The Euro and Fiscal Policy

Antonio Fatás and Ilian Mihov
INSEAD

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1. Introduction

The creation of a single currency in Europe has been accompanied by some major changes in the institutional setting for fiscal policy. In this chapter we ask whether these institutional changes have led to a change in the conduct of fiscal policy in the members of the euro area. The run up to the launch of the euro was already difficult and driven by the strict criteria defined by the Maastricht Treaty. Because this was a process driven by entry conditions, limited attention was paid to the long-run optimality of these conditions. With the introduction of the Euro in January 1999 and the replacement of the Maastricht Treaty criteria by the rules of the Stability and Growth Pact (SGP) the issues became broader and moved from a matter of debate in the academic profession to a real-time challenge for policy-makers. Within the first years of the EMU, the framework for fiscal policy embedded in the Stability and Growth Pact has been subjected to many criticisms and has certainly failed to provide a credible framework for the conduct of fiscal policy. Although the Pact was intended to be conducive to an environment of discipline, coordination, and stability, its constraints became binding for several countries and presented challenges to macroeconomic stability and to the credibility of the Pact at the very early years of the EMU.

We review the behavior of fiscal policy after the introduction of the Euro in several dimensions: procyclicality, volatility, coordination, and the role of automatic stabilizers. We characterize how the common currency and the constraints associated to the Stability and Growth Pact have shaped fiscal policy among the members of the union. The focus of the paper is not so much in providing yet one more discussion on the merits and defaults of the Stability and Growth Pact and how it could be reformed. We are after characterizing the behavior of fiscal policy and understanding whether from the perspective of the Euro and monetary policy there should be any strong concerns about this behavior. Is the ECB being hurt by the behavior of fiscal policy? Does monetary policy have to compensate for the poor behavior of fiscal policy? In that sense, we see our analysis as taking place at the aggregate level more than at the national level. Nevertheless, this analysis might seem displaced as there is no fiscal policy decision that is taking place at the level of the monetary union. In order to provide a more complete picture of fiscal policy, we also report results related to the behavior of fiscal policy at the national level.

Our results show that despite the significant change in the institutional setting, the cyclical behavior of fiscal policy in the Euro area is mildly procyclical and has not changed much since the introduction of the new currency. In contrast, US fiscal policy has become distinctly countercyclical. We also document that there has been a broad-based decline in the volatility of discretionary fiscal policy in all major economies. This decline is quite substantial for the euro area and is present in the majority of the member states. Furthermore, the

discrepancy of fiscal policy across euro-area countries – measured by the dispersion of cyclically-adjusted balances – has decreased threefold since 1999.

The paper is organized as follows: we first provide an assessment of the debates around fiscal policy as well as an overview of the academic literature. In Section 3 we characterize the behavior of fiscal policy at the Euro level while Section 4 provides a similar analysis at the national level. Section 5 looks into the question of whether there is coordination of fiscal policies and Section 6 concludes.

2. The debates on fiscal policy

The introduction of the Euro and the fiscal framework of the Maastricht Treaty have created a renewed interest in fiscal policy and in the design of institutions that promote good policies. The first problem in the analysis of the recent experience in the euro area comes from the observation that it is difficult to reach consensus on what is the appropriate policy stance. Our approach is to a focus on a set of particular behaviors of fiscal policy that relate both to a broad set of theoretical frameworks and to the empirical regularities that have been documented in the literature. We characterize the performance of fiscal policy authorities and the environment in which they operate along three main dimensions: (1) Long-term sustainability of fiscal policy; (2) The behavior of fiscal policy over the business cycle; (3) Volatility (i.e. changes in fiscal policy that are exogenous to the cycle). Implicitly, we assume that good fiscal policy must be sustainable, possibly (but not necessarily) countercyclical and it should not be a significant source of volatility.

We start with an overview of the debates on these topics and a brief review of the academic literature. We also offer a short discussion of the rules and institutions designed to constrain fiscal policy discretion. The analysis is framed in the context of EMU. In the next section we empirically characterize each of the fiscal policy behaviors we describe.

2.1. Sustainability of fiscal policy

Long-term sustainability is central to the institutional setting of fiscal policy in EMU and one of the biggest concerns of both policy makers and academics. For emerging markets, confidence in the sustainability of government budgets has direct effects on interest rates and economic performance. Many

of the deepest crises that these countries have faced have been characterized by large increases in the risk premium or defaults on government debt.

In developed countries, the concerns started with the increase in government debt levels in the mid-70s and while these levels have stabilized or have even gone down in recent years, the uncertainty of the consequences of future demographic changes has kept the debate alive.

The difficulty of governments to produce sustainable budgetary plans became known in the academic literature as the deficit bias of governments (Persson and Svensson (1989) and Alesina and Tabellini (1990)). This deficit could be due to the common pool problem or the strategic behavior of politicians in power as they tie the hands of the new elected governments or simply a sign of short sightedness of policies (for a survey of the theoretical literature see Persson and Tabellini (2001)).

In the EMU context, the Maastricht Treaty identifies sustainability as the most important bias to deal within the context of a single-currency area. What is the economic rationale for such a concern in a monetary union? Unsustainable fiscal policy may generate excessive macroeconomic volatility, which in turn will complicate the goal of the central bank in maintaining stability within the EMU. The potential tension between fiscal and monetary authorities is present in any economy but these tensions might be more relevant for a monetary union where fiscal policy is decentralized and coordination might be more difficult or simply not to the interest of national governments.

This has been made clear by the ECB in their statements, where the "sustainability of public finances" it is seen as the main goal of the fiscal framework. And the logic is that "sound fiscal policies and a monetary policy geared to price stability are fundamental for the success of a Monetary Union. They are prerequisites for macroeconomic stability and cohesion in the euro area" (Statement of the Governing Council of the ECB, March 21 2005)

Under extreme circumstances, unsustainable fiscal policy plans can lead to a deterioration of credibility and the assumption that monetary policy will bail out governments by creating unexpected inflation. In the context of a shared currency it can be that this bias becomes stronger as governments do not internalize the consequences of their behavior on the credibility of the common currency. This could create externalities in terms of credibility or simply through interest rate channels. Although this is a possibility, the academic literature does not reach a consensus on whether these externalities matter and on their size.

While sustainability relates to the long-term behavior of fiscal policy, it is connected in many ways to the discussions around business cycle stabilization

policies. The lack of discipline in fiscal policy can make the macroeconomic management of the economy difficult. First, from a dynamic point of view, if governments face debt levels which are unsustainable, they will have very little room to use automatic stabilizers in bad times so all the pressure will fall on monetary policy to smooth the business cycle. As such, a combination of high deficits and procyclical fiscal stance amplifies economic fluctuations because it reduces the effectiveness of automatic stabilizers (as argued by Melitz (2000) and Perry (2002)). Second, unsustainable plans will have to turn into sustainable ones by fiscal consolidations which are likely to have a short-term effect on the economy. Finally, high debt levels lead to higher interest rate and lower investment and growth (Mankiw and Elmendorf (1999) provide a survey of the empirical literature). Of course, a deterioration of macroeconomic performance might not have a direct impact on the conduct of monetary policy but there is, however, the argument that favorable macroeconomic conditions can make the running of monetary policy easier from a political point of view. For example, in the presence of inflationary pressures, fiscal prudence will reduce the need to increase interest rates.

There is yet another connection between sustainability and the cyclical stance of fiscal policy; one that is related to the design and implementation of budgetary plans. When it comes to the discussions on what constitutes a sustainable fiscal policy, there is the need to measure, characterize and monitor annual budgets. Because of the short-term fluctuations in budgets due to automatic stabilizers, there is the need to capture the structural balance in a given year, i.e. the budget balance adjusted for cyclical changes. Without a proper understanding of how fiscal policy behaves over the business cycle, it is impossible to provide long-term guidance to budgetary plans. This has been one of the major difficulties of the implementation of the limits on deficits and debt of the Maastricht Treaty. While they were based on simple principles of sustainability, there were endless discussions on the special circumstances that had led to balances that did not corresponded with the projected levels. The 2005 reform of the Stability and Growth Pact allowed for a more flexible interpretation of the limits that takes into account the cyclical position of the economy. There is, however, no consensus on how this adjustment needs to be made and some see this flexibility as a relaxation of the constraints.

In summary, although the main concern of the EMU fiscal policy framework was long-term sustainability, the implementation of the rules have led to debates that have focused much more on the cyclical behavior of fiscal policy. We now turn to this debate.

2.2. Fiscal policy stance and management of business cycles

Although there is a large body of theoretical literature on fiscal policy, it is difficult to provide an easy characterization of what the appropriate behavior of fiscal policy over the business cycle should be. A starting framework could be one of tax smoothing as in Barro (1979). Within that framework we can find a pattern of cyclical fluctuations of the budget as distortionary taxes are kept constant and the balance has to absorb changes in other revenues or expenditures or changes in taxes that follow the stochastic properties of the cyclical shocks (as in Chari, Christiano and Kehoe (1994)). Within the context of Keynesian models, and under the assumption that consumers are liquidity-constrained it is expected that governments run deficits during bad times and surpluses during good times as this will help stabilizing the economy.

From the perspective of monetary policy, high deficits can lead to inflationary pressures and might force the ECB to keep interest rates higher than what they otherwise would be. Of course, it has to be that these high deficits take place at a time when they are not needed, which leads to the discussion on what is the appropriate stance of fiscal policy during the cycle. This is relevant for economies where fiscal and monetary policies are decided at the same level but it might become more acute when we have a scenario of a monetary union. The decentralized nature of national budgets can make the coordination of policies more difficult.

Beyond the theoretical discussions, the issue of the cyclicality of fiscal policy has become more relevant given that empirically there is evidence that fiscal policy tends to be less countercyclical than what it should otherwise be. In fact, in many cases, fiscal policy is procyclical which will exacerbate the business cycle and makes the conduct of monetary policy more difficult. The theoretical argument of why we observe this behavior is that in good times spending increases in excess of the increase in taxes. Most Latin American economies, for example, display procyclical fiscal policy as documented in Gavin and Perotti (1997) and explained in terms of the voracity effect in Tornell and Lane (1999). The evidence for OECD and European economies is somewhat mixed. There is some evidence of procyclical behavior, but in most cases, policy is either acyclical or only slightly countercyclical. Lane (2003) and Wyplosz (2002) present evidence on the cyclical properties of fiscal policy for this group of countries. More recent studies corroborate these results (e.g. Kaminsky, Reinhardt and Vegh (2004)). Alesina, Campante and Tabellini (2007) also discuss similar evidence and present alternative political economy theories of why this behavior is observed.

