The real effects of budgetary adjustments

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1. Introduction

In the last two decades, several OECD countries have undertaken large budgetary adjustments in order to reduce, or at least stabilise, previously escalating debt to GDP ratios. According to the Keynesian view, this should have had a contractionary impact on output, but this has often not been the case. To the contrary, in some well documented cases, most notably Denmark in 1983-86 and Ireland in 1987-89, the economy experienced an acceleration in growth after sharp fiscal retrenchments, while several other EU countries also boomed after major cuts in government spending. These examples have often been cited in the literature focussing on the 'non-Keynesian' effects of fiscal policy (Giavazzi and Pagano, 1990, Perotti, 1999, Giavazzi et al. 2000). Evidence from VAR based studies, estimating the effects of fiscal policy on output, have also called into question the conclusions from conventional demand driven models (Blanchard and Perotti, 2002, Perotti, 2002). These studies typically find that the values of fiscal multipliers are likely to be quite small and falling over time, and that a negative response of GDP to increases in fiscal spending is not unusual.

The real effects of fiscal adjustments are a crucial issue at present as many Member States strive to meet their medium-term targets of 'close to balance' required by the Stability and Growth Pact. Several countries have breached the 3% of GDP reference value of the Treaty, and are required by the Council to take all the necessary measures to reduce their deficits substantially. But many commentators have argued that these budgetary consolidations risk aggravating the current slowdown. This paper assesses the short and medium term effects of fiscal policy on economic activity in EU member states and considers the circumstances of past expansionary fiscal consolidations. In doing so, it addresses two questions. First, is there something peculiar about the episodes of expansionary fiscal consolidations and can one identify in which circumstances fiscal policy can have expansionary effects? Second, what are the channels through which these non-conventional effects operate?

Among the factors that have often been found to be relevant to characterise episodes of expansionary consolidations are the size of fiscal adjustment (as measured by a sufficient degree of improvement in structural budget balances), the composition (i.e. the extent to which it is achieved through tax increases or expenditure cuts) and the initial state of public finances (the debt/GDP ratio).
Most research has focussed on the response of private consumption to large fiscal policy adjustments. Fiscal retrenchments may lead to an increase in aggregate consumption already in the short run if households anticipate lower future tax liabilities. For these wealth and confidence effects, the role of consumers' expectations are crucial in determining the impact of fiscal consolidations on the short-run growth of consumption and these, in turn, are affected by the size of consolidations and by the state of public finances. Alesina et al (2002) focus on the effects of fiscal policy on business investment and concentrate on the supply side, in particular on how profits are affected through the impact of fiscal policy on real wages in the private sector. Fiscal consolidations may lead to higher expected profits and higher investment by reducing the tax burden on firms and inducing wage moderation. Also in this respect, the composition of the fiscal adjustment and the institutional characteristics of the labour market may play a major role.

The first section of the paper briefly discusses the existing theoretical explanations of possible non-Keynesian effects of fiscal policy. The main channels through which fiscal consolidations may lead to higher growth in the short run are highlighted and discussed. The following section makes a review of the empirical results about the impact of fiscal consolidations on growth and the conditions which underpin such outcome. It then identifies characteristics and effects of fiscal

consolidations in the EU through the examination of a dataset covering EU countries during the 1970-2002 period. The evidence shows that roughly half of the episodes of fiscal consolidations undertaken in EU countries exhibit potential non-Keynesian features, i.e., are followed by an acceleration in growth. Moreover, results seem to be quite robust with respect to the criteria used to identify consolidation episodes and output expansions. However, since these results are subject to possible misinterpretations (due especially to the difficulty of interpreting correctly the direction of causality and to properly account the impact of concomitant factors such as the stance of monetary policy) model simulations with the European Commission's QUEST model are presented in section 3, with the aim of investigating the likelihood of the emergence of expansionary effects from fiscal consolidation policies in a representative EU country.[1] The policy experiments performed with the QUEST model permit to evaluate the likely impact of fiscal retrenchment obtained either through tax increases or via cuts in different expenditure items, controlling for other factors, such as the stance of monetary policy. The model simulations allow also an evaluation of the relevance of the alternative channels through which fiscal policy operates identified in the theoretical literature. Results show that fiscal consolidations have in general a negative impact multiplier but that expansionary effects can emerge already in the short run. Moreover, the emergence of expansionary effects is more likely when fiscal adjustment is obtained through expenditure cuts.

