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« Automatic Stabilisation, Discretionary Policy and the Stability Pact »

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Automatic Stabilisation, Discretionary Policy and the Stability Pact[1]

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Abstract

This paper describes recent trends on the efficiency of stabilisers in the European Union. Using both macro evidence on the cyclical sensitivity of budget deficit to economic activity, and micro evidence on the tax and expenditure profiles, we conclude, in agreement with the recent literature, that the importance of automatic stabilisation has decreased. After remarking that this trend is contradictory with the current economic institutions of Europe relying exclusively on automatic stabilisation for the conduct of fiscal policy, we argue that increasing flexibility, one alternative way to reduce cyclical fluctuations, does not seem a viable path. The paper concludes defending the appropriateness of discretionary fiscal policy. We argue by means of a simple model that the theoretical arguments against its use are not conclusive, and we describe a recent stream of literature, based on structural VAR models, that concludes rather robustly for the effectiveness of discretionary fiscal policy in the short and long run.

Keywords: Automatic stabilisers, progressivity, unemployment benefits, discretionary fiscal policy, European fiscal institutions.
JEL Codes: E6 H2 H3 H6

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1. Introduction

The economic institutions of Economic and Monetary Union in their actual design stem from two main sources. The first is the founding Treaty signed in Maastricht in 1991, and the second is the Amsterdam Treaty of 1997, that completed the setup with the Stability and Growth Pact (hereafter SGP).

The Maastricht Treaty defined the convergence criteria that countries had to fulfil in order to be admitted to the single currency area. In particular, it required a deficit to GDP ratio of no more than 3%, and a public debt below 60% of GDP, or approaching that level at a satisfactory pace.

The Amsterdam Treaty contains further provisions regarding fiscal policy that have the objective of increasing transparency and control on public finances. The Stability and Convergence Programmes that each year Member States present to the Commission have to contain a medium-term objective for the budgetary position of close to balance or in surplus, together with an account of the adjustment path towards the objective. The Excessive Deficit Procedure states what deviations from the 3% budget deficit ceiling are acceptable and describes the sanctions for the violators. As of December 2007, no country has been fined, although disapproval of budget positions in some countries has been expressed.

The prolonged period of low growth experienced by most Euro area countries (especially the largest ones), and the increasing number of countries struggling to maintain their deficits within the limits set by the Stability and Growth Pact (SGP), have triggered a debate on the flaws of the current fiscal framework, and on possible reforms aimed at a better functioning of fiscal policy in Europe[2]. The reform adopted by the European Council in March 2005 relaxes somewhat the medium term objective of a zero structural deficit for countries with low debt and/or with high potential growth; furthermore, it contemplates a number of circumstances (e.g. a strong engagement in costly structural reforms) allowing temporary deviations from the deficit ceiling, and longer delays for correcting them.

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[2] For detailed accounts of the debate on reforming the Pact, see e.g. Arestis et al., (2001), Buti et al., (2003), Creel et al., (2002), Farina and Tamborini, (2007), Fitoussi and Le Cacheux, (2007), Mathieu and Sterdyniak, (2003), Monperrus-Veroni and Saraceno, (2005).

The requirement to attain a position of close to balance or surplus in the medium term is an important innovation of the SGP with respect to the Maastricht Treaty, and it was left substantially unchanged by the reform of 2005. In fact, it implies the strong consequence that public debt as a ratio to GDP should tend asymptotically to zero, a position hard to justify *per se* (De Grauwe, 2003).

Even after the reform of 2005, the focus of the Stability and Growth Pact has been on the full operation of automatic stabilisers which would allow the implemention of a counter-cyclical short run fiscal policy. However, recent assessments of fiscal policies in the EU-15 have either pointed to their a-cyclicality (Gali and Perotti, 2003) or to their pro-cyclicality (Farina and Ricciuti, 2006). This raises doubts about the effectiveness of automatic stabilisers all over Europe. In the first part of the present contribution, we support this conclusion with a variety of stylised facts related either to the tax and benefit systems or to the sensitivity of unemployment public expenditures to unemployment and GDP growth rates. We then argue that a contradiction has arisen in Europe between the fact that the SGP advocates the use of automatic stabilisers and the reality of their declining effectiveness.

A subsequent step will consist in analysing possible solutions to the contradiction. Two situations are possible: further reducing the scope of fiscal policy and making the EU economy depend even more on markets and their flexibility; or making room in the European fiscal framework for discretionary and counter-cyclical fiscal policies to compensate for the reduction in the efficiency of automatic stabilisers[3]. We argue in favour of the latter solution.

The standard textbook consensus on which rest the European economic institutions is that monetary policy is assigned the task of reacting to area wide shocks, while national fiscal policy is left in charge of country specific shocks[4]. Within this framework, fiscal policy has to be limited to automatic stabilisation, banning discretionary intervention from the toolbox of policy interventions. The standard argument maintains that the limit of total

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[3] A third proposition could be to rebuild the effectiveness of the automatic stabilisers (Solow, 2004), but their effectiveness has been deteriorating so much over the years in Europe that a dramatic U-turn is needed to compensate. Moreover, time elapsed before automatic stabilisers become effective again will be very long. Implementing discretionary fiscal policies may give quicker results.

[4] While it is not the main subject of this essay, it is nevertheless worth mentioning the inconsistency of the framework, which leaves to monetary policy the task of reacting to common output shocks, while at the same time explicitly limiting its mandate to inflation targeting (article 4, comma 2 of the Treaty). This leaves in fact an objective (reaction to common output shocks) without assigned instruments.

deficit to 3 percent, coupled with the requirement of structural balance, could avoid fiscal indiscipline (thus protecting central bank independence), while letting enough room for automatic stabilisation to take care of country specific shocks. (Brunila et al., 2002). Nevertheless, some empirical studies (see, e.g., Barrell and Pina, 2004) discussed the fact that the initial levels of debt-to-GDP ratios and cyclically-adjusted deficits in some Euro area Member States might be too high to permit the automatic stabilisers to operate freely within the constraints of the SGP.

2. The Decreasing Effectiveness of Automatic Stabilisers in the EU-15

The European framework for fiscal policy has tended to privilege the operation of automatic stabilisers at the expense of discretionary policy changes. Distinguishing between the cyclical and the structural parts of a public deficit is not an easy task. Even abstracting from the difficulties involved in the measurement of the output gap and potential output, automatic stabilisers depend on a variety of factors from the macro and the micro spheres that are often country specific. The effectiveness of automatic stabilisers depends on the sensitivity of government revenues and spending to economic fluctuations and on the sensitivity of economic activity to cyclical changes in government revenues and spending. Among the factors affecting budgetary sensitivity, the literature highlights the size of the public sector, the progressivity of the tax and benefit system, the sensitivity of tax bases to economic fluctuations, the institutional time profile of the tax system[5], the level of unemployment benefits and the sensitivity of unemployment to fluctuations in economic activity. Other determinants have an influence on the effectiveness of automatic stabilisers: the nature and size of shocks. Finally, the overall flexibility of the economy may also dampen the shocks and automatic stabilisers may seem more effective than they are in reality.

Despite the difficulty of identifying the relative smoothing properties of automatic stabilisers and economic flexibility, the picture in the European context shows some key elements whose incidence on the effectiveness of automatic stabilisers presents no ambiguity: budgetary sensitivity has undoubtedly been on a downward trend for many years and recent reforms (e.g., the recent fiscal package approved by the newly elected

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[5] By this we mean that automatic stabilisers are more effective if e.g. main tax revenues come from taxes which are very sensitive to economic fluctuations and whose lags are short. For example, corporate taxes have generally been very sensitive to the economic cycle but delays in collection have reduced the overall effectiveness of this tax as a prominent automatic stabiliser.

French government) are not such that one can expect a reverse trend in the near future. This long lasting change therefore questions the exclusive reliance of European fiscal policies on automatic stabilisation.

1.1. *Automatic stabilisers: Macro evidence*

We begin with a summary, in **table 1,** of the main conclusions of different macroeconometric models that estimate the percentage of fluctuations in output which are smoothed by automatic stabilisers. The most striking result is the heterogeneity of countries in terms of the sensitivity of economic activity to the cyclical changes in government revenue and spending. The standard error across countries goes from 2 to 8%, for an average smoothing of 19% across models and countries. Moreover, the extent of automatic stabilisers smoothing for a country is quite different from one model to the other and the standard errors across models are large, ranging from 6% for Germany to 12% for the Netherlands.[6] Overall, table 1 tells us that the scope of automatic stabilisers in the EU is low: at best, they smoothed a maximum of 36% of economic fluctuations and at worst only 5% of them.

To complement the studies mentioned in **table 1** we give our own preliminary assessment of the size of automatic stabilisers in 5 countries between 1971 and 2005. These countries are representative of the size heterogeneity of the Euro area Member States and they will also be shown later to have behaved distinctly with respect to the progressivity of the tax and benefit system. We focus on the sensitivity of public deficit (our endogenous variable) with respect to economic fluctuations (one-quarter lagged GDP growth). We report two different OLS specifications: one with a lag in fiscal policy and one without (columns 2 and 1 of **table 2** respectively), the former giving a better fit. A first noteworthy pattern is the heterogeneity across countries, which confirms the findings of **table 1**. Crossing the results of the two tables we are able to obtain additional information, most notably about the comparison between UK and France. While **table 1** displayed a relatively high smoothing of economic fluctuations in the UK, **table 2** shows that the overall sensitivity of public deficit to economic fluctuations is similar. This may lead to conclude that automatic stabilisers are more efficient in the UK than in France.

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[6] Contrary to the other studies, the one based upon NiGEM introduces rational expectations by households on future fiscal policy. In this context which draws heavily on some sort of Ricardian equivalence, it is normal that the effectiveness of fiscal policy is small.

Table 2 also shows that cyclical sensitivity of the public deficit is very strong in Sweden, mild in the Netherlands and weak in France and the UK. In Italy, GDP growth shows the wrong sign whatever the specification used. In this country fiscal policy is highly inertial: one explanation may be related to the high level of debt and to the ensuing burden of interest payments on Italian public finances. Another explanation is the very low level of unemployment related expenditure, which in Italy has always been largely below 1% of GDP (see **figure 5**). In the other four countries, the inertial component is comparable. Lastly, the cyclically-adjusted deficits, captured by the constant term, are also very comparable across countries except Italy.