When analyzing the cyclical behavior of fiscal policy it is important to understand that fiscal policy is a combination of automatic stabilizers and discretionary policy. Most of the papers above deal with discretionary

changes but we cannot forget that for most countries the majority of cyclical changes in budgets are a result of automatic stabilizers.

The role of automatic stabilizers is one that has received relatively speaking little attention in the literature. The assumption is that they are influenced by tax codes and spending rules which have not been affected by the limits on deficits and debt. Many studies about automatic stabilizers take a public finance perspective and attempt to measure the elasticity of different fiscal components to the cycle. For example Auerbach and Feenberg (2000) study the size of the automatic stabilizers in the US to conclude that there have been quite stable despite changes in tax rates.

From a macroeconomic point of view, the effects of automatic stabilizers have been linked to the size of governments. The reason for this link is the empirical regularity presented in Gali (1994) and confirmed in Fatás and Mihov (2001) that large governments display less volatile business cycles. The logic is that the size of the governments is related to the safety network provided by governments. There is some evidence that this robust empirical regularity has gotten weaker in recent years as some governments have reduced their size which has not resulted in a more volatile economy (see Debrun, Pisany-Ferry and Sapir (2008)). Because the evidence is based in a reduced-form analysis, it is difficult to reach a conclusion on why this is happening but it could be that changes in government size have happened without a reduction in the ability of certain components to react to the cycle, maybe those who have not been reduced in size.

2.3. Volatility

Fiscal policy can be a source of business cycles. When governments implement changes in fiscal policy for political reasons or, more generally, for reasons which are not driven by economic conditions, then these changes will lead to fluctuations in output and consumption. In principle, such policies may have a negative effect on the economy if they simply add volatility, which in some cases may slow down growth. The effects of fiscal policy shocks has received much attention after the work of Blanchard and Perotti (2002), Fatás and Mihov (2001) and Burnside, Eichenbaum and Fisher (2004). The origin of these changes has been associated to the political business cycle. While the evidence is mixed, there is some recent support for the presence of an electoral cycle among some economies (Drazen (2000)). The macroeconomic consequences of volatility in fiscal policy as well as its institutional origin has been documented in Fatás and Mihov (2003) and (2007) where the aggressive use of discretion in fiscal policy has been shown to generate macroeconomic volatility and lower growth.

The issue of volatility has not been a major concern in the EMU context, but we will still study it empirically to see if there is any evidence of changes in the use of discretionary fiscal policy. It is possible that the absence of national currencies has changed the incentives of governments to engage in policies that lead to a political business cycle.

2.4. Fiscal policy in the context of EMU: Rules, institutions and fiscal policy

From the perspective of EMU, appropriate fiscal policy has been defined by the rules of the Maastricht Treaty and the Stability and Growth Pact. The basic rules were defined around simple numerical constraints for deficits and debt. This led to a debate about the appropriateness of such simple rules. It is difficult to provide an exhaustive review of this literature but Buti and Sapir (2003), Gali and Perotti (2003), Fatás, von Hagen, Hughes Hallett, Strauch and Sibert (2003), Blanchard and Giavazzi (2002), Brunila, Buti and Franco (2001), Buiter and Grafe (2002) provide a review of the early years as well as proposals to modify the stability and growth pact. More recent reviews include von Hagen (2005) and Wyplosz (2007). This debate is also linked to the earlier academic literature on the effects of budget-balance constraints of US states (Alt and Lowry (1994), Poterba (1994), von Hagen (1992) and Alesina and Bayoumi, (1996). There is also a broader literature on the connection between budgetary processes and fiscal outcomes (Poterba and von Hagen, (1999).

The early years of the Stability and Growth Pact provided strong evidence that the limits to deficits and debt were not working as expected. Although there was a successful effort in the run up to EMU in 1999, the years that followed showed clear signs of fatigue as fiscal consolidation slowed down or it was even reversed. The economic slowdown of the years 2002/03 and the fact that many countries were very close to or above the 3% deficit limit made clear the weaknesses of the system and the fact that the enforcement mechanisms were ineffective. That led to the modifications of the Stability and Growth Pact introduced during 2005 that allowed for more flexible interpretations of the limits on deficits, including adjustment for cyclical conditions. These changes were criticized by the ECB as an attempt to relax the constraints that governments faced. The fact that the European economies witnessed healthy growth rates in the years that followed eased the tensions imposed by the limits on deficits. What remains unclear is how the new rules, which provide much more room to interpretation about what constitutes an excessive deficit, will work in a more challenging economic environment. The debate remains open about the trade off that exists between simple rules that might be seen as inappropriate or short-sighted, and the necessary flexibility to deal with the individual conditions of each country and each year. The evolution of the Stability and Growth Pact has been towards flexibility, which has been

welcomed by governments, but there are well-founded concerns that the added flexibility has relaxed the constraints of the system to a point that they have become irrelevant.

In addition, we have witnessed both at the academic and policy-maker level, two other debates regarding these constraints. The first one is the extent to which these constraints are needed at the Euro level or they are simply an attempt to capture "good" policy and that, as such, they should be implemented and justified at the national level. If this was the case then there is no need to impose the same rules on every country. Those who argue that a supranational framework support their conclusions by talking about the potential externalities of national fiscal policy on the policy of the EC (as we have argued before) and on overall interest rates. The second debate is about rules versus institutions. Even if we accept that there is a need to control governments and fiscal policy, are numerical rules the right way to do so or can we design a set of budget processes and institutions that can ensure the proper behavior of fiscal policy by using (good) judgment? See Wyplosz (2003) and Fatás, von Hagen, Hughes Hallett, Strauch and Sibert (2003) for two different proposals in this direction as well as a summary of this literature.

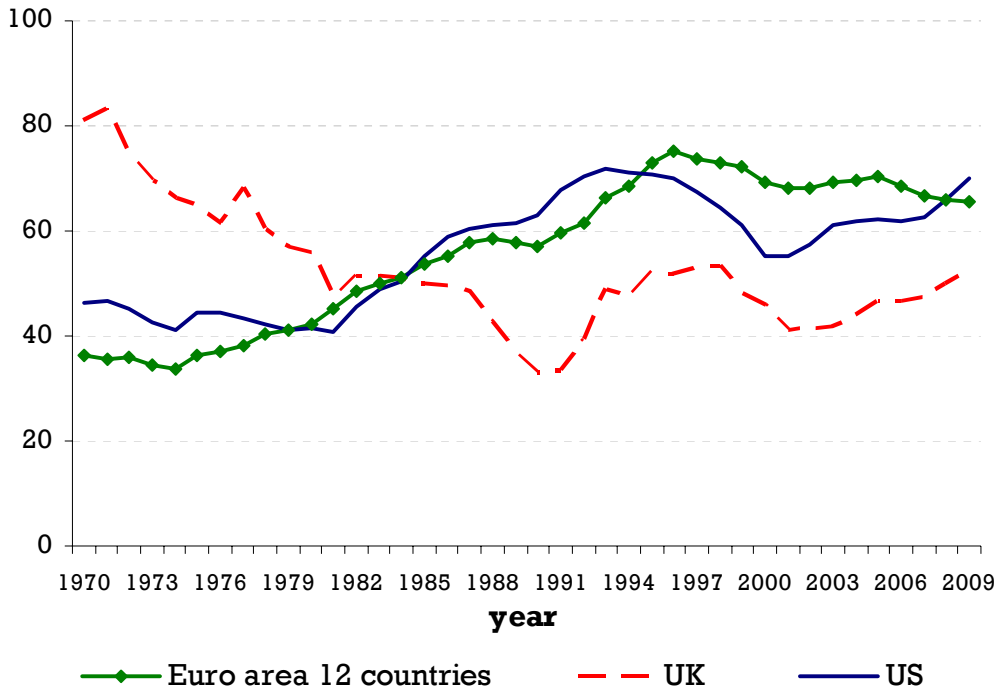
3. Fiscal stance in the euro area

We start our empirical analysis by documenting the performance of fiscal policy at the aggregate euro level. We take the perspective of the ECB as it tries to manage the economic conditions of the Euro area and it has to deal with the Euro fiscal policy stance. This fiscal policy stance is the result of a collection of decentralized national fiscal policies. Of course, each of these policies is decided independently and they react to national economic conditions but this is, in principle, irrelevant to the conduct of monetary policy that is only concerned with the aggregate of the Euro countries.

3.1 Sustainability of fiscal policy

Figure 1 shows the evolution of the debt to output ratio for the Euro area, the UK and the USA. The evolution of this ratio for the Euro countries shows an increasing trend until the mid-1990's. There is a clear downward trend that starts at this point. This trend was also followed also by the US and the UK until 2001-2002. The trend in the euro area has been interpreted before as a clear sign of the discipline that the entry conditions imposed on all members.