[1] This section builds on work on the effectiveness of fiscal policy presented in European Commission (2002, Part IV.5), already pointing out that the multiplier is small and varies with the composition of the fiscal adjustment.

2. Expansionary budgetary consolidations

According to the standard Keynesian view fiscal multipliers are expected to be positive, although there are several factors (substitution effects, interest rates response, wealth effects, openness) that could explain values smaller than one. [2] The idea that fiscal policy may have short-run effects opposite to those predicted by the Keynesian model has been first suggested by Giavazzi and Pagano (1990) who, looking at the fiscal consolidation experiences of Denmark and Ireland at mid eighties, documented in both cases an acceleration in growth just after the governments put in place measures that drastically reduced budget deficits.

Table 1. Some puzzling effects of fiscal policy

Country	Year	Deficit/ GDP ([1])	Debt/ GDP	GDP growth ([2])
Denmark ([3])	1982	8.9%	62.5%	3.0%
	1986	-3.3%	62.3%	3.6%
Ireland	1986	10.5%	113.8%	0.3%
	1989	1.7%	100.1%	6.2%
Sweden	1989	-5.4%	45.3%	2.4%
	1993	12.2%	75.8%	-2.2%

Source: Giavazzi and Pagano (1996).
The table presents the changes in the fiscal stance and its impact on debt and GDP growth. Values are shown for the year before the consolidation (stimulus) started and its last year.
[1] Negative values correspond to a surplus
[2] Annual change.
[3] In Denmark the debt was on a downward path after a peak of 73.4% in 1984 and real GDP growth accelerated to 4.4% in 1984 before returning to the previous level in 1986.

Table 1 shows deficits and debt ratios, as well as GDP growth rates, in Denmark and Ireland during the cited fiscal consolidation episodes and in Sweden during the early nineties, when its deficit and debt rose dramatically. While growth accelerated after the Irish and Danish consolidations, the Swedish fiscal stimulus was followed by an output contraction.
The possibility that fiscal policy may have non-Keynesian effects has attracted increasing attention among academics. There is a large literature investigating empirically the cases of expansionary fiscal consolidations (for an overview, see section 3). Some of the research was directed at providing a conceptual framework in which non-Keynesian effects of fiscal policy could be rationalized. Most of this work has emphasised the consumption channel. If agents are forward-looking and rational in forming their expectations, they will anticipate that a tax cut today, financed by government debt, will translate into higher taxes at some point in the future. If, in addition, government intervention is non-distortionary, capital markets are perfect and consumers sufficiently long-lived, the so-called Ricardian equivalence will hold, namely, permanent income will be unaffected by fiscal policy, and so consumption. Under these abstract circumstances, fiscal multipliers will be zero, since higher government savings obtained through fiscal consolidations will be compensated by an equivalent reduction in private savings.[3]
However, if distortions introduced by taxation are taken into account a first reason for expecting non-Keynesian effects of fiscal policy emerges. This can be the case, for instance, when a current expenditure cut is expected to be offset in the future by a reduction in future distortionary taxes.

[2] For a recent survey on the estimated value of fiscal multipliers see, for instance, Hemming, Kell and Mahfouz (2002).

[3] If consumers have short-term horizons or are affected by liquidity constraints (as is the case in the QUEST model simulations in this paper) Ricardian equivalence will no longer hold, and fiscal policy will affect consumption according with the predictions of standard models in the Keynesian tradition (see, e.g., Blanchard, 1985).

