 %	−0,87 %	−3,85 %
Spain	3,99 %	−0,14 %	−4,13 %

High lamda

	Trend 1995	Trend 2014	Change
Austria	2,05 %	1,62 %	−0,42 %
Belgium	1,95 %	1,52 %	−0,43 %
Finland	2,76 %	1,64 %	−1,12 %
France	1,84 %	1,32 %	−0,52 %
Germany	1,31 %	1,20 %	−0,12 %
Greece	2,19 %	0,10 %	−2,09 %
Ireland	4,74 %	2,71 %	−2,03 %
Italy	0,87 %	0,15 %	−0,72 %
Netherlands	2,17 %	1,42 %	−0,75 %
Portugal	1,50 %	0,47 %	−1,03 %
Spain	2,81 %	1,65 %	−1,15 %

APPENDIX 2

Econometric Analysis of the Relation Between
Growth and Flexibility

In order to find out how labour and product market flexibility affect economic growth, we performed an econometric analysis identifying the variables that can

affect economic growth. The traditional theory of economic growth has identified a number of fundamental variables that drive the economic growth process. These variables are population growth, physical and human capital accumulation and technological progress (the residual in Solow's growth model). Recent theoretical contributions have highlighted the importance of institutions as deep variables that influence the process of capital accumulation and technological progress (productivity growth). Influential contributions are Barro and Sala-i-Martin (2003), Acemoglu and Robinson (2012).

There are many institutional features that can influence the economic growth process. The econometric literature has put a lot of emphasis on political institutions (nature of democracy, transparency of political system, rule of law, etc.) that affect the dynamics of physical and human capital accumulation and technological progress, and through this channel economic growth. The flexibility of labour and capital markets (or the lack thereof) is part of the institutional characteristics of countries that can affect economic growth.

In this section we present the results of estimating an econometric growth model using indicators of the degree of flexibility in labour and product markets (as measured by the OECD) as one of the institutions that can facilitate capital accumulation and productivity growth. The analysis is based on De Grauwe and Ji (2015).

The study is limited in that it focuses on flexibility in labour and product markets and not the many other institutions that have been identified in the econometric growth literature (see Barro and Sala-i-Martin (2003) and Acemoglu (2009)). One institutional feature we introduce in the analysis is the quality of public governance. We use the World Bank's index of government effectiveness. Our study is limited in another sense. We restrict our econometric analysis to OECD countries. The main reason is that the indices of labour and output market flexibility that we are interested in have been constructed by the OECD for the OECD-member countries.

One must also take into account that *reverse causality* may be at work and bias the results. This reverse causality runs as follows. In countries with high growth, there is a high demand for labour protection. Workers and their representatives are strong and are pushing for legislation to provide strong employment protection. As a result, we will observe that high growth is correlated with a lot of employment protection. This is in fact what we find when applying an OLS estimator in a model explaining growth by employment protection (see De Grauwe and Ji (2015)).

In order to correct for this reverse causality, we used an instrumental variable method. We selected two instruments. One is the lagged index of employment protection (EPL), the other is the ideological composition of the government along the scale right to left. This takes the view that employment protection is positively correlated with the ideological composition of governments, i.e. more leftist governments push for more employment protection. The results of this instrumental variable estimation are presented in Table 4.

We find that investment in physical and human capital has the expected positive and significant effects on economic growth. Employment protection and

product market regulations do not have a significant effect on economic growth. Note that similar results were found recently by IMF (2015). By contrast, the World Bank index of government effectiveness has a significantly positive effect on economic growth, while government consumption (as a % of GDP) negatively affects economic growth.

We conclude that the mainstream policy view that flexibility in labour and production is important to boost economic growth is not based on strong empirical evidence. The paradox is that the austerity programmes followed in the eurozone have reduced public investment dramatically and thereby have eliminated one of the most important channels that lead to long-term economic growth.

Table A4

Estimation of Economic Growth as a Function of Variables in First Column

	(1) Advanced economies 1985–2013	(2) OECD economies 1998–2013	(3) OECD economies 1998–2013	(5) Advanced economies 1998–2013	(6) Advanced economies 1998–2013
Second Stage:					
Investment GDP ratio	0.111 (0.091)	0.270** (0.129)	0.339** (0.140)	0.192** (0.095)	0.257** (0.118)
Tertiary education/total population	1.798*** (0.148)	1.492*** (0.160)	1.464*** (0.138)	1.456*** (0.147)	1.429*** (0.127)
Real effective exchange rate	−0.041*** (0.011)	−0.039*** (0.013)	−0.050*** (0.015)	−0.040*** (0.012)	−0.052*** (0.015)
Working population growth	−0.425 (0.331)	−0.776*** (0.299)	−0.901*** (0.311)	−0.658** (0.274)	−0.792*** (0.290)
Government consumption GDP ratio	−0.670*** (0.148)	−0.597*** (0.180)	−0.535*** (0.165)	−0.733*** (0.174)	−0.666*** (0.154)
Real retirement age	0.170 (0.148)	0.080 (0.192)	0.085 (0.189)	0.192 (0.175)	0.189 (0.173)
Government effectiveness	0.737 (1.019)	1.016 (0.961)	0.766 (0.932)	0.829 (0.991)	0.528 (0.946)
Crisis	−1.595*** (0.286)	−1.771*** (0.320)	−2.142*** (0.406)	−1.415*** (0.315)	−1.740*** (0.378)

Employment protection	1.936*	−1.267	−0.784	1.101	1.608
	(1.069)	(2.484)	(2.509)	(1.066)	(1.138)
Product market regulation			−0.775		−0.647
			(0.590)		(0.455)
First Stage					
Excluded instruments:					
Lagged employment protection	0.877***	0.7893***	0.7728***	0.8660***	0.8365***
	(0.085)	(0.0864)	(0.0872)	(0.0908)	(0.093)
Government (left) composition	0.0004*	0.0004**	0.0004*	0.0004*	0.0003
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Partial R-squared of excluded instruments	0.6065	0.5387	0.5217	0.5720	0.5432
Weak Identification F test	0.0064	0.0068	0.0061	0.0064	0.0075
Hansen J statistic	0.7150	0.8469	0.8589	0.6875	0.7408
Observations	389	405	399	347	341
R-squared	0.464	0.387	0.404	0.452	0.473
Number of countries	23	28	28	23	23

Robust standard errors in parentheses, *** p < 0.01, ** p < 0.05, * p < 0.1

Advanced economy: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Japan, South Korea, Luxemburg, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, UK, US

Regression: fixed effect module