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DO AUTOMATIC STABILISERS TAKE CARE OF ASYMMETRIC SHOCKS IN THE EURO AREA?

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Abstract: This paper deals with the question whether the automatic fiscal stabilisers are strong enough to solve the problem of asymmetric shocks in the Euro area. The question is important for many reasons, for instance in terms of policy coordination and fiscal federalism. The paper reviews the current estimates of automatic stabilisers and structural deficits published by the EU, IMF and OECD. The differences between the countries as well as the stability and consistency of the estimated measures is scrutinised. In addition to this, we present also out own estimation results on the working of the automatic stabilisers and runs sensitivity analyses for EU countries to see, how likely the countries are to violate the Maastricht deficit criterion if they face country-specific output or export shocks or interest-rate shocks.

Key words: Fiscal policy, structural deficits, monetary union

Tiivistelmä: Tutkimus käsittelee kysymystä finanssipolitiikan vakauttavasta vaikutuksesta empiirisen analyysin keinoin. Aineistona on keskeiset makrotalouden indikaattorit OECD-maista vuosilta 1961-98. Raportissa tarkastellaan kriittisesti kansainvälisten organisaatioiden (OECD, IMF, EU) tuottamia arvioita eri maiden julkisten talouksien rakenteellisesta alijäämäisyydestä. Eri organisaatioiden tuottamat arviot poikkeavat toisistaan selvästi; lisäksi arviot tietyn hetken tilanteesta muuttuvat sen mukaan, milloin ne on tehty. Arvioiden ekonometrinen analysointi osoittaa, että viralliset budjettialijäämäennusteet perustuvat erilaiseen dynamiikkaan kuin todelliset alijäämät. Tutkimuksessa estimoidaan alijäämäyhtälöitä eri maille ja havaitaan, että automaattiset vakauttajat ovat merkittäviä kaikissa EU-maissa. Tuotannon kasvun vaikutukset alijäämään vaihtelevat maittain. Vaikutukset johtuvat ensi sijassa julkisten tulojen herkkyydestä tuotannon kasvulle, ei niinkään menojen muutoksista. Lopuksi tutkimuksessa arvioidaan euromaiden budjettitasapainon herkkyyttä samanaikaisten tuotanto- ja korkoshokkien tapauksessa. Analyysi perustuu NIGEM-mallilla tehtyihin simulaatioihin. Tulosten mukaan useimmilla euromailla on vaikeuksia täyttää kasvu- ja vakaussopimuksen tasapainovaatimukset, jos automaattisten vakauttajien annetaan toimia vapaasti samanaikaisten kasvu- ja korkoshokkien esiintyessä. Kasvu- ja vakaussopimuksen noudattaminen tällaisessa tapauksessa johtaa taas perusuraa heikompaan tuotannon kehitykseen.

Asiasanat: Finanssipolitiikka, rakenteellinen alijäämä, rahaliitto

Contents

1. Introduction *

The aim of this paper is to review and discuss the role of automatic fiscal stabilisers. The paper discusses the measurement problems and inconsistencies related to the use of the concepts of structural deficits and automatic stabilisers, and reviews the estimates published by international organisations. We also present our own estimation and simulation results on the output elasticities of deficits and on the sensitivity of OECD countries' fiscal balances.

The theme of this paper is related with the important policy question -- whether the automatic stabilisers are strong enough to solve the problem of asymmetric shocks in the Euro area. The question is important because if automatic stabilisers are not sufficient to absorb asymmetric shocks, then some kind of federal system of fiscal transfers must be developed in future. Otherwise the countries suffering from asymmetric shocks may face the risk of prolonged recessions within the monetary union.

In the early stages of the preparation for the European monetary union, an influential report (The MacDougall Report of 1977 [European Commission 1977]) supported the view according to which the automatic stabilisers of the national budgets were not sufficient for the purposes of stabilisation in a planned monetary union. Twelve years later, in 1989, the Delors Report (Delors et al. 1989) took a different view. Soon that became the official position of the European Commission; it was assumed that no measures of fiscal federalism were needed in monetary union although it was admitted that in some cases "a significant development of Community financial activity" would be required (European Commission 1990). What actually has happened in this field is not the establishment of any kind of federal transfer mechanisms but the introduction of the Stability and Growth Pact[1] which precludes "excessive" deficits (i.e. deficits exceeding 3 % of GDP) in most cases. So the final outcome is the preclusion of fiscal federalism and a formal restriction on the use of national fiscal adjustment.

Although the Maastricht Treaty and the Stability and Growth Pact have practically solved the problem of fiscal federalism by precluding such an alternative, the question of the effectiveness of the automatic stabilisers of

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[1] The Stability and Growth Pact does not set any outlines for stabilising transfers from federal budget to member countries hit by asymmetric shocks. Instead, it threatens the disobedient member countries with the imposition of fines if a deficit exceeds the 3 percent of GDP limit.

national budget remains still open. There are, of course, earlier studies on the subject.

The European monetary union has by many authors been compared to the United States, where according to several studies the federal budget has a significant stabilising element (see e.g. Obstfeld and Peri [1998], Melitz and Zumer [1998] and Blanchard and Perotti [1999]): the size of the built-in automatic stabilisers of the U.S. federal budget is about 20 percent of shocks facing the states. Melitz (1997) presents results according to which the fiscal policy in Europe has been pro-cyclical and hence has failed to stabilise the output fluctuations. If that is the case, then the lack of fiscal federalism in monetary union may not make things worse. However, this pessimistic view has been challenged by other studies.

Although the European monetary union lacks large federal budget with built-in stabilisers, the member countries of the euro area do have large national budgets which can more than compensate the lack of fiscal federalism. The reason for this difference in favour of Europe is the fact that most U.S. states have to keep their budgets balanced (due to self-imposed legal restrictions) so that the state-level automatic stabilisers are not allowed to absorb shocks while the European countries tend to have large public sectors -- and large deficits, if necessary.[2]

The question of the importance of automatic stabilisers is of course related to the more general question of the non-neutrality of fiscal policy. To us this question is empirical. There is some recent empirical research on the effectiveness of fiscal policy and the functioning of automatic stabilisers which has to be referred to in this connection. Burnside, Eichenbaum and Fisher (2000) have studied the effects of exogenous fiscal shocks in the U.S. (unexpected military spending) and found that they tend to increase employment in spite of higher taxation; the results contradicts clearly the outcomes of real business cycle models based on the assumption of policy-neutrality. Cohen and Follette (2000) analyse and quantify the 'quiet' working of automatic stabilisers. They conclude that the automatic stabilisers have helped to smooth cyclical variations significantly in the United States. Also Fatas and Mihov (1999) present evidence that automatic stabilisers do stabilise. The December 1999 issue of the OECD Economic Outlook (OECD 1999) investigates the impact of the automatic stabilisers of OECD countries, and finds support for fiscal stabilisation, too. [3]

In this paper we aim to find answers to the question of the effectiveness of the automatic stabilisers in the OECD and especially in the euro zone countries. In addition to our own estimates, the paper reviews the current estimates of

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[2] There is some research on this issue. See e.g. Sala-i-Martin and Sachs (1992), Viren (1998), Allsopp and Vines (1996), Diba (1992); Giovannini (1992).

[3] See also Blanchard and Perotti (1999), and Blanchard (2000).

automatic stabilisers computed by the EU, IMF and OECD. In particular, we scrutinise the differences between countries as well as the stability of the measures. It turns out that the estimates of structural deficits are very unstable. Furthermore, the forecasts of deficits seem to have different relationship with GDP than the actual deficits, which of course is not an unproblematic observation. We also analyse the debt service costs and their impact on government deficits. Finally, some sensitivity analyses are carried out in terms of the Maastricht deficit criterion to see whether the countries which seem to be close to the critical values have more problems due to country-specific output shocks or because of rising interest rates. The standard deviation of the budget deficits of EU countries suggests that there are only a few countries who are likely to find the Maastrict deficit criteria binding – assuming that the debt service costs do not change. However, all countries are very vulnerable to any interest rate shocks. This result is opposite to those presented by Barrell and Pina (2000) and Dury and Pina (2000) , who used stochastic simulations to analyse the same question.

The rest of this paper is organised as follows. The next section discusses the problem of deficit decomposition. The third section reviews the estimates of fiscal stance published by OECD, EU and IMF. In section 4 we present our own estimates of the automatic stabilisers of the OECD countries. In section 5 we use the estimation result to find out whether the Maastricht fiscal criteria are likely to be binding for the EMU countries or not. The last section contains concluding remarks.

2. Distinguishing between cyclical and structural deficits

Automatic stabilisers constitute an essential ingredient in fiscal policy. To pursue meaningful stabilisation policy one has to know what is the nature and magnitude of cyclical elements in both expenditures and revenues. If the cyclical sensitiveness of public finances is strong, then additional discretionary policy measures may not be needed and vice versa. Overly sensitive cyclical deficits are likely to lead to high actual deficits and hence create problems in achieving the deficit criterion of the Growth and Stability Pact of the European monetary union. Hence, with highly sensitive deficits, even a modest depression may cause the deficit to fall below the critical level of 3 percent of GDP.

It is thus very important to be able to distinguish between the cyclical and structural components of expenditures, revenues and the deficit. Although the basic idea of this kind of distinction is quite simple, its empirical and operational applications are not that easy or straightforward. Assume, for instance, that the government pursues systematic (counter)-cyclical fiscal policies. How can the effect of such policies be distinguished from pure cyclical effects (automatic stabilisers) if we used only unrestricted time series models in deriving the cyclical effects as it is customarily done? If the policies were totally discretionary, the case would be a bit easier but not trivial even then.[4] Today the idea that fiscal policy would be totally discretionary does not sound very appealing. One reason which radically reduces the appeal of discretionarity is the fact that in monetary policy the emphasis has shifted completely to analysis of (optimal) policy rules. A consequence of this 'policy rules assumption' is, of course, strongly reduced interest in cyclical adjustment of budget deficits.[5]

Cyclical adjustment is not only a conceptual problem, it is also a fully pragmatic problem of measurement. Not surprisingly, there are several competing ways of making the structural corrections and there is really no consensus how to make the decompositions. International organisations like IMF, OECD and the European Union make their own adjustments and, in addition, several other (national) adjustment procedures are applied.[6]

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[4] In this connection, we should perhaps refer analogous problems which may turn out when we try to distinguish the policy effects on, say, output growth. As pointed out by Blinder and Solow (1973), it can be shown that if we pursued systematic counter-cyclical policies and if were completely successful in eliminating the cycles, it would look like policies were completely impotent.

[5] A structural VAR framework – proposed by Blanchard and Perotti (1999) – offers a promising solution for the identification problem.

[6] See e.g. Blanchard (1990), Barrell, Margan, Sefton, Veld (1994) Brandner, Diabalek and Schuberth (1998) and Giorno et al. (1995) for overviews of these procedures.

The most important differences are, however, related to the cyclical behaviour of government expenditure and revenues. The corresponding GDP elasticities are not only different in terms of magnitude but also different in terms the sign. That makes it very difficult to forecast the development of government expenditures and revenues, and it is clear that even if the output increased (decreased) in the similar way in all countries, government deficits would behave in a completely different way in different countries. The differences in other policy environment variables (e.g. public debt and unemployment) are, however, even much larger. The most surprising fact is, however, that the GDP elasticities of government revenues and expenditures differ enormously between countries, suggesting that the fiscal systems are very different indeed.[7]

The estimation of structural deficits is based on an educated guess on the true potential output of the economies or the output gaps. This is analogous with the estimation of structural unemployment which also has been notoriously difficult. In many cases the estimates of structural unemployment and potential output follow closely the actual time paths of unemployment and output which makes the structural variables time-dependent.

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[7] The corresponding elasticities are in quite extensive way reported in Mäki and Virén (1998).

3.   A review of current estimates of automatic stabilisers

There are three well-known international organisations which produce regularly computations of structural budget deficits, which can serve as an indicator of the effectiveness of automatic stabilisers. These estimates are provided by the EU, IMF and OECD. In Figures *1(a-s)* we provide the estimates of structural budget deficits by these organisations and an indicator of Blanchard fiscal impulse (BFI) for 19 OECD countries. It can be seen that the estimates are in most cases very similar although they are far from identical. Furthermore, in some cases there are rather large differences; for instance, for Belgium (for years 1980-81), Finland (1991-93), The Netherlands (1979-83), Norway (most of the time!), Sweden (1980-83) and the UK (1981-83) one can find differences which exceed 4 percent of GDP! This shows how difficult it is to judge whether a shock is transitory or permanent in nature.

