

Econometric Research and Special Studies Department

**The role of fiscal policy in EMU: a simulation with EUROMON**

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a simulation with EUROMON

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## ABSTRACT

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M. Demertzis and H.M.M. Peeters

Country members of EMU as well as the United States have improved their fiscal positions during the course of the past decade. This article considers the impact of further government debt and deficit reductions in the EMU area. First the literature on government finance establishing the role of fiscal policy in macroeconomic management is reviewed. Next some empirical simulations using the macroeconometric multi-country model EUROMON of the Nederlandsche Bank are carried out. With these it is investigated what countries would have to incur if they were to improve their fiscal positions further and more generally, what is the role of fiscal policy in the context of the single currency. This discussion focusses on how countries' fiscal policy can affect first each other and second, general price stability. Finally, a US simulation is presented that shows the possible impact of a further improvement of the US fiscal position as recently projected by the Congressional Budget Office, on the eurozone.

Keywords: fiscal policy, price stability, EMU, EUROMON

JEL Codes: C53, E60

## SAMENVATTING

De rol van het begrotingsbeleid binnen de EMU: een simulatie met EUROMON

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De aan de EMU deelnemende landen alsmede de Verenigde Staten hebben hun begrotingsposities het afgelopen decennium verbeterd. In dit artikel wordt bezien wat de invloed kan zijn van een verdere vermindering van de overheidsschulden en -tekorten binnen het eurogebied. Eerst wordt op basis van literatuur de rol van het begrotingsbeleid binnen het algehele macro-economische beleid besproken. Vervolgens worden enkele empirische simulaties uitgevoerd met behulp van het macro-economische meerlandenmodel EUROMON van de Nederlandsche Bank. Daarmee wordt getracht vast te stellen wat de gevolgen zouden zijn van een verdere verbetering van de begrotingsposities van de landen van het eurogebied en, meer in het algemeen, wat de rol is van het begrotingsbeleid in het kader van de gemeenschappelijke munt. Vervolgens wordt belicht hoe het nationale begrotingsbeleid dat van andere landen kan beïnvloeden alsook hoe dit van invloed kan zijn op de algehele prijsstabiliteit. Tenslotte wordt voor de Verenigde Staten een simulatie gepresenteerd waaruit volgt wat een verdere verbetering van de Amerikaanse begrotingspositie, zoals die onlangs is geraamd door het CBO, zou kunnen inhouden voor het eurogebied.

Trefwoorden: begrotingsbeleid, prijsstabiliteit, EMU, EUROMON

JEL Codes: C53, E60



## 1 INTRODUCTION AND BACKGROUND

The adoption of a single currency in Europe has introduced an asymmetry in the level of monetary and fiscal governance. The monetary instrument is given to a central supra-national authority with a view to safeguarding area-wide price stability in the medium-term, whereas the fiscal instrument is still within the hands of the individual governments. Decisions on the management of the monetary instrument are thus taken at the European Economic and Monetary Union (EMU) level, whereas the use of the fiscal instrument is decided separately at the level of the nation-states. The merits of this institutional arrangement in terms of helping achieve price stability are rigorously analysed in the literature and agreed upon among the EMU policy makers. What is less obvious and perhaps more uncertain in the future however, is the role that the fiscal instrument will acquire in this asymmetric set-up. The argument put forward in the literature is that in the absence of a national monetary instrument, governments are more likely to resort to a greater than otherwise use of their fiscal instrument. If that proves to be the case, then what will that mean for macroeconomic stability in general and for prices, more specifically. It is often quoted that excessive use of the fiscal instrument can jeopardise the level of inflation. The question that can be raised is whether European countries are more likely to use their fiscal instrument now than in the past. And if they are, whether this will make the European Central Bank's objective of price stability in the medium-term more difficult to attain. The 'new' role for fiscal policy and its potential effects on price stability in EMU constitute the motivation for examining the issue.

In what follows these issues are examined in three parts. The first part concentrates on the theory of fiscal policy and what the literature identifies as the merits but also potential pitfalls of fiscal expansions. Next to that, it is also discussed how, the creation of EMU may have altered the nature of fiscal policy and with what consequences. The second part then portrays the government financial position for countries in the single currency area and the United States (for comparative purposes) over the past decades. This aims to describe where countries are now and what challenges they may face ahead. Lastly, section three implements a number of fiscal scenarios using the Bank's multi-country model, EUROMON (see DNB, 2000a). Our aim is to identify what is required of countries if they are to achieve fiscal balance on the one hand, but also what it would mean if instead, they were to resort to overusing their fiscal instrument. This is of interest both with respect to price stability in the eurozone but also in terms of how countries can actually affect each other. In this section the recent projections of the Congressional Budget Office (CBO) with respect to the future US fiscal position are also presented. The principal aim of this simulation is to show the EU area's sensitivity to US budgetary policies.

## 2 AN OVERVIEW OF THE LITERATURE

### **The role of government debt**

The importance of fiscal policy lies in the ways that it interacts with monetary actions and the role of debt in affecting the economic cycle. The conventional view on the issuance of government debt is that it stimulates economic growth in the short-run but crowds out capital (and thus reduces national income) in the long-run (see Elmendorf and Mankiw, 1999). Evaluating now a government's financial position usually relies heavily on the course of its debt, despite it not being its only liability<sup>1</sup>. In particular, assessing fiscal policy requires looking at both the level the government financial position is at, as well as how deficits are financed. Blanchard and Perotti (1999) find consistent evidence that positive government spending shocks have a beneficial effect on output while positive tax shocks prove to be detrimental. Looking at the argument the other way, spending cuts are seen to have positive effects on resource use, while tax increases to have negative effects on incentives. More generally, the existence of debt has potentially three more harmful effects (see Elmendorf and Mankiw, 1999). A tax-financed deficit may give rise to a dead-weight loss, which is associated with distorting individuals' behaviour. Moreover, a high government debt may alter the political process and make an economy more vulnerable to a crisis of international confidence. Lastly, the beneficial short-run effects of a budget deficit on consumption and saving constitute a poor guide to the long-run effects of debt on national wealth.

### **Monetary and fiscal interdependencies**

There are a number of channels through which fiscal and monetary policy can affect each other and a number of theories that defend the relative merits of each one. Which however, is the most relevant empirically, remains an issue that is difficult to test.