In such a case agents' permanent income may increase due to reduction in the dead-weight losses introduced by taxation. Such a case for non-Keynesian effects of fiscal policy has been first illustrated by Blanchard (1990). In this model, it is shown that the effects of fiscal policy on aggregate consumption are likely to be *non-linear*. The reason for this is that the dead-weight loss of taxation increases significantly with the extent of taxation. So, if a consolidation is made starting from a low level of current debt, a traditional positive fiscal multiplier will result.[4] If instead a fiscal consolidation is made starting from a high debt level, consumption may react positively as a result of an expected increase in permanent income. The reason is that by consolidating now, the government will not raise taxes too much in the future to pay back the debt. Since the extent of distortions increase with the tax rate, this smoothing of government revenues reduces the dead-weight loss imposed by taxes, thus raising agents' permanent income.[5]
A different motive to expect fiscal policy to have non-linear effects has been proposed by Bertola and Drazen (1993). The assumption here is that when public expenditure become sufficiently high, then agents start anticipating a future major fiscal adjustment to occur. A consolidation occurring when public spending is high may then change agents' expectations concerning a future major retrenchment, thus raising permanent income and consumption. [6]
A further rationale for possible non-Keynesian effects through the consumption channel emerges if fiscal consolidations are assumed to affect the risk of government insolvency. By reducing their budget deficits, governments will signal to markets their willingness to switch to 'sound finances'. If this signal is taken as credible, interest premia on government bonds will fall. The consequent reduction in interest rates will in turn contribute to raise agents' permanent income, since they will discount future income streams at a lower rate. The crucial ingredient of this explanation for the emergence of non-Keynesian effects is the *credibility* of government action to make public finances sustainable. As emphasised, for instance, by Feldstein (1982), the credibility of the regime shift can be enhanced by the *size* of the consolidation. While small adjustments in the budget may be believed to be short-lived, major fiscal retrenchments may signal the willingness of the government to face the political costs associated with the shift to sound public finances. Furthermore, as illustrated for instance by Cotis et al. (1998), the introduction of fiscal rules for the maintenance of budgetary discipline (like the SGP) may also increase the credibility of the fiscal adjustment and thereby the likelihood of the emergence of non-Keynesian effects.

Expansionary consolidations working through the consumption channel act on aggregate demand, leaving supply conditions unaffected. Output expansions above potential obtained through the consumption channel are therefore inevitably short-lived. However, recent empirical research has shown that fiscal consolidations may produce significant short-run expansionary effects also through the investment channel, thus affecting not only demand but also supply factors (Alesina and Ardagna 1998, Alesina, Perotti and Tavares, 1998, Alesina et al., 2002). The rationale for fiscal policies producing non-Keynesian effects through an investment channel has been formalized in Alesina et al. (2002). The highlighted channel is not working via possible reductions in real interest rates associated with fiscal contractions as predicted by standard macroeconomic models. The link between fiscal policy and investment behaviour is rather represented by the labour market. As in models rationalising non-Keynesian effects through the consumption channel, agents are assumed to be forward-looking and to behave on the basis of the actual value of future income streams. The relevant agents are in this case firms, that decide about

[4] In Blanchard (1990) this is due to the fact that agents' horizons are short-term, since each of them are face with a constant positive probability of death. Hence, Ricardian equivalence does not hold in this model even in absence of tax distortions.

[5] Results similar to those to Blanchard (1990) are obtained in Perotti (1999). In this model, however, Ricardian equivalence does not hold on aggregate because of fraction of consumers are assumed to be liquidity-constrained.

[6] A similar non-linear effect of fiscal policy is obtained in Sutherland (1997).

their factor service purchases by looking at the present value of profits. Investment decisions are driven by the expected present value of the net marginal product of capital, which in turn is a negative function of real wages. Fiscal consolidations obtained through expenditure cuts can then reduce wage pressures and so increase short-run investments. The possibility for fiscal consolidations to exhibit non-Keynesian effects through the investment channel will then crucially depend upon the composition of adjustment (expenditure cuts versus tax increases) and on institutional factors, above all the working of the labour market.

In sum, a number of reasons have been identified in the theoretical literature that may explain why fiscal consolidations may have expansionary effects. The possibility of non-Keynesian effects working through the consumption channel is expected to be mainly affected by factors affecting the credibility of the adjustment and agents' expectations, such as the size of the consolidation and the initial state of public finances. The likelihood of non-Keynesian effects acting via the investment channel is instead crucially affected by the composition of the adjustment. As illustrated in the next section, the empirical research on budgetary consolidations has focused on the above factors to identify the characteristics of expansionary consolidations and the relevant channels.

3. Characteristics and effects of fiscal consolidations in the EU: evidence from cross-country analysis

3.1 Survey of existing studies

In existing cross-country studies, fiscal consolidations are defined in terms of a given improvement in the budget balance as a fraction of GDP achieved over a time period of several years, given ex-ante or determined ex-post. In order to exclude changes in the budget balance associated with the economic cycle, measures of the cyclically adjusted budget balance have generally been used. Moreover, in order to better isolate fiscal policies of discretionary type, interest expenditures have been deducted from the structural budget balance in most studies, i.e., changes in the primary cyclically adjusted budget balance have been adopted to identify consolidation periods.