The uncertainty of estimates of structural deficit is not just a question of different organisations doing different estimates. Also the same organisation may review its own past estimates significantly. In Figures 2(*a-t*) and 3(*a-q*) there are the OECD and IMF estimates of structural deficits for 19 OECD countries which have been published in years 1993 - 1999. Current estimates of structural deficits for a given year appear to be relatively unreliable in a sense that they are prone to be changed later; in some cases the differences are several percents of GDP.

There are many countries for whom the estimates seem to be very time-dependent; that is, the organisations have later made significant reviews in their past estimates of what is cyclical and what is structural. The estimates have been highly time-dependent for Australia, Ireland, Greece, Japan, the Netherlands, Norway, Sweden and Finland. It has even occurred that the sign of structural surplus/deficit has been later changed so that what once has been seen as structural surplus has later been re-interpreted as deficit and vice versa. Such changes can be seen in the figures of Denmark, Ireland, Japan, Norway, Sweden and Finland.

This uncertainty of the magnitude of cyclical and structural deficits quite obviously makes fiscal policy more tedious (in the same way as Brainard uncertainty in terms of effectiveness of policy instruments). The problem is that the uncertainty of magnitude is not the only thing which complicates fiscal planning – one has also to take into account the uncertainty related to overall economic development (or simply GDP growth).

Here we do not deal with the general forecast uncertainty (see e.g. Andersen [1997], Artis [1996], Virén [1998] and Artis and Marcellino (1999) for that

issue). Instead of that we are interested in scrutinising the relationship between government deficits and GDP growth in published economic forecasts. In what follows we focus on the OECD forecasts. In order to understand the obscurity of the deficit estimates, we estimated the relationship between the (OECD) forecast and actual values of government deficits and output growth (see Table 1). It turns out that the forecasts of budget deficits and output growth are not consistent. The deficit forecasts seem to be based on different cyclical variation than the actual data. An analysis of these forecasts show that the both forecast values are clearly biased: forecasters have a very strong 'mean reverting' tendency in their assessment of fiscal policy. Interestingly, it turns out that the relationship between the forecast values of deficits and GDP growth are quite different from the corresponding relationship between the actual values. It is also evident that the OECD deficit forecasts (which are conditional to the forecast output growth) are systematically different from the actual (conditional) deficit forecasts. This could be interpreted so that also the forecasts of structural deficits differ in a systematic way.

Table 1. *The relationship between forecast and actual values of government deficits and output growth*

Y | x	X	y-1	trend	R2/see	DW
$\Delta y^e \mid y^e$	.082 (3.26)			.589 (0.780)	1.480
$Def^e \mid def$	.690 (83.63)			.802 (1.859)	1.334
$Def\text{-}def^e \mid \Delta y\text{-}\Delta y^e$	.374 (23.72)			.259 (1.898)	1.535
$Def\text{-}def^e \mid \Delta y\text{-}\Delta y^e$	.328 (27.97)	.268 (9.03)		.322 (1.817)	2.011
$Def^e \mid \Delta y^e$	.690 (72.83)		.027 (5.27)	.803 (1.860)	1.340
$Def \mid \Delta y$	.269 (3.84)		.029 (1.16)	.642 (2.616)	0.493
Fctres | actres	.736 (97.17)		.013 (2.21)	.551 (1.750)	1.471

Def denotes general government surplus (negative values are deficits), Δy GDP growth, fctres residual from regression $Def^e = a_0 + a_1 \Delta y^e + a_2 trend$, where the superscript e denotes forecast values (OECD December forecast for next year), and fctact residual from a corresponding regression in terms of the actual values of def and Δy. All equations are estimated rom pooled cross-country data from 16 OECD countries using a fixed effects model and the SUR estimator. Thus, the model also includes 16 country dummies. The number of observations is 240.

These observations can be summarised as follows. First, it seems to be very difficult to forecast the development of public finances. Secondly, the forecasts of GDP and budget deficits appear to be dissimilar and as such inconsistent.

Thirdly, the deficit forecasts seem to be based on different cyclical variation than the actual data on deficits. And finally, the deficit forecasts have also other problems than the inconsistencies with the GDP.

4. Estimating the automatic stabilisers

Since there are wide differences between the many official estimates of the cyclical and structural components of deficits, it is intriguing to re-estimate them in a consistent manner.

Here we report only the aggregate elasticities of government deficit/GDP ratio with respect to output growth (see Figure 4). In addition we compute the same measure for the cyclical component of government deficit (in relation to trend GDP, see Figure 5).[8] Here, we use the EU definition of the cyclical component of deficit (net lending). The estimating equation takes simply the form:

$$DEF / Y = a_0 + a_1 t + a_2 (y - p) + u \qquad\qquad (4.1)$$

where *DEF* is government deficit (alternatively the cyclical component of *DEF*), *Y* is GDP (alternatively the trend GDP), *y–p* the growth rate of real GDP and *u* the error term.

The elasticity estimates from (4.1) give the same basic result that is obtained from disaggregated expenditure and revenue regressions (see Mäki and Virén (1998)). According to the results, the EU countries seem to differ strikingly much in terms of the cyclical behaviour of the deficits. In some countries like in Sweden deficits are very sensitive to output growth while in some other countries there is no significant observable relationship between deficits and output growth. Moreover, the results appear to be very sensitive to the estimation period. If the 1980 – 1998 period is compared to the longer period of 1960 – 1998 it turns out that two completely different outcomes may arise: either the output growth elasticities increase or they go to zero (like in the case of the Netherlands, Italy, Germany and Denmark). In the later case, the explanation to this observation is likely to be related to discretionary policy changes or to country-specific factors (Germany, Ireland) which break the conventional cyclical relationship.

This interpretation is supported by the results with the cyclical component of government deficit (Figure 5). Although there are some outlier observations (Luxembourg and Ireland), the results are generally quite time-invariant. Also the ranking of elasticities seems to follow a logical pattern according to which economies with large public sectors have large output elasticities. This is what one might have expected; the larger the public sector, the higher is also the gross tax rate and hence the sensitivity of revenues. A large public sector is usually related with large transfers which makes the expenditure side sensitive, too.

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[8] In the case of DEF/Y measure there is an obvious simultaneity problem in terms of output growth.

It is obvious that the results depend on the way the cyclical component of deficit is computed. A somewhat surprising result is the fact that the estimated elasticities are quite low (and the explanatory power of the regression is only about 20 %). Thus, the cyclical deficit appears to be largely non-cyclical (assuming, of course, that changes in GDP growth reflect correctly cyclical changes). The fact that the elasticity of the cyclical component is on average lower than that of actual deficits is a bit hard to swallow. Clearly it suggests that the 'elasticity approach' suffers from several measurement problems which are shortly discussed below.

The cross-country variance of the elasticities of cyclical components is very small (about 0.09) while the corresponding measure for actual deficits varies between 0.24 and 0.33 depending on the estimation period. Intuitively, this result makes sense but given the quite low values of the respective elasticity, it cannot be considered a final truth.

Table 2.   *Output elasticities of government revenues, expenditures and deficits*

Dependent Variable	Δy	Trend	R2 SEE	DW
Real revenues	.506 (11.33)	-.001 (11.18)	.359 (.029)	2.059
Real revenues	.659 (13.80)		.262 (0.032)	1.824
Real expenditures	-.000 (0.03)	-.002 (14.21)	.341 (0.032)	1.708
Real expenditures	.212 (3.75)		.073 (0.038)	1.247
Nominal revenues	1.002 (31.37)	-.001 (5.23)	.751 (0.032)	2.003
Nominal revenues	1.063 (37.04)		.736 (0.033)	1.945
Nominal expenditures	.746 (19.09)	-.002 (6.61)	.638 (0.041)	1.392
Nominal expenditures	.850 (22.16)		.591 (0.044)	1.318
Deficit/GDP	-.268 (8.72)	-.112 (12.20)	.514 (2.864)	0.344
Deficit/GDP	-.338 (9.57)		.442 (3.068)	0.321

The data cover the period 1960-1999 and come from the European Commission. Number of countries is is 14 and the total number of observations is 520. The estimator is a fixed effects SUR estimator. Except for the Deficit/GDP variable, the dependent variable is in a log difference form. Δy denotes the log difference of GDP. With nominal revenues and expenditure, also GDP values are nominal.

Given the very large cross-country differences in parameter estimates it might be worthwhile to consider instead the "representative" values that are obtained from cross-country panel data. Estimating output elasticities for EU countries using data from the European Commission for years 1960 - 1999 (see Table 2) gives rise to following conclusions: first, the revenue and expenditure elasticities are very different (see also Figure 8). Second, it is not perfectly clear what is structural and what is cyclical. And third, the elasticities are different depending on whether we use nominal or real figures. The effect of output growth on actual fiscal deficit seems to be relatively low in most EU countries although definitely not unimportant (cf. Melitz (1997)).

The reason why the elasticities are so low (particularly for the 1980-98 period) may reflect some fiscal policy shocks or structural reforms in some of the sample countries (see e.g. single-country results for Italy, Germany, Netherlands).[9] Thus, it looks like the automatic stabilisers have lost importance which is, however, not necessarily the case.[10]

It is obvious that the elasticities can behave quite differently under inflationary and non-inflationary periods, depending on the way the estimating equations are specified. One has to recall that even in the case in which the both variables are expressed in real terms there are problems in choosing the right deflator and we have to take into account that expenditures and revenues are indexed in a different way, and the effect of indexation crucially depends on the rate of inflation.

Furthermore, though fiscal policy is often interpreted in terms of the deficit variable, it is not at all clear that the behaviour of revenues and expenditures is important only if it affects the decifcit. Taxes and government expenditure probably do affect output in a different way due to the different impacts they have on income distribution, labour supply and dynamics through interest rates and public debt. Therefore, it is worthwhile to analyse the role of automatic stabilisers also separately on the expenditure and revenue side.

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[9] Estimation results seem to be quite sensitive with respect to the estimator. Thus, single country estimates with OLS (reported in Figure 4) appear to be somewhat higher than the corresponding SUR estimates with the whole panel data. With some countries, the differences are even larger. Hence, with Sweden, for instance, the OLS estimate of nominal expenditure elasticity is 0.33 while the corresponding SUR estimate is only 0.05!

[10] It is hard to say what is automatic and what is discretionary. In order to do that one should know the actual fiscal decisions made in all countries and be able to measure their effects; since this is not possible with cross-country data one has to rely on aggregates which always include the effects of discretionary policies.

5. How binding are the Maastricht fiscal criteria?

According to the Stability and Growth Pact of the European Monetary Union countries which have an actual fiscal deficit exceeding 3 percent of GDP will be punished (although not automatically but under certain circumstances and after certain procedures). The idea of the Pact is that the member countries of the EMU should target to balanced budgets and should never had larger than three percent deficits. In the latter half of the 1990s all EU countries managed to fulfil this condition. However, this achievement was reached in the era of moderate economic growth and low nominal interest rates. Figures 9 and 10 shows quite clearly the late 1990s have been somewhat exception in terms of real interest rates and GDP growth.[11] The figure also shows that the historical variability of these key variables is considerable suggesting that under quite normal circumstances a several percentage points change in both variables is well possible (the cross-country average of the standard deviation of deficit/GDP (GDP growth) is 2.5 (1.8) per cent).

It is interesting to know how likely the deficit limit will be violated if the automatic stabilisers are allowed to function freely in recession. The answer quite obviously depends on several factors like the standard deviation of output growth, the sensitivity of deficit with respect to output growth and on the initial debt and deficit. What matters also is the level of interest rates.[12]

Here, we consider the case mainly from the point of view of income and interest rate shocks. Thus, we simply run alternative simulations with a multi-country macromodel to see how large income and (long-term) interest shocks are required for the deficit to exceed the 3 per cent of GDP.

The are carried out by using the quarterly multi-country NiGEM-model of the National Institute for Economic and Social Research (NIESR). We used the model to calculate the medium term fiscal effects of the following changes in the policy environment:

- a permanent one per cent GDP shock

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[11] Interest rate changes are strikingly large in some (previous) high-inflation countries like Portugal and Spain (see Figure 10). A considerable amount of interest rate differentials between countries and time arises already because of different debt instruments and taxation of interest income.