Figure 1. Gross Government Debt (%of GDP)

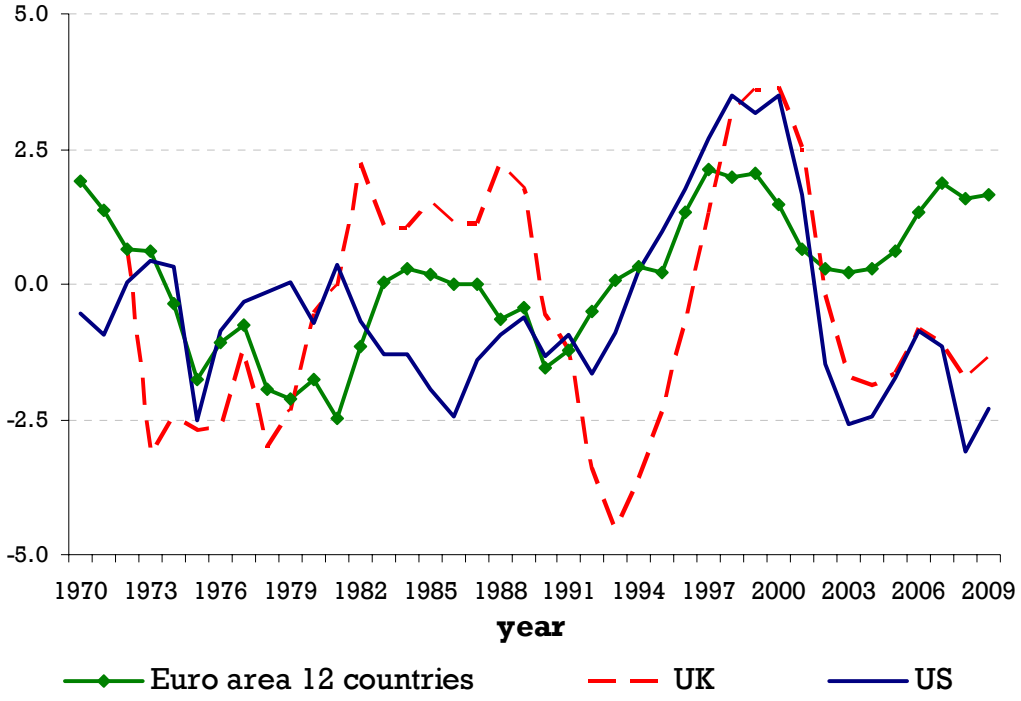


Notes: Data are from the OECD Economic Outlook. The series for the UK are gross government financial liabilities as a percentage of GDP. For the Euro area the series are gross government financial liabilities (Maastricht definition) as percentage of GDP. Data for 2008 and 2009 are forecasts.

Figure 2 provides more insights on these trends by looking at structural budget balances, which are measured as the cyclically adjusted balance as a % to potential output (using the OECD methodology). The decade of the 1970's as well as late 1980s and early 1990s showed high deficits for all countries in the sample. As the government debts levels increased, by the end of the early 1990s there was a growing need to tackle these deficits. This effort started in the mid 1990's, which coincides with the adoption of the Maastricht Treaty among European countries. Therefore, for EMU countries, the fiscal consolidation efforts that were necessary because of the high debt levels were reinforced by the limits on budget deficits and debt that were being created as a condition for entry into the single-currency area.

During this period of fiscal consolidation all major economies with the exception of Japan behaved in a very similar way: structural budgets were brought up closer to balance or even to surplus. The improvement in the Euro-area budget balance is not as large as in the case of the UK and the US but it is also true that the worsening of the balances as a result of the economic slowdown of 2001/2003 is much more pronounced in the US and the UK than in the Euro area.

Figure 2. Cyclically-adjusted budget balance as a % of potential output.



Notes: Data are from the OECD Economic Outlook. Data for 2008 and 2009 are forecasts.

For the Euro countries, 1997 represents an inflexion point as the adjustment of structural deficits clearly slows down right at the time when entry decisions for EMU are made. The Euro structural balances improve again after 2003/2004 which coincides with a period of faster growth rates.

3.2 Estimating different components of fiscal policy

To be able to interpret the stance of fiscal policy we need to separate the cyclical component from the structural one. Separating the cyclical from the structural component of fiscal policy is not easy and it is one of the most controversial issues in the academic literature. Not only there are some practical issues related to estimating the cyclical behavior of fiscal policy, because of endogeneity, but there is also the broader debate on how to characterize the business cycle itself. Before we look at the data it is good to do a simple taxonomy of the different concepts of fiscal policy we want to measure.

From a methodological point of view, we can think of fiscal policy as a combination of three elements:

1. *Automatic stabilizers*: this is the reaction of fiscal policy to business cycles and it is a result of the tax code and spending rules that link budgetary components to changes in GDP.
2. *Endogenous discretionary fiscal policy*: it includes changes in fiscal policy taken in response to changing economic conditions. These changes are discretionary in the sense that they are not coded in tax or spending laws.
3. *Exogenous discretionary fiscal policy*: here we include changes in fiscal policy which are not related to economic conditions. They can be driven by political considerations (e.g. elections) or, in the case of European countries, by the conditions set by the Maastricht Treaty.

From a conceptual point of view, it might be difficult to separate these three components. For example, governments that are trying to implement a reduction in their debt levels (as if has been the case for most of these countries during recent years) might wait for a favorable economic environment to implement their adjustment policies. This could be seen as an endogenous change in fiscal policy but it is not directly motivated by the economic cycle.

From an econometric point of view, we can summarize the behavior of fiscal policy by using a fiscal policy rule such as

$$\mathrm{Bal}_t = \alpha + \beta\,\mathrm{Cycle}_t + \lambda\,\mathrm{Debt}_{t-1} + \phi\,\mathrm{Bal}_{t-1} + \varepsilon_t \qquad (1)$$

Where *Bal* is a measure of fiscal policy, *Cycle* is a variable that captures the state of the economy. *Debt* is gross government debt as percentage of GDP. [1]The logic of this rule is that fiscal policy is a function of the level of debt (the parameter λ can then be seen as an indicator of sustainability) and it reacts to the business cycle (captured by β). Any change in fiscal policy which is not directly related to the state of the economy or the level of debt will be part of the residual, which we will identify with exogenous discretionary fiscal policy.

There are two alternative approaches to estimating this policy rule: if fiscal policy is measured as the actual budget balance then the parameter β captures both the automatic stabilizers and the endogenous changes in discretionary fiscal policy. If instead we use a cyclically-adjusted measure of the budget balance on the left-hand side, the parameter β is reflecting the endogenous response of fiscal policy to the business cycle. We will follow this methodology and use the OECD measures of cyclically-adjusted balances. For details on this methodology see Girouard and Andre (2005).

[1] The inclusion of debt in fiscal policy rules is advocated among others by Favero and Giavazzi (2007).

This methodology ensures consistency in the way fiscal policy is decomposed into the three components. As a drawback, it heavily relies on the process to extract the cyclical component out of fiscal policy which requires strong assumptions on potential output, cyclical elasticities of different fiscal variables and could potentially create a bias on the results. Blanchard (1993) and Mohr and Morris (2007) discuss the potential drawbacks of cyclically-adjusted measures of fiscal policy.

Generally speaking the elasticities used to adjust the budget balance assume that the cyclical adjustment is happening mostly through revenues and not spending (see Girouard and Andre (2005)). There is however evidence that spending also adjusts to the cycle in a countercyclical manner (Melitz (2006)).

From an econometric point of view there could be a problem of endogeneity when it comes to the estimation of the above policy rule and for that reason we will be displaying estimates using both OLS and instrumental variables. We use as instruments one lag of the output gap as well as one lag of the US output gap. For the US we use the output gap of the euro area as the additional instrument.

3.3 The endogenous response of fiscal policy to the cycle

Table 1 shows the results of estimating (1) by OLS and IV for the Euro area, Japan, the UK and the USA. The reason for comparing the Euro area to these three countries is that they are the largest three countries with similar level of GDP per capita and therefore the closest benchmark we can find. We start using as dependent variable the cyclically adjusted deficit as percentage of potential output.

When it comes to the coefficient on debt, in all cases the coefficient is positive, as expected. The largest coefficient is in the USA, while the coefficient for the Euro and the UK are of similar value. It is hard to reach strong conclusions just from the size of this coefficient but fiscal policy in the USA seems to be more responsive to concerns of sustainability.[2]

The coefficient on the output gap is negative in all cases with the exception of the USA. This indicates that the discretionary component of fiscal policy behaves in a procyclical manner for all countries except for the US (in the OLS estimate). The size of the coefficient reveals that the Euro area fiscal policy is among the most procyclical policies of the countries in this sample.

[2] Of course, a positive coefficient may also capture that once debt becomes low, fiscal policy becomes expansionary.

[Insert Table 1 about here]

Another important insight from this table is that many of the coefficients on the output gap are not significant. In fact, only in the Euro area and in the OLS regression for the US we see coefficients that are significant. In some sense, this could be expected given that the cyclically-adjusted balance has been constructed by purging the cyclical component from the budget balance. However, the method used is not simply an econometric one but one that relies on information on elasticities of the different fiscal components. So as long as governments engage often, and in the same direction, in fiscal policy decisions that are discretionary and related to the cycle, we should expect these coefficients to be significant. The fact that the coefficients are not significant could be an indication that this is not a behavior that we observe often. It could also be that the behavior is not consistent: maybe in some years fiscal policy behaved procyclically and in others countercyclically.

We now ask the question of whether we have seen any change in fiscal policy as a result of EMU. Here we need to be very careful as we will be looking at very short time series when we split the sample into two. There are two possible ways of splitting the sample: in 1992 when the Maastricht Treaty was approved and governments started dealing with limits on budget deficits, even if they were just entry conditions, and 1999 when the limits are actually enforced and there is a single monetary policy. We will show in the main text of the paper the results where we split the sample in 1999 but an appendix (available upon request) includes the results when the sample is split in 1992.

Table 2 shows how the coefficient on the cyclicality of fiscal policy changed if we break the sample in 1999. Overall we see a pattern of policies becoming more countercyclical after 1999 for all countries with the exception of the Euro area where policy has remained procyclical.