It is commonly agreed in the literature that monetary policy has a comparative advantage over the use of fiscal instruments in achieving counter-cyclical goals. Experience has shown (see Taylor, 2000) that the implementation timing is much shorter for monetary than for fiscal policy, with the exception of automatic stabilisers which avoid the slow implementation that can cause discretionary policy to lag so far behind events. In general terms, discretionary changes in fiscal policy may have poorly timed

<sup>1</sup> This is the case because although it is not the only one, debt held by the public represents the largest explicit government liability. Furthermore, it is usually difficult to assess the value of many of the government's assets.



effects on aggregate demand. Taylor even argues that the use of discretionary fiscal policy could make the job of the monetary authority more difficult because it would then have to spend time forecasting the size of the fiscal proposals. The aim of fiscal policy instead is to keep aggregate demand close to potential GDP, a policy that is perceived to be good in its own right.

The literature is agreed as to how fiscally undisciplined behaviour may threaten monetary stability. This refers to the threat of debt monetisation (monetary bailout) or in other words, the expectation that a central bank can always allow creeping inflation to reduce the real value of debt (see Sargent and Wallace, 1981)<sup>2</sup>. A widely agreed means of removing this expectation of monetary rescue is the delegation of monetary decisions to a politically independent monetary authority with a clear mandate, that of stable prices. A fiscal authority which is tempted to overuse its instrument is therefore aware that, so the argument goes, high deficit and debt levels can only be corrected through disciplined fiscal conduct. Delegation is thus perceived to eliminate the possibility of an escape route for the fiscal authorities. And indeed, under stable macroeconomic conditions, this may very well act as a necessary and sufficient disciplinary device. It does not however provide a solution when faced with exceptional circumstances that result to unusually high levels of debt; the monetary authority may still be called to the rescue. Furthermore, it could be argued that the threat to price stability remains even under normal macroeconomic conditions. This stems from the ways fiscal policies feed through to the economy. The question that arises is whether there are costs to excessive fiscal behaviour and if there are then who is the bearer. It can be argued that although free to achieve its monetary objectives, the central bank is not immune to fiscal developments. Fiscal actions can and do affect prices and growth and can potentially hamper the central bank's objectives. By means of an example assume an expansionary fiscal policy implemented through tax cuts. If households expect the present tax cut to be met in the future with cuts in government purchases, then the policy implemented has provided them with net benefits. This occurs because the current government expansion will have stimulated consumption, reduced national saving and increased households' stream of future income. This in turn generates growth but also inflationary pressures in the short-run. If the objective of the central bank is to achieve stable prices, then it will need to use its monetary tool to counteract expansive fiscal policies. If on the other hand, households expect this tax cut to be met with future tax increases instead, then there will be no

<sup>2</sup> This admittedly may be unlikely for a low inflation country where seignorage revenues contribute only very modestly to government revenues.

change in their future stream of income and as a result no change in the macroeconomic variables. The central bank needs to react differently depending on which of the two actually prevails <sup>3</sup>.

The main explanatory factor that renders some fiscal policies ineffective while others not, lies in the role of households' expectations. The effectiveness of fiscal policy is a much more complicated issue and depends on the timing of the intervention as well as the general economic conditions under which policies are implemented. In the example above it is the expected cut in government purchases (or increase in future taxes) rather than the tax cut itself, that stimulates (leaves) consumption (unaffected). From a policy perspective, capturing the role of expectations is perhaps the most important, although also the most difficult task in evaluating a fiscal stance. Further to that, nowhere is it specified when the debt is eventually, if ever, to be repaid. All that is required is an expectation that sufficient funds will be generated to justify current expenditures. This adds further to the difficulty with evaluating the sustainability of fiscal policy <sup>4</sup>.

### **The role of fiscal policy in EMU**

As already mentioned, the distinct economic feature of EMU is the asymmetry in the level of monetary and fiscal governance. Monetary policy is given to a supra-national body, the European System of Central Banks (ESCB) to conduct, and is designed to achieve and maintain price stability in the medium-term. Fiscal policy on the other hand, still remains within the countries' jurisdiction. It is of course true that the Maastricht Treaty and the Stability and Growth Pact do provide a framework for monitoring the fiscal actions of the individual members. This is implemented by requiring that countries maintain a fiscal position close to balance or in surplus in the medium-term, providing at the same time for the use of the fiscal instrument under exceptional circumstances. They aim thus to restrict the fiscal instrument from being used in ways that would jeopardise area-wide monetary stability and impose costs across the countries. Furthermore, what the Stability and Growth Pact also aims at encouraging the effective use of automatic fiscal stabilisers in dealing both with structural

<sup>3</sup> The distinction in the way that a fiscal expansion is expected to be resolved in the future is very often associated in the literature with Ricardian versus Non-Ricardian equivalence. The former implies fiscal neutrality whereby private agents anticipate in full future changes in their tax burden following current fiscal actions. In a non-Ricardian world on the other hand, private agents remain agnostic about the future of fiscal policy and base their decision on current events. And there are numerous reasons to depart from Ricardian equivalence: people may be childless and not care about future generations, or they may not always leave bequests, credit markets may be imperfect, or individuals credit-constrained (Blanchard and Fischer, 1990).

<sup>4</sup> In the literature, fiscal solvency is assumed as long as the rate of growth of a government's debt does not exceed the interest rate on that debt.

issues as well as the different parts of the business cycle. In terms of macroeconomic management however, countries maintain fiscal policy and lose the use of the monetary instrument at the national level. Monetary policy is in use at the European level, but it is not directed to the specific needs of the countries. It is fiscal policy – and perhaps wage policy – that is now called to deal with country specificities. The important implication of this arrangement is that there is now greater scope for an otherwise ‘excessive’ use of the fiscal instrument (see Hughes Hallett and Vines, 1993). And if monetary union intensifies the use of the fiscal instrument (see Demertzis et al., 1999) then for a given level of growth and interest rate, it also increases the risk of fiscal default. The important question is therefore, how likely countries are to use their fiscal tool in ways that may eventually jeopardise aggregate price stability. The literature on this point remains divided. There are studies which point to structural differences between countries (see Bayoumi and Eichengreen, 1994, Demertzis et al., 1998), and others that consider the asymmetries insignificant and in any case diminishing as trade is encouraged by the single currency (see Frankel and Rose, 1998).

In what follows however, a number of unresolved questions relating to the use of fiscal policy in the context of a single currency is presented. We allude to the reasons -provided by the literature- why countries may actually be tempted to use this instrument and why the current institutional arrangements may not insulate monetary policy from fiscal ‘mischief’.