[12] Dalsgaard and de Seeres (1999) provide a thorough analysis of the EU countries´ case in the VAR framework. Their conclusion is that, for the majority of countries, if governments were to aim for cyclically adjusted budget deficit between 1.0 and 1.5 per cent of GDP, the actual deficit would, with a 90 per cent likelihood, remain within the 3 per cent limit over a three-year horizon, without the need to adjust fiscal policy in a pro-cyclical fashion. However, that study do not aloow for simultaneous adverse real interest shock. The same can be said of simulation studies by Barrell and Pina (2000) and Dury and Pina (2000) who also present sanguine results.

- a permanent one per cent interest rate shock
- a permanent one per cent export shock
- a permanent one per cent public consumption shock

The results of these simulations are reported in Figures 11-15.

Figure 11 reports basic simulation in which a one per cent negative GDP shock and a one per cent interest rate shock is introduced in the model. Both shocks are considered to be "permanent" in the sense that they last for 20 quarters. The time paths of both simulated values are compared with (nonvariant) baseline value which corresponds to the model´s basic solution for 1999Q4. In the case of Figure 11, the GDP shock is introduced directly to the model as an endogenous variable shock. Alternatively, we could some of (seemingly) exogenous variable like the volume of exports. That is indeed done and the outcome is reported in Figure 12. Notice now that the effect of exports on GDP does not stay constant and this should also be taken into account when evaluating the changes in government surplus/GDP.

When running the simulations we impose now solvency requirement for the public sector. That does not, of course, make sense if the shocks are large and/or the time span is long. In the NiGEM model one can, however, quite easily impose the solvency requirement which in practice means that direct taxes are adjusted over time to ensure that the baseline solvency condition restored (also in the case of "positive shocks"). Solvency means thus procyclicality of fiscal policy – positive shocks lead to lower taxes while negative shocks lead to higher taxes

The simulations were, in fact, also computed using this condition. The outcome can be seen from Table 3 that contains both the insolvency (in the Figure marked with an abbreviation "insol") and solvency (sol) simulation in the case of an exogenous exports shock. Figure 13 illustrates the outcome for the Euroland aggregate values (considering now a negative exports shock).

Before commenting on these simulation we may briefly refer to Figures 14 and 15 which contain some simple fiscal policy simulations in which public consumption is increased by one pr cent. The effect is scrutinised both on an individual country level and on the Euroland aggregates level. [13]

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[13] All simulations have been made with the January 2000 version of the NiGEM model of the National Institute of Economics and Social Research (NIESR). In all simulation, the shock and simulation period is 2000Q1-2004Q4 (20 quarters). In the case of (the volume of) exports and public consumption, a one per cent exogenous permanent shock is feeded into the model while in the case of a GDP shock, an endogenous one per cent shock is introduced into the respective variable. Exports and public consumption shocks are introduced to all EMU countries at the same time while the GDP shocks are country-specific.

Now, turn to analysing the simulation results for the GDP and interest rate shocks (Figure 11). Although there is considerable cross-country differences the basic outcome of the analysis is quite clear. First, the GDP shock tends to dominate the interest rate shock although the size of the interest rate effect is also quite important being often of the same size as the GDP effect – in some case (most notably the UK) even exceeding it. One can quite easily see that a combination of a negative output shock and positive interest rate shock could push several countries over the limit of the 3 per cent deficit This is particularly true with the large countries: France, Germany and Italy).[14] Mainly this tells about the importance of initial conditions. The GDP elasticities appear to be of considerable importance for practically all EU countries. The average value of output elasticities appears to be 0.38 (for 4 lags) and 0.56 (for 8 lags). Accordingly the interest rate (semi)elasticities are 0.17 and 0.37. Thus a combination of a two per cent decrease in output and two per cent increase in (long-term) interest rates lowers the surplus/GDP by 1.86 within a two-year horizon. [15]

Scrutinising the output effects coming from the growth of exports (Figure 12) tells basically the same story in terms of the average output elasticities of government surplus[16]. The Figure also illustrates the differences in output (and surplus) dynamics. Even if the export market would change in the same way and time for all EMU countries, GDP would start growing in a very different way in different countries. Obviously, that is just one form of country-specific shocks.

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[14] For some curious reason, Belgium seems to completely insensitive to interest rate movements.

[15] The implied elasticities of the NiGEM model seem to differ from the very low values of Melitz (1997)

[16] The average GDP elasticity turned out to be 0.37 (4 lags) and 0.50 (8 lags).

Table 3.   *The effects of an exogenous export shock on GDP and sur-*
                 plus/GDP with solvency and insolvency rules

	GDP: solvency	GDP: Insolvency	Surplus: solvency	Surplus: insolvency
Austria	.256	.226	.053	.125
Belgium	.218	.203	.040	.140
Finland	.262	.249	.073	.114
France	.289	.278	.046	.097
Germany	.320	.263	.070	.138
Ireland	.372	.367	.052	.095
Italy	.203	.187	.062	.127
Netherlands	.242	.224	.061	.123
Portugal	.186	.172	.031	.069.
Spain	.384	.328	.057	.148

Effects have been computed after 8 quarters.

In the context of exports shocks we may deal with the importance of the solvency condition (Table 3 and Figure 13). Quite clearly, the condition is important both for the fiscal stance and output growth. Thus, for instance in the case of a negative export shock of, say, –10 percent, the automatic stabilisers would decrease the fiscal surplus in most countries by one percent of GDP. If this is neutralised by higher taxes, the GDP would finally end up to be one percent lower. However, the output differential between the two policy alternatives becomes visible only gradually.

This kind of results quite obviously raise questions about the (unintended) consequences of the Growth and Stability Pact. It seems to be clear that a single exgenous shock like a drop in exports does not launch procyclical fiscal reaction. However, if such a shock is connected or possible caused by a simultaneous interest rate shock which also reduces domestic demand, procyclical and discretionary fiscal policy is needed if the GSP is to be followed. It is easy to deal with short-lived transitory shocks but what happens if there is hysteresis and slow-downs will be longer (as they usually do)?

Finally, some brief comments on fiscal policies merit note. As can be seen from Figure 14 and 15, a one per cent increase in public consumption (which is equivalent to a 0.2 % of GDP) produces a GDP effect which more or less corresponds to unitary fiscal multiplier. The deficit effect is smaller in the short run reflecting the increase in output. In the long run, the GDP effect vanishes and deficit effect remains unless some solvency requirement is imposed on these additional deficits. Looking a the fiscal multipliers is an analysis which goes

beyond this paper. Still, one has to acknowledge also public finance shocks are important elements of the determination of output, debt and deficits.

6. Concluding remarks

In this paper our purpose was to find answers to the question of the effectiveness of the automatic stabilisers in the OECD countries. In addition to our own estimates, we also reviewed the current estimates of automatic stabilisers computed by the EU, IMF and OECD. In particular, we scrutinised the differences between countries as well as the stability of the measures. It turned out that the published forecasts of budget deficits and output growth are not consistent. The deficit forecasts seem to be based on different cyclical variation than the actual data. An analysis of these forecasts shows that the both forecast values are clearly biased: forecasters have a very strong 'mean reverting' tendency in their assessment of fiscal policy. Interestingly, it turns out that the relationship between the forecast values of deficits and GDP growth are quite different from the corresponding relationship between the actual values.

In our estimations the most surprising result was that the GDP elasticities of government revenues and expenditures differ enormously between countries, suggesting that the fiscal systems are very different indeed (creating problems to policy coordination, at least). Estimating output elasticities for EU countries using data from the European Commission for years 1960 - 1999 gave rise to following conclusions: first, the revenue and expenditure elasticities are very different. Second, it is not perfectly clear what is structural and what is cyclical. And third, the elasticities are different depending on whether we use nominal or real figures. The effect of output growth on actual fiscal deficit seem to be relatively low in most EU countries although definitely not unimportant.

Finally, we wished to do some sensitivity analyses in terms of the Maastricht deficit criterion to see whether the countries which seem to be close to the critical values have more problems due to country-specific output shocks or because of rising interest rates. It turns out that the fiscal balanced achieved in EU countries in the 1990s is still quite fragile. Although the fiscal surpluses in 1999 were clearly above the Maastricht criterion in most cases they were not high enough to maintain required balance if the countries were to face normal economic fluctuations. In this respect our study differs from some other recent studies. Our point is that the apparently small structural deficits have mainly been achieved through low nominal interest rates. Given the still high levels of public debt in most EU countries, any interest rate shock would radically change the fiscal assessment. Only after the debt burden is considerable smaller than it is today, the possibility that some countries have to pursue procyclical fiscal policies because of the Maastrich Treaty becomes a truly exceptional case.

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Figure 1.   Alternative structural deficit estimates
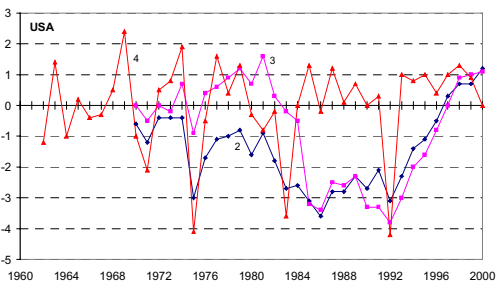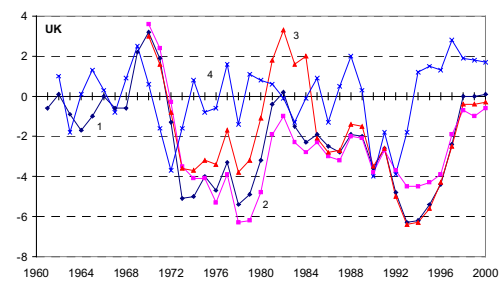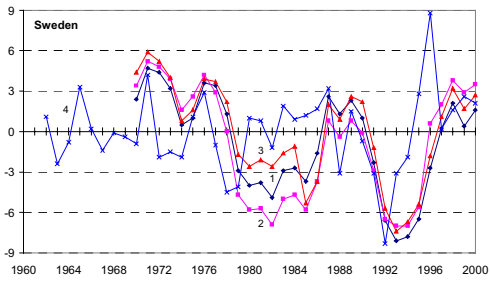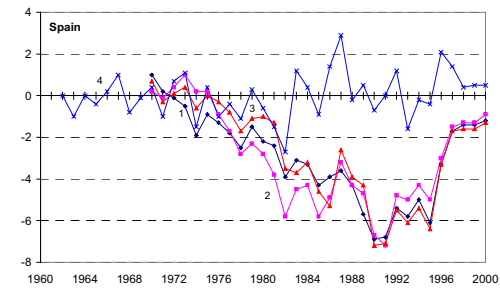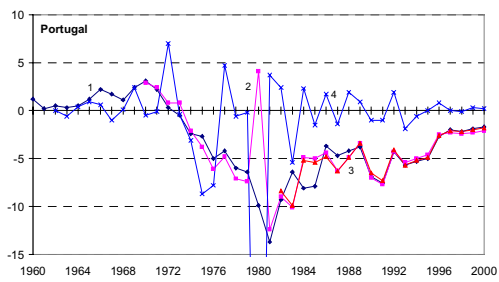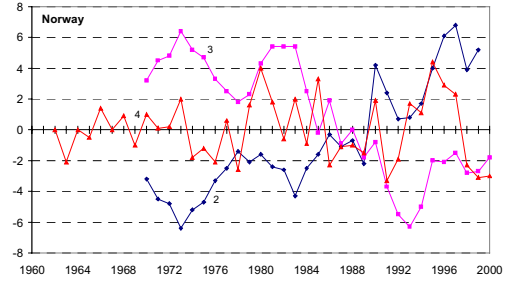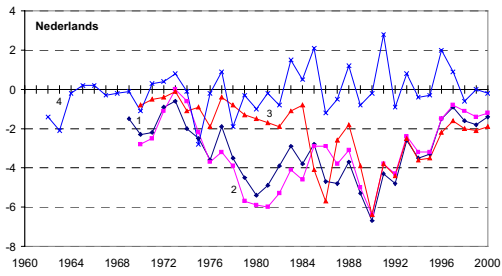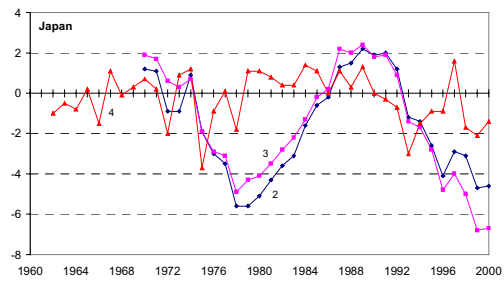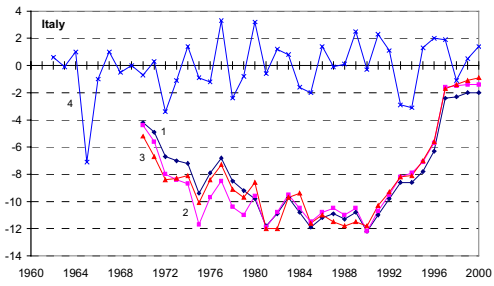
1 EU
2 IMF
3 OECD
4 BFI