To assess the stability of specification (2), we performed a CUSUM test (Brown et al., 1975) on the cumulative sum of the recursive residuals. The test finds parameter instability of the regression if the cumulative sum goes outside the area between the two 5% critical lines. **Figure 1** displays the results. Italy and France witnessed some instability in the coefficients, between 1985 and 1991 in the former and between 1993 and 1995 in the latter. For both countries, the improvement in the specification which occurred after these respective phases came to an end soon afterwards, although instability was not significant. In the Netherlands and the UK, the macro evidence reported in specification (2) was never significantly unstable, although the fit was continuously deteriorating from 1975 to 1990. For the UK, a new deterioration occurred between 1995 and 2000, around the implementation of the new fiscal rules. Finally, the specification for Sweden seems fairly stable.

These results confirm that macro evidence regarding automatic stabilisers is fairly robust across the time sample and it is possible to conclude that the homogeneity of imposed fiscal rules within the EU is contradictory with the heterogeneity of empirical rules since the 1970s.

1.2.   Recent changes in revenue and expenditure trends: Micro evidence

The working of automatic stabilisers rests predominantly on the size of the public sector, on the structure of the tax and benefit systems and on the level of unemployment benefits and their sensitivity to economic fluctuations. The evolution of these factors is described in the next subsections.

1.2.1. The size of the public sector

With a sample of 20 OECD countries, Fatas and Mihov (2001) showed that government size and the volatility of the business cycle were negatively correlated; they concluded that larger governments had more efficient automatic stabilisers: the fact that expenditures or taxes were independent of the economic cycle was in itself a stabiliser because it was reducing volatility in the economy. Government size was measured by the ratio of public expenditures or tax revenues to GDP.

Table 3 displays the level and evolution of government size in 6 EU countries. A first striking result is the decrease in the discrepancy across countries, measured by the standard error: between 1980 and 2006 it was reduced by 32% for total expenditures, and by 47% for total revenues. The second important result is that the Netherlands, UK, Sweden and Germany have rather substantially reduced the size of their governments. For these countries, and following Fatas and Mihov (2001), it can be concluded that automatic stabilisers are today less effective than in the past. An opposite conclusion holds for France and Italy, for which government size has been on an upward trend.

1.2.2. The progressivity of the tax and benefit system

The progressivity of the tax and benefit system is meant to help an economy tackle ups and downs. A progressive tax system, including a generous transfer system, dampens the cycle: during the upturns, an increase of average income increases the average tax rate, thus reducing disposable income and cooling off aggregate demand. Symmetrically, during a slump, the decrease of income will entail a lower average tax rate, and hence a less than proportional decrease in disposable income, thus sustaining demand.

If, in addition, the cycle impacts differently on different income brackets (in particular, if expansions benefit the wealthiest the most), a progressive tax rate both reduces income inequalities and improves economic stabilisation: during an upswing, the wealthiest pay relatively high taxes whose revenues help to reduce possible past deficits; they also improve future fiscal leeway. Meanwhile, the poorest pay relatively low taxes that help their disposable income converge towards that of the wealthiest. During a downswing, the more progressive the tax system, the highest the decrease in taxes paid by the wealthiest and the more the tax system helps to counterbalance the crisis. We can broadly speaking attribute two distinct (even if often related) objectives to a tax and benefit system: improving the situation of the poorest, on the one hand; and making the wealthiest contribute more to welfare and social expenditure, on the other hand.

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Since the end of the 1990s, there has been a sharp modification in the tax and benefit systems of the EU-15 countries: In many of them the redistributive role of the system has been attenuated, while at the same time top marginal tax rates were reduced.

Aggregate data at the EU-15 level tell a mixed story. Between 1998 and 2001 (comparable data are not available for other years), the distribution of disposable income[7] remained constant, the three first deciles receiving 14% of total disposable income, the next four 35%, and the highest income groups more than 50%. A comparison of interdecile ratios for disposable and pre-tax incomes shows instead that the EU-15 underwent a small change between 1998 and 2001: **table 4** shows that the benefit and tax systems permitted a reduction in inequality between Decile 5 and Decile 1 of 43.7%[8] in 1998, but only of 42.0% in 2001. In the meantime, redistribution between Decile 10 and Decile 5 was more substantial in 2001 than in 1998.

Here we are confronted with a specific feature of some European tax and benefit systems: For the EU-15 as a whole, the capacity of the system to redistribute between the wealthiest and the middle income deciles has increased, while redistribution between the latter and the poorest income earners has been reduced. **Figure 2** can be illustrative in this respect. On the x-axis, a positive value means that the relative situation of households from Decile 1 has deteriorated *vis-à-vis* that of Decile 5 between 1998 and 2001. On the y-axis, a positive value means that the relative situation of households from Decile 5 has deteriorated *vis-à-vis* that of Decile 10 during the same time span. If the two above-mentioned objectives are reached by a country (we label it Regime 1), both values should be negative. In the case where one out of the two is reached, one value is negative whereas the other is positive: Regime 2 holds when the poorest and the wealthiest are favoured at the expense of middle-income earners; Regime 4 holds when the situation of middle-income earners improves *vis-à-vis* the poorest and the wealthiest. Last, Regime 3 holds when the situation of the wealthiest improves *vis-à-vis* low-income and middle-income earners.

Data for EU-15 countries show that few of them have actually reached both objectives over this short period; Denmark, France, Ireland and the UK are in the same quadrant as

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[7] Disposable income is original income (from employment, investment, private pension) minus taxes plus received benefits, from maternity allowances to public pensions.

[8] In 1998, for the EU-15 countries on average, the ratio of Decile 5 to Decile 1 original income was equal to 473%; with disposable income data, it was equal to 266%. Thus, we have a variation of minus 43.7%.

the average of EU-15 (Regime 4), favouring middle-income earners[9]. On the opposite, Luxembourg, Spain, Sweden and, to a lesser extent, Belgium, have improved the relative situation of the poorest households, and substantially so, at the expense of middle-income earners whose relative position with respect to the wealthiest households decreased (Regime 2). Finland, the Netherlands and Portugal are all in Regime 3, witnessing a deterioration in the situations of low-income and middle-income earners, at the benefit of the wealthiest. Among the countries of the EU-15 only Austria, Germany and Italy were able to reduce both types of income inequality. However, the latter two are far from the 45° line for which the improvements in the two objectives would be comparable: Germany made more efforts for the poorest than it did to increase the contribution of the wealthiest to the tax and benefit system; the reverse is true for Italy.

To sum up, countries are quite evenly distributed across the four regimes and, except in Austria, Germany and Italy, the progressivity of the tax system decreased between 1998 and 2001 and with it, the efficiency of automatic stabilisers on the side of public receipts.

One can also assess progressivity by looking at marginal tax rates. **Table 5** reports marginal tax rates for top-wage earners in a few European countries in 2000 and 2003. The decrease was sharp in Belgium, France, Luxembourg and Spain. A smoother decrease occurred in Germany and Italy. **Table 6** displays corporate tax rates in EU-15 countries in 1990, 2000 and 2005. Except in Spain, corporate tax rates have decreased since 1990 or 2000. These reductions are generally meant, in a language that would not hurt the European Commission, to enhance production, incentives and entrepreneurship. In the short run, lower corporate tax rates may induce higher profitability that may fuel investment and employment. Nevertheless, they may also induce to distribute more profits which may then be invested elsewhere in the world economy and which may be missing for financing the benefit system. The decreasing size of the government may thus impair economic stability, as Fatas and Mihov (2001) argued (*cf. supra*), but it may also fuel social unrest. This may be all the more true if marginal tax rates on dividends are also reduced and this is what occurred between 2000 and 2003 in Belgium, France, Spain, Luxembourg and Ireland (**table 7**). Moreover, if lower corporate taxes do not

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[9] The situation of the "middle-class" in these societies is well beyond the scope of this contribution which intends to give some macroeconomic and microeconomic clues on the efficiency of automatic stabilisers. By "middle-income earners", we only refer to Decile 5. It is possible that the "middle-class" starts at, say, Decile 4 or 6 and, were it the case, conclusions related to the possible improvement or deterioration *vis-à-vis* the "upper-class" (also to be strictly defined) might be different.

succeed in fuelling production and growth, the consequent rise in public deficits in Europe may push governments to reduce transfers and other public expenditures; in this sense, lower taxes may have as a side effect the reduction of automatic stabilisation.

Possible tensions on public finances because of lower taxes do not come exclusively from corporate tax rates: taxes on labour incomes have also decreased in the recent past (**table 8**). Only Denmark and, to a lesser extent, Finland, Greece and Sweden, have not witnessed such a decrease. Apart from these countries, tax cuts are general and they may have a bad influence on the efficiency of future automatic stabilisers. The latter are also currently hurt by the implementation of the OECD Employment Strategy: Belgium, Denmark, Germany, Ireland, the Netherlands and UK all experienced declining replacement rates and/or shortened benefit duration.

After describing the revenue side of automatic stabilization, in the next subsection we turn to the expenditure side, more precisely to the analysis of unemployment benefits.

1.2.3. Unemployment expenditures

Some items of public spending, in particular those linked to the support of the unemployed, help to balance the consequences of shocks. A negative shock on aggregate demand is partly dampened by generous unemployment benefits which sustain consumption of those most dramatically hit by the shock. More active unemployment public expenditures – those labelled under the heading of active labour market policies (ALMP), mostly training – also reduce the costs of unemployment for the unemployed, promoting their employability and improving their probability of finding a new job, thus shortening unemployment duration. Expenditure aimed at fighting unemployment can help to maintain economic stability through a combination of supportive measures for the demand for labour and enhancing the effective supply of labour.

Consequently, we use the sum of passive *and* active unemployment public expenditures although the different choices between the two types of expenditures by EU countries may produce different lags in the stabilisation properties of unemployment expenditures: passive expenditures like benefits undoubtedly impinge quicker on the aggregate demand than active expenditures which are meant to reduce the duration of unemployment for those unemployed. However, in some EU countries, the decrease of unemployment benefits cannot be separated from the increase of ALMP.

In general, the responsiveness of unemployment expenditures to the unemployment rate has decreased, thus reducing the stabilising properties of the system. **Figure 3** displays

pairs of yearly variations[10] in unemployment public expenditures (active and passive expenditures) and yearly variations in unemployment rates, for the EU-15 countries, distinguishing two samples: 1991-1997 and 1998-2003.[11]

Within this figure, we expect pairs to be evenly distributed on an upward line whose slope would reveal the average elasticity of unemployment expenditures to the unemployment rate. There is actually a very interesting pattern in Europe: since 1998, the elasticity of unemployment public expenditures to the unemployment rate has been lower than before (0.1 rather than 0.2 on average). Stated differently, the relationship between variations in unemployment expenditures and rates was more positively sloped in the preceding period despite the Maastricht public finance criteria.

It is also noteworthy that the level of unemployment expenditures for the same rate of unemployment has decreased since 1998, in comparison with the preceding period. This latter property of the European social system appears clearly in the cases of Italy, France and Germany (**figure 4**). The UK is an outlier in this respect: With the exception of one point in the 1998-2003 sample, the relationship between unemployment expenditures and unemployment rate has hardly changed.