Firstly, the nature of the fiscal regime present in each country as described in the previous section, may create asymmetric transmissions. If household expectations are different between countries -in terms of how they expect current expansions (fiscal or monetary) to be financed in the future- then similar policies will have different effects. Secondly, although the motivation behind imposing disciplinary rules is correct in that they do help ensure overall stability, at the same time the evidence is not entirely in favour of tight fiscal limits. From a welfare point of view, tight fiscal limits can actually be as harming as no limits, especially in the absence of a federal structure (see Sala-i-Martin and Sachs, 1992). Thirdly, as alluded above, the introduction of a single monetary policy may in fact create the incentive to overuse one’s fiscal instrument. This may arise because a country knows that the costs of being fiscally undisciplined may not only be felt by itself, but may also be shared across all the members of EMU (given the uniqueness of the short-term interest rates). That implies that the country will initially reap the benefits of the fiscal expansion single-handedly, but will only share in the subsequent burden. This incentive may admittedly, be moderated if the country was to account for the potential inflationary impact of its fiscal actions. If that was indeed to be taken into consideration then the benefits mentioned would in fact be reduced. Lastly, the price stability that EMU entails encourages residents to invest in debt issued by other member countries’ governments. But greater exposure of their residents to foreign debt, may automatically increase the pressure they face to bailout

members in financial distress. To the extent that this may be anticipated, it may generate greater incentives for fiscal expansion, hence increasing the level of interdependence between countries (see Viegli, 1999).

### 3 THE HISTORICAL EVOLUTION OF EMU COUNTRIES' FISCAL POSITIONS

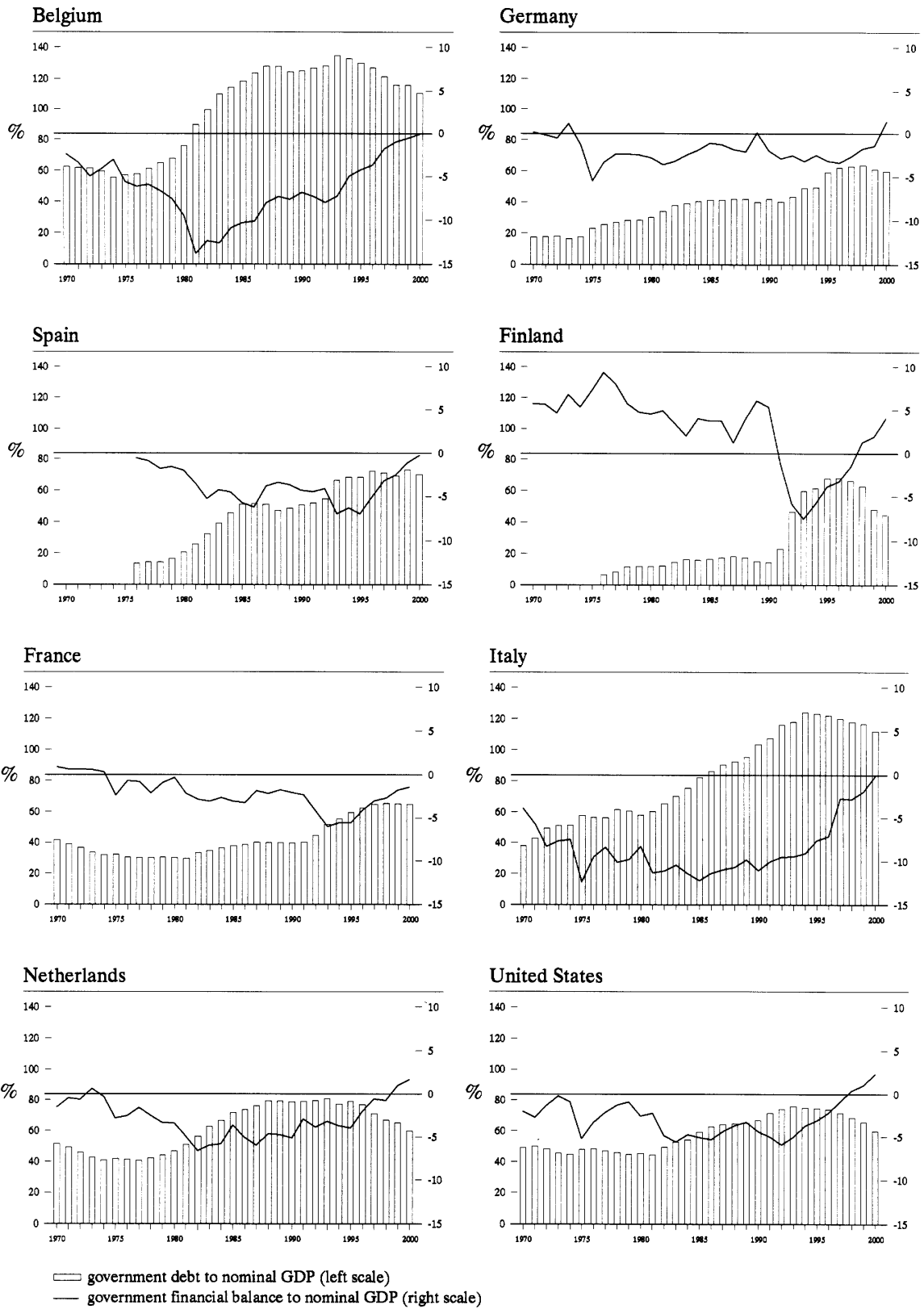
The Maastricht criteria as laid down in the Treaty, have disciplined the debt and financial positions of the European governments. Those countries that joined EMU in the first wave in 1999 have satisfied the deficit criterion of less than 3% as a proportion of nominal GDP. Most countries have managed to bring their debt ratios close to (or below) 60%, as a proportion of nominal GDP, with the exception of Belgium and Italy which have debt ratios of more than 100%. Over the past years the debt and deficits have continued to decrease in most EMU-countries due to, among others, higher economic growth.

Chart 1 shows the debt and deficit to GDP ratios for seven EMU countries and the United States. Debt ratios in Belgium, France, the Netherlands and the United States decreased slightly in the mid-seventies. At the end of the decade and during the eighties the debt ratios increased up to about 60% or even 100% as a proportion of GDP due to, among others, lower economic growth. Then, 1992 proved to be a turning point in each of the countries considered. The end of the nineties saw lower deficits and hence lower debt ratios, a downward trend that has not stopped yet. During the 90s most of the countries had the highest deficit in the years 1992 or 1994. This also holds for the United States, where 1992 saw the start of a period of prolonged growth.

The figures in Chart 1 are realisations for the period between 1970-1999 and estimates for 2000. For the years 2001 and 2002, some institutions have also provided projections, for the medium term outlook. The OECD, for instance (see December 2000), foresees further debt reductions for each of the EMU-countries. Debt to gap is projected to slow down in Germany from 59.6% in 2000 to 57.5% in 2002 and in France from 64.6% to 62.6%. Ireland may even reach a government debt stock that is only 16.7% of nominal gap in 2002. For the Netherlands, according to the OECD but also according to DNB forecasts with the Dutch model MORKMON (see DNB, 2000c), the debt ratio may reach levels less than 50%. In this respect, the Netherlands shows a similar pattern to the United States.