Figure 2.   *Alternative OECD structural deficit estimates*
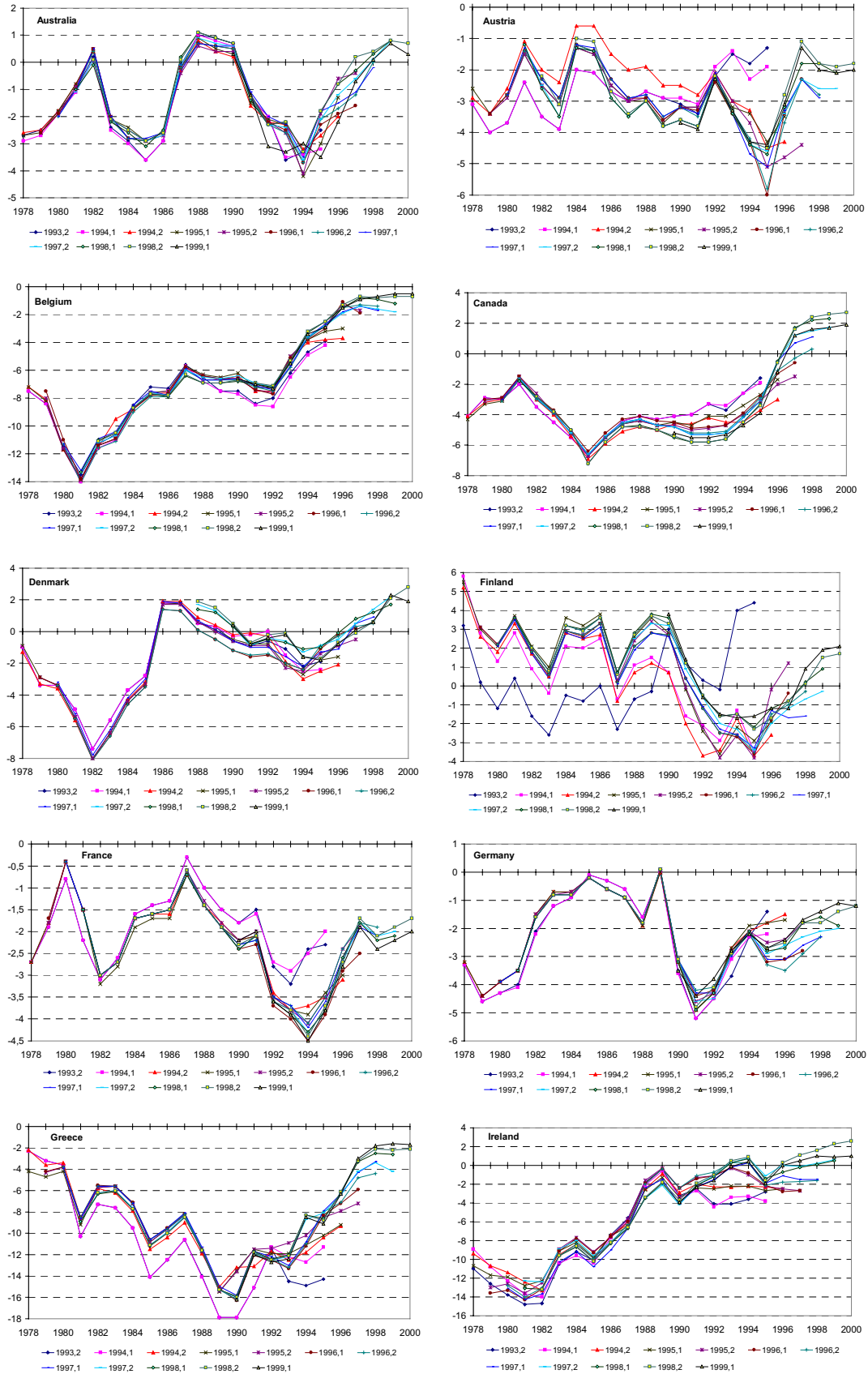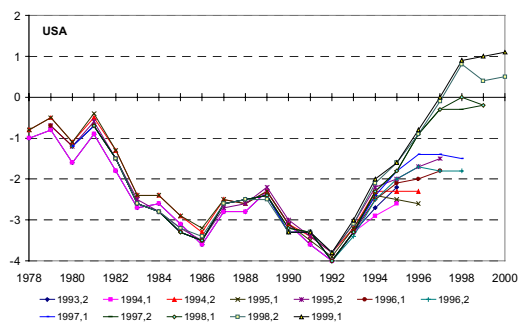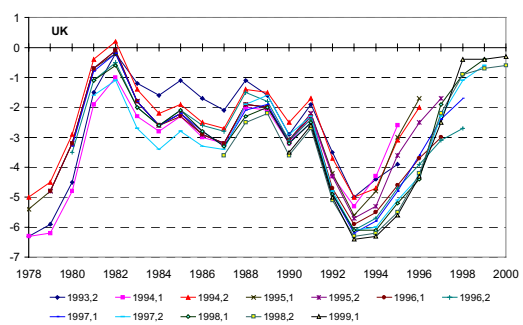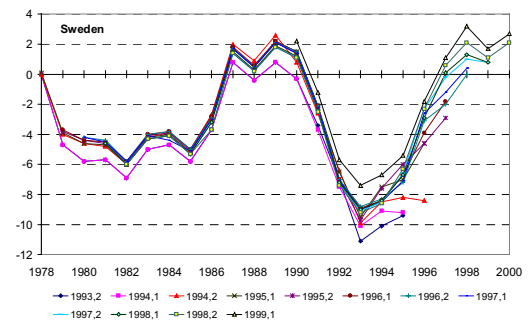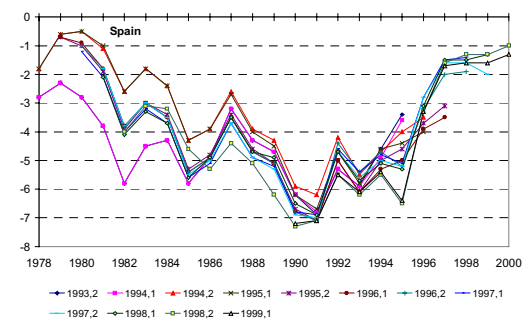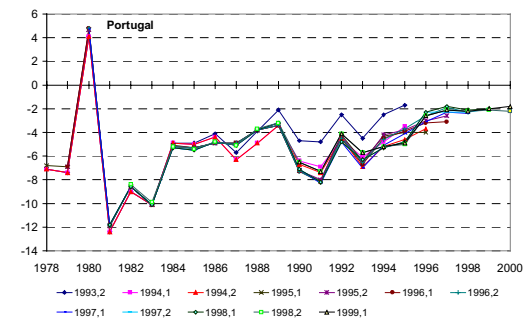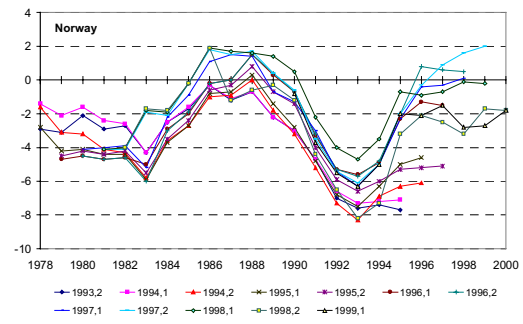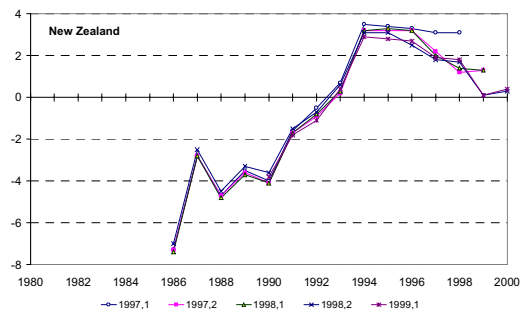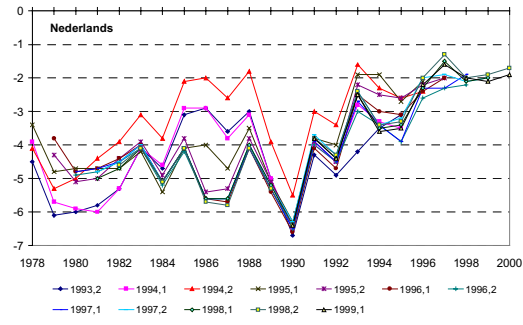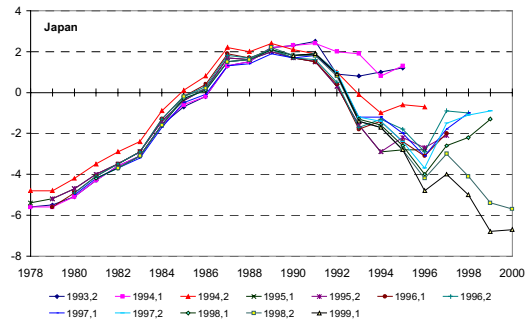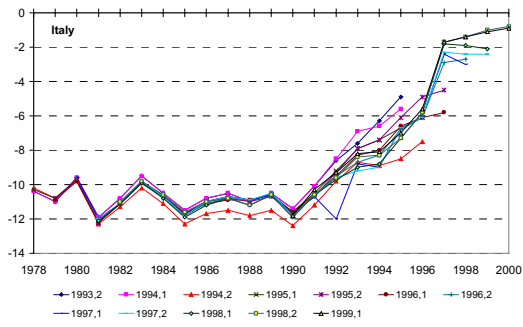
Figure 3. *Alternative IMF structural deficit estimates*
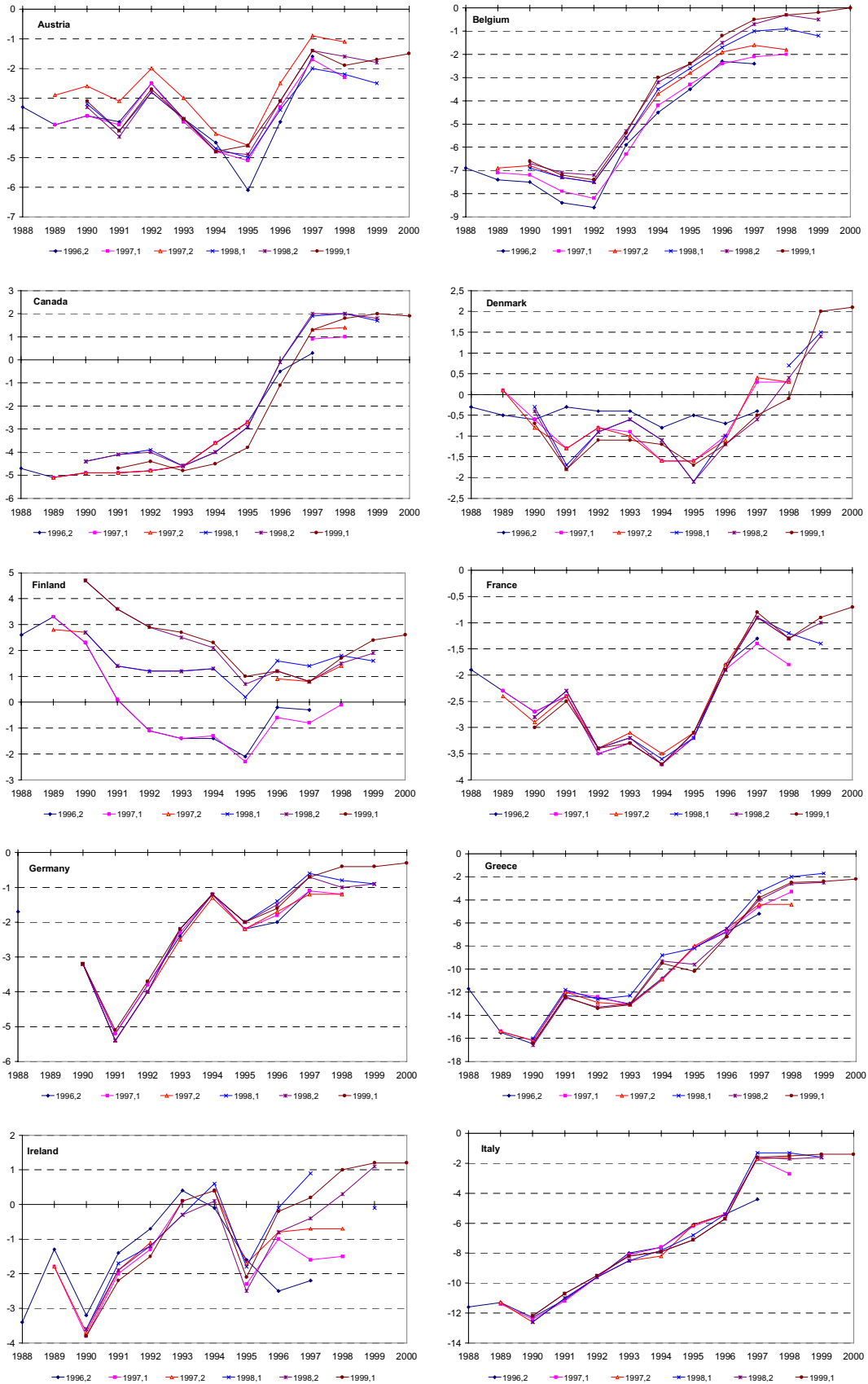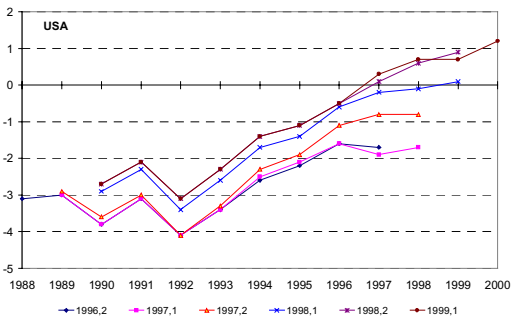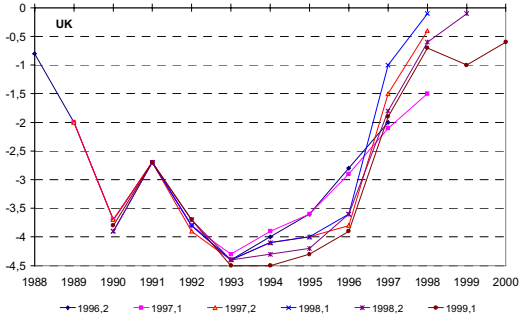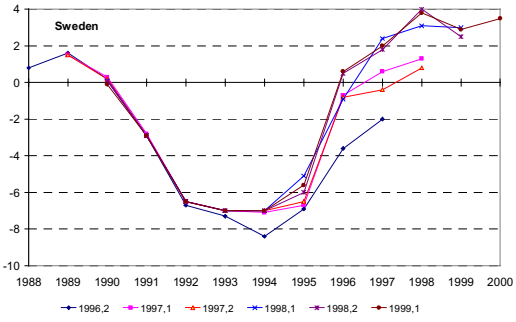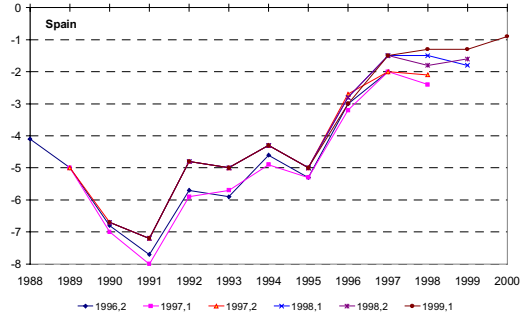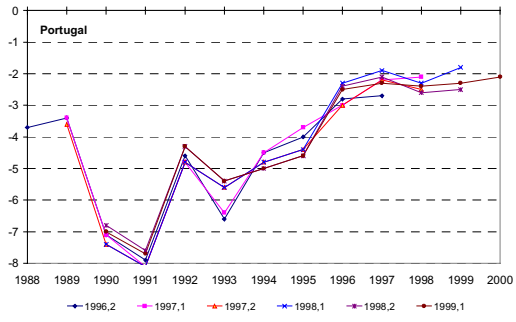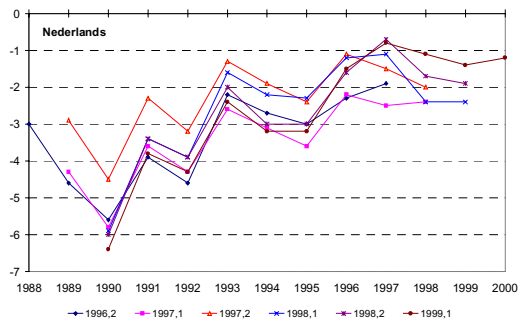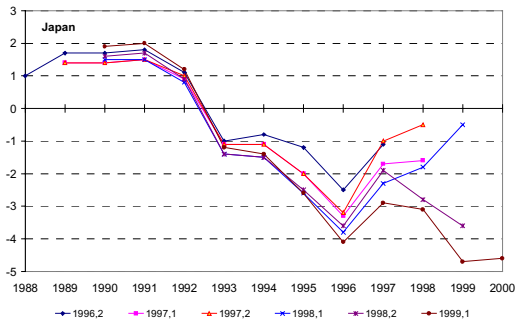
Figure *4.* Output growth elasticity of government deficit
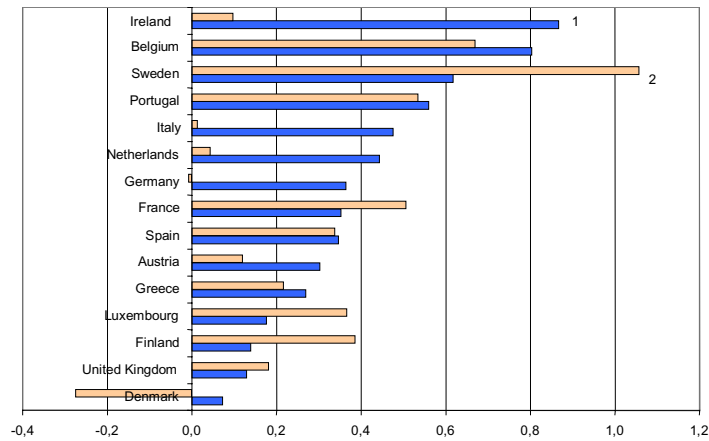
1 1961–1998 values
2 1980–1998 values