[Insert Table 2 about here]

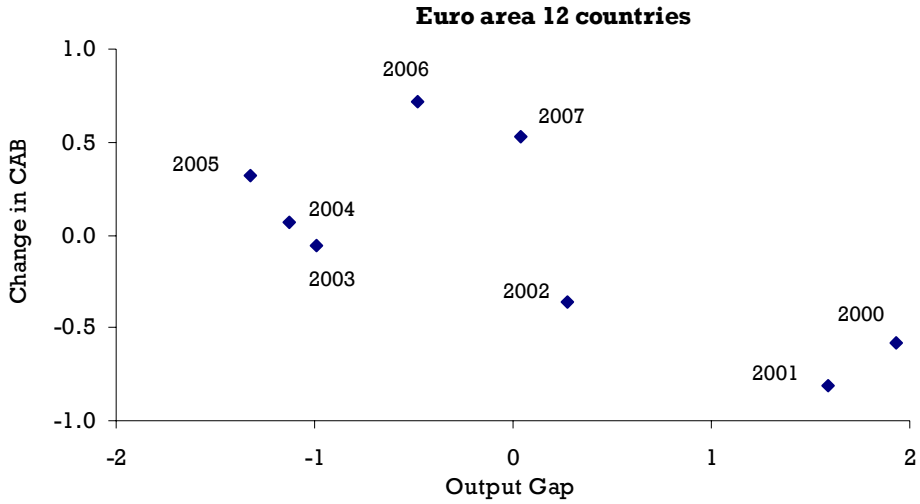
To some it might look like a surprise that the Euro area fiscal stance is clearly procyclical given that we have seen in recent years an improvement in the budget balance during a period (post 2003) where the economy displayed increasing growth rates. It might look that these results contradict those in other papers that show acyclical or even countercyclical fiscal policy for Euro countries (for example Alesina, Campante and Tabellini (2007)). It is important to notice that we are looking at the cyclicality of the cyclically-

adjusted budget balance, so we are ignoring automatic stabilizers.[3] Our methodology is the one used by Gali and Perotti (2003). Their results are closer to ours but, still, there is a difference when it comes to the Euro area, where we are showing that fiscal policy is much more procyclical. Their estimates for the cyclicality of fiscal policy at the aggregate level are coming from estimating regression (1) for each of the countries and then aggregating the coefficients across countries. We are looking at the whole Euro area without taking into account individual behavior. In addition, our sample is longer and all these factors could explain the differences in results.

To understand better the strong procyclicality of fiscal policy of the Euro area, we have plotted the change in the cyclically adjusted budget balance against the output gap for the years between 2000 and 2007. This is not exactly what is in our regression where we have the level of the balance on the left hand side but the coefficient on the lagged value is high (although lower than one) plus it is quite common in the literature to look at this graphical representation of the fiscal policy stance (see European Economy 2008 or Alesina, Campante and Tabellini (2007)).

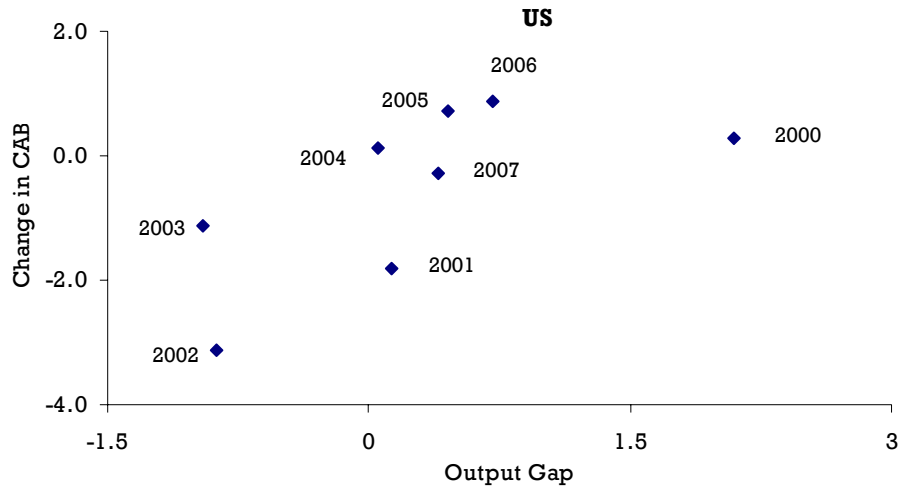
Figure 3 plots these two variables for the Euro area and Figure 4 does the same thing for the USA.

Figure 3. Fiscal Policy Stance and the Output Gap. Euro.



[3] A regression of the primary balance on the output gap indicates counter-cyclicality of fiscal policy stance in the Euro area. If one includes real GDP growth instead of the gap, then counter-cyclicality becomes even more pronounced and statistically significant.

Figure 4. Fiscal Policy Stance and the Output Gap. USA.



The difference between the two plots is shocking. While for the US there is a clear positive correlation signaling strong countercyclical policy, for the Euro area we see exactly the opposite, a strong negative correlation. The evolution of the Euro fiscal stance is marked by decreasing balances after 2000 which reflect the relaxation of fiscal policy after the launch of the Euro, a sign of fatigue after the strong pre-1998 decrease in deficits to qualify for membership to EMU. After the recession of 2002/2003 and despite the existence of a negative output gap, there is an improvement in the structural balance which represents again procyclical policy. This improvement is due to two reasons: First, some of the Euro countries were caught in levels of deficit that were too close to 3% (or above 3%) and they had little room to adjust their fiscal policies. In addition, and this is especially true in 2005, tax revenues increased faster than what many governments expected. One interpretation is that the tax elasticities were larger than normal. Some of this could be due to composition effects such as an increase in profits as a share of GDP during these years (see European Economy, 2008). These increases in revenues and elasticities were assumed to be permanent by governments and led to increases in spending or decrease in taxes that in the years that followed (2006 and 2007) led to a structural balance that remained too low despite the improvement in the cyclical condition of the economy.

This reading of the behavior of fiscal policy during these eight years reveals that some of it is due to special circumstances (such as the effects of the launch of the new currency) but it is also difficult to avoid a sense that the fiscal policy framework did not work as expected and it is likely that we will see similar behavior in the future.

Having said that, we need to be very careful interpreting some of these results because of the use of the output gap and the possibility that it is not measured properly. What if we look at a different cyclical indicator? Figures 5 and 6 plot the change in the structural balance against real growth for the Euro area and the US. It is interesting that while for the US the picture looks very similar to the previous plot, for the Euro area, we now see a much less clear picture. While the year 2000-2002 show procyclical fiscal policy, the years that follow 2002-2007 we see a positive slope, signaling acyclical or countercyclical policy.

Figure 5. Fiscal Policy Stance and Output Growth. Euro Area.

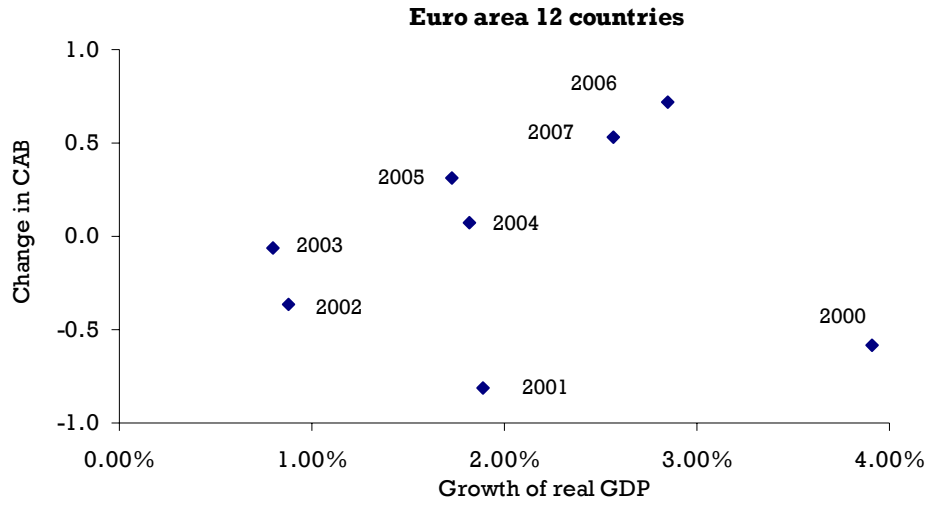
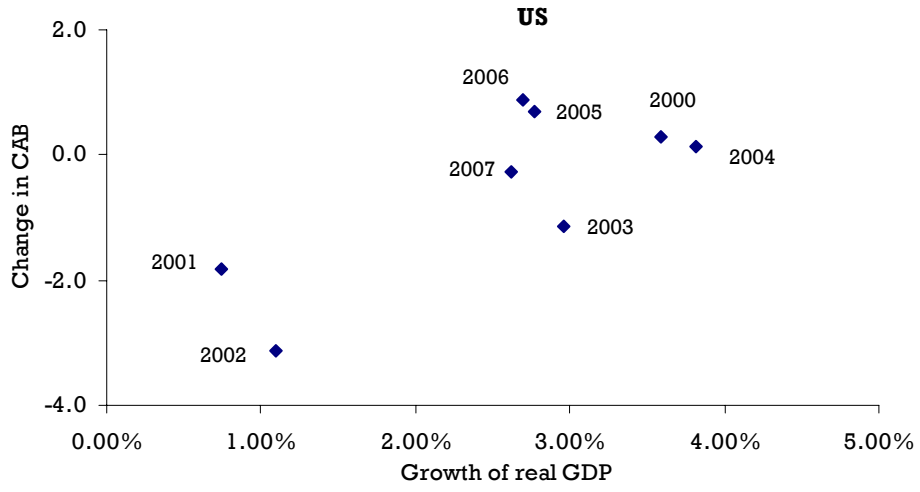


Figure 6. Fiscal Policy Stance and Output Growth. USA.



The comparison between Figure 3 and Figure 5 opens the door for a different interpretation of our results. There is still no doubt that US fiscal policy is more countercyclical (and in a consistent manner) than the Euro one. But whether the Euro fiscal policy has been countercyclical or procyclical (or has switched from one to the other) remains an open question. The European Commission uses the output gap as the cyclical indicator to assess the stance of fiscal policy. Our results suggest that one has to look at alternative cyclical indicators to see whether indeed policy is procyclical.

Overall, the results so far show that across countries, our measure of discretionary policy does not seem to be that much related to the cycle, except for the Euro area where there seems to be some evidence of procyclicality. There are no significant changes between the first and second samples, when we introduced a break in 1999.

3.4 Automatic stabilizers

We now look at the automatic stabilizers component of fiscal policy. In Table 3 we rerun the regression above by using as dependent variable the component of fiscal policy that is linked to automatic stabilizers. This is measured as the difference between the actual and the cyclically-adjusted budget deficit.