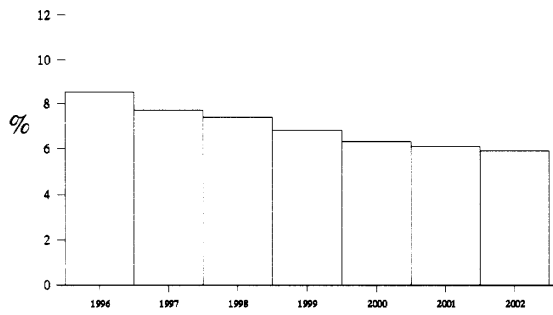
The debt stock reduction during the last years has led to a much lower burden of interest payments by the government. Chart 2 shows this for the same seven EMU-countries as in Chart 1 and for the United States, for the years between 1996-2002. Again, the data until 1999 are realisations, for 2000 estimates and for 2001-2002 projections. As shown, the strongest reductions of interest payments from 1997 onwards occurred in those countries with the highest debt, i.e. Belgium, Italy and Spain. Italy, for instance, faced lower interest rate payments from 11.1% to 9%. In these countries, the observed decrease in interest debt payments between 1996-1999 was made possible by the higher economic growth, but also by the reduction in the debt stock itself and lower EMU- and US interest rates. EMU

Graph 1 Government debt and government financial balance ratios in seven EMU-countries and the US