The stylised facts on the reduction of tax rates, the reduction in the progressivity of the tax and benefit systems, and the reduction in the generosity of the unemployment insurance system, all seem to point unequivocally towards a decrease of the effectiveness of automatic stabilisation in European countries.

Therefore, public deficits may be less and less cyclical, or less and less able to dampen fluctuations. In the literature, usual assessments (e.g., Girouard and André, 2005) report elasticities of taxes, transfer payments and other expenditures to GDP growth which have generally remained constant over time. Looking at unemployment expenditures only, it is however possible to suggest that for most of EU countries their relationship with GDP growth rate has changed substantially since the end of the 1990s.

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[10] With a short sample it is not possible to perform a panel test with fixed effects, so that we chose the specification in first differences to remove country effects.

[11] The Amsterdam Treaty in 1997 made clear that the transition period towards the adoption of the Euro would not be followed by a benign-neglect attitude towards public deficits: the convergence criterion of a public deficit below 3-percentage points of GDP was soon to become a rule of conduct within the newly constituted Euro area.

Figure 5 shows a dramatic change in the slope and the level of unemployment expenditures (in percentage points of GDP) versus the rate of economic growth[12]. In Austria, Denmark, Finland, Ireland, the Netherlands and Sweden, a positive slope emerged at the end of the 1990s: unemployment expenditures became procyclical. Moreover, for a given GDP growth rate, expenditures are substantially inferior to their level of the early 1990s, ranging from a loss of 0.5 percentage point of GDP (Austria, between 1993 and 2002), to a loss of 1.5 point (the Netherlands, between 1996 and 2000). In Germany and Spain, the negative slope has increased since 1999: the effect at the margin of the changes on the rate of economic growth on unemployment expenditures has decreased. Moreover, in Spain, for a given GDP growth rate, expenditures were 1 percentage point lower between 1990 and 2001. Exceptions are France whose negative slope has been decreasing since 2001, Greece whose a-cyclicity is obvious, Italy whose negative slope has been maintained but the level of unemployment expenditures for a given GDP growth rate has been lowered, and Portugal and the UK for which the deterioration of the automatic stabilisers occurred between 1993 and 1999 for the former and between 1991 and 1996 for the latter.

3. How to Substitute For Automatic Stabilisation?

If the effectiveness of automatic stabilisers has decreased, as we documented in the previous section, we need to ask whether something else could allow the system to adjust. In fact, it may be argued; e.g. by the promoters of the Classical School, that in a competitive world, where markets (for labour, goods and services or finance) are highly flexible, prices adjust rapidly to bring output fluctuations under control. The operation of automatic stabilisers could thus turn out to be less necessary than in the past.

Although the above-mentioned argument is common among economists who promote more flexibility and "structural reforms" in Europe (see e.g. Sapir et al., 2003), it needs to be supported by identifiable empirical facts. In the vein of McConnell and Perez-Quiros (2000), who documented the decline of US output volatility, we study output volatility in Euro area countries taken as a whole, and in some EU-15 countries taken individually. We remove the mean of GDP growth from yearly GDP growth rates; we then fit a constant and a linear trend to the ensuring gap; and we perform a CUSUM and CUSUM

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[12] Here we assume that the relationship between the unemployment rate and economic growth has remained unchanged.

of squares test on the cumulative sum of the recursive residuals[13]. The CUSUM of squares test reports possible instability in the variance of the parameters.

For the Euro area taken as a whole, parameter instability occurs only around the German reunification years. Nevertheless, although not statistically significant, parameter instability had been on an upward slope since 1985 and until 1991. The CUSUM of squares test for the Euro area detects statistically significant instability in the variance during the crisis of 1993. Movements outside the critical lines, which are suggestive of variance instability, are also revealed in the UK from 1975 to 2000, in Italy from 1978 to 1986, in the Netherlands from 1980 to 1997, and in Sweden from 1981 to 1998 (figure 6). Over the recent years, like the US, Europe seems to have experienced a decline in output volatility.

Nevertheless, contrary to what happened in the United States, the decreased variability in Europe happened against a background of soft growth through the 1990s, with the largest European countries, notably Germany and Italy, which experienced growth rates close to zero (in 2002-3) and significantly below the EU average. In a context of low growth, it is not surprising that the variability of growth decreased. To eliminate the effect of changing growth trends, we detrended the series and analyzed the behaviour of cyclical components. We used the filter proposed by Iacobucci and Noullez (2005) that over short samples has a better performance with respect to more widely used filters (like Baxter-King or Hodrick-Prescott). **Figure 7** shows the cyclical components of real GDP for the euro area for a number of frequency bands, from medium (6-3 years) to very short (1 year – 6 months) cycles. A visual inspection shows that, in particular for the 6-3 year band, we observe an increase in variability in the early 1970s, and in the early 1990s, two periods of macroeconomic turbulence. Nevertheless, the picture shows no clear reduction in variability in recent periods, no matter what frequency we examine. To obtain a less impressionist assessment, we computed, for each of the frequency bands, the standard errors of two subperiods of equal length (1970Q3 to 1988Q2, and 1988Q3 to 2006Q2). The results, reported in **figure 8**, show that for all the frequencies (except the very long cycles 18-6 years) the variability in the second period is slightly larger than in the first. Using a cut-off between the periods linked to institutional changes (for example the

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[13] A well-known drawback with a CUSUM test based upon recursive residuals is that a shift late in a sample is likely to go relatively unnoticed. A CUSUM test using OLS residuals gives better results for late-sample data, but none of the tests can be considered significantly superior to the other (Ploberger and Krämer, 1992).

Single European Act of 1986, or the Maastricht Treaty of 1992), does not alter significantly our findings, which are also robust to detrending the series with the HP filter. Furthermore, this cyclical pattern is confirmed for most individual countries, with the exception of the UK[14].

Finally, we may notice that, contrary to the US, the EU countries are confronted with a very specific policy architecture which leaves monetary and fiscal policy uncoordinated, which fetters domestic fiscal policies and whose federal budget is both small (1 percentage point of EU-25 GNP) and not allowed to contribute to stabilising the economies.

Thus, we can conclude that the likely occurrence of asymmetric shocks in the EU and the institutional framework question the belief that increasing flexibility will be sufficient to assure income stabilisation (especially when average growth will go back to more standard levels). In the next section we argue that in light of a number of recent articles on the subject, and of the decreased efficiency of automatic stabilisation described above, discretionary fiscal policy should be reconsidered as a possible tool for economic stabilisation, either to dampen output fluctuations or to sustain potential output through public investment expenditures.

4. A Role for Discretionary Policy

The institutional framework that rules the economic governance of Europe, restricting fiscal policy to the working of automatic stabilisers, is not fortuitous, as it stems quite logically from the widespread aversion of the academic profession for discretionary fiscal policy, which emerged over the 1980s and 1990s. Four main sets of arguments have been advanced to justify this aversion: the first is that discretionary fiscal policy is subject to a number of delays (from decision to implementation) that make it impossible to use it to react to shocks. By the time the effects of policy are felt, the shock it was supposed to address may have vanished. These arguments were, among others, at the roots of the shift of attention from fiscal to monetary policy as the main stabilisation tool. Nevertheless, as pointed out by Blinder (2006), while the inside lags are larger for fiscal policy, the outside lags are much longer for monetary policy. Furthermore, the inside lags have nothing to do with fiscal policy *per se*, but rather with institutions that are not always well adapted. Arestis and Sawyer (2003) made a slightly different point: they recalled that monetary policy "being less subject to democratic decision making", it does not need

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[14] Figures are not reported. They are available from the authors upon request.

Parliamentary approval. For this reason, monetary policy can be decided and implemented quickly whereas expenditure changes generally take much longer. Blinder (2006) notes that the arguments on implementation or inside lags do not hold for particular items of fiscal policy, like temporary tax cuts, that proved very effective in changing the intertemporal allocation of resources by the private sector. Arestis and Sawyer (2003) further point out that the adoption of a fiscal policy rule in the vein of the monetary "Taylor rule", *i.e.* with reference to deviations of economic activity from the desired level, would contribute to reducing inside lags.

The second set of arguments against discretionary fiscal policy deals with its effectiveness, originating from the rational expectations revolution, and the Lucas' Critique (Lucas, 1976). First, a fiscal expansion may crowd out private expenditure (in particular investment) up to a point at which the overall increase in income becomes negligible. This may happen because the deficit is financed through borrowing, thus increasing interest rates and the cost of investment; or because public spending is aimed at moving the economy away from some sort of optimal or "natural" position, so that rational consumers react in order to bring the system back to its natural level. A weaker version of this argument focuses on the intertemporal budget constraint of rational consumers, who anticipate future tax increases to repay for current deficits, and hence react by increasing their current savings and reducing their expenditure (the Ricardian equivalence, see Barro, 1974)[15].

A third argument against fiscal policy discretion, made popular by the recent experience in the US, is the *twin deficits* hypothesis; based on the national accounting identity it is possible to show that an increase in budget deficit may create an equivalent deficit of the current account, so that total domestic income may not increase, and the expansionary effect may benefit other countries through increased imports[16].

Finally, fiscal policy may be inflationary, if it succeeds in improving economic activity (thus increasing imports and putting downward pressure on the exchange rate) and reduce

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[15] A strand of the literature, that on "expansionary fiscal contractions", has largely stemmed from a mix of this equivalence and credibility issues influencing risk premia (see Hemming et al., 2002, for a general survey; and Creel et al., 2004, for a critical one).

[16] It must be acknowledged that though twin deficit is an accounting identity (under the assumption of constant net private savings), at another level it tends to be seen as 'budget deficits cause current account deficits'. It is worth distinguishing between the formal accounting position and the causal relationship which is often postulated. We discuss below that empirical evidence on the causal relationships has not been convincing so far.

unemployment. In a globalised world financial markets may react withdrawing funds from the economy and causing a financial crisis.

Theoretical counter arguments or empirical weaknesses may be found for each of these reasons against the use of discretionary fiscal policy as a tool for stabilisation. As a general first point, we can observe that these arguments are not necessarily coherent with each other: If there is crowding out then neither inflation nor twin deficits will appear.

Going more into detail, it does not seem that the link deficit-interest rate-private spending is as robust as it would seem at first sight. First, a good policy mix can allow to increase borrowing without significant increases in interest rates. This may explain why past evidence that increases in the public debt were correlated with rises in interest rates is weak (see, e.g. Heilbroner and Bernstein, 1989). Furthermore, the empirical link between interest rates and private spending (in particular investment) is also weak (see, e.g. Fazzari, 1994-95, Ducoudré, 2005).