[Insert Table 3 about here]

This exercise produces very different results. First of all, the coefficient on the cycle now becomes clearly significant, as one would expect. In addition, the coefficients for the Euro area now show clearly the countercyclical nature of fiscal policy. When comparing the Euro area with the US, we see that the size of the coefficient, in absolute value, is higher for the Euro area. One potential reading of this comparison is that European countries have stronger automatic stabilizers built in and they have less need to use countercyclical discretionary measures. This is consistent with the fact that European governments have larger governments and that the size of governments have been associated to the significance of automatic stabilizers. (Gali (1994) and Fatas and Mihov (2001).

The coefficients on the gap are closely related to the elasticities used by the OECD to derive the cyclically adjusted budget balance. The OLS regression should uncover the weighted average of all elasticities (direct taxes, indirect taxes, social security payments, etc.) with the weights being given by the significance of each category in the overall budget. Since the OECD uses time-invariant elasticities, there is no point in searching for time-variation in

these coefficients. The R^2 also shows that the errors in this estimation are quite small, which implies that indeed this manipulation uncovers the elasticities used by the OECD.

3.5 The use of (exogenous) discretionary fiscal policy

To establish whether exogenous discretionary policy has become more aggressive since 1999, we calculate the volatility of the residuals from equation 1. Table 4 compares the volatility of discretionary policy before and after EMU as well as with US, UK and Japan. We show volatilities calculated using a fiscal policy rule with a break in 1999 (the first two columns) as well as estimation without a break (the last two columns).

[Insert Table 4 about here]

What is evident from the above numbers is that the Euro area has the lowest standard deviation of the residual, so the size and frequency of fiscal policy exogenous "shocks" is much smaller than for the other countries. We also see a decrease in the volatility over time. The fact that the volatility is lower for the Euro area should not be a surprise as this is an aggregate of national fiscal policies and it is difficult to think about coordinated changes in fiscal policy. It might be that we observe such changes of policies at the national level but they are not synchronized and therefore vanish when we aggregate all the countries. However, and as we have seen in the previous section, we do observe some significant changes in fiscal policy at the Euro level. So one potential reading of these results is that European countries are less willing to engage in discretionary changes in fiscal policy. It is possible that this decline in aggressiveness is due to the increased monitoring of national fiscal policies by the European Commission. On the margin, changing fiscal stance for reasons unrelated to the state of cycle has become more difficult as any change is carefully scrutinized by the commission. Potentially this is only a partial explanation, as the volatility in the US has declined even faster than in the Euro area.

In the last two columns of Table 4 we report estimates of policy volatility that are based on a regression, which does not allow for a change in the cyclical elasticity of fiscal policy. It is interesting that for the other countries, estimating a rule that allows a change in the cyclicality of fiscal policy makes a large difference when it comes to the assessment of volatility of discretionary fiscal policy. By allowing a change in 1999, the fiscal policy rule captures much better the behavior of fiscal policy and reduces the amount of volatility that goes to the residual. This means that other countries have changed their fiscal policies after 1999 more than what we see in the Euro area (at least at

the aggregate level). In other words, the model without the break is mis-specified, which results in much larger variance of the residuals.

4. The perspective of national fiscal policy

At the national level we are interested in the same characterization of fiscal policy but the issues that arise are slightly different. National governments are worried that in the absence of monetary policy they need to be more aggressive in the use of fiscal policy as a way to smooth the business cycle. This is even more relevant in the European context where mobility of labor, is very limited. Has this happened? Or have the constraints on deficits and debt limited the flexibility available to fiscal policy?

A second source of costs for national economies could be associated to interest rate effects of fiscal policies in other countries. As all countries share a common currency, there could be a spillover from deficits in the other members of EMU via the interest rate (or the premium associated to the Euro currency, if it had an effect on the credibility of the ECB). This raises issue of coordination and the extent to which national fiscal policies take into account what is happening in other countries or at the European level.

4.1 A look at national endogenous discretionary fiscal policy

Tables 5a and 5b present the results of estimating fiscal policy rules for individual countries. The dependent variable is the cyclically-adjusted deficit (as a % of potential output).

The coefficient on debt remains positive for all countries with the exception of New Zealand. There are large variations in this coefficient. If we ignore Luxembourg that displays a very large coefficient, we find the largest coefficients in Italy and outside of the Euro area (Sweden, Switzerland, Australia, and Canada).

[Insert Tables 5a and 5b about here]

When we look at the coefficient on the output gap, we see that many of the coefficients are not significant. This was also the case in Gali and Perotti (2003) when they ran a similar exercise. As argued before, this could be an indication that governments have not engaged in a consistent discretionary policy to deal with business cycles above and beyond automatic stabilizers. In terms of the sign and size of the coefficients, we see at the national level that

many of the coefficients are negative – especially in the Euro area – signaling procyclical behavior of fiscal policy.

Have policy changed in the post-1999 period? Tables 6a and 6b display the results from a regression that allows for a break in the coefficient on the output gap in 1999. Once again, it is difficult to reach strong conclusions given that many of the coefficients are insignificant (and the short sample size can be an added factor here), but, overall, and looking at the point estimates in the two samples, we confirm that in most Euro area countries, policy has been procyclical.

[Insert Tables 6a and 6b about here]

When comparing the pre and post 1999 samples we do not see any clear direction of change – in seven countries policy has become less procyclical, while in 5 policy has become more procyclical. Formal tests as indicated by the p-values reported both for the OLS and IV signal that there is no evidence of a statistically significant shift in the cyclicality of fiscal policy in the Euro area. Of all countries in the sample, only in the US there is a statistically significant shift towards more countercyclical policy.

4.2 Automatic stabilizers at the national level

For the analysis of automatic stabilizers we use as a dependent variable the difference between the actual and the cyclically-adjusted budget balance. The results at the national level confirm the ones for the Euro area. Coefficients are positive and highly significant. Coefficients in the Euro area vary from a low 0.3 (Greece) to a high of 0.65 (Germany), while in the US and the UK these coefficients are 0.29 and 0.39 respectively. Thus in the Euro area the increase of the gap by 1% generates a budget surplus of about 0.46%, while in the US, the surplus goes up only by 0.29%.

[Insert Tables 7a and 7b about here]

As we mentioned above, there is no time-variation in these elasticities as they assumed to be constant in the construction of the cyclically-adjusted balance. At the same time recent research has shown that the empirical relationship between government size and the volatility of GDP seems to have become weaker (as documented in Debrun, Pisany-Ferry and Sapir, 2008). The fact that the relationship has become weaker is an indication that there have been changes in the effectiveness of automatic stabilizers that have also weakened

the link between the size of the government and their smoothing effect. Given the close link between government size and automatic stabilizers, it seems important to review the assumption of time-invariant elasticities. If one finds that elasticities have changed, then researchers will be able to construct better measures of the structural balance. If on the other hand it turns out that elasticities have not changed, then the link between government size and stabilization has become indeed weaker, which will lead to review of the desirability of having large governments. Larger governments, as much as they might be able to provide a cushion to business cycle fluctuations can be associated with crowding out and lower growth.

4.3. Volatility

As we did for the Euro area we also look into the volatility of discretionary fiscal policy as a measure of the frequency and size of changes in the fiscal policy stance which are not related to the state of the economy.

[Insert Table 8 about here]

Table 8 displays results where we allow for a break in the cyclical coefficient on fiscal policy. The results confirm that most Euro countries display low volatility of exogenous discretionary policy, which is consistent with what we found for the aggregate of the Euro countries. We also see that this volatility has decreased in the second half of the sample for all countries with the exception of Austria, Ireland, and Luxembourg. Outside of the EU-15, only Canada and the US show substantial reduction in policy volatility.

5. Coordination of national fiscal policies. Is there a Euro-wide fiscal policy stance?

In the previous sections of the paper we looked both at the behavior of fiscal policy for the aggregate of the twelve Euro countries as well as for each of the countries. Although there is no government behind the behavior of the Euro aggregate, it is simply the collection of twelve individual policies; these individual policies have been designed within the institutional framework of the Maastricht Treaty and the Stability and Growth Pact so the idea of Euro-wide fiscal policy is not entirely meaningless. The framework has possibly introduced some commonalities across national fiscal policies. For example, the run up to the Euro launch led to fiscal consolidation efforts for many of the governments. In addition, the interpretation and implementation of the Stability and Growth Pact has led to increasing emphasis on coordination of

national fiscal policies. This coordination of national fiscal policies runs contrary to the intuition that with a common monetary policy, fiscal policy should behave in an even less coordinated fashion as it needs to deal with idiosyncratic national shocks. In this section we look at national fiscal policies and ask the question of whether we have seen any move towards coordination or synchronization.

Figure 7. Dispersion of cyclically-adjusted budget balances (standard deviation across countries in %)

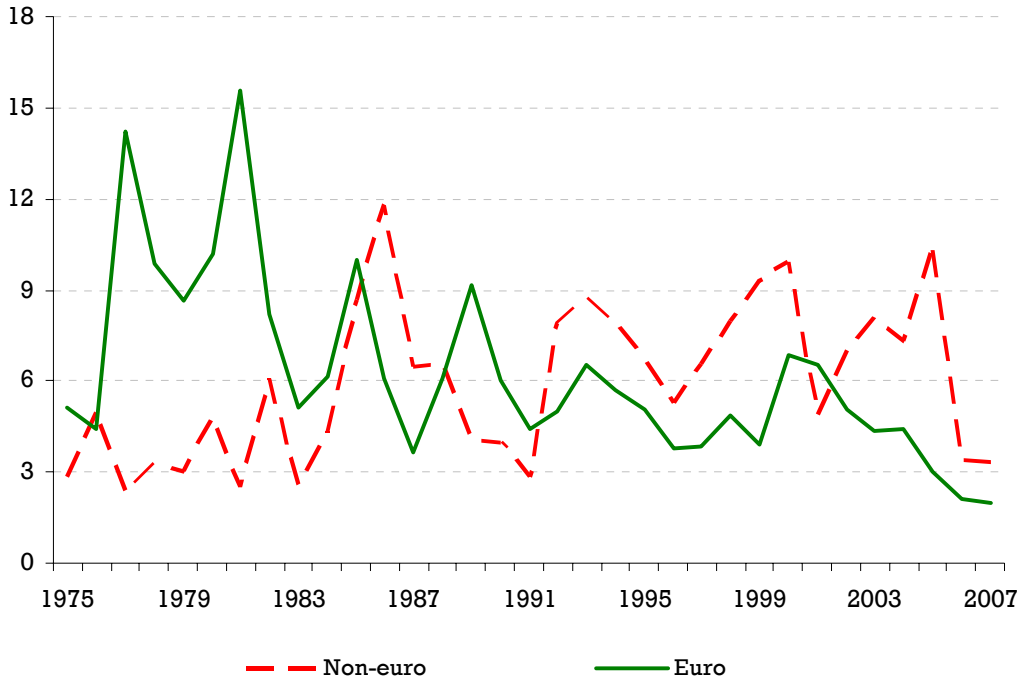


Figure 7 plots the annual standard deviation of the structural budget balance across euro countries and compares it to the same measure for the non-Euro countries in the sample.[4] Since 1999, there is a clear trend towards less dispersion among the Euro countries which is not evident for the rest of the countries. This trend can be the result of proactive coordination but it could also be the outcome of some countries being close or above the limits established for budget deficits.