Figure *5.* Output growth elasticity of cyclical deficit
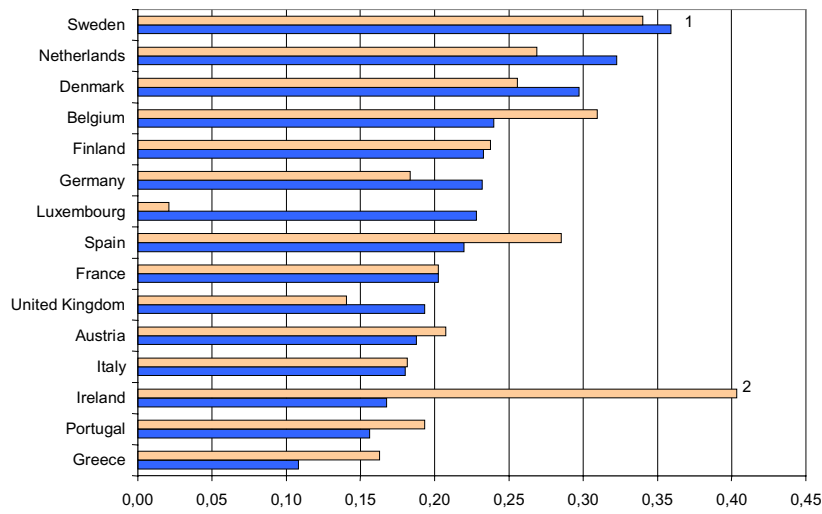
1 1961–1998 values
2 1980–1998 values