Depending on the particular study considered, the concept of fiscal consolidation has been focused either on the idea of a sufficiently strong fiscal adjustments achieved in a given period (*size* criterion), or on the idea of a sufficiently long time period during which the budget balance constantly improves (*persistence* criterion). Some studies refer to a further refinement of the concept of consolidation, by defining as *successful* those consolidations that manage to bring about a sustained reduction in the debt/GDP ratio.

The methodologies adopted in the existing studies differ quite widely. In almost all studies there is a descriptive analysis of the sample characteristics of relevant fiscal and macroeconomic variables before, during and after consolidations periods. This permits to check the general requirement for the identification of expansionary fiscal consolidations: the occurrence of positive growth development after the fiscal adjustment. By looking at sample averages of fiscal variables it is possible to describe the characteristics (in terms of size of adjustment, initial conditions of public finances or composition of adjustment) of fiscal consolidations, and to identify how these characteristics differ depending on whether consolidations turned out to be expansionary or contractionary. In some studies Probit/Logit regressions have also been performed in order to identify econometrically the main factors affecting the probability for fiscal consolidation to be successful (Von Hagen, Hughes-Hallett and Strauch (2001) or expansionary (Alesina and Ardagna (1998). Sample evidence on relevant macroeconomic variables (e.g., interest rates, exchange rates) permits to judge whether fiscal consolidations have in general been accompanied by active monetary policies or devaluations. Some studies complement descriptive sample statistics with country case studies, aimed at better understanding the policy environment during consolidation periods (e.g., wage agreement policies, exchange rate devaluations,…).

In a number of studies, empirical verifications of theoretically grounded hypotheses are also provided. Giavazzi and Pagano (1996) estimate consumption functions to test whether fiscal consolidations may have non-Keynesian effects via the consumption channel, due to consumers' revised expectations and increased expected life-time income. Giavazzi, Pagano and Jappelli (2000) perform a similar test by estimating saving functions. Alesina et al. (2002) instead verify empirically the hypothesis that non-Keynesian effects of consolidations may come from the investment channel by estimating investment equations.

In spite of the above mentioned differences in methodology, a number of results are common to almost all studies.

- There is evidence of fiscal consolidations likely to exhibit non-Keynesian features in almost all studies.
- Consolidations leading to a permanent reduction in debt ('successful') are more likely to be expansionary.
- During expansionary consolidations both an acceleration in private consumption and business investment is observed.
- The policy environment in which fiscal consolidations are undertaken matters. In particular, the monetary, exchange rate and wage policies accompanying consolidations may affect significantly the impact of fiscal adjustments on growth.

Where consensus is missing is on the characteristics of expansionary fiscal consolidations. Some papers find that fiscal adjustments with expansionary effects are more likely when the size of consolidation is large (Giavazzi and Pagano, 1996, Giavazzi, Pagano and Jappelli, 2000). In other studies instead it is found that what is most significant to characterise expansionary consolidations is the composition of the adjustment. Fiscal adjustments based on expenditure cuts rather than tax increases have expansionary effects with a higher probability, especially if expenditure cuts are concentrated on public employees compensations and on government transfers (Alesina, Perotti and Tavares, 1998, Alesina and Ardagna, 1998, Alesina et al., 2002). Finally, there are studies that emphasize the initial state of public finances. Consolidations are more likely to have non-Keynesian effects when they occur in countries and periods where debt/GDP ratios are high (Alesina and Ardagna, 1998, Perotti, 1999).

Overall, although cross-country empirical analyses permit to shed light on several features of fiscal consolidations, the results arising from such analyses need to be interpreted with caution for a number of reasons. First, there are problems in measuring and defining fiscal consolidation episodes. In particular, relying on deficit-based measures tend to exclude fiscal reforms with a limited impact on current budget balances but potentially large effects on long-term public finances such as pension reforms. Second, existing empirical analyses quite often fail to take properly into account relevant factors, such as developments in monetary and exchange rate policies, that contribute to shape the links between fiscal consolidations and economic activity.[7] Third, when interpreting the links between fiscal policy and economic activity simultaneity issues are to be taken into account. Not only fiscal consolidations affect output growth, but actual and expected growth affect budget balances and policy makers' choices.[8] Finally, there is the possibility that results are driven to some extent by a sample selection bias problem. Most of the episodes of fiscal consolidations that, once started, have been aborted due to very adverse growth consequences are by definition missing from the samples used in cross-country analyses.