The trend towards more similar structural balances might be a result also of synchronization of business cycles. Indeed, figure 8 shows that the dispersion of the output gap has been declining steadily since early 1990s. Interestingly,

[4] Norway is excluded from this calculation because of the high volatility of the budget stemming from fluctuations in oil prices.

however, this trend is visible both for the Euro area and for the group of the non-Euro area countries. If we compare now Figures 7 and 8, it seems that there is more to the synchronization of fiscal policy stances across Euro countries than just synchronization of business cycles.

Figure 8. Dispersion of output gaps
(standard deviation across countries in %)

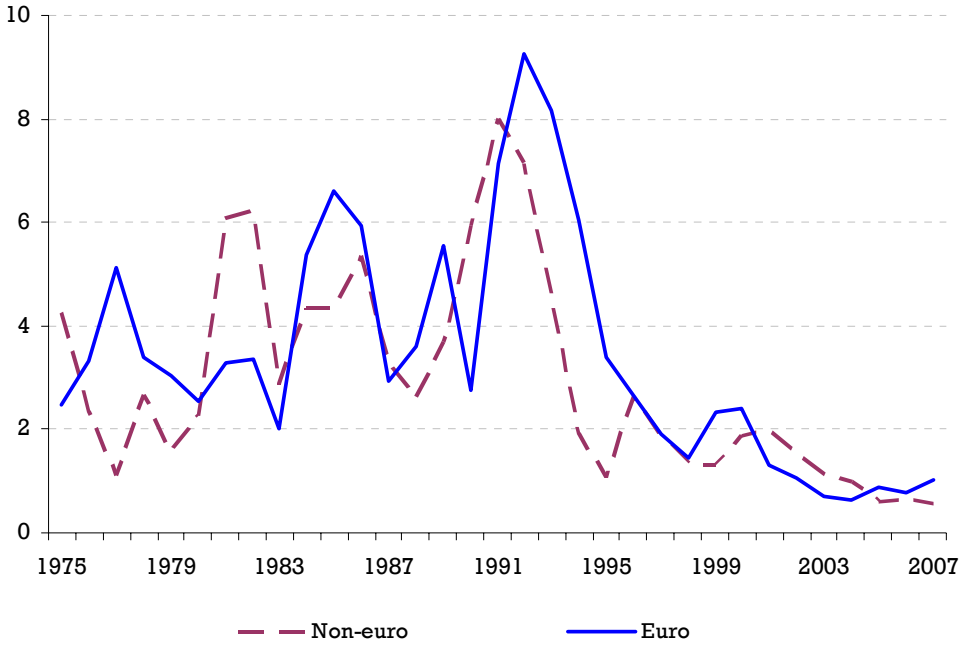
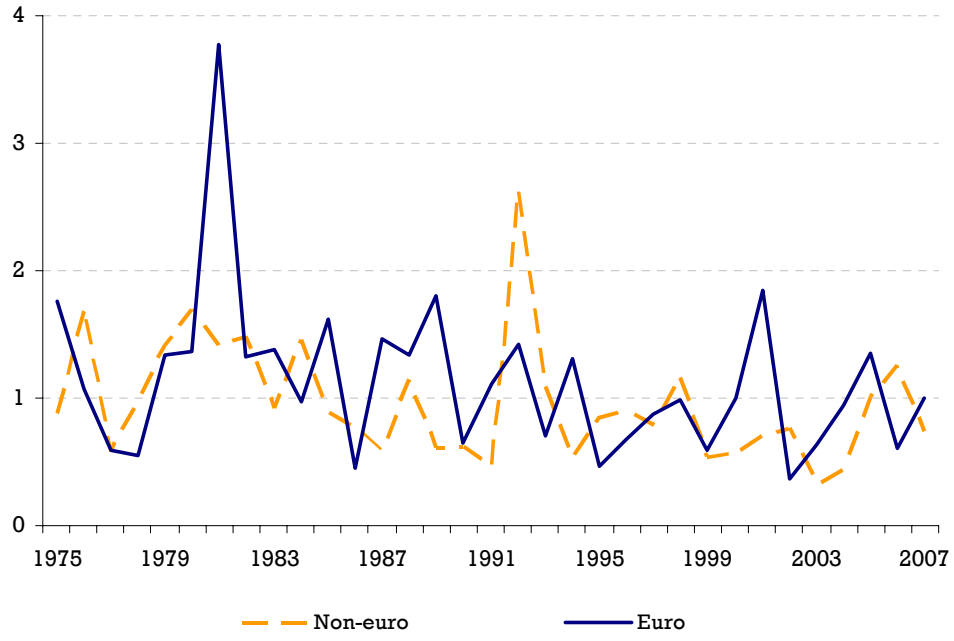


Figure 9. Dispersion of exogenous discretionary fiscal policy



Finally, Figure 9 reports synchronization of fiscal policy by looking at the exogenous component. We measure the dispersion (using standard deviation) of the residuals from equation (1) across both euro and non-euro countries. In this case we see that there is a very small downward trend for both samples. We already know that the typical size of these shocks has decreased over the sample period, so this could simply be due to the fact that we see fewer and smaller changes in discretionary fiscal policy and, therefore, an increase in synchronization for many countries. Of course, this needs not be the case, as it is possible that many large and coordinated changes in fiscal policy lead to a small cross-country standard deviation.

6. Concluding Remarks

The 1992 Maastricht Treaty recognized the importance of providing a framework for fiscal policy in EMU and established limits to deficits and debt in order to "avoid excessive government deficits" (Article 104). At the same time it defined an Excessive Deficit Procedure in case of violations. The Stability and Growth Pact (1997) developed the original ideas of the Maastricht Treaty into a set of more detailed rules and processes to ensure budget discipline and enforcement. The principles of the Stability and Growth pact were later amended by a report of the ECOFIN council in March 2005 which was later endorsed by the European Council.

This is the environment under which fiscal policy has been conducted in the Euro area, an environment that has been a source of criticisms and debates. Some have been seen these limits as unnecessary constraints on national fiscal policy at a time when it was needed the most, with negative consequences on the macroeconomic performance of these economies. For those who had to implement the constraints and procedures (European Commission) or those who were supposed to care about them (ECB), the rules have not provided an easily-enforceable system and the outcome has been far from what the system was designed for. Fiscal consolidation has not been large enough and national policies have continued to display many of the prior biases (such as procyclicality).

In this paper we have provided a characterization of fiscal policy at the Euro and the national levels and used countries outside of the Euro area as benchmark. Our goal was not to propose an alternative fiscal policy framework but more to validate or disprove the conventional wisdom about how fiscal policy has behaved and the extent to which the EMU fiscal policy framework has affected that behavior.

Overall, our results have shown that, among several dimensions, the behavior of fiscal policy in the Euro area has not been too different from what we have seen in other countries and that the introduction of the Euro has not led to a significant change. The fear that fiscal policy would become less disciplined because governments would not internalize the cost of "bad" fiscal policy in the absence of national currencies is not validated by our results. There is also very little evidence that the fiscal policy stance at the national level has gotten worsen. Although cyclically-adjusted balances still show some tendency to be procyclical for some countries in the euro zone, it is still true that the automatic stabilizers do most of the countercyclical adjustment in the union. The other positive reading of our results is that governments have not abused their discretion and that the size of frequency of politically-motivated fiscal policy changes has decreased among the European economies.

Coordination of fiscal policies has received much recent attention by the European Commission as a way to justify the strong surveillance mechanisms that they impose on national countries. The notion of coordination is some times linked to that of economic convergence but this link is theoretically not founded as we should expect the opposite: as countries have abandoned monetary policy, there is a stronger need to rely on fiscal policy as an automatic stabilizer. Of course, if business cycles become more synchronized, we will see coordination but there is no need to impose that coordination as one lets automatic stabilizers run their course. This is indeed what our results show. But it also seems that there is something beyond business cycle synchronization since a similar decline in dispersion for the countries outside the euro zone has not be met with a decline in the dispersion of structural balances. Other measures of fiscal policy, those that also include the discretionary component, do not show any tendency to become less coordinated. If any, there seems to be more coordination and synchronicity at that level, which supports the view that governments have not taken advantage of the Euro fiscal framework to push different political agendas through the use of fiscal policy.

Our analysis of the Euro-wide aggregates provided us with the perspective that the ECB and monetary policy have about fiscal policy. In some sense, it could be argued that this is the relevant dimension in which to discuss fiscal policy in the Euro area. As much as national fiscal policies can show biases and behaviors which are not optimal, when it comes to monetary policy and the currency, what matters is the behavior of fiscal policy at the aggregate level (of course, the aggregate is made out of the sum of all the national fiscal policies, so their understanding can still provide very useful insights).

When looking at the euro-wide fiscal policy we see a behavior which is different from what we have seen in the US. Fiscal policy is more procyclical in the Euro area than in the US (where it is strongly countercyclical), but it is also true that the automatic stabilizers are larger in the euro zone. In addition, and this should be welcomed by the ECB, fiscal policy is less volatile at the

Euro level when it comes to exogenous changes, those that are not motivated by the economic environment.