Another reason for the empirical weakness of the crowding out argument is the extremely restrictive set of assumptions on which Ricardian equivalence builds. If consumers for whatever reason do not discount the future perfectly, or if public expenditure is productive, and increases the future tax base, then there is no *a priori* reason for crowding out. A very simple model can also precisely highlight two other shortcomings of the Ricardian argument: it also assumes public spending irresponsibility and very few liquidity-constrained households.

Take an economy in which a proportion μ of households are liquidity constrained. As in Hayashi (1982) and Campbell and Mankiw (1990), liquidity-constrained individuals cannot borrow or lend, so that they consume all their disposable income in each period. The economy lasts 2 periods. In the first ("Keynesian"), demand drives production, while in the second ("Classical") the contrary holds. Without investment, the usual demand equations hold:

$$y_1 = c_1 + G_1, \quad (1)$$
$$y_2 = \overline{y} \quad \quad (2)$$

where subscripts refer to time periods, y is production or demand, c is private consumption and G are public expenditures.

Unconstrained individuals smooth consumption over their entire horizon: their consumption depends on their permanent income. They maximise their intertemporal utility function subject to the usual intertemporal budget constraint:

$$Max \quad u = \ln(c_1) + \beta \ln(c_2)$$
$$s.t. \quad c_1 + c_2 = R$$

where $R = y_1 + y_2 - (T_1 + T_2)$ is lifetime income, defined as the sum of disposable incomes, β is the discount factor, and T is total taxes on individuals. To simplify the exposition and without loss of generality, a zero interest rate on savings and a constant intertemporal price of consumption are assumed. Under perfect foresight, the solution gives:

$$c_1 = \frac{1}{1+\beta} R$$
$$(3)$$
$$c_2 = \frac{\beta}{1+\beta} R$$

Aggregate consumption of liquidity-constrained and unconstrained individuals in period 1 thus writes:

$$c_1 = \mu(y_1 - T_1) + (1-\mu)\frac{1}{1+\beta} R \quad (4).$$

The government has an intertemporal budget constraint (BC): $B_0 + G_1 + G_2 = T_1 + T_2$, where B_0 represents the initial level of public debt in the economy.

Following Perotti (1999), present and future public expenditures are assumed to be correlated; i.e. they follow an inertial process whose strength depends on the value of ρ:

$$G_2 = \bar{G} + \rho G_1 \quad (5),$$

where $\bar{G}$ are discretionary expenditures in period 2.

Defining $B_0 + \bar{G} = \Gamma$, the BC becomes:

$$\Gamma + (1+\rho)G_1 = T_1 + T_2 \quad (6).$$

At equilibrium, production writes:

$$y_1 = G_1 + c_1 \quad (7)$$

Substituting (4) in (7) gives:

$$y_1 = G_1 + \mu(y_1 - T_1) + \frac{(1-\mu)}{1+\beta}\left(y_1 + y_2 - \Gamma - (1+\rho)G_1\right)$$

$$(8)$$

$$= \frac{\beta + \mu - \rho(1-\mu)}{\beta(1-\mu)}G_1 - \mu\frac{1+\beta}{\beta(1-\mu)}T_1 + \frac{1}{\beta}\left(y_2 - \Gamma\right)$$

from which the multiplier effect of public spending on short-run GDP can be computed:

$\frac{\partial y_1}{\partial G_1} < 0 \Leftrightarrow \rho(1-\mu) > \beta + \mu$. It is then straightforward to show that non-Keynesian (NK)

effects occur if and only if:

$$\mu < \frac{\rho - \beta}{1 + \rho} \quad (9).$$

Intuitively, in this extreme framework, if an increase in expenditure today is perceived as permanent, and consumers are not patient enough, then G crowds out private expenditure and has negative effects on income. NK effects would thus appear if the degree of persistence of fiscal policy is larger than the discount factor: long-lasting expenditure cuts would improve permanent income as individuals would expect lower taxes in period 2. There are a number of reasons for considering that condition (9) cannot be met. First, it is really tricky to obtain: with a share of liquidity-constrained households (μ) equal to one third, and a discount factor (β) equal to 0.95, the degree of persistence in public expenditures necessary to yield NK effect would have to be extremely high ($\rho \geq 1.95$). Second, as the fraction of liquidity-constrained agents approaches to 1, the area of NK effects decreases. Therefore, assuming NK effects is equivalent to assuming the existence of Ricardian consumers; however, the empirical validity of the second assumption is very disputable (see Ricciuti, 2003, for a recent assessment and survey of the literature). Third, a necessary, though not sufficient, condition to satisfy inequality (9) is $\rho > \beta$. This condition would become sufficient only if there were perfect consumption smoothing ($\mu = 0$), but again the literature holds that this is rather implausible.

If crowding out is not an automatic consequence of running a deficit, then the current account argument has to be reconsidered as well. Twin deficits are not an empirical regularity, and in fact seem to be more of a long run national accounting phenomenon, than a property that holds over the cycle when the *ex ante* equality between investment and savings is not necessarily guaranteed. Moreover, the US current account imbalances started in 1992-93, at a time when public deficits were sharply declining. Finally, there is no convincing evidence that financial markets react to "normal" rates of inflation, and at

the same time, in a situation of financial distress contractionary fiscal policies do not seem a viable solution, as proven recently by Argentina.

Beyond the "critique to the critique", there are two prominent reasons for defending discretionary fiscal policy: First, a recent strand of literature, started by Blanchard and Perotti (2002), confirms that the empirical evidence is unable to rule out a positive role for discretionary fiscal policy. If anything, it generally shows significant short term effects and also, in some studies, a significant effect in the long-run (the multiplier values for some of these papers are reported in **table 9**). Second, Taylor (2000) has shown that lower efficiency of automatic stabilisers in the US, assessed by the estimated response of the cyclical surplus to the output gap, has been compensated by a "rather sizeable countercyclical" discretionary stance. A similar exercise was conducted by Farvaque et al. (2006) on EU countries, but results in terms of countercyclical discretionary stance were much less pronounced than in the US case.

The papers in the vein of Blanchard and Perotti (2002) borrow from the structural VAR methodology. Very simple reduced form VAR models are estimated, and then the identification is obtained by imposing to the contemporaneous residual correlation matrix a number of constraints that originate in the institutional system, in estimated elasticities, and so on. Contrary to Taylor's methodology, Blanchard and Perotti (2002) have attempted to extract purely discretionary fiscal components. They did not use computed structural deficits which rely on estimations of the output gap and the biases they are associated with. Moreover, the discretionary stance has been corrected for interest payments.

The impulse response functions for these exercises usually show short term Keynesian effects across countries (Blanchard and Perotti, 2002; Perotti, 2004; Biau and Girard, 2005; Giordano et al., 2006). Perotti (2004) is an exception in this respect: he found low and even negative fiscal spending multipliers in the short run in the UK, Australia, and Canada, depending on the sample (1960-2000, 1960-79, 1980-2000). Creel et al. (2007a,b) recently extended this methodology by imposing longer run constraints (namely through the introduction of a debt accumulation equation); neglecting these constraints, as done in the existing literature did not seem justified, especially when trying to assess the effect of public investment. They show that, if the long term interaction between debt, fiscal policy and monetary policy is not artificially shut off, the long run multiplier remains significantly positive and equal to 2 in France after a discretionary shock on the primary deficit and to 3 in the UK after a discretionary shock on public investment.

It is therefore possible to conclude that, on empirical grounds, a discretionary fiscal policy has a positive and persistent impact on output. From a short run perspective, it also means that this policy has an impact on long-run economic growth, hence it has an impact on potential output. This empirical conclusion is consistent with a strand of the literature which argues that the natural rate of growth is sensitive to aggregate demand (see, e.g. Leon-Ledesma and Thirlwall, 2002) or with papers which argue that fiscal contractions impinge negatively on potential output, since "the failure to use expansionary fiscal policy when slack resources exist could lead to a prolonged period of wasted economic potential" (Fazzari, 1994-95, p. 245).

5. Concluding remarks

In this paper we highlighted a contradiction between the spirit of the Stability and Growth Pact, and the actual behaviour of fiscal policies in Europe. On the one hand the former is designed with the objective to rule out any discretion in the conduct of fiscal policy, thus leaving to automatic stabilisation the exclusive burden of countercyclical policy; on the other hand, though, a number of stylized facts that we reported in the paper point to a significant decrease of the role of automatic stabilisation. Progressivity of the tax system and the size of the public sector have been reduced in most European countries, and structural breaks in the sensitivity of public spending to GDP changes appeared in the 1990s.

Thus, even if we were to adhere to the principles behind the setting chosen by European countries to rule economic policy, and we gave importance only on automatic stabilisation, we would be forced to admit that nowadays fiscal policy in the EMU is mostly dysfunctional[17].

We believe that this moment of crisis may actually be an opportunity. The debate opened at the beginning of this decade on the flaws of the Stability Pact has been closed by the reform of 2005 that took it out of the political agenda. Maybe that reform was too hasty, and what is needed is a more radical rethinking of the framework for fiscal policy. This paper and the small illustrative model that we presented suggest that a reformed fiscal rule for Europe should leave some room for discretionary policy. In particular we believe

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[17] Andres et al. (2008) show that government size and the volatility of output are negatively correlated, arguing then that this stylised fact cannot be replicated in a real-business cycle model. They conclude that "models with Keynesian features can better replicate the empirical evidence on the effects of fiscal policy on the volatility of output fluctuations". Nevertheless, they do not conclude that a fiscal framework where automatic stabilisers are made less and less efficient is dysfunctional.

that the countries of the Euro area should learn from the successful experience of the UK (see Creel, Monperrus Veroni and Saraceno, 2007), and implement some form of "golden rule" to encourage long term public spending (investment, but also expenditure on crucial items like public health and education), without hampering the long term sustainability of public finances.

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6. Appendix: tables and graphs

Table 1. Effectiveness of automatic stabilisers across EU countries (in %)

	Bundesbank model (1)	QUEST model (2)	NiGEM model (3)	INTERLINK model (4)
France	19	23	7	14
Italy	14	21	5	23
Netherlands	14	20	6	36
UK	24	18	n.a.	30
Germany	23	17	18	31
Unweighted average	18.8	19.8	9.0	26.8
Std error	4.8	2.4	6.1	8.5

Note: percentage of fluctuations in output which are smoothed by automatic stabilisers.
Sources: (1) Scharnagl and Tödter (2004); (2) European Commission (2001); Barrel and Pina (2004); van den Noord (2000).