[7] In Von Hagen, Hughes-Hallett and Strauch (2001) there is an attempt to take into account the links between fiscal and monetary policies by estimating, together with output equations, fiscal and monetary policy reaction functions.

[8] Some studies (Giavazzi and Pagano, 1996, Giavazzi, Jappelli and Pagano, 2000) account for possible simultaneity problems by using 2SLS estimation techniques.

Table 2. Cross-country evidence on fiscal consolidations

Study	Definition of consolidation	Aim of the analysis	Type of analysis	Main findings
McDermott and Westcott (1996), IMF (1996). 20 OECD countries, 1970-95.	The primary structural balance improves by at least 1.5 % of GDP over 2 years and does not decrease in any year.	Analyse the characteristics and effects of successful consolidations, i.e., of consolidations leading to a 3 % of GDP reduction in debt.	Descriptive.	Successful consolidations leads on average to increased growth, unsuccessful to reduced growth. Size and composition both important to identify successful consolidations.
Giavazzi and Pagano (1996). 19 OECD countries, 1970-92.	The cumulative change in the primary structural balance is above a given threshold as a % of GDP (5, 4, or 3) over a given number of years (resp. 4, 3, or 2).	Analyse the existence of non-Keynesian effects of fiscal consolidations via the consumption channel.	Panel data estimation of consumption functions.	Size of adjustment is relevant to identify episodes exhibiting non-Keynesian features.
OECD (1996): 18 OECD countries, 1975-95.	The cumulative change in the structural budget balance is above 3 % of GDP over a period of at least 2 years.	Analyse characteristics and effects of fiscal consolidations.	Descriptive.	There were fiscal consolidations during which growth was above potential. Accommodating monetary policy seems to matter to limit output contractions.
Cour et al. (1996). 17 OECD countries, 1970-94.	Continuous improvement in the primary structural budget balance, with a period of at most three years during which the primary structural budget balance improves by at least 3 % of GDP.	Analyse characteristics and effects of fiscal consolidation episodes with a particular focus on the consumption channel of non-Keynesian effects.	Descriptive and estimation of consumption functions.	Size of adjustment is relevant to identify expansionary episodes.
Alesina, Perotti and Tavares (1998). 19 OECD countries, 1960-95.	The primary structural balance improves by at least 1.5 % of GDP.	Analyse characteristics and effects of fiscal consolidation, exploring alternative channels for non-Keynesian effects.	Descriptive.	Successful consolidations more likely to lead to expansions. Composition more important than size to identify expansionary episodes. Labour market structure also matters.
Alesina and Ardagna (1998). 20 OECD, 1960-94.	The primary structural balance improves by at least 2 % of GDP or by at least 1.5 % of GDP per year over two years.	Analyse characteristics and effects of fiscal consolidation, exploring alternative channels for non-Keynesian effects.	Descriptive, Probit regressions, collection of case studies.	Composition more important than size to identify expansionary episodes. Wage agreements and exchange rate devaluations are also relevant accompanying factors.
Perotti (1999). 19 OECD countries, 1965-94.	n.a.	Analyse whether initial fiscal conditions are relevant for the effects of fiscal policy.	Estimation of dynamic consumption functions.	High debt levels are associated with a higher probability for fiscal policy to have non-Keynesian effects.
Giavazzi, Jappelli and Pagano (2000). 18 OECD countries, 1970-96.	The structural balance improves by at least 1.5 % of GDP per year over two years.	Analyse the existence of non-Keynesian effects of fiscal consolidations via the consumption channel.	Panel data estimation of saving functions.	Size of adjustment is relevant to identify episodes exhibiting non-Keynesian features. Non-Keynesian effects more likely for tax changes than expenditure changes and for fiscal consolidations than for fiscal expansions.
Von Hagen, Hughes-Hallett and Strauch (2001). 20 OECD countries 1960-98.	The structural balance improves by at least 1.25 % of GDP per year over two years or by at least 1.5 % of GDP in one year and by a positive amount in a consecutive year.	Describe characteristics and effects of fiscal consolidations with special reference to the EU.	Descriptive analysis, case studies, Probit regressions, estimation of output equations and monetary and fiscal policy reaction functions.	Fiscal policies exhibit in general Keynesian effects, but in the EU in the nineties there is no evidence neither in favour nor against Keynesian effects.
Alesina et al. (2002). 18 OECD countries 1960-96	The primary structural balance improves by at least 2 % of GDP or by at least 1.25 % of GDP per year over two years.	Analyse the existence of non-Keynesian effects of fiscal consolidations via the investment channel.	Estimation of investment equations, descriptive analysis.	Cuts in public expenditure, particularly in public employees' compensations, boost investment. Expansionary consolidations associated with acceleration in investment growth.