Figure 6.   *Variability of GDP growth in OECD countries*
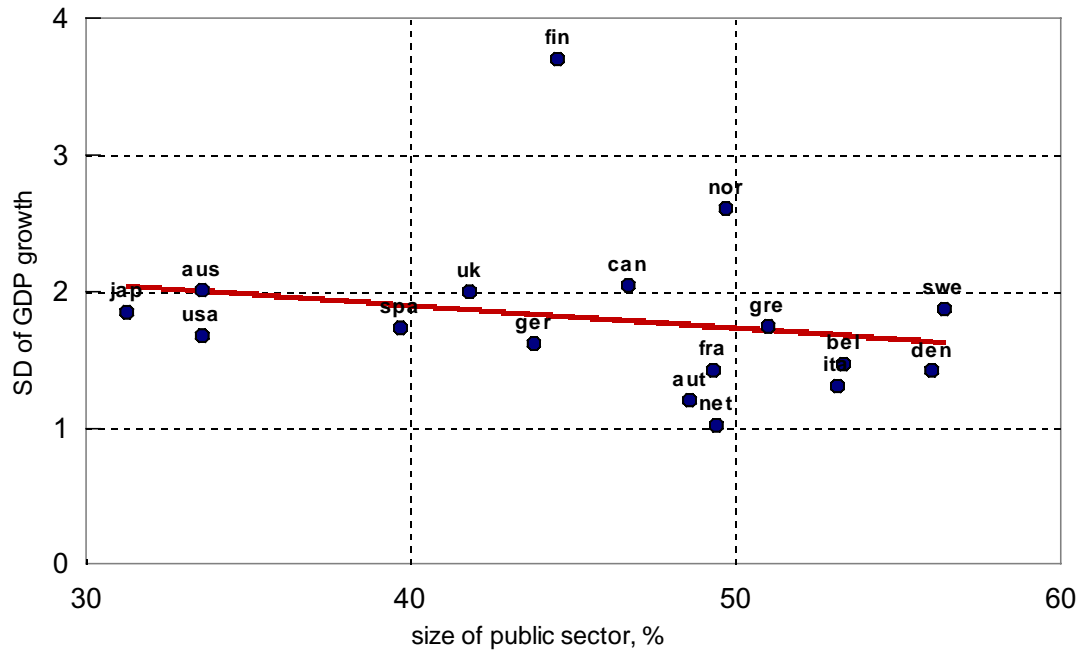
Figure 7.   *Variability of deficits in OECD countries*
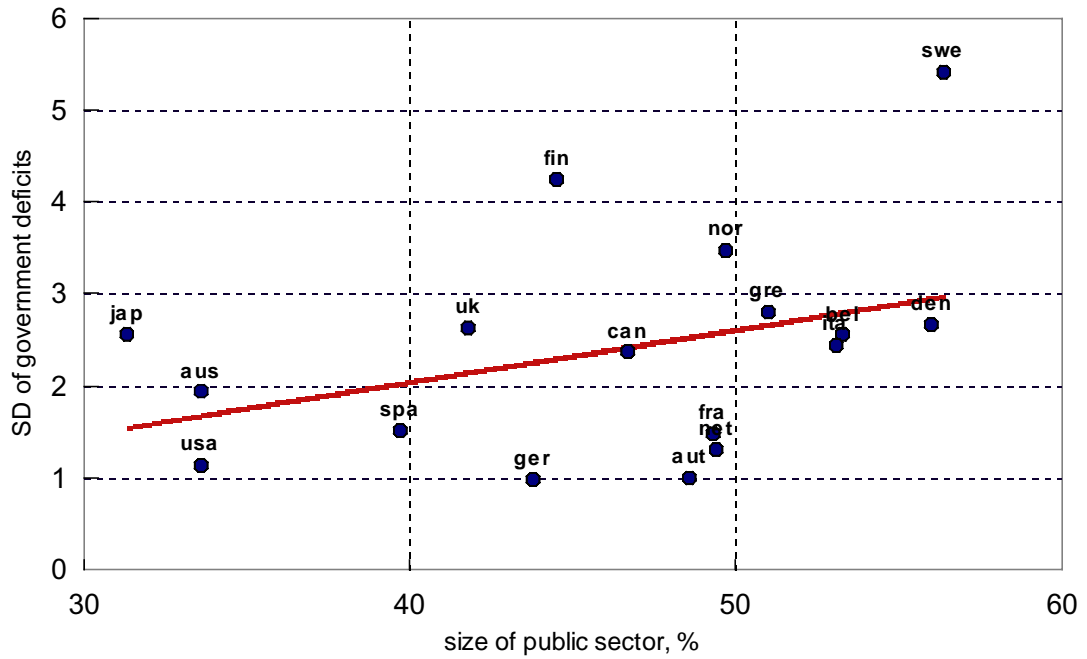
Figure 8.   *Estimated expenditure, revenue and deficit elasticities*
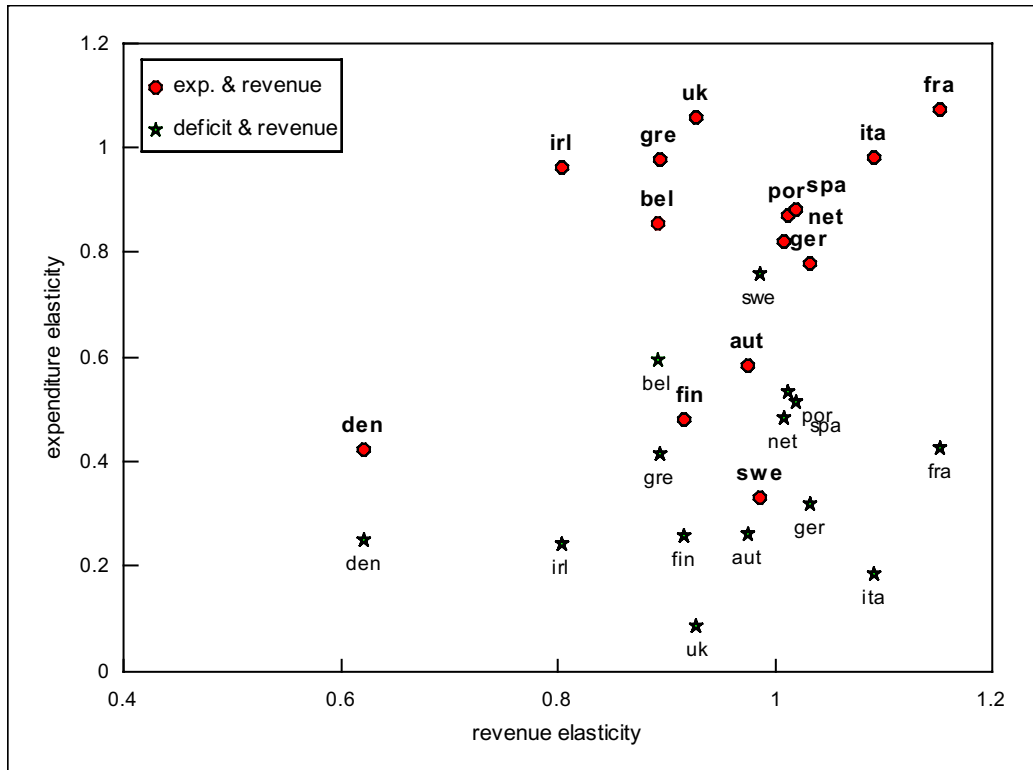
Figure *9.* *GDP growth and real interest rates in EU countries*
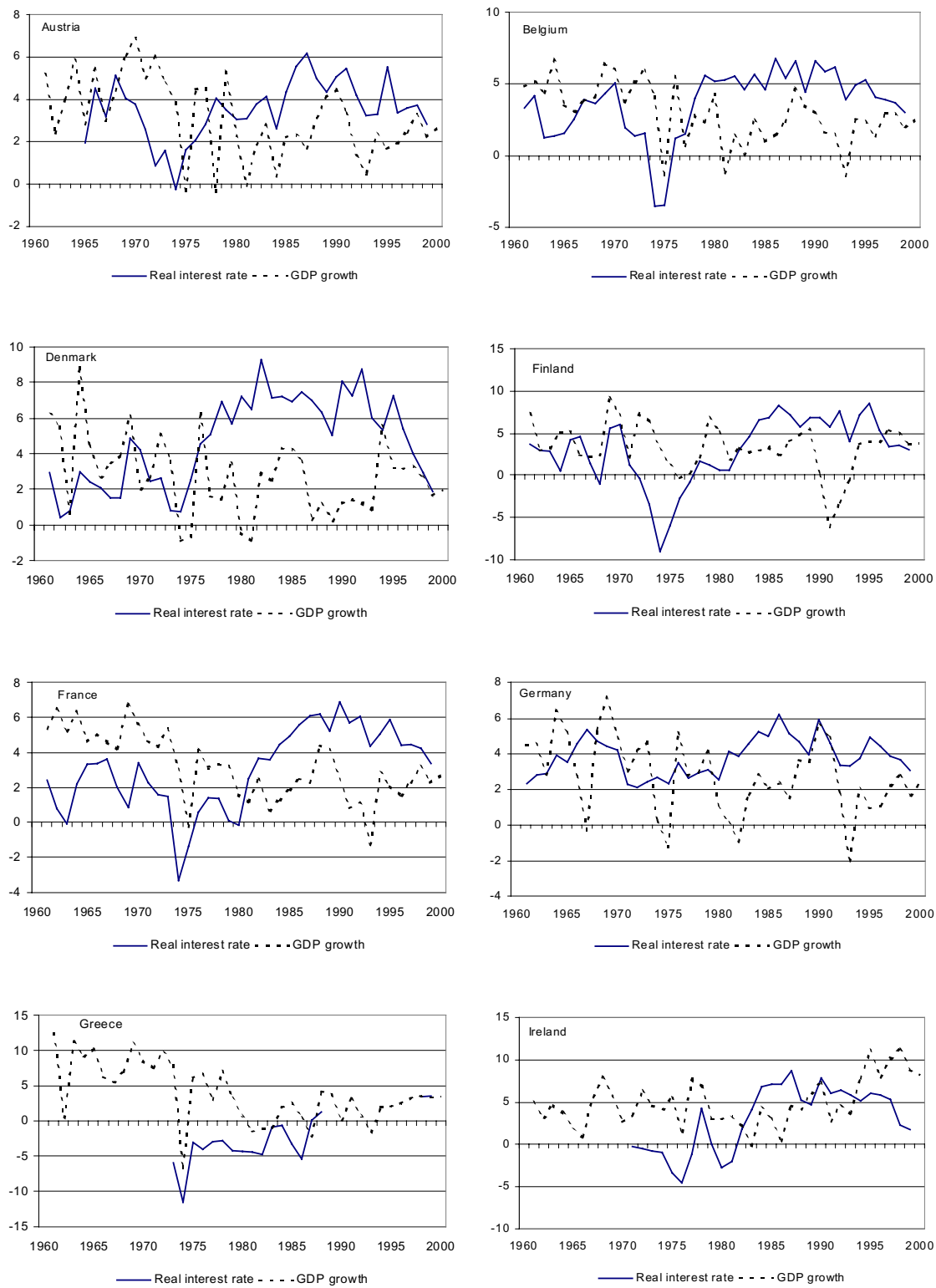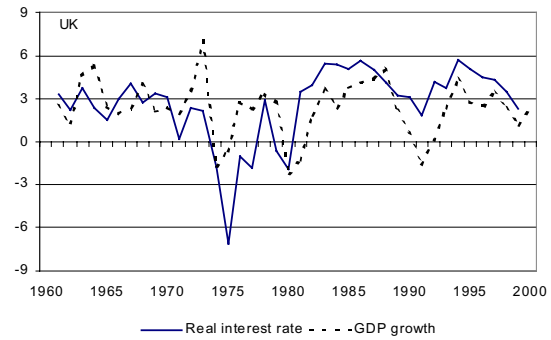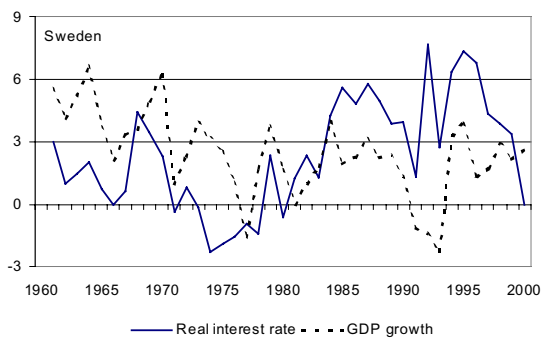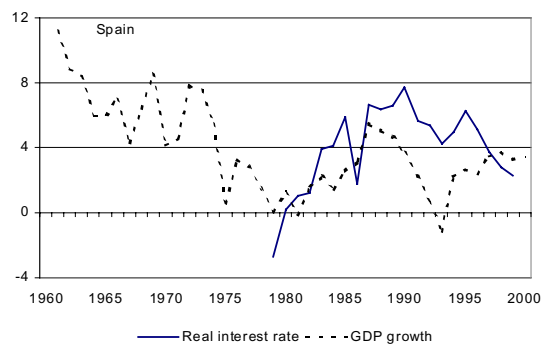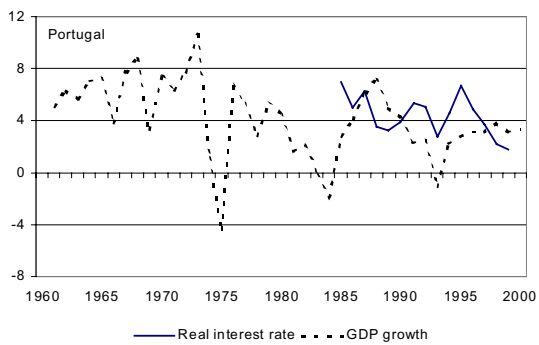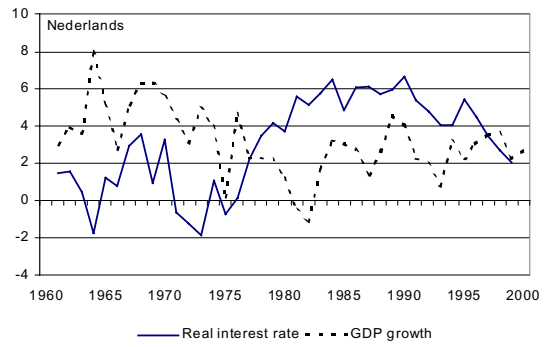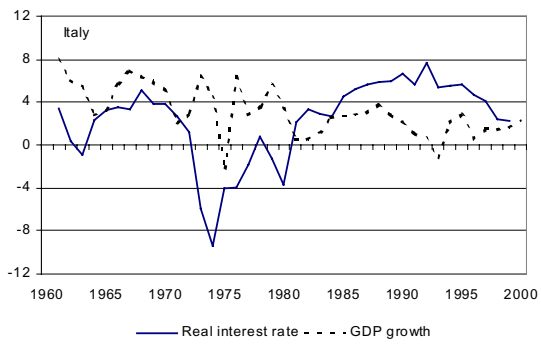
Figure 10.   *Implicit and long-term nominal interest rates for Government*