Table 2. Automatic stabilisers
Dependent variable: government net lending in percent of GDP, 1971-2005

	Ita.		Fra.		UK		Nld.		Swe.	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
ΔGDP$_{-1}$	-0.28	-0.26	0.79	0.28	0.52	0.25	0.53	0.34	1.32	0.75
	(0.9)	(1.9)	(5.4)	(1.9)	(2.6)	(1.7)	(2.8)	(2.5)	(3.3)	(2.7)
Gvt net lend.$_{-1}$	-	0.89	-	0.64	-	0.68	-	0.68	-	0.69
		(11.6)		(5.1)		(5.3)		(6.7)		(6.5)
Const	-7.0	-0.19	-4.3	-1.6	-4.3	-1.5	-4.0	-1.9	-3.1	-1.7
	(7.5)	(0.3)	(10.5)	(2.6)	(6.9)	(2.3)	(7.1)	(3.5)	(2.8)	(2.3)
$\bar{R}^2$	0.00	0.81	0.46	0.70	0.14	0.55	0.17	0.64	0.22	0.66

Note: t-stat are reported between brackets.
Source OECD, Economic Outlook.

Table 3. General government size in the EU (in % of GDP)

		1980	1990	2000	2006
France	Total expenditure	45.6	49.6	51.6	53.5
	Total revenue	45.7	47.2	50.2	50.8
Italy	Total expenditure	40.8	52.9	46.2	49.5
	Total revenue	33.8	41.5	45.3	44.9
Netherlands	Total expenditure	55.4	54.2	44.2	46.6
	Total revenue	51.5	48.9	46.1	46.5
UK	Total expenditure	47.4	41.5	36.9	44.6
	Total revenue	41.7	39.9	40.8	41.7
Sweden	Total expenditure		72.4[1]	56.8	55.6
	Total revenue		61.1[1]	61.8	58.4
Germany	Total expenditure	47.9	44.5	45.1	45.8
	Total revenue	45.0	42.5	46.4	43.5

Source: European Commission, Economic Forecasts, Autumn 2006.
[1]: 1993

Table 4. Reduction of interdecile inequality after fiscal and social transfers, in percentage points

	D5/D1		D10/D5	
	1998	2001	1998	2001
EU-15*	-43.7	-42.0	-31.1	-32.4
France	-40.1	-37.6	-29.0	-29.4
Germany	-59.5	-63.7	-30.4	-30.6
Italy	-16.7	-17.2	-25.7	-28.7
Netherlands	-59.3	-58.4	-28.1	-23.1
Spain	-27.9	-40.8	-41.2	-30.8
Ireland	-91.7	-90.2	-33.0	-41.7
UK*	-76.4	-76.0	-35.1	-35.2

*: euros adjusted for PPP.
Sources: EUROMOD statistics on Distribution and Decomposition of Disposable Income, accessed at www.iser.essex.ac.uk/msu/emodstats/DecompStats.pdf on 1998 and 2001 using EUROMOD version 31A; computations by the authors.

Table 5. Marginal tax rates for top-wage earners*, in percentage points

	2000	2003		2000	2003
Belgium	60.5	53.5	Spain	48.0	45.0
France	61.2	56.1	Luxembourg	47.1	38.9
Germany	53.8	51.2	Ireland	44.0	42.0
Italy	46.4	45.9	UK	40.0	40.0

*: top wages are at least equal to twelve times in 2000 and 10 times in 2003 the average production wage.
Source: OECD, Recent Tax Policy Trends and Reforms in OECD countries, 2004, reproduced from Saint-Etienne & Le Cacheux (2005, p.21).

Table 6. Corporate tax rates, in percentage points

	1990	2000*	2005		1990	2000*	2005
Austria	30		25	Ireland	43 (10: industry)	24	12.5
Belgium	43	40.2	35.5	Italy	36	37	33
Denmark	50		28	Luxembourg	34	37.5	30.4
Finland	33		26	Netherlands	35		31.5
France	42 (distributed profit) 37 (retained profit)	37.8	34.9	Portugal	34		27.5
Germany	36 (distributed profit) 50 (retained profit)	52	39.3	Spain	35	35	35
Greece	46 (40: industry)		32	Sweden	52		28
EU-15	41.8		34.1	UK	35	30	30

Sources: European Tax Handbook, reproduced from Sterdyniak (2005, p.24), except year 2000 reproduced from Saint-Etienne & Le Cacheux (2005, p.22).

Table 7. Marginal tax rates for dividends, in percentage points

	2000	2003		2000	2003
Belgium	49.1	43.9	Spain	52.7	50.0
France	63.2	57.0	Luxembourg	52.3	44.0
Germany	53.8	55.5	Ireland	57.4	49.3
Italy	45.9	46.1	UK	47.5	47.5

Source: OECD, Recent Tax Policy Trends and Reforms in OECD countries, 2004, reproduced from Saint-Etienne & Le Cacheux (2005, p.23).

Table 8. Structural reforms on the labour markets, 1994-2004

	Replacement rate	Benefit duration	Taxes on labour incomes
Austria	[+, -]		+
Belgium		+	+
Denmark	+	+	-
Finland	[+, -]		[+, -]
France	-	+	+
Germany	[+, -]	+	+
Greece			[+, -]
Ireland	+		+
Italy	-		+
Luxembourg			+
Netherlands		+	+
Portugal			+
Spain	+	-	+
Sweden	[+, -]		[+, -]
UK		+	+

Source: OECD, Employment Outlook, 2006.
Note: +: reforms have been implemented in the direction of the OECD Employment Strategy;
-: reforms have been implemented counter to the OECD Employment Strategy; [+, -] reforms have gone in both directions.

Table 9. Fiscal multipliers in the recent literature

	Country	Multiplier of …		
Blanchard and Perotti (2002)	USA	expenditure	= [0.9; 1.3]	(short run)
Perotti (2004)	USA	expenditure	= [0.1;0.7]	(short run)
			= [-1.3;1.0]	(long run)
	Germany	expenditure	= [0.8;1.3]	(short run)
			= [-0.7;1.1]	(long run)
	UK	expenditure	= [-0.2;0.5]	(short run)
			= [-1.1;0.8]	(long run)
	Canada	expenditure	= [0.1;0.6]	(short run)
			= [-2.2;0.9]	(long run)
	Australia	expenditure	= [0.0;0.6]	(short run)
			= [0.2;0.6]	(long run)
Biau and Girard (2005)	France	expenditure	= 1.4	(short run)
			= 1.8	(long run)
Giordano et al. (2006)	Italy	expenditure	= 1.7	(short run)
Creel et al. (2007a)	France	primary balance	= 0.8	(short run)
			= 2.0	(long run)
Creel et al. (2007b)	UK	investment	= 3.1	(long run)

Figure 1.
Stability of automatic stabilisers

ITALY

SWEDEN

NETHERLANDS

FRANCE

UK

31
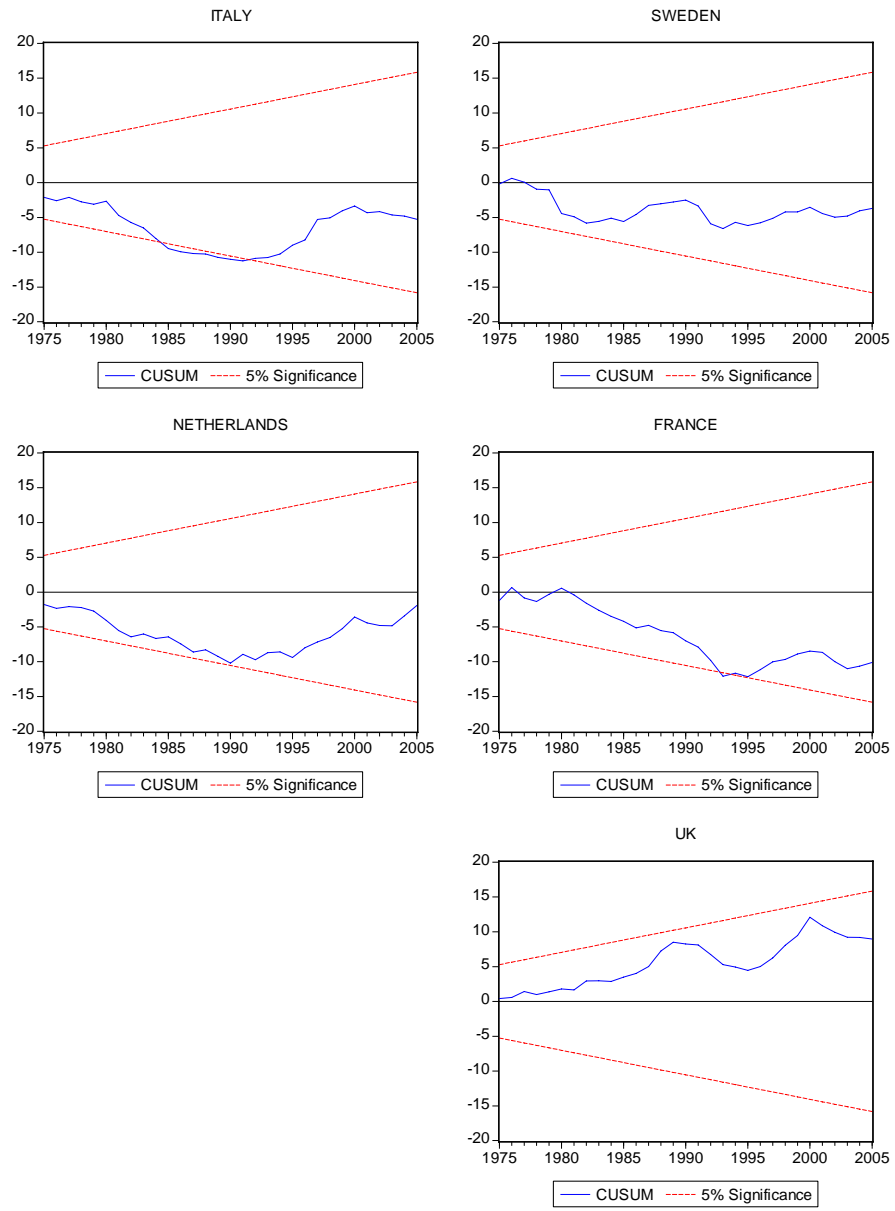
Figure 2. Evolution of interdecile disposable income between 1998 and 2001, EU 15
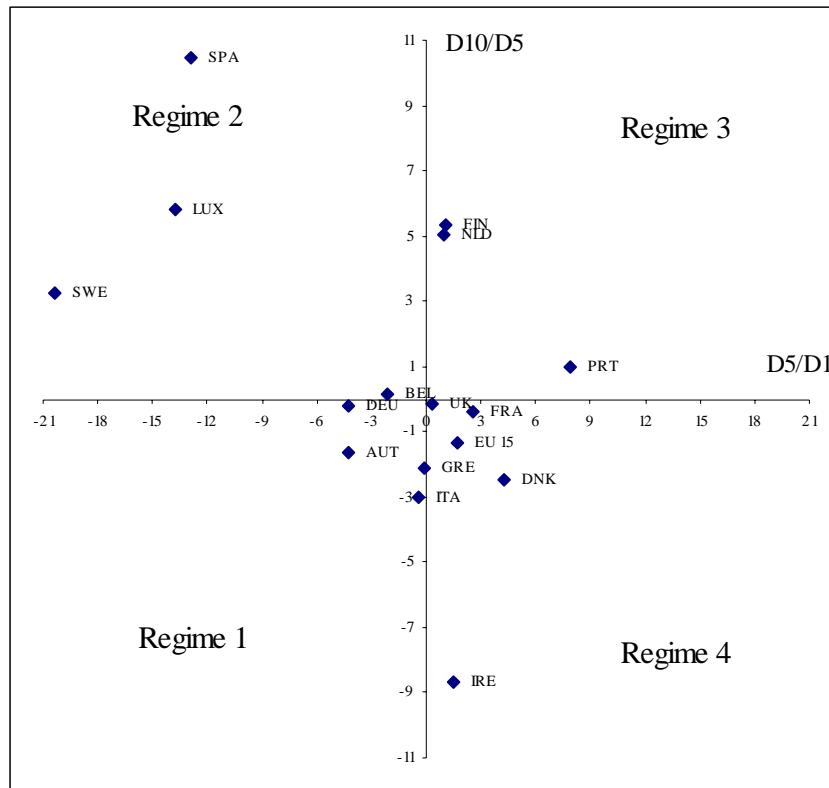
Notes: *Regime 1*: improvement in the two objectives; *Regime 2*: improvement in objective 1, deterioration in objective 2; *Regime 3*: deterioration in the two objectives; *Regime 4*: improvement in objective 2, deterioration in objective 1; *Objective 1*: reducing inequality for low-income earners; *Objective 2*: increasing the contribution effort of high-income earners.
Source: EUROMOD (see table 1), computations by the authors.