3.2 Were there expansionary fiscal consolidations in the EU? A close look at the data

This section carries out a statistical analysis of the fiscal consolidations that took place in the EU in the past decades. The analysis covers the current EU countries with the exception of Luxemburg during the period 1970-2002.[9] The source of the data used in the analysis is the AMECO database developed by DG ECFIN. The main purpose of the analysis is that of identifying and describing the characteristics of the fiscal consolidation episodes that appear to be expansionary. An analysis of the macroeconomic scenario preceding and following the fiscal consolidation episodes is also provided. Compared with existing event studies of expansionary fiscal consolidations the focus here is on testing the robustness of this concept with respect to alternative definitions of fiscal consolidation episodes and of their expansionary status.

In the existing literature analysing fiscal consolidation episodes using country/year panel datasets, quite different definitions of fiscal consolidation have been proposed, so that the comparison of findings is not always easy and immediate. By fiscal consolidation period it is generally meant either (see table 2):
i) a period in which a given country experiences a sufficiently large improvement in its budget balance due to discretionary policy, or
ii) a period of continuous improvement of the budget balance due to discretionary policies,
or a combination of both the above criteria. In order to capture changes in the government budget balance of discretionary nature, consolidation periods are generally identified by looking in changes in cyclically adjusted figures for budget balances budget balance (possibly net of interest payments to isolate discretionary fiscal adjustments).

Criterion i) emphasizes the *size* aspect of the adjustment in a given time period, while criterion ii) focuses on the *persistence* aspect, i.e., the fact that fiscal consolidations are protracted policy actions, which are not reversed quickly. For instance, the definitions provided in Alesina and Ardagna (1998) or Alesina et al. (2002) mainly refer to the size criterion, while those in Cour et al; (1996), Giavazzi and Pagano (1996) or OECD (1996) refer especially to the persistence criterion (see table 2).

In several analyses there is reference to a further refinement of the concept of fiscal consolidation, i.e., that of 'successful' fiscal consolidation (see, e.g., Alesina and Ardagna, 1998, or Von Hagen , Hughes-Hallett and Strauch, 2001). By 'successful' consolidation it is meant a consolidation episode that contributes to improve the budget balance over a relatively long time period. In the following analysis there is no reference to the notion of successful consolidations.[10]

Concerning the definition of *expansionary* fiscal consolidations the criteria used in existing work differ widely. In general, for a fiscal consolidation period to be defined as expansionary, the economy must perform sufficiently well (e.g., growth sufficiently fast compared with respect to previous years or some benchmark growth rate) after the fiscal adjustment takes place. It is to

[9] The exclusion of Luxemburg is due to missing data. As will be clear in the following exposition, the very last years of the sample are necessarily dropped when identifying expansionary consolidations since it is not possible to evaluate countries growth performances after those years.