Italy — Implicit interest rate / Nominal interest rate

Nederlands — Implicit interest rate / Nominal interest rate

Portugal — Implicit interest rate / Nominal interest rate

Spain — Implicit interest rate / Nominal interest rate

Sweden — Implicit interest rate / Nominal interest rate

UK — Implicit interest rate / Nominal interest rate
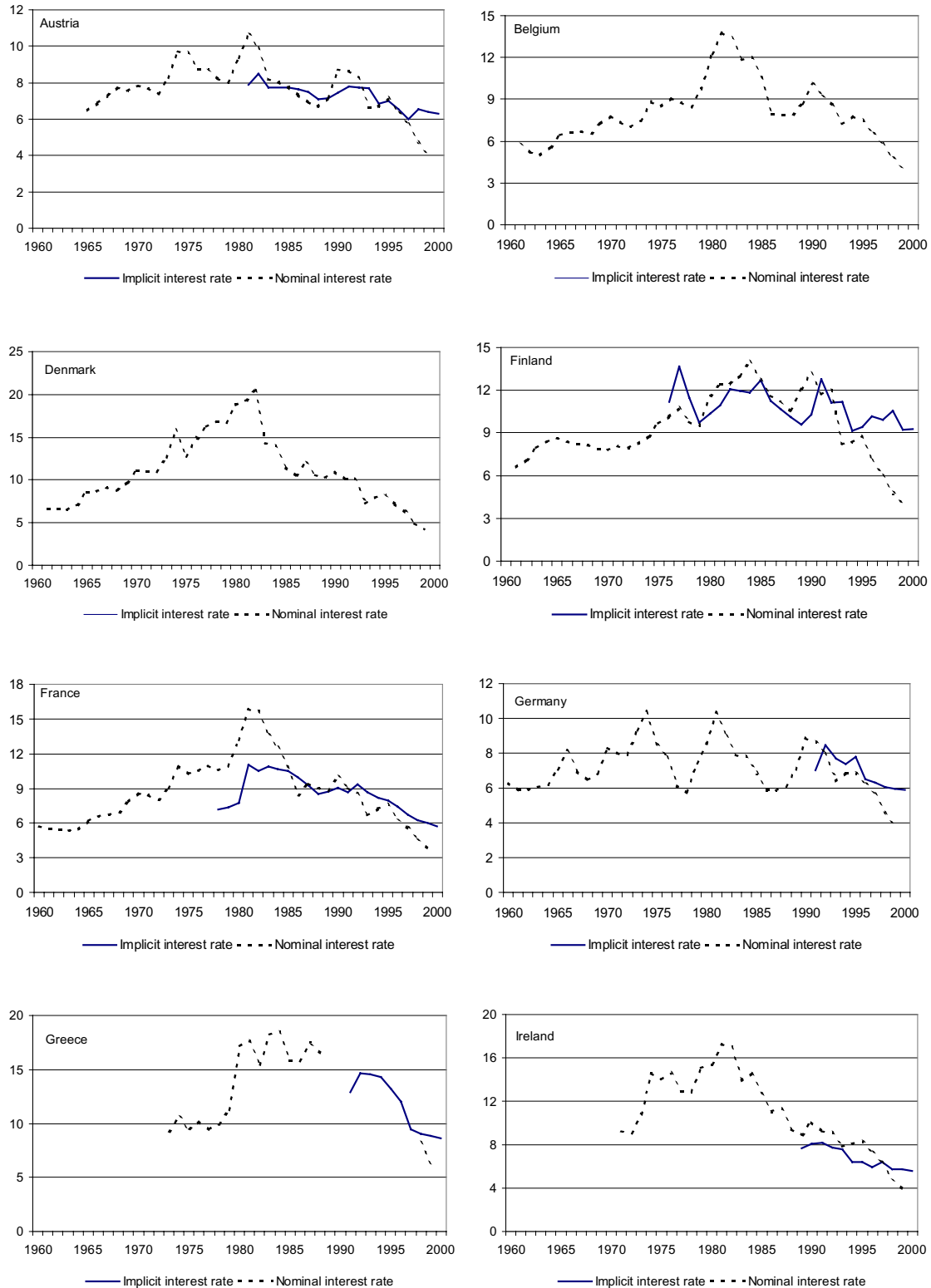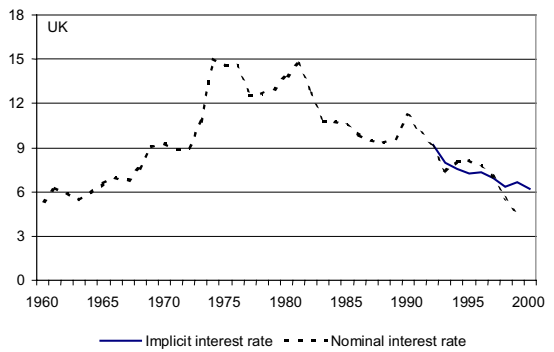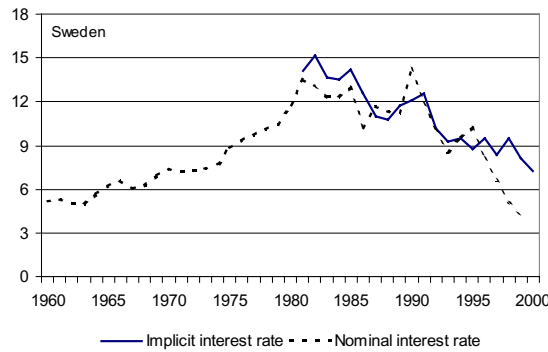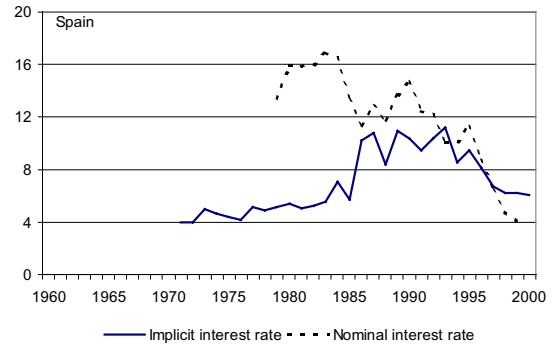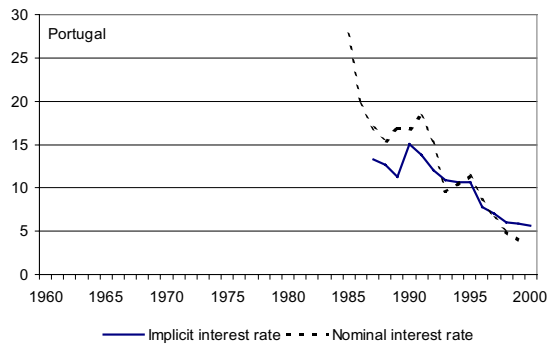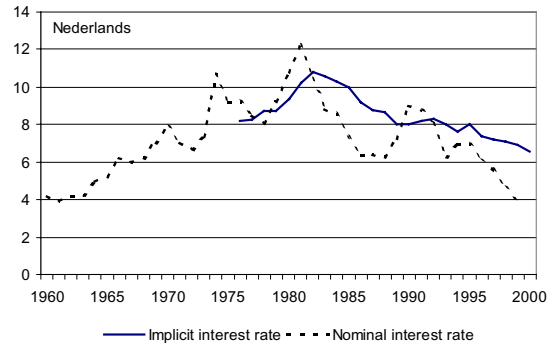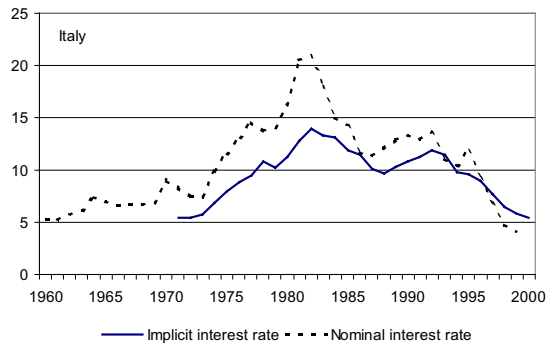
Figure 11. *Effect of a one per cent increase in GDP and long-term interest rate on government surplus/GDP*