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Table 1: Full sample
(Dependent variable: Cyclically adjusted balance)

	Euro		Japan		UK		USA	
	OLS	IV	OLS	IV	OLS	IV	OLS	IV
Output gap	-0.145	-0.258	-0.042	-0.06	-0.196	-0.14	0.133	-0.004
	(0.061)*	(0.061)**	(0.100)	(0.154)	(0.127)	(0.132)	(0.065)*	(0.113)
Debt (t-1)	0.016	0.014	0.005	0.004	0.017	0.015	0.028	0.031
	(0.006)*	(0.007)	(0.007)	(0.007)	(0.032)	(0.036)	(0.014)	(0.015)*
CAB(t-1)	0.721	0.737	0.904	0.907	0.837	0.827	0.770	0.778
	(0.076)**	(0.082)**	(0.069)**	(0.070)**	(0.095)**	(0.101)**	(0.103)**	(0.106)**
Constant	-0.888	-0.754	-0.644	-0.627	-0.975	-0.845	-1.584	-1.813
	(0.397)*	(0.427)	(0.549)	(0.545)	(1.591)	(1.765)	(0.798)	(0.873)*
Observations	37	37	36	36	35	35	37	37
R-squared	0.82	0.80	0.78	0.78	0.67	0.66	0.69	0.67

Robust standard errors in parentheses
* significant at 5%; ** significant at 1%

Table 2: With a break in 1999
(Dependent variable: Cyclically adjusted balance)

	Euro		Japan		UK		US	
	OLS	IV	OLS	IV	OLS	IV	OLS	IV
Gap <1999	-0.134 (0.076)	-0.255 (0.074) **	-0.103 (0.093)	-0.090 (0.163)	-0.194 (0.133)	-0.130 (0.134)	0.120 (0.071)	-0.035 (0.133)
Gap >1999	-0.175 (0.098)	-0.203 (0.133)	0.513 (0.653)	0.537 (0.921)	-0.051 (0.688)	1.211 (4.006)	1.051 (0.220) **	1.326 (0.267) **
Debt (t-1)	0.019 (0.008) *	0.015 (0.009)	0.014 (0.009)	0.013 (0.010)	0.015 (0.035)	0.011 (0.039)	0.033 (0.014) *	0.033 (0.016) *
CAB(t-1)	0.735 (0.086) **	0.734 (0.091) **	0.834 (0.081) **	0.833 (0.085) **	0.840 (0.105) **	0.797 (0.184) **	0.735 (0.080) **	0.700 (0.071) **
p-value: H0: Gap<1999 = Gap>1999	0.76	0.74	0.36	0.51	0.84	0.74	0.00	0.00
Observations	37	37	36	36	35	35	37	37
R-squared	0.82	0.80	0.80	0.80	0.67	0.65	0.80	0.77

Robust standard errors in parentheses
* significant at 5%; ** significant at 1%

Table 3: Automatic stabilizers

Dependent variable: (Primary budget balance - Cyclically adjusted balance)

	Euro		Japan		UK		US	
	OLS	IV	OLS	IV	OLS	IV	OLS	IV
Gap	0.464 (0.005)**	0.467 (0.005)**	0.267 (0.012)**	0.319 (0.028)**	0.391 (0.021)**	0.487 (0.031)**	0.293 (0.013)**	0.383 (0.031)**
Constant	0.021 (0.009)*	0.025 (0.008)**	-0.014 -0.021	-0.012 -0.028	-0.011 -0.033	-0.021 -0.046	0.000 -0.020	0.032 -0.036
Observations	38	37	37	37	36	36	38	37
R-squared	1.00	1.00	0.95	0.92	0.94	0.88	0.95	0.87

Robust standard errors in parentheses

* significant at 5%; ** significant at 1%

Table 4: Volatility of the residuals

	OLS break		OLS no break	
Country	Before 1999	After 1999	Before 1999	After 1999
EURO area 12 countries	0.304	0.146	0.357	0.281
Japan	1.096	2.543	1.293	5.934
United Kingdom	1.845	0.899	2.187	1.624
United States	0.641	0.135	0.778	2.146

Table 5a: Fiscal policy reaction function (OLS estimates, No break)

	Gap		Debt (t-1)		CAB (t-1)		R^2
	Coefficient	s.e	Coefficient	s.e	Coefficient	s.e	
EURO area 12 countries	-0.145	(0.061)*	0.016	(0.006)*	0.721	(0.076)**	0.82
Austria	-0.014	(0.087)	0.022	(0.011)	0.523	(0.126)**	0.49
Belgium	-0.199	(0.124)	0.038	(0.014)*	0.711	(0.123)**	0.91
Finland	0.232	(0.084)*	0.034	(0.015)*	0.601	(0.096)**	0.71
France	-0.127	(0.083)	0.009	(0.006)	0.652	(0.151)**	0.49
Germany	-0.240	(0.118)	0.017	(0.012)	0.681	(0.092)**	0.80
Greece	-0.388	(0.228)	0.029	(0.012)*	0.562	(0.114)**	0.76
Ireland	-0.219	(0.121)	0.006	(0.012)	0.832	(0.057)**	0.88
Italy	-0.195	(0.126)	0.065	(0.014)**	0.510	(0.104)**	0.92
Luxembourg	-0.033	(0.168)	0.968	(0.478)	0.311	(0.186)	0.62
Netherlands	-0.191	(0.164)	0.007	(0.019)	0.704	(0.163)**	0.51
Portugal	-0.161	(0.067)*	0.036	(0.040)	0.356	(0.119)**	0.42
Spain	-0.079	(0.072)	0.036	(0.014)*	0.832	(0.110)**	0.87
Denmark	0.467	(0.125)**	0.040	(0.010)**	0.669	(0.105)**	0.83
Sweden	0.699	(0.255)*	0.050	(0.018)*	0.537	(0.155)**	0.75
United Kingdom	-0.196	(0.127)	0.017	(0.032)	0.837	(0.095)**	0.67
Australia	0.070	(0.117)	0.052	(0.018)**	0.833	(0.092)**	0.77
Canada	0.100	(0.070)	0.051	(0.013)**	0.727	(0.076)**	0.91
Japan	-0.042	(0.100)	0.005	(0.007)	0.904	(0.069)**	0.78
New Zealand	0.364	(0.143)*	-0.009	(0.019)	0.394	(0.238)	0.65
Norway	-0.013	(0.127)	0.048	(0.040)	0.997	(0.064)**	0.93
Switzerland	0.014	(0.106)	0.068	(0.027)*	0.535	(0.212)*	0.81
United States	0.133	(0.065)*	0.028	(0.014)	0.770	(0.103)**	0.69

Robust standard errors in parentheses
* significant at 5%; ** significant at 1%

Table 5b: Fiscal policy reaction function (IV estimates, No break)

	Gap		Debt (t-1)		CAB (t-1)	
	Coefficient	s.e	Coefficient	s.e	Coefficient	s.e
EURO area 12 countries	-0.258	(0.061)**	0.014	(0.007)	0.737	(0.082)**
Austria	0.024	(0.129)	0.024	(0.012)	0.522	(0.126)**
Belgium	-0.094	(0.230)	0.043	(0.017)*	0.697	(0.131)**
Finland	0.079	(0.126)	0.030	(0.015)	0.719	(0.133)**
France	-0.239	(0.108)*	0.008	(0.006)	0.690	(0.166)**
Germany	-0.392	(0.084)**	0.014	(0.012)	0.649	(0.076)**
Greece	-0.212	(0.442)	0.031	(0.011)**	0.577	(0.124)**
Ireland	-0.375	(0.209)	-0.003	(0.012)	0.838	(0.051)**
Italy	-0.362	(0.137)*	0.066	(0.015)**	0.479	(0.100)**
Luxembourg	0.154	(0.251)	1.015	(0.505)	0.221	(0.176)
Netherlands	-0.325	(0.178)	0.004	(0.019)	0.775	(0.176)**
Portugal	-0.216	(0.072)**	0.049	(0.038)	0.319	(0.131)*
Spain	-0.106	(0.077)	0.036	(0.014)*	0.839	(0.113)**
Denmark	0.640	(0.433)	0.042	(0.012)**	0.627	(0.140)**
Sweden	0.801	(0.381)*	0.051	(0.019)*	0.493	(0.215)*
United Kingdom	-0.140	(0.132)	0.015	(0.036)	0.827	(0.101)**
Australia	-0.162	(0.261)	0.052	(0.017)**	0.918	(0.131)**
Canada	-0.010	(0.108)	0.047	(0.014)**	0.759	(0.077)**
Japan	-0.060	(0.154)	0.004	(0.007)	0.907	(0.070)**
New Zealand	-0.763	(1.340)	-0.037	(0.053)	1.156	(1.129)
Norway	-0.066	(0.144)	0.053	(0.041)	0.976	(0.068)**
Switzerland	0.154	(0.160)	0.084	(0.029)*	0.428	(0.234)
United States	-0.004	(0.113)	0.031	(0.015)*	0.778	(0.106)**

Robust standard errors in parentheses
* significant at 5%; ** significant at 1%

Table 6a: Fiscal policy reaction function (OLS estimates, with a break in 1999)