Figure 3. Relationships between the variation in unemployment public expenditures (expressed in percentage points of GDP) and the variation in unemployment rate, both stated in %, EU 15, 1991-1997 and 1998-2003
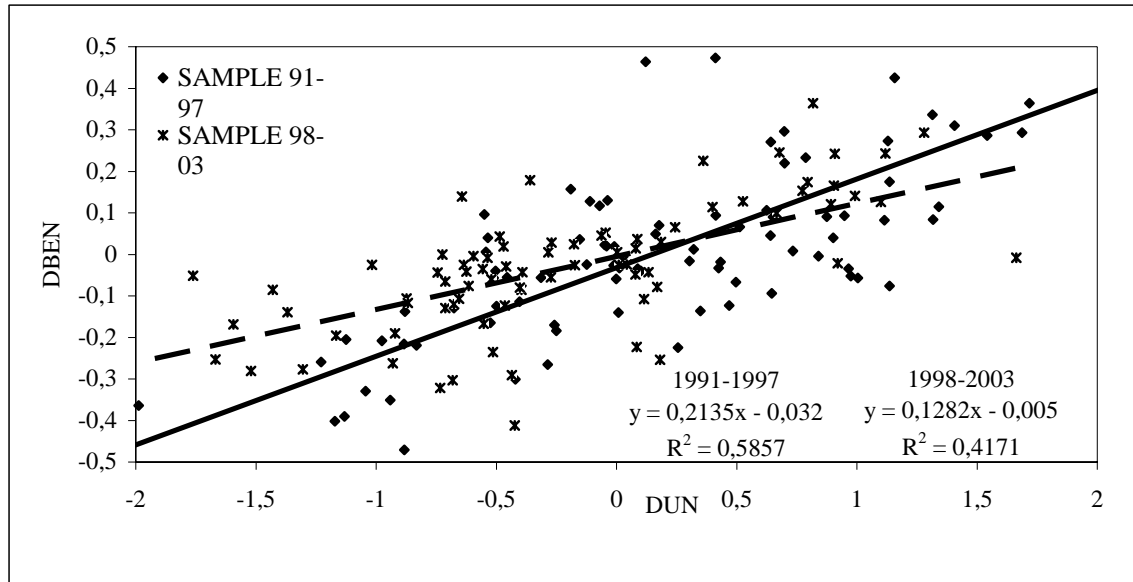
Source: OECD, computations by the authors.

Figure 4. Relationships between unemployment public expenditures (expressed in percentage points of GDP) and unemployment rate, 4 main EU-15 countries, 1991-1997 and 1998-2003
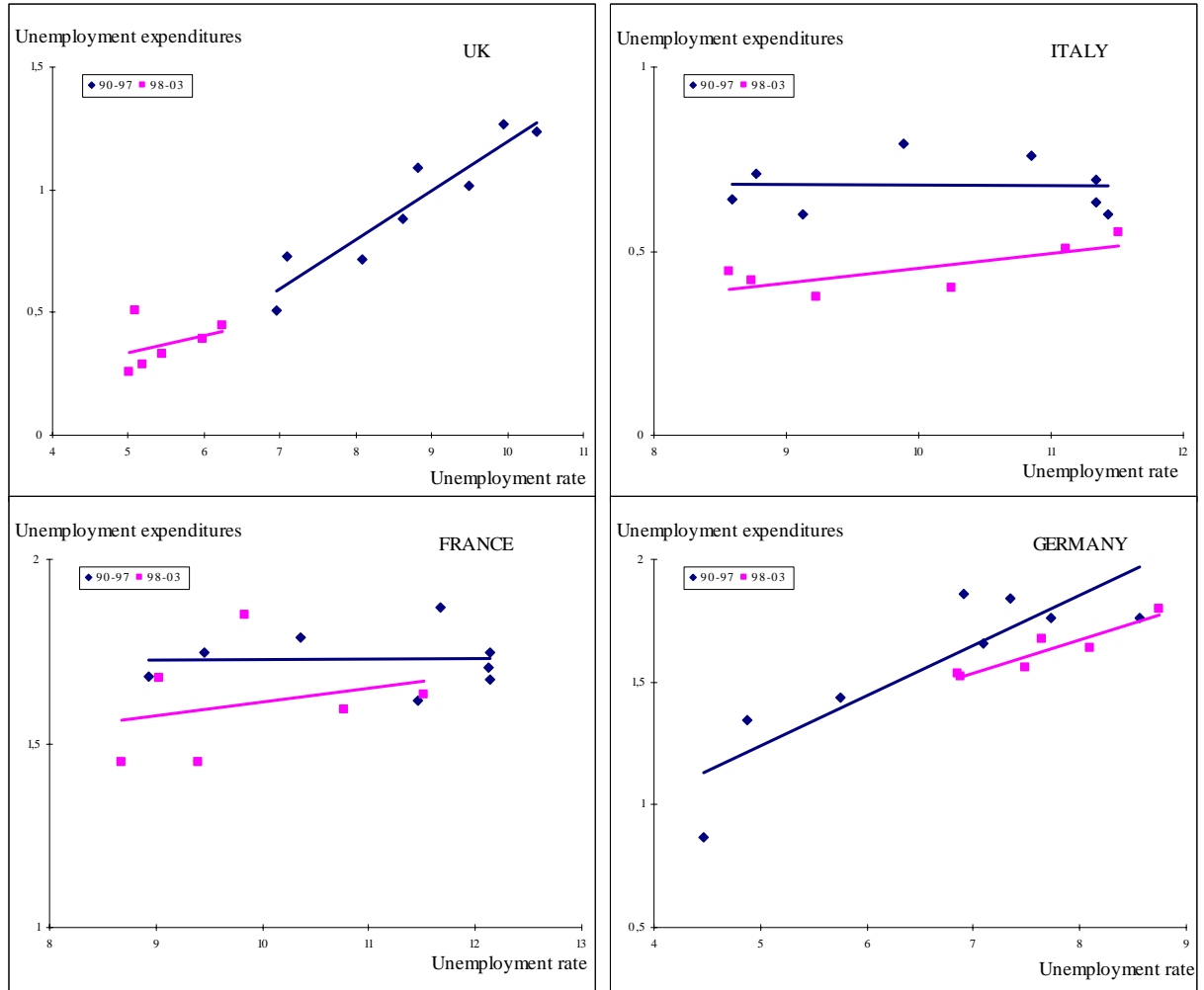
Source: OECD, computations by the authors.

Figure 5. Relationships between unemployment public expenditures (expressed in percentage points of GDP) and GDP growth rate
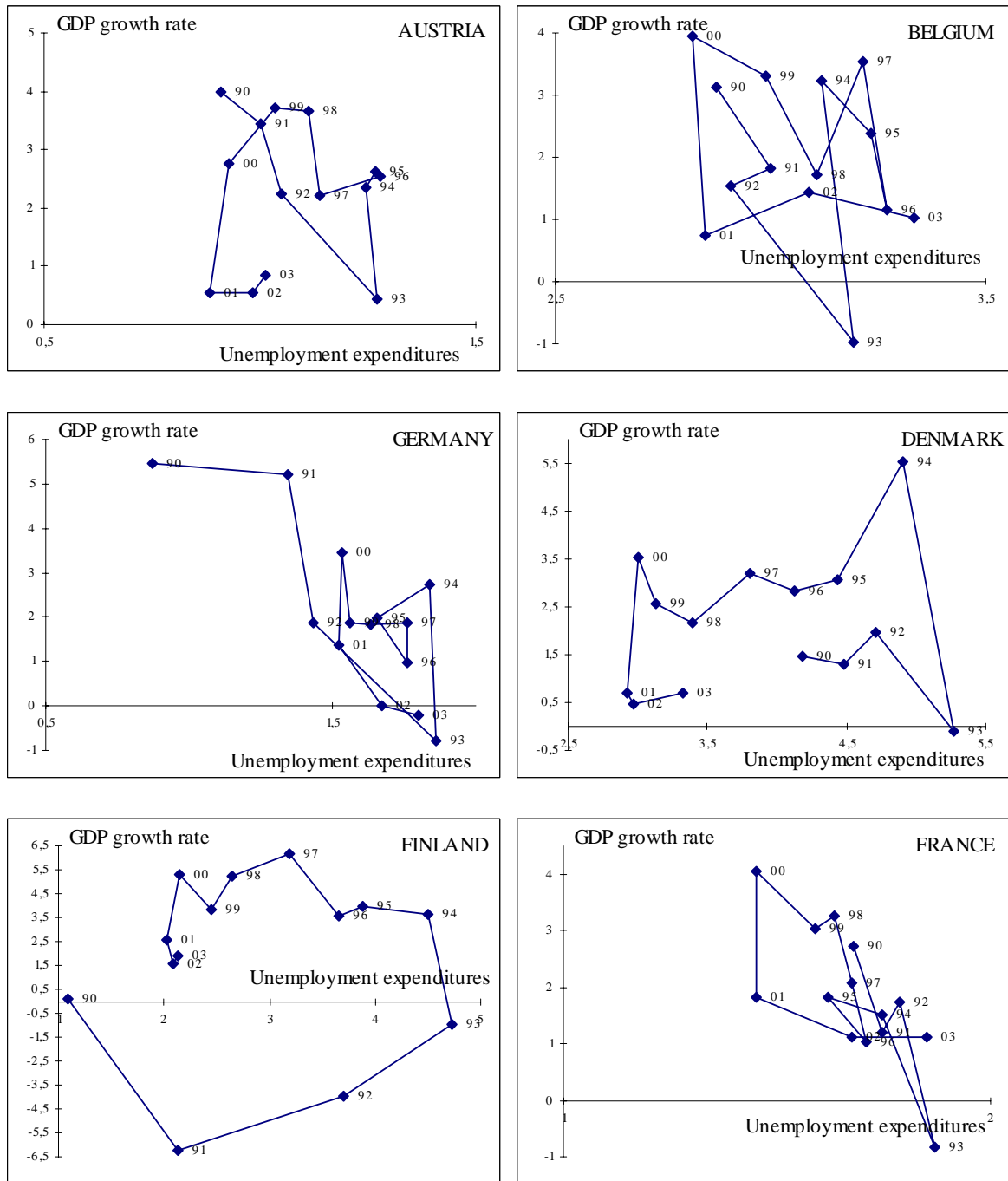
Source: OECD, computations by the authors.