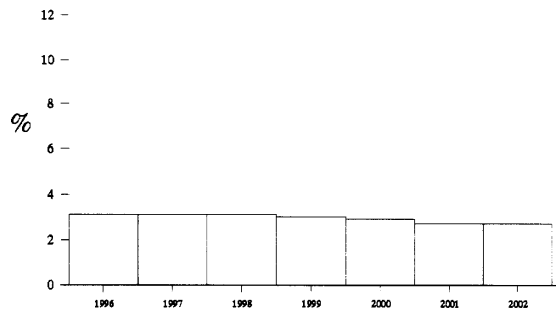


Graph 2 Interest payment component in government debt to nominal GDP

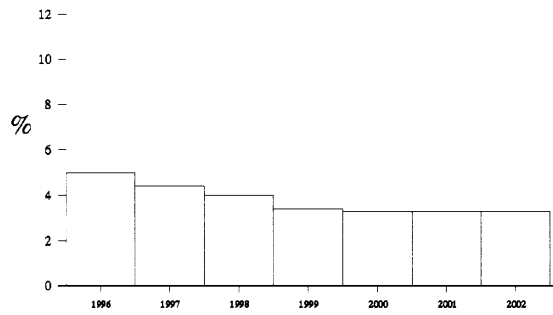
**Belgium**



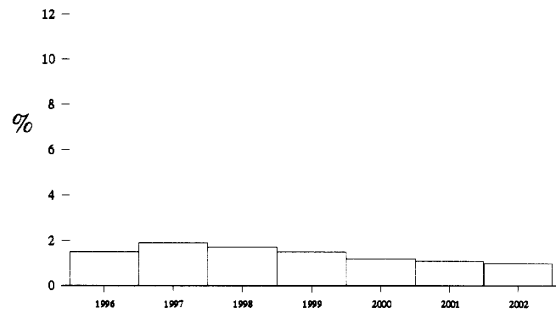
**Germany**



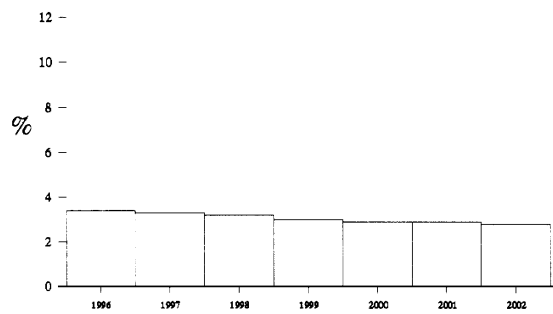
**Spain**



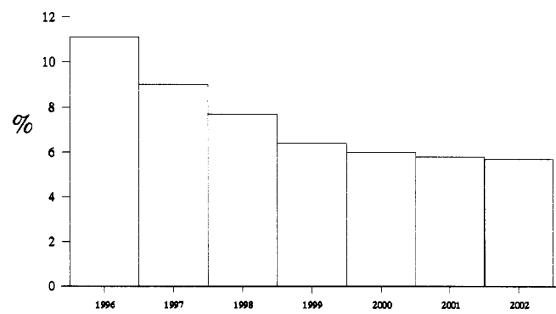
**Finland**



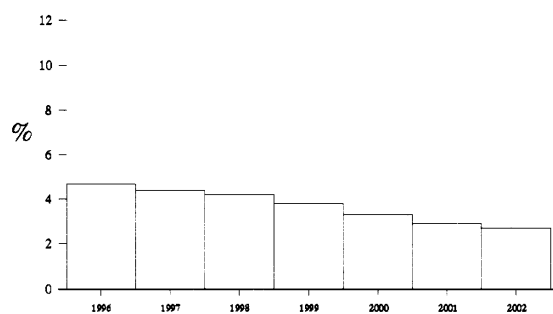
**France**



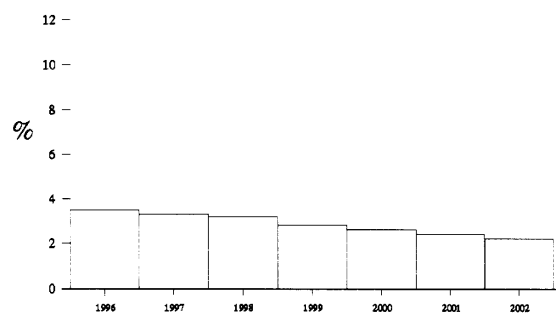
**Italy**



**Netherlands**



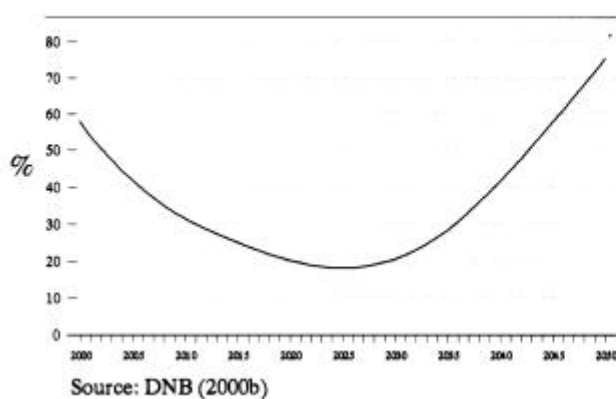
**United States**



short and long rates declined from 4.9% in 1996 to 3.1% in 1999 and from 7.1% to 4.7%, respectively, and US long rates from 6.4% to 5.6%. The debt to GDP ratios are expected to continue to decrease until 2002. Looking at forecasts for the debt ratios in the longer term however, prospects are different. Many forecasters in European countries and in the United States are expecting the debt to GDP ratio to stop decreasing after 2030. These projections are made on the basis of generational accounting models that take into account the government expenditure and tax income per cohort in a population explicitly. To give an example, very young and elderly cohorts are expected to be receiving more money from the government through funds for education, health care or retirement than they pay back through taxes. Assumptions concerning interest rates, labour participation rates and economic growth are in these models often based on the current situation. The populations in many European countries and the United States are ageing as birth and death rates decline. Populations are expected to be most at age around 2020-2030. Due to this expected development, the costs of social security, medicare, pensions and other government expenditures are projected to outweigh tax revenues of the government by then. Under the current assumptions and hence no further policy changes, the government will thus run deficits, which in turn will burden the government debt to GDP ratio.

Projections for the Netherlands made by the Nederlandsche Bank in 2000 indicate that the debt to GDP ratio may decrease from about 60% in 2000 to 20% in 2025 and then rise until a bit less than 80% in 2050 (see DNB, 2000b). This is shown in Chart 3. The underlying assumptions are that the real interest rate is 4% and the growth of labour productivity 1.5%. The elderly dependency ratio – the number of people in the Netherlands above 65 as a proportion to the number of people between 20 and 65 - is calculated to be 40% by 2050. This is almost double the dependency ratio of 22% in 2000, pointing to the considerable shift in the population age distribution. Nevertheless, with the exception of Ireland, Luxembourg and Finland, Dutch elderly dependency ratios are lower in comparison with

**Graph 3 Debt to nominal GDP ratio in the Netherlands according to generational accounting model**





other European countries. Italy and Spain compare the least favourable as their populations are expected to age the most (see ECB, 2000). The turn in the debt ratio and its increase in most of the other European countries in the long term (between 30 and 50 years ahead), may thus be as severe as outlined for the Netherlands in Chart 3.

In summarising this section, the following can be said. In European countries and in the United States, debt and government interest payments to GDP ratios have decreased over the last years. Projections for the two years ahead are that this decline in debt to GDP ratios may continue. However a shift in the populations from relatively young and productive to ageing people over the next 20 years is expected in these countries. *Ceteris paribus*, governments will therefore be forced to augment their expenditures. This will entail higher government deficits and consequently higher debt to GDP ratios.

#### 4 THREE SIMULATIONS WITH EUROMON

Reviewing the literature and discussing the historical evolution of countries' levels of debt leads to two questions that might currently be of policy relevance. This section, attempts to provide answers to these questions using the Bank's multi-country model, EUROMON. Following the theoretical argument that debt can be detrimental to growth in the long run and might also threaten price stability, we examine first what it would take for countries to eliminate debt. This is done in simulation 1 where a surplus in EMU countries' government financial position is imposed and then look at how long it would take for the accumulation of surpluses to eliminate debt. This gives us an indication of the 'cost of debt'. On the other hand, as discussed above, the adoption of a common monetary policy creates an incentive for countries to overuse their fiscal instrument. Our second simulation examines the consequences of this 'excessive' use. This simulation has two aims: identify the benefits that countries accrue from these fiscal actions (and therefore say something about their incentives to carry them through) but also examine what these actions would entail for the other country-members. This will also allow us to say something about the fiscal effects on overall price stability. In particular an expansion through increased government spending is considered. Our third simulation considers the effects of a US fiscal shock on Europe. This is not directly connected to the theory described above but nevertheless aims to show the degree of interdependence between the two economic areas. The scenario applied is constructed to fit the recent announcements of the CBO (31st January 2001) and - examine the potential effects of the prolonged US surplus projected, on the EMU area.

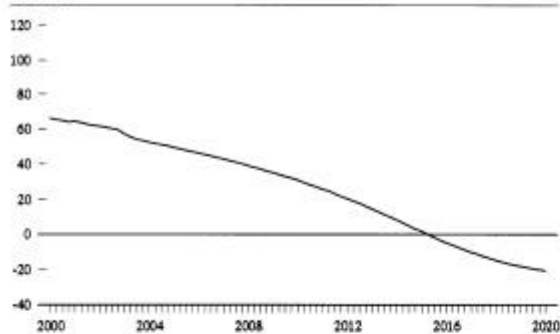
As indicated, all simulations are carried out with the macroeconometric multi-country model EUROMON. The model contains Austria, Belgium, Denmark, Germany, Spain, Finland, France, Italy, the Netherlands, Sweden, the United Kingdom, Japan and the United States. 'EMU' in this context consists of Austria, Belgium, Spain, Germany, Finland, France, Italy and the Netherlands. The simulation results that follow are executed while the full model is in operation, implying that all spill-over and spill-back effects across countries are taken into account. The simulation period is ten years.

##### **Simulation 1: The cost of debt in EMU**

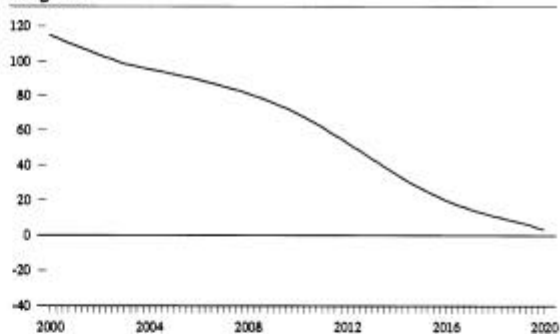
As an illustrative example, a 3% surplus (as a percentage of GDP) is imposed on the government financial position of each EMU-8 member for the whole period, under the assumptions of constant interest and exchange rates. This aims to identify how quickly individual countries can eliminate their debt. The results are plotted in Chart 4. Our baseline is generated based on the assumption that governments gradually reach a balanced financial position till 2002 and maintain this balance