[10] The focus of the present analysis is in fact on the distinction between expansionary and non-expansionary consolidations. Moreover, the concept of successful consolidation tend to overlap with that of fiscal consolidation based on a persistence criterion.

note that the reference period considered to evaluate the growth performance of consolidating countries is generally a relatively *short-term* one (1 to 3 years after consolidation).
The benchmark definition of fiscal consolidation used in this study is taken from Alesina and Ardagna (1998). According to this definition, a year of fiscal consolidation is a "year in which the cyclically adjusted primary balance improves by at least 2 per cent of GDP or a period of two consecutive years in which the cyclically adjusted primary balance improves by at least 1.5 per cent per year, in both years". This notion of fiscal consolidation puts emphasis on the size of the improvement in the primary budget balance.
The benchmark notion of expansionary fiscal contraction used in the present study is the same as that proposed by Alesina et al. (2002). This criterion classifies as expansionary an episode of fiscal consolidation if "the average real GDP growth in each adjustment year and in the two years after is greater than the average real GDP growth in the two years before". [11]

In section 3.2.1, keeping constant the benchmark definition of expansion, expansionary consolidation periods will be identified and described according with the benchmark size-based definition of consolidation and with an alternative criterion of consolidation based on persistence.
In section 3.2.2 instead, keeping constant the size-based benchmark definition of consolidation, expansionary consolidation periods will be identified and described according with the benchmark definition of expansion based on growth acceleration with alternative expansion criteria: acceleration in trend growth, in the cyclical component of growth and on the growth differential with the EU average.

In identifying expansionary consolidations, a further distinction will be made, in order to isolate those expansionary consolidation episodes that are unlikely to be attributable to concomitant monetary policy easing or exchange rate devaluation policies. It has been shown in fact that fiscal contractions have been quite frequently accompanied by expansionary monetary policies in EU countries (see, e.g., OECD, 1996, Alesina and Ardagna, 1998). The notion of *'pure' expansionary* fiscal consolidation is thus proposed as one during which short run real interest rates do not fall.[12]
Several characteristics of consolidation periods are analysed including their size, the initial state of public finances and how the fiscal adjustment is achieved (tax increases or expenditure cuts). The macroeconomic environment before, during and after consolidation periods is analysed by reporting average statistics on growth, output gaps, interest rates and on the change in the different components of aggregate demand.

3.2.1 When does a fiscal consolidation occur?

The first exercise is that of comparing the characteristics of expansionary fiscal consolidations that arise using different definitions to identify consolidation episodes.

[11] The above criterion is different, for instance, with respect to that employed in Alesina and Ardagna (1998) which specifies that the average real GDP growth rate (in difference from the G7 average) in the period of consolidation and in the two years after must be greater than the average value of the same variable across all episodes of consolidation. While the concept of expansion used in Alesina et al. (2002) selects consolidation periods after which growth picked up, that in Alesina and Ardagna (1998) identifies those consolidation episodes after which growth has been higher compared with average consolidation periods. In this study the criterion based on growth acceleration is chosen as the benchmark because it is better suited to identify fiscal consolidation episodes potentially exhibiting non-Keynesian features.

[12] Under likely assumptions, non decreasing real interest rates tend to exclude both monetary expansions under floating exchange rates and devaluation policies under fixed exchange rates regimes. This the case for instance in a Mundell-Fleming open economy setting with uncovered interest rate parity (see, e.g., Krugman and Obstfeld, 2001).

To this end, the results obtained when using the benchmark definition by Alesina and Ardagna (1998) based on the size of adjustment are compared with an alternative definition based on the persistence of adjustment. According to this alternative criterion, fiscal consolidations occur when the primary cyclically adjusted budget balance improves by at least 3 percentage points of GDP over three years (the note to table 3 provides a formal definition).

Table 3. Expansionary consolidations: description of episodes with alternative definitions of consolidation

	Size	Persistence
Number of consolidation episodes	49	59
Number of expansionary episodes	24	32
Number of 'pure' expansionary episodes	11	16
Description of expansionary episodes		
BE	1984, 1985	1985, 1986, 1987
DK	1983, 1984	1984
DE	1982	1982, 1983, 1984
EL	1982,1987, 1994, 1996	1986,1987, 1991, 1994
ES	1986	1994, 1997, 1998
FR	..	1996, 1997
IE	1976, 1987, 1988	1984, 1987, 1988, 1989
IT	1976, 1977, 1993	1993
NL	1993	1982, 1983
AT	..	1996, 1997
PT	1986	..
FI	1993	1977
SE	1983, 1987, 1995, 1998	1982, 1983, 1984, 1985, 1987
UK	1997	1981, 1982, 1997

Definitions of fiscal consolidation.

Size: The primary cyclically adjusted budget balance improves by at least 2 percentage points of GDP at time t or by at least 1.5 points in two consecutive years (i.e., t and t-1 or in t and t+1).