Figure 5. [continued]
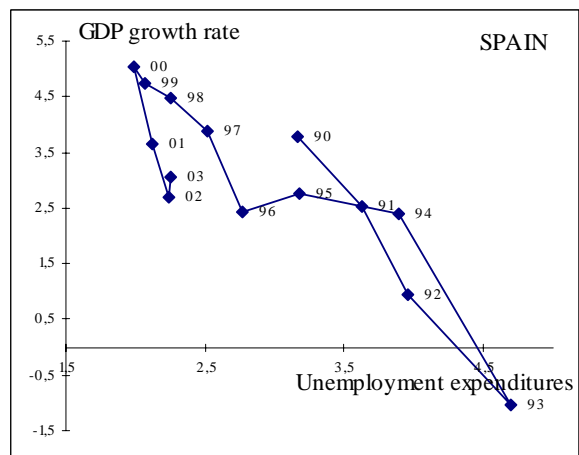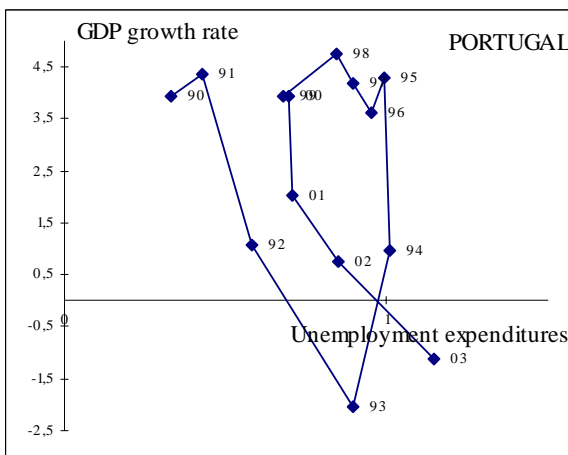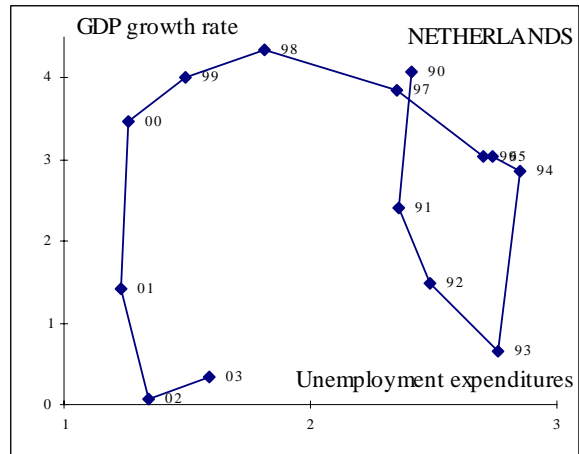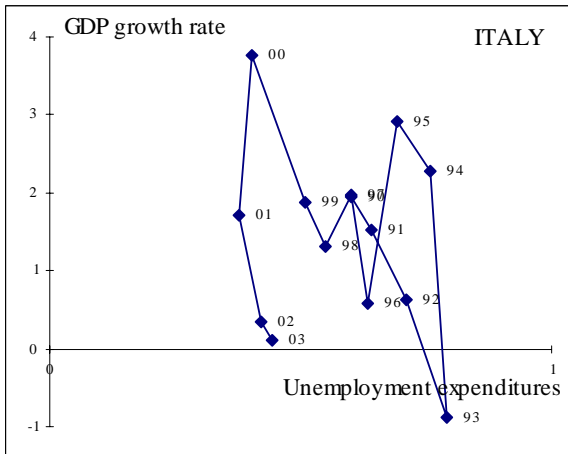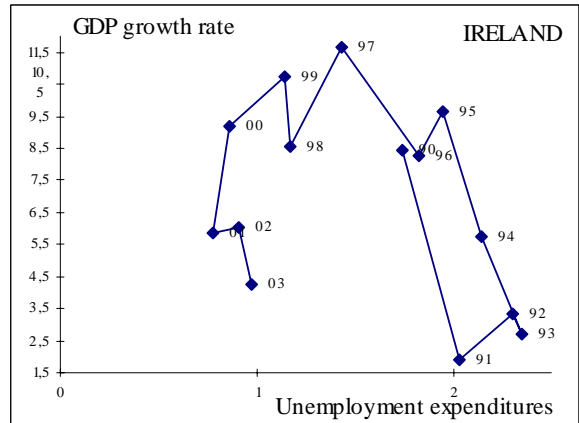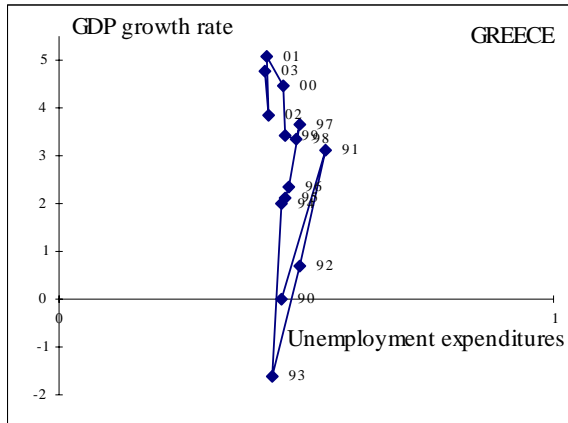
Figure 5. [continued]
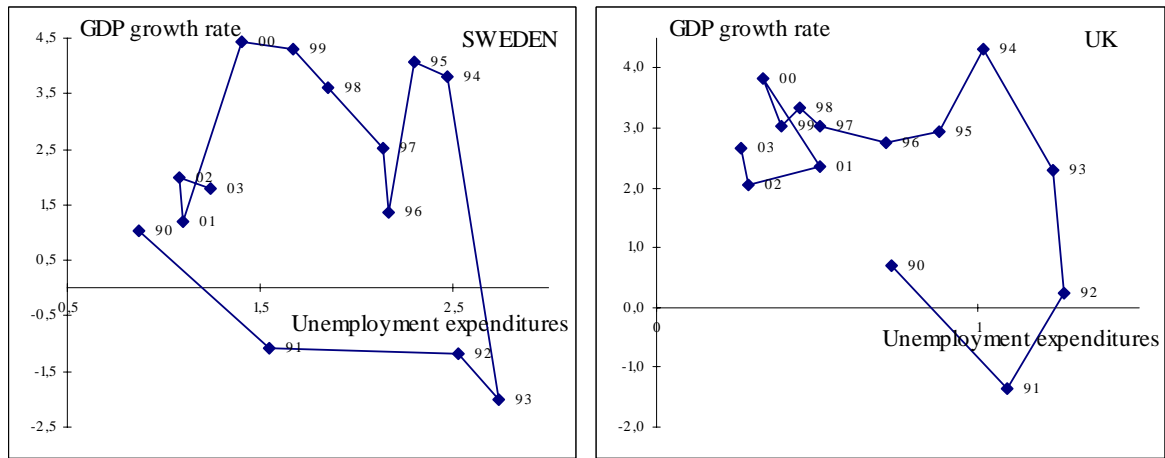
Figure 6. Real GDP growth rates, 1970:1-2006:2
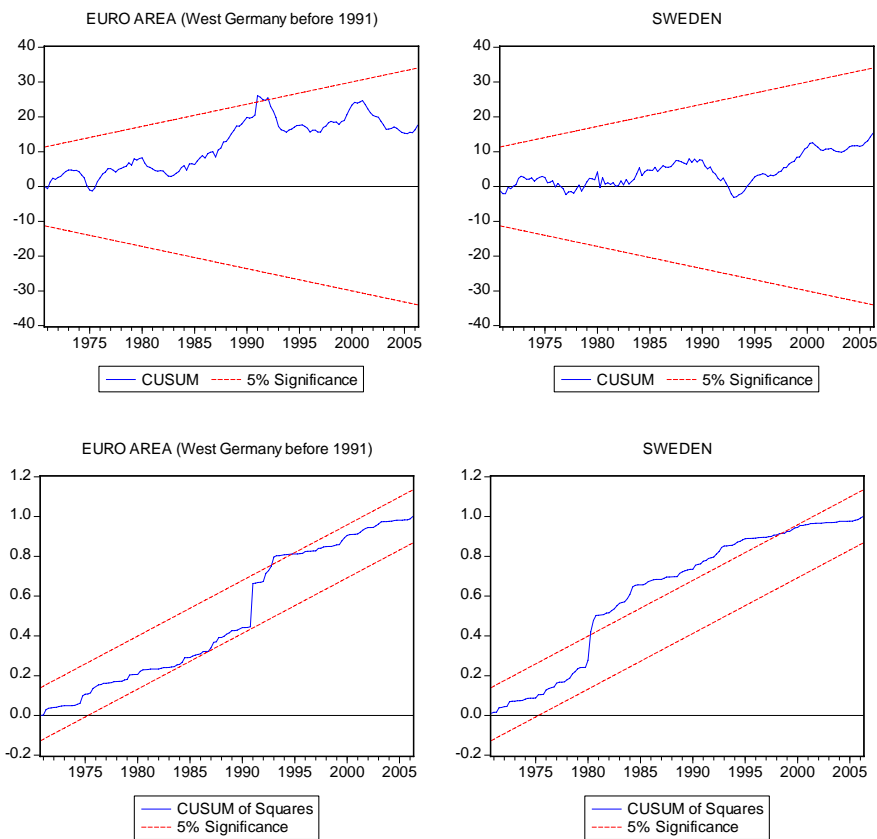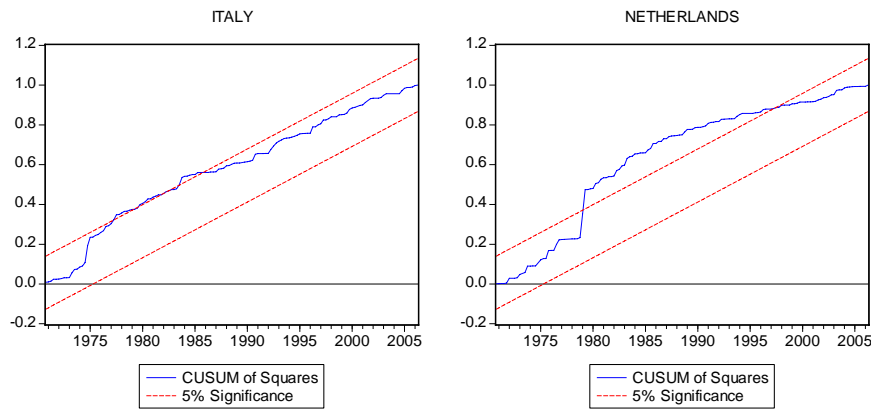