Graph 4 Debt ratio at 3% government surplus, 2000-2020  
Percentages

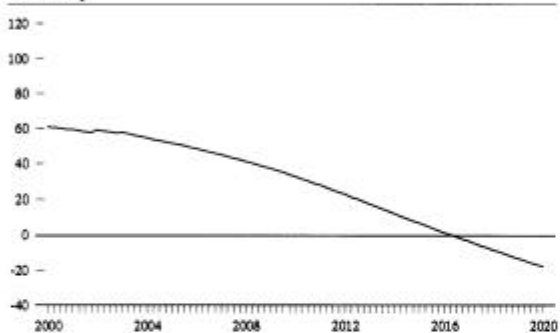
Austria



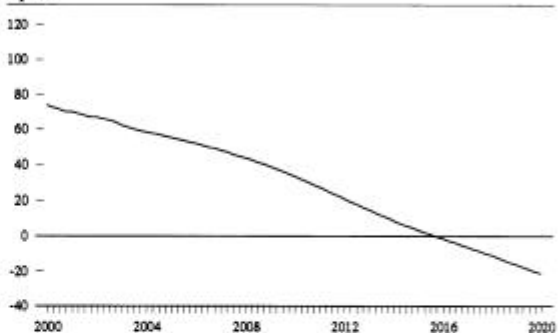
Belgium



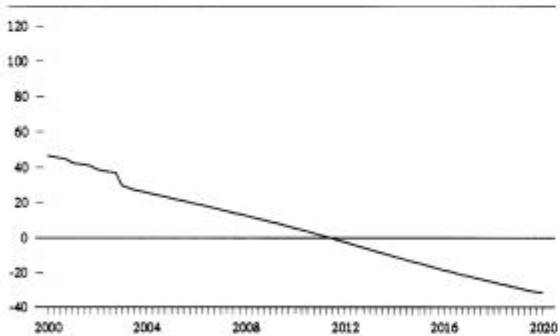
Germany



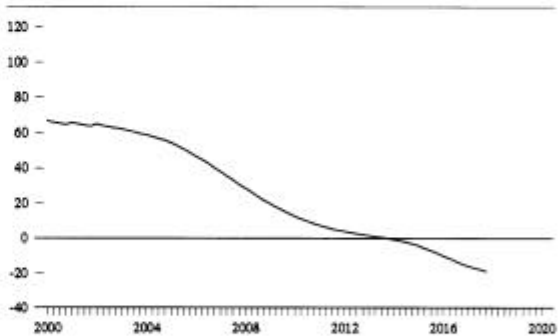
Spain



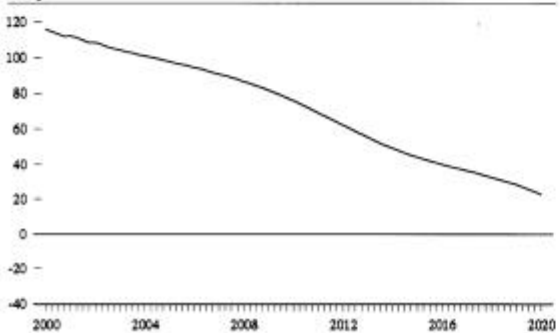
Finland



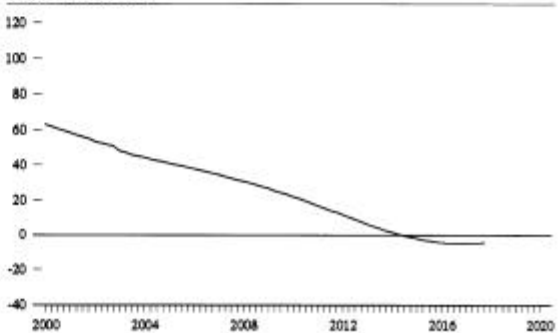
France



Italy



The Netherlands



— simulation series

thereafter. The OECD projections for 2001 and 2002 are assumed. Consistently with this setting, debt reduces gradually till 2002 and constant thereafter. Chart 4 shows, for instance, that for Austria it would take about 15 years before debt is eliminated. This term is shorter for Finland and France but longer for Belgium and Italy who are faced with a relatively higher level of debt to begin with. The message from this simulation is that countries aiming to reduce their levels of debt, would require prolonged periods of high government surpluses.

### **Simulation 2: Government expansion**

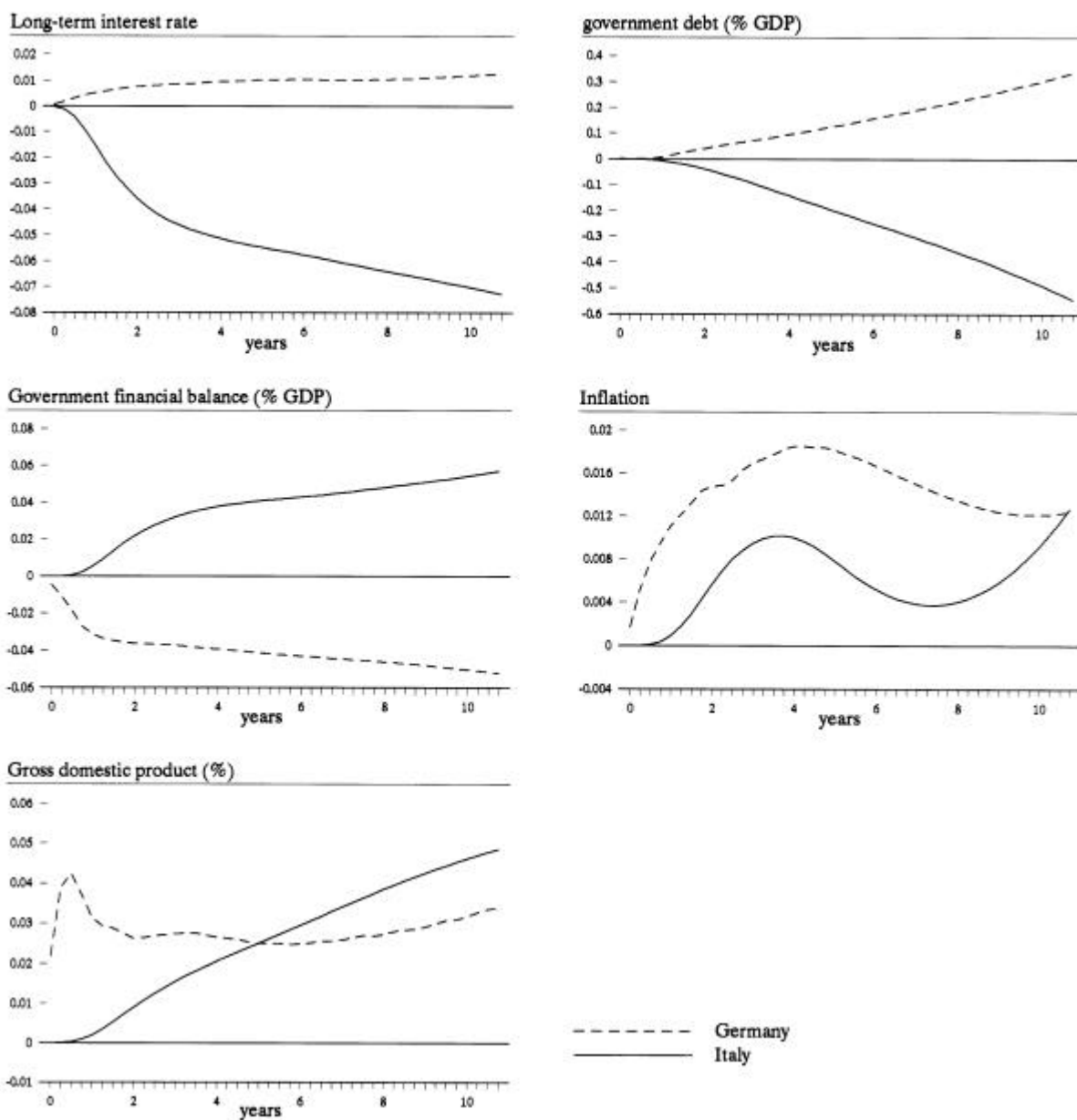
The shock examined next is that of a government expansion in an EMU country through expenditure increases. The experiments performed are applied to Germany and Italy individually. The choice of countries is based on the size of their economy but also the relative difference in their current fiscal positions, as Germany has a low and Italy a high level of debt. It is examined how shocks affect both the domestic economy as well as the other country considered. In this simulation monetary policy is assumed to maintain constant real interest rates. This is a neutral way of modelling monetary policy. It implies that the change in the eurozone short-term interest rate is precisely equal to the change in inflation in the eurozone.