Italy

Netherlands

Portugal

Spain

Sweden

United Kingdom

Baseline

GDP shock

Interest rate shock
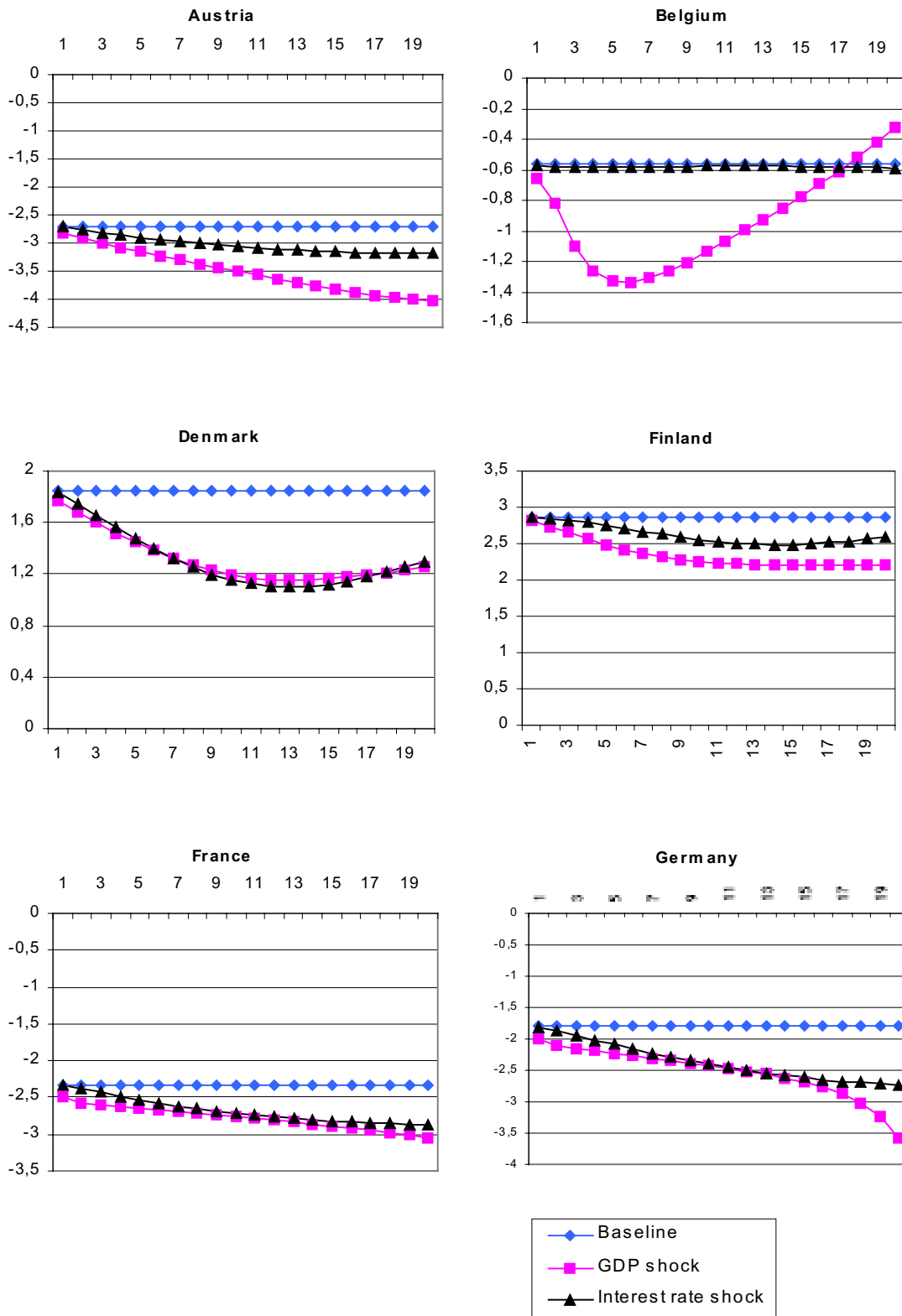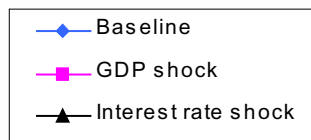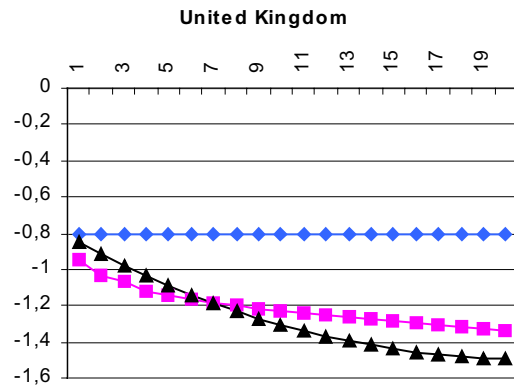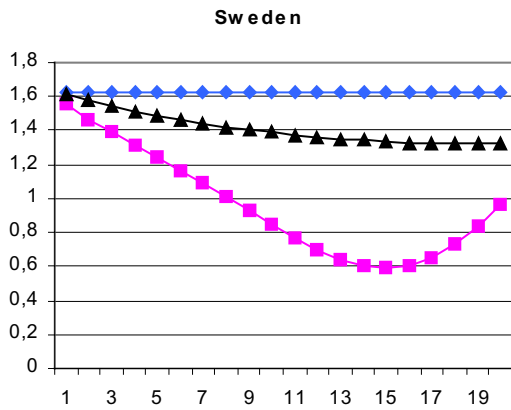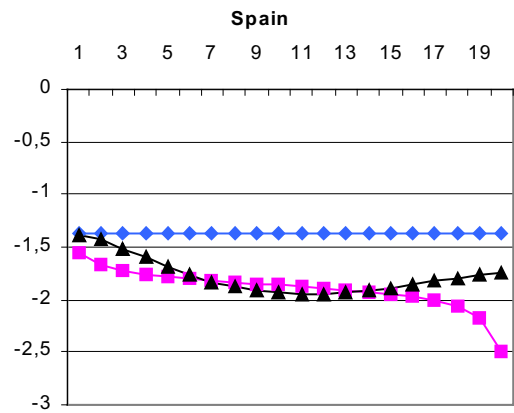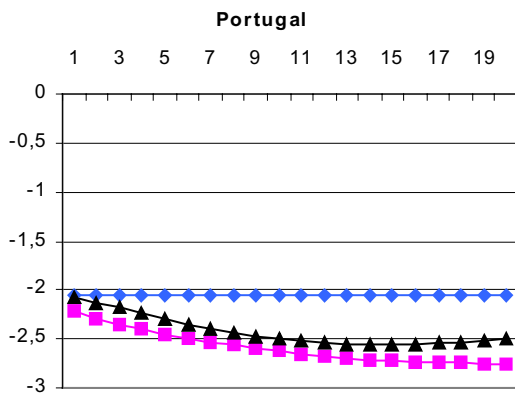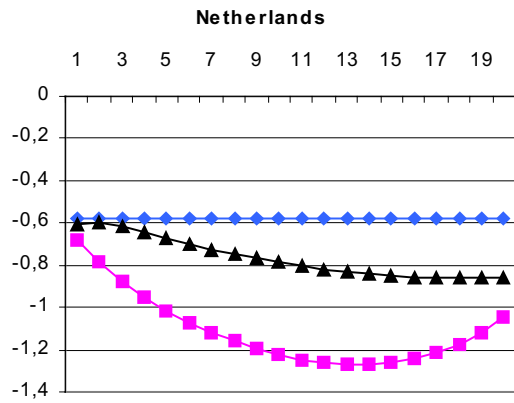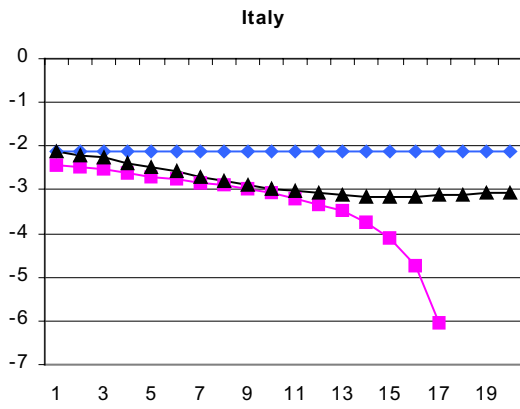
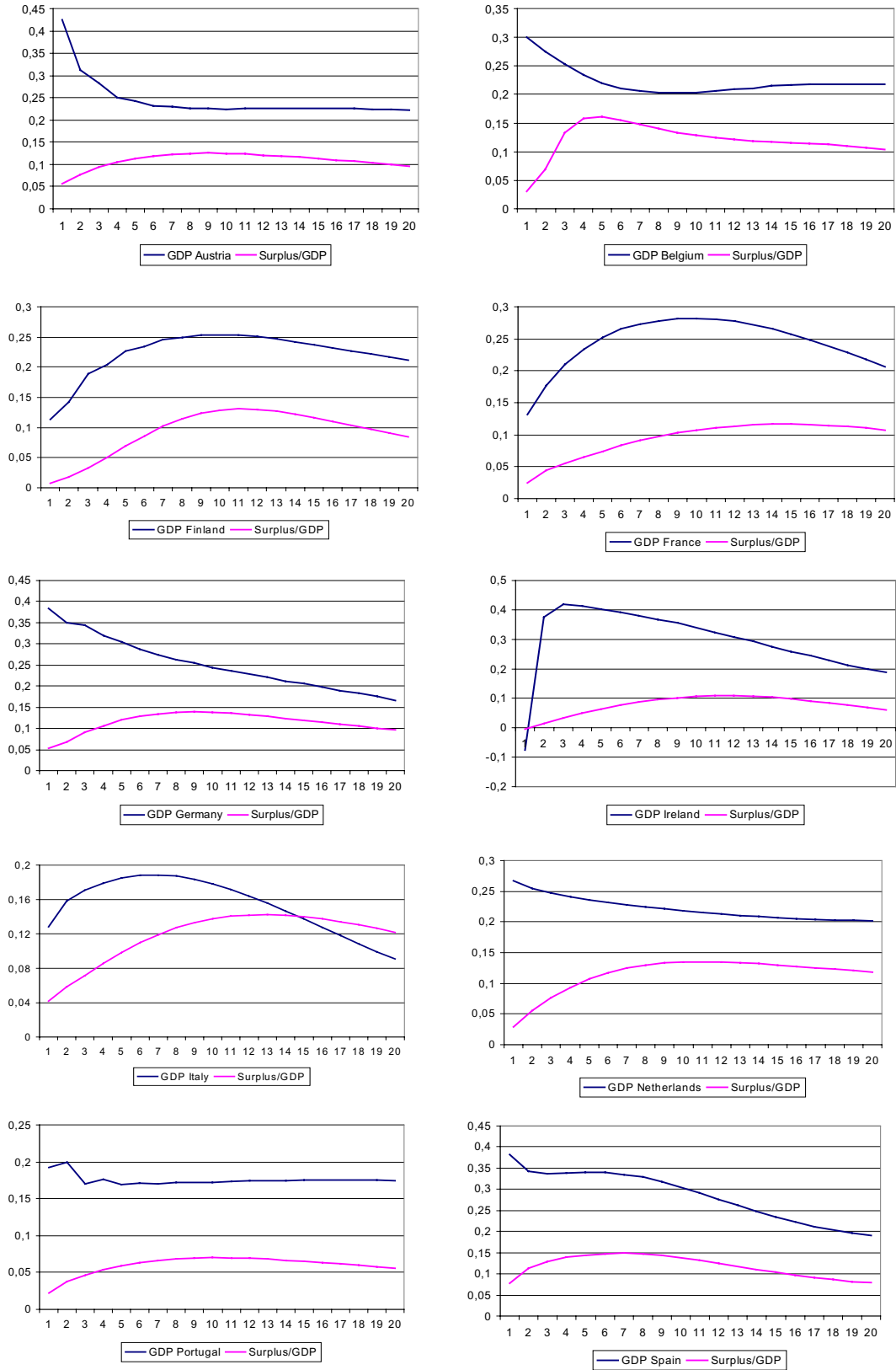*Figure 12.* *Effect of an increase in exports on GDP and government surplus/GDP*

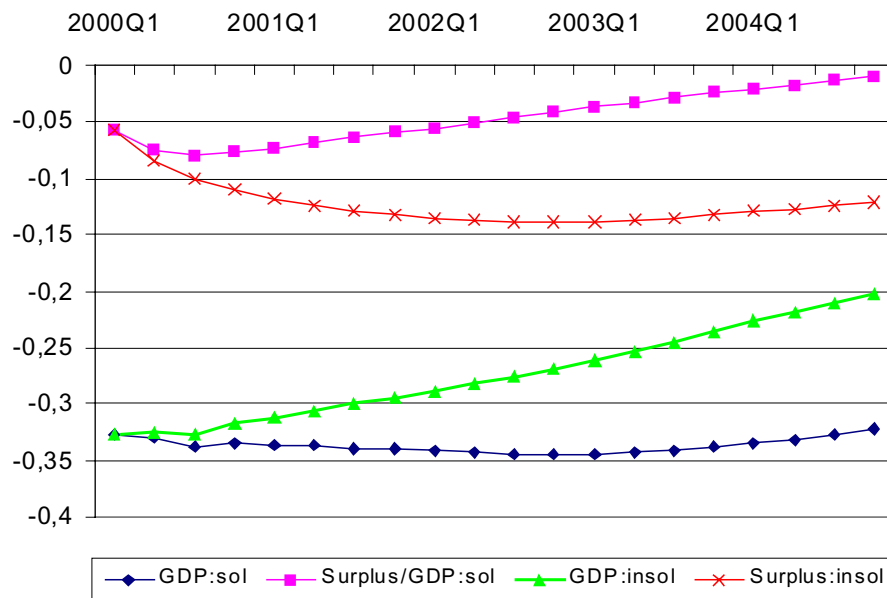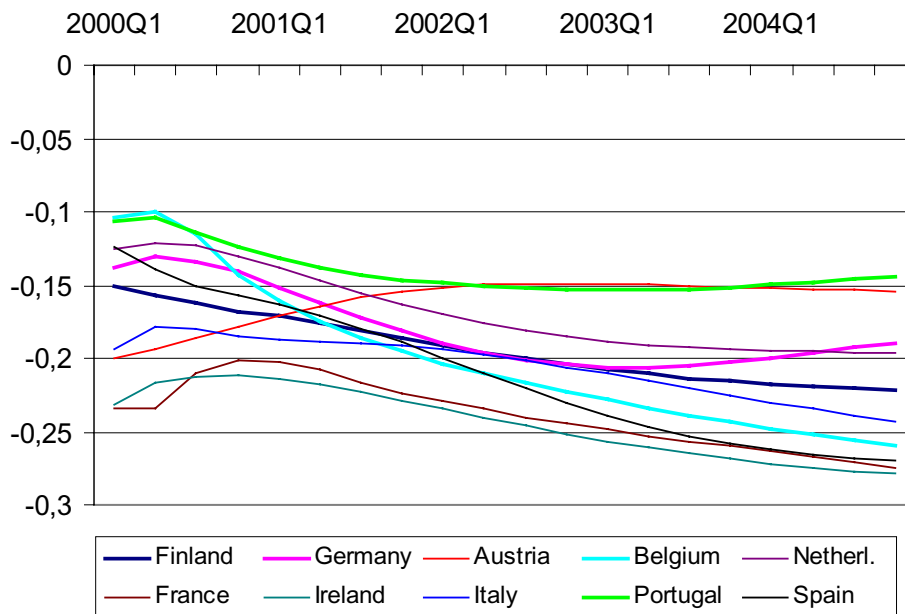*Figure 13.   Effect of the solvency requirement on fiscal policy effects*

Figure 14.   Effect of a one per cent increase in public consumption on sur plus/GDP (upper panel) and GDP (lower panel)
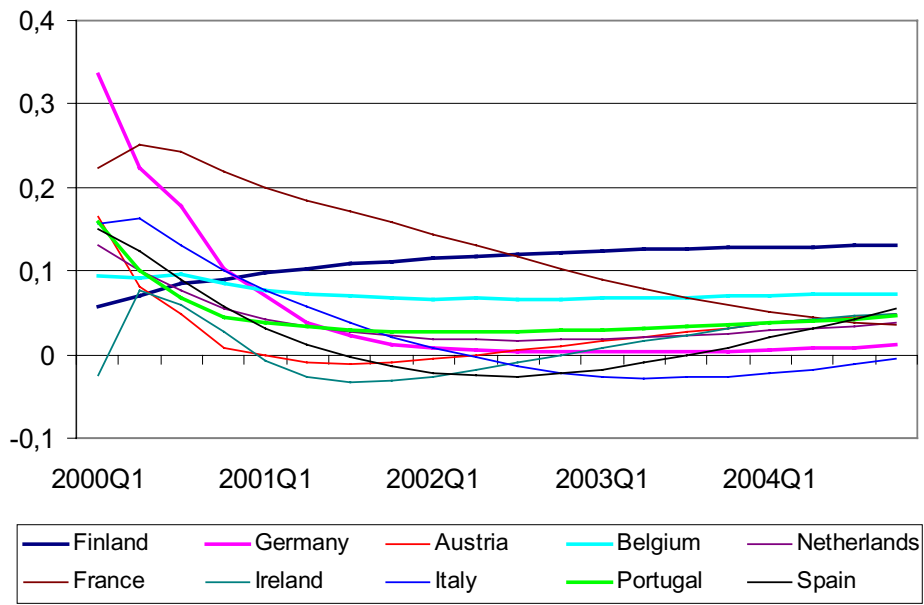
Figure 15.   *Effect of a one per cent increase in public consumption on Euroland economy*