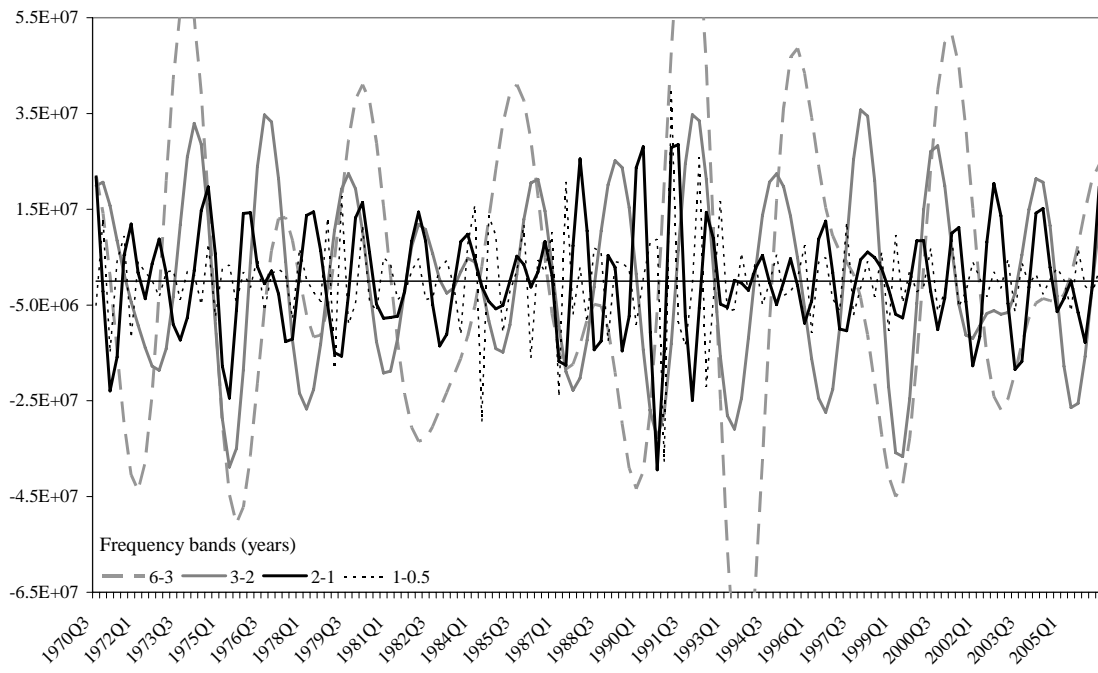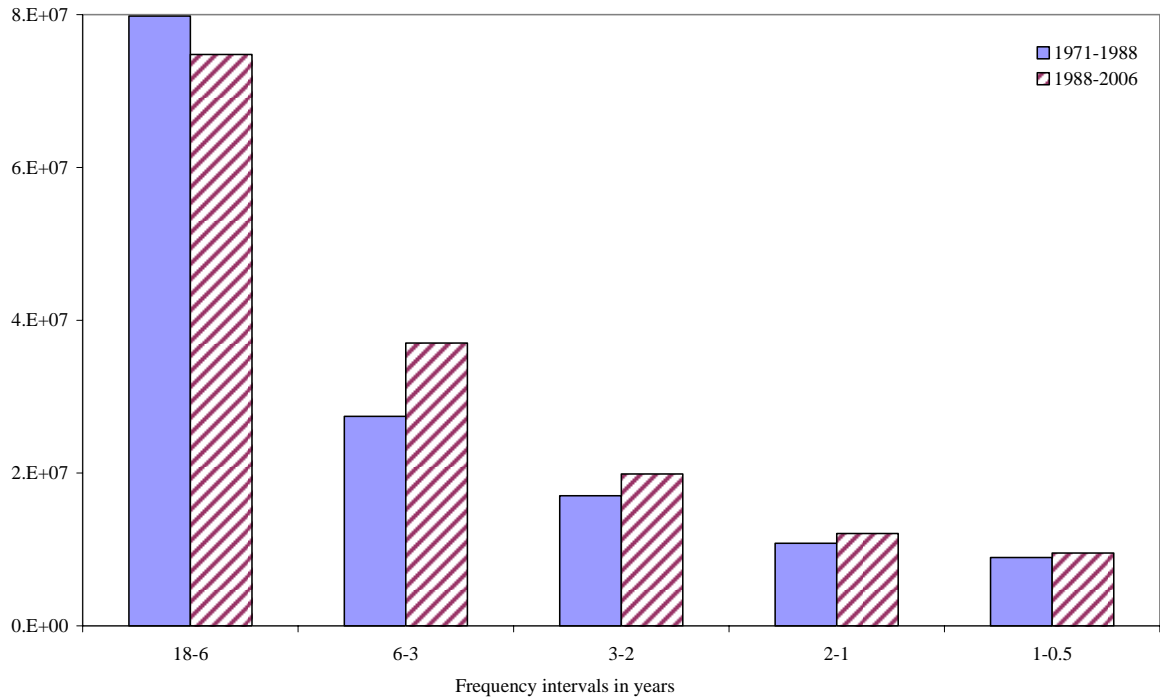**Figure 6**. [continued]
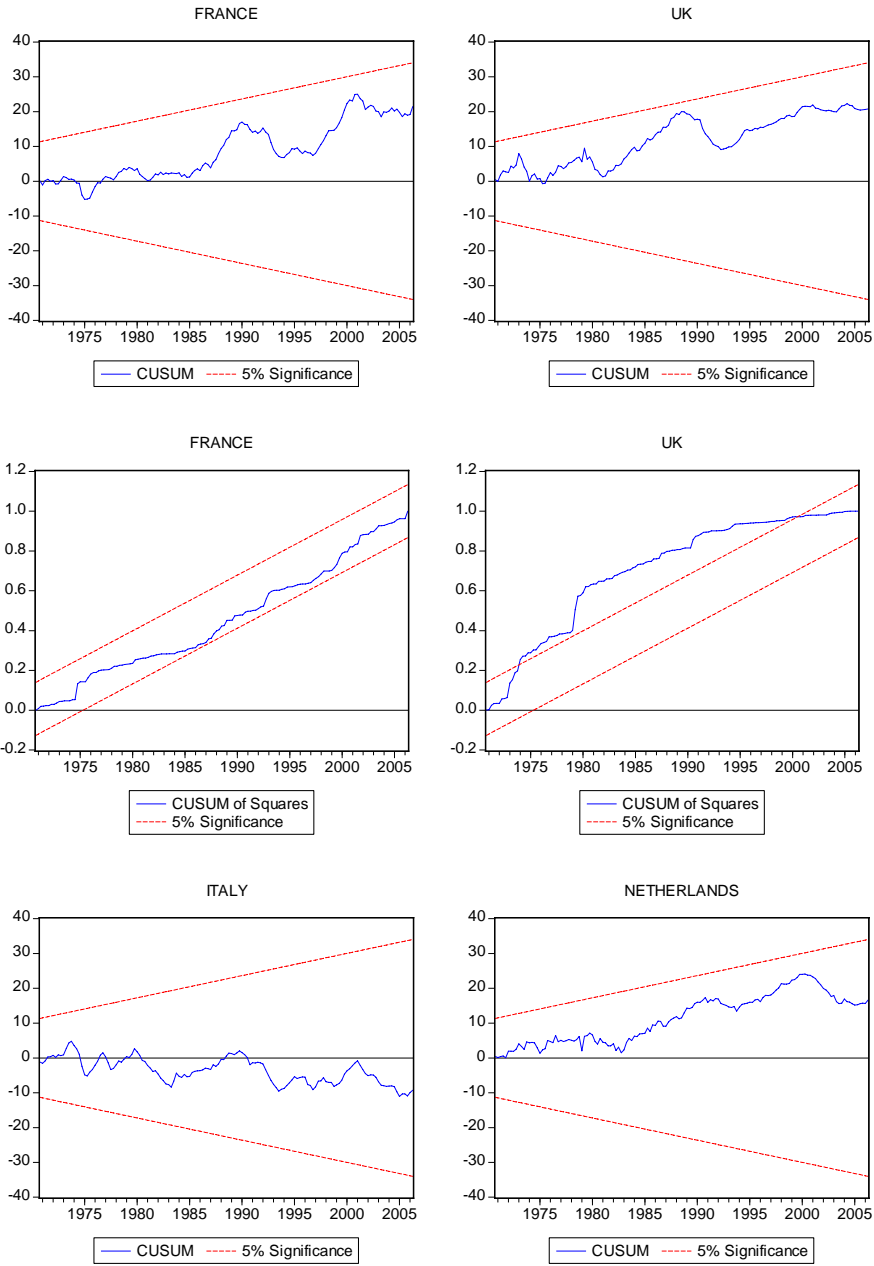
Figure 6. [continued]

Figure 7. Cyclical components for the Euro area real GDP; selected frequencies

Source: OECD. Series obtained using the Iacobucci and Noullez (2005) filter.

Figure 8. Standard error of the filtered series at different frequencies. Two subsamples of equal length.

Source: OECD; series obtained using the Iacobucci and Noullez (2005) filter. Calculations of the authors