#### **A permanent 1% government investment shock applied to Germany**

Chart 5 shows the results of a 10-year government investment shock of 1% in Germany. Given the assumed balanced-budget baseline, government expenditures are greater than revenues, by the shock applied for the 10-year period. The first consequence is that the government financial position and the debt deteriorate across the whole period. This deterioration has an adverse effect on the German long-term interest rate, reflecting the prospect of a burdened government financial position <sup>5</sup>. Real economic growth is stimulated as a result of the government expansion and despite the increase in long-term interest rates. Inflation increases as a consequence of higher domestic demand. The consequences for Italy, also shown in Chart 5, are that it benefits from the shock in Germany both in terms of lower long-term interest rates which in turn stimulate growth, as well as lower debt levels. At the same time however, the inflationary impact of the German expansion is also felt in Italy.

<sup>5</sup> Equations for the long-term interest rates for each of the countries in EUROMON are estimated. As explanatory variables they contain the short-term interest rate, inflation and the government financial balance to nominal GDP ratio. The effect of the government financial balance on the long-term interest rate is negative. So, when government balance decreases, the long-term interest rate increases, *ceteris paribus*.

**Graph 5 Results of 1% permanent increase in government investment in Germany**  
Absolute percentage deviations from baseline



### **A permanent 1% government investment shock applied to Italy**

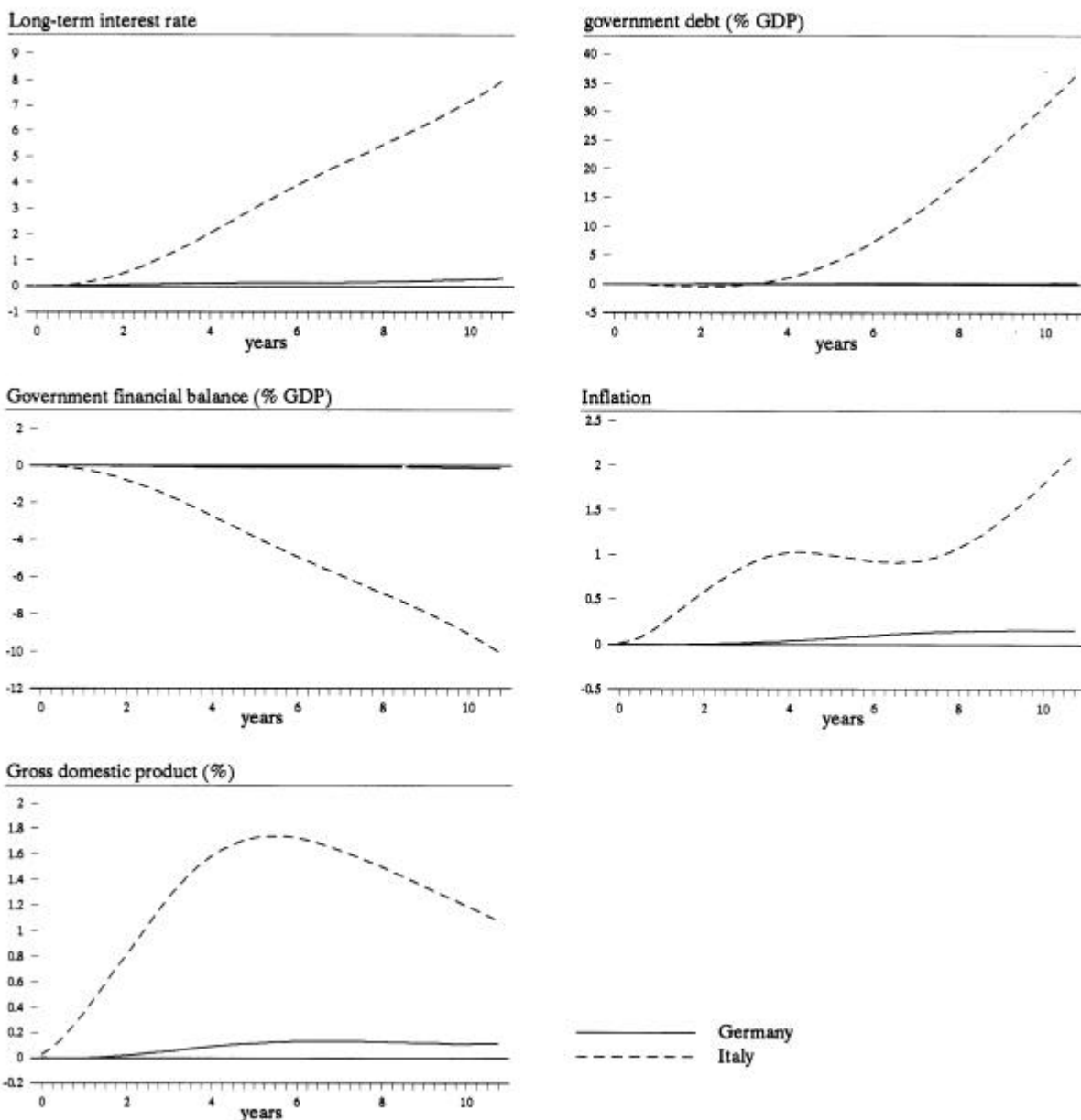
Chart 6 now shows the results for a similar shock applied to Italy. In Italy, domestic long-term interest rates are affected by far more, reflecting the greater elasticity of the rates with respect to the government financial position. The increase observed amounts to about 3 percentage points in the first five years. Indeed the Italian fiscal position deteriorates sharply with the deficit reachings about 5% by the end of the first five years. Similarly the debt increases, but only after the end of the fourth year. Real output on the other hand benefits in the first five years from the fiscal stimulus, reaching 1.8% in deviation from baseline. Inflation on the other hand does suffer, with a 1% point increase in the first five years and accelerating thereafter. The effects on Germany resulting from a fiscal shock in Italy are notably small.