	Gap before 1999		**Gap after 1999**		p-value:	**Debt (t-1)**		**CAB (t-1)**		R^2
	Coefficient	s.e	Coefficient	s.e	Equality	Coefficient	s.e	Coefficient	s.e	
EURO area 12 countries	-0.134	(0.076)	-0.175	(0.098)	0.76	0.019	(0.008)*	0.735	(0.086)**	0.82
Austria	-0.031	(0.099)	-0.048	(0.267)	0.95	0.017	(0.014)	0.487	(0.134)**	0.50
Belgium	-0.159	(0.135)	-0.124	(0.293)	0.92	0.057	(0.021)**	0.532	(0.197)*	0.92
Finland	0.203	(0.079)*	0.851	(0.402)*	0.12	0.032	(0.017)	0.613	(0.127)**	0.74
France	-0.127	(0.091)	0.115	(0.183)	0.22	0.016	(0.011)	0.643	(0.171)**	0.51
Germany	-0.230	(0.140)	-0.176	(0.187)	0.83	0.040	(0.019)*	0.611	(0.109)**	0.82
Greece	-0.298	(0.257)	-0.499	(0.734)	0.79	0.036	(0.014)*	0.567	(0.130)**	0.77
Ireland	-0.219	(0.086)*	-0.224	(0.399)	0.99	0.019	(0.024)	0.815	(0.064)**	0.88
Italy	-0.170	(0.161)	-0.270	(0.206)	0.74	0.064	(0.015)**	0.542	(0.134)**	0.92
Luxembourg	0.353	(0.564)	0.461	(0.222)	0.84	0.759	(0.469)	0.000	(0.293)	0.72
Netherlands	-0.296	(0.237)	-0.255	(0.180)	0.88	0.046	(0.026)	0.583	(0.188)**	0.55
Portugal	-0.171	(0.072)*	-0.121	(0.183)	0.82	0.094	(0.058)	0.110	(0.173)	0.54
Spain	-0.090	(0.069)	-0.516	(0.353)	0.25	0.045	(0.015)**	0.641	(0.146)**	0.89
Denmark	0.563	(0.141)**	-0.082	(0.204)	0.01	0.040	(0.011)**	0.645	(0.110)**	0.85
Sweden	0.721	(0.276)*	0.461	(0.325)	0.47	0.051	(0.020)*	0.533	(0.179)**	0.75
United Kingdom	-0.194	(0.133)	-0.051	(0.688)	0.84	0.015	(0.035)	0.840	(0.105)**	0.67
Australia	0.123	(0.137)	-0.258	(0.651)	0.57	0.061	(0.021)**	0.705	(0.179)**	0.79
Canada	0.137	(0.072)	-0.396	(0.296)	0.08	0.051	(0.013)**	0.777	(0.104)**	0.91
Japan	-0.103	(0.093)	0.513	(0.653)	0.36	0.014	(0.009)	0.834	(0.081)**	0.80
New Zealand	0.164	(0.243)	0.587	(0.382)	0.27	0.017	(0.051)	0.421	(0.346)	0.69
Norway	0.076	(0.121)	0.165	(0.214)	0.71	0.043	(0.042)	0.879	(0.083)**	0.94
Switzerland	-0.082	(0.126)	-0.007	(0.139)	0.70	0.047	(0.024)	0.462	(0.248)	0.82
United States	0.120	(0.071)	1.051	(0.220)**	0.00	0.033	(0.014)*	0.735	(0.080)**	0.80

Robust standard errors in parentheses
* significant at 5%; ** significant at 1%

Table 6b: Fiscal policy reaction function (IV estimates, with a break in 1999)

	Gap before 1999		**Gap after 1999**		p-value:	**Debt (t-1)**		**CAB (t-1)**	
	Coefficient	s.e	Coefficient	s.e	Equality	Coefficient	s.e	Coefficient	s.e
EURO area 12 countries	-0.255	(0.074)**	-0.203	(0.133)	0.74	0.015	(0.009)	0.734	(0.091)**
Austria	-0.070	(0.145)	0.328	(0.412)	0.37	0.014	(0.016)	0.531	(0.144)**
Belgium	-0.121	(0.259)	0.059	(0.329)	0.69	0.059	(0.025)*	0.526	(0.215)*
Finland	0.079	(0.119)	0.705	(0.551)	0.27	0.026	(0.020)	0.689	(0.159)**
France	-0.236	(0.118)	0.087	(0.221)	0.17	0.012	(0.011)	0.653	(0.183)**
Germany	-0.342	(0.094)**	-0.338	(0.239)	0.99	0.033	(0.020)	0.604	(0.090)**
Greece	-0.173	(0.471)	0.639	(0.948)	0.40	0.035	(0.013)*	0.646	(0.154)**
Ireland	-0.336	(0.140)*	-0.582	(0.639)	0.72	0.019	(0.030)	0.821	(0.066)**
Italy	-0.414	(0.166)*	-0.192	(0.175)	0.41	0.068	(0.016)**	0.462	(0.126)**
Luxembourg	1.376	(0.828)	1.813	(1.306)	0.57	0.400	(0.621)	-0.794	(0.724)
Netherlands	-0.415	(0.258)	-0.385	(0.235)	0.93	0.051	(0.029)	0.619	(0.212)**
Portugal	-0.182	(0.077)*	-0.188	(0.192)	0.98	0.090	(0.058)	0.108	(0.174)
Spain	-0.124	(0.071)	-0.351	(0.297)	0.47	0.045	(0.015)**	0.644	(0.146)**
Denmark	0.871	(0.393)*	-0.431	(0.554)	0.03	0.040	(0.013)**	0.609	(0.142)**
Sweden	0.879	(0.385)*	0.360	(0.489)	0.20	0.054	(0.021)*	0.475	(0.233)
United Kingdom	-0.130	(0.134)	1.211	(4.006)	0.74	0.011	(0.039)	0.797	(0.184)**
Australia	0.136	(0.251)	0.508	(1.022)	0.72	0.066	(0.023)**	0.664	(0.205)**
Canada	0.053	(0.106)	-0.990	(0.887)	0.25	0.049	(0.014)**	0.808	(0.114)**
Japan	-0.090	(0.163)	0.537	(0.921)	0.51	0.013	(0.010)	0.833	(0.085)**
New Zealand	0.124	(0.232)	0.733	(0.447)	0.18	0.028	(0.049)	0.391	(0.337)
Norway	0.123	(0.126)	0.035	(0.464)	0.86	0.048	(0.048)	0.889	(0.083)**
Switzerland	0.132	(0.146)	0.077	(0.181)	0.77	0.070	(0.035)	0.427	(0.252)
United States	-0.035	(0.133)	1.326	(0.267)**	0.00	0.033	(0.016)*	0.700	(0.071)**

Robust standard errors in parentheses

* significant at 5%; ** significant at 1%

Table 7a: Automatic Stabilizers (OLS estimates)

	Gap		Constant		R^2
	Coefficient	s.e.	Coefficient	s.e.	
EURO area 12 countries	0.464	(0.005)**	0.021	(0.009)*	1.00
Austria	0.430	(0.015)**	0.011	(0.034)	0.95
Belgium	0.582	(0.046)**	0.042	(0.082)	0.83
Finland	0.460	(0.010)**	-0.194	(0.046)**	0.98
France	0.439	(0.016)**	0.001	(0.028)	0.94
Germany	0.647	(0.062)**	0.334	(0.094)**	0.82
Greece	0.307	(0.019)**	0.012	(0.020)	0.94
Ireland	0.410	(0.012)**	-0.010	(0.033)	0.98
Italy	0.378	(0.019)**	-0.071	(0.032)*	0.93
Luxembourg	0.423	(0.026)**	0.013	(0.061)	0.96
Netherlands	0.534	(0.036)**	-0.015	(0.068)	0.88
Portugal	0.333	(0.010)**	0.077	(0.036)*	0.98
Spain	0.422	(0.013)**	-0.023	(0.044)	0.97
Denmark	0.503	(0.034)**	0.016	(0.064)	0.85
Sweden	0.522	(0.022)**	-0.108	(0.044)*	0.96
United Kingdom	0.391	(0.021)**	-0.011	(0.033)	0.94
Australia	0.339	(0.017)**	-0.008	(0.025)	0.91
Canada	0.370	(0.013)**	-0.055	(0.021)*	0.97
Japan	0.267	(0.012)**	-0.014	(0.021)	0.95
New Zealand	0.417	(0.007)**	0.047	(0.015)**	0.99
Norway	1.518	(0.268)**	11.656	(1.194)**	0.57
Switzerland	0.392	(0.014)**	-0.197	(0.035)**	0.98
United States	0.293	(0.013)**	0.000	(0.020)	0.95

Robust standard errors in parentheses
* significant at 5%; ** significant at 1%

Table 7b: Automatic Stabilizers (IV estimates)

	Gap		Constant	
	Coefficient	s.e.	Coefficient	s.e.
EURO area 12 countries	0.467	(0.005)**	0.025	(0.008)**
Austria	0.494	(0.021)**	0.004	(0.042)
Belgium	0.583	(0.062)**	0.042	(0.079)
Finland	0.477	(0.015)**	-0.176	(0.049)**
France	0.493	(0.025)**	-0.003	(0.030)
Germany	0.675	(0.075)**	0.296	(0.093)**
Greece	0.303	(0.029)**	0.011	(0.020)
Ireland	0.451	(0.015)**	-0.004	(0.039)
Italy	0.422	(0.025)**	-0.062	(0.035)
Luxembourg	0.469	(0.033)**	-0.011	(0.066)
Netherlands	0.656	(0.046)**	0.055	(0.093)
Portugal	0.334	(0.011)**	0.078	(0.037)*
Spain	0.448	(0.015)**	0.007	(0.045)
Denmark	0.787	(0.104)**	0.056	(0.108)
Sweden	0.563	(0.029)**	-0.087	(0.052)
United Kingdom	0.487	(0.031)**	-0.021	(0.046)
Australia	0.452	(0.071)**	0.019	(0.036)
Canada	0.429	(0.021)**	-0.027	(0.033)
Japan	0.319	(0.028)**	-0.012	(0.028)
New Zealand	0.426	(0.010)**	0.048	(0.015)**
Norway	1.514	(0.273)**	11.650	(1.209)**
Switzerland	0.403	(0.017)**	-0.215	(0.039)**
United States	0.357	(0.020)**	0.020	(0.027)

Robust standard errors in parentheses
* significant at 5%; ** significant at 1%

Table 8: Volatility of the residuals

Country	Before 1999	After 1999
EURO area 12 countries	0.304	0.146
Austria	0.792	1.123
Belgium	1.658	0.927
Finland	1.811	1.062
France	0.517	0.171
Germany	0.713	0.492
Greece	2.729	1.461
Ireland	0.904	2.784
Italy	1.416	0.415
Luxembourg	0.628	0.953
Netherlands	1.189	0.798
Portugal	1.379	0.961
Spain	0.625	0.457
Denmark	1.377	1.200
Sweden	3.017	1.082
United Kingdom	1.845	0.899
Australia	0.613	0.711
Canada	1.018	0.409
Japan	1.096	2.543
New Zealand	0.109	0.281
Norway	1.466	1.399
Switzerland	0.219	0.308
United States	0.641	0.135