Persistence: The primary cyclically adjusted budget balance improves by at least 3 percentage points of GDP over three consecutive years (i.e., between t-2 and t, or between t-1 and t+1 or between t and t+2) and in each year the change in the primary cyclically adjusted budget balance cannot be below –0.5 percentage points of GDP:

Definition of an expansionary fiscal consolidation.

A fiscal consolidation in which the average real GDP growth between t and t+2 is greater than between t-1 and t-2.

Definition of a pure expansionary consolidation.

An expansionary fiscal consolidation in which the average change in real short run interest rates between t-1 and t+1 is non-negative.

Source: Commission services

Table 3 reports the number of fiscal consolidations identified and describes countries and periods for expansionary episodes. In the sample of 462 observations used (14 EU countries, 33 years) 49 fiscal consolidation episodes of have been identified which are consistent with the definition

based on size.[13] Using the concept of fiscal consolidation based on persistence, the number of consolidation episodes rises to 59.
Concerning the number of expansionary episodes, roughly half of the total number of consolidation experiences amounts to be expansionary. This result does not seem to depend on the definition of fiscal consolidation employed (size or persistence). Refining further the concept of expansionary consolidation to account for the monetary stance or possible devaluations, 11 and 16 consolidation episodes using, respectively, the size and the persistence concept of consolidation period are found to be 'pure'.
Concerning the description of the expansionary consolidation episodes, it is confirmed the evidence of expansionary effects registered in Belgium, Denmark and Ireland reported in previous studies. Sweden also appears to be have been characterised by expansionary consolidations at mid eighties and, if referring the a 'size criterion', in the late nineties. The identification of expansionary consolidations in the remaining EU countries depends quite strongly on the concept used to define consolidation periods. Overall, the correlation index between 'size' and 'persistence' expansionary consolidation indicators is positive but quite low (0.33).[14]

Table 4 reports statistics concerning the characteristics (size of adjustment, initial state of public finances, composition of adjustment) of the fiscal consolidations identified, distinguishing whether the consolidation proved to be expansionary or not. Results appear to be very robust with respect to the concept of fiscal consolidation employed (size or persistence) and supportive of findings reported in previous studies (Alesina and Ardagna, 1998, Alesina et al., 2002). In particular, the size of adjustment (measured by the change in the primary cyclically adjusted budget balance) does not seem to be significantly different between expansionary and non-expansionary consolidation periods. Concerning the initial state of public finances, the average value of debt/GDP ratios are found to be higher in expansionary fiscal consolidation periods by about 10 GDP percentage points, irrespective of the concept of consolidation employed (size or persistence). However, t tests show that this difference is not statistically significant.[15] What appears to be relevant to distinguish expansionary from non-expansionary periods of fiscal adjustment is the composition of consolidation. Fiscal adjustments based on expenditure cuts are more likely to be expansionary than consolidation periods based on tax increases. Looking at overall values for primary expenditure and of government revenues (cyclically adjusted or not) differences are statistically significant irrespective of the concept of consolidation employed (size or persistence). The definition of consolidation appears to matter instead as far as the composition of expenditure is concerned. In particular, the reduction in the public wage bill, found to be relevant to characterise expansionary fiscal consolidations in other studies, is significantly higher in expansionary than in non-expansionary consolidations only when adopting a persistence-type definition of fiscal consolidation.

[13] The episodes may not coincide with those reported in Alesina and Ardagna (1998) because the method used to obtain cyclically adjusted figures differ (HP filter in the present study, Blanchard' -trend regressions in Alesina and Ardagna, 1998).

[14] Expansionary consolidation indicators take the value 1 for country/year combinations in which an expansionary consolidation occur and zero otherwise.

[15] When performing comparisons between variables, t tests permit to take into account both measures of position (averages) and of variability (standard deviations). This helps in understanding when apparently large differences in averages are mainly driven by the fact that variables are highly volatile.

Table 4. Size and composition of expansionary consolidations: alternative definitions of consolidation

Criterion for fiscal consolidation	Size			Persistence		
	Average values		t test for (1)≠(2)	Average values		t test for (3)≠(4)
	(1)	(2)		(3)	(4)	
Variables (change as a % of GDP)	