A direct comparison of the results derived for the two countries point to the following. Government expansion does seem to stimulate growth although at different magnitudes in the two countries. This arises from the fact that government investment in Italy represents a bigger proportion of national income than it does in Germany. In both countries however, the incentive to use the fiscal instrument in a short-term context is justified, although by far more in Italy. Furthermore, such a policy generates inflationary pressures, although to different extents in the two countries examined. Comparing Charts 5 and 6, there is a discrepancy in the way that the two countries affect each other. Initially, the domestic effects of a German shock are much smaller in magnitude by comparison to when the shock is applied to Italy. Secondly, Chart 5 shows that a shock applied to Germany affects Italy strongly. When the shock is applied to Italy on the other hand (Chart 6), the effects on Germany are indiscernible by comparison to domestic changes. There is an asymmetry therefore, in the way countries affect each other. However, the acceleration in prices observed domestically as a result of the Italian shock, will contribute significantly (given the size of the country) to the area-wide level of inflation.

### **Simulation 3: The effects for EMU of a further reduction of the US-debt**

Recent projections by the Congressional Budget Office (CBO, 31 January 2001, Washington) show a significant decrease in the US debt stock over the next ten years. The projections even foresee that a zero debt situation for the US government would be possible within the next decade. This of course, depends strongly on the fiscal policy pursued and further economic developments. If president Bush's tax cut plans of about 1.3 to 1.6 trillion dollars over the next ten years are implemented or if the US economy slows down, the debt to GDP ratio will reduce at a slower pace than current projections suggest.

**Graph 6 Results of 1% permanent increase in government investment in Italy**  
Absolute percentage deviations from baseline



If current CBO projections for the next decade were to prove accurate, an impact on EMU would be expected. In order to analyse the effects of such a fiscal US-position, a US budget scenario is simulated with EUROMON. A 'bright' (as the CBO calls it) fiscal budget scenario the way they project is carried out and the impact of a US surplus during a 10-year period on the EMU economy is analyzed. The simulation is performed by imposing a shock in which US government surplus (gradually) increases from 2.4% of nominal GDP in 2000 to 4.9% in 2010. This is compared to a baseline in which the US economy has a balanced budget (i.e. is fiscally neutral) in the period examined.

The responses obtained with EUROMON for the EMU-economy are as follows <sup>6</sup>. The US long-term interest rate falls as a consequence of the increase in the government surplus and, in response, long-term interest rates in Europe fall. All exchange rates in EUROMON are assumed to remain constant. The surplus imposed during the ten-year period, brings down the US debt to nominal GDP ratio to less than 10%. Further, the long-term interest rate reduces which makes business and housing investment in the US cheaper. As both sorts of investment increase, they contribute positively to US economic growth. Long-term interest rates in Europe follow the decline in the US long rate and investment expenditure in EMU starts increasing. Through higher investment, domestic production rises and more labour is demanded. This imposes pressure on the labour markets in the United States, and to a lesser extent in the European countries. Due to the tighter labour market, wage pressures may induce inflation. The extent to which inflation may materialise then depends on the reaction of the monetary authorities. Table 1 reports results for the United States and for the EMU, like in the previous simulation, under the assumption that monetary policy maintains constant short-term real interest rates.

Table 1 Responses from a US debt reduction during 2001-2010 for EMU  
(*Deviations from baseline*)

	year 1	year 5	year 10
GDP (percentages)	0.0	1.1	2.8
Inflation (percentage point)	0.0	0.5	1.3
Long-term interest rate (percentage point)	-0.1	-0.6	-0.4

<sup>6</sup> The shock is given to the US government financial balance. Government expenditures are exogenised. The model further contains tax rates, that are exogenous. So, the shock can be seen as a shock to both government expenditures and government revenues. GDP is kept endogenous, so the government financial balance to nominal GDP ratio may differ (slightly) from what the CBO projects.



The results from this fiscal consolidation simulation show that after five years the long-term interest rate in the United States is 2.6 percentage points below baseline. In EMU the long-term interest rate (constructed as the average of all long-term interest rates of component countries) is 0.6 of a percentage point below the baseline in the fifth year. In EMU, GDP is 1.1% higher in deviation from base and inflation higher by 0.5 of a percentage point. GDP and inflation effects after 10 years are stronger than the effects in the fifth year. If the euro-dollar exchange rate were also to react to the simulated US fiscal policy actions (not assumed in this simulation), EMU would take more advantage due to additional trade and/or financial flows.

This simulation thus shows that a continuous debt reduction in the United States during a full decade can cause significantly lower long-term interest rates and higher growth in EMU, under the assumption of a neutral monetary policy and constant exchange rates. This, in return, would improve the fiscal positions of each of the EMU-countries *ceteris paribus*. According to this simulation, the debt to GDP ratio for EMU would decrease about 10 percentage points in 10 years. It is to be re-emphasised that in this simulation the dollar-euro exchange rate is kept constant. If the exchange rate was free to respond to the state of the government financial position, the dollar vis-à-vis the euro would appreciate. The eurozone could be faced with higher exports, lower imports and subsequently higher economic growth.

## 6 CONCLUSIONS

The theoretical literature as well as our empirical simulations with the Bank's own model EUROMON, provide us with the following insights about the role of fiscal policy:

? Most countries in EMU have improved their fiscal positions after the inception of the Maastricht Treaty. It can therefore be argued that it has contributed to greater fiscal discipline.

? Far from complacent, this emphasises the need for further and more explicit co-ordination at the intergovernmental level, beyond the broad economic policy guidelines and the Stability and Growth Pact.

? This need arises from the fact that countries have an incentive to use their fiscal instrument to generate growth, and perhaps more than they would in the absence of Monetary Union. But countries' fiscal actions do affect each other both in terms of debt and deficit levels, as well as in the way they influence prices. This is of particular interest to the European System of Central Banks, which is now in charge of monetary policy.

? Finally, the EU area may still be affected by US policies. Our simulations show that a reduction in US debt can lower both the domestic as well as the European long-term interest rate. It can thus stimulate economic growth in both economic areas and contribute to lower debt ratios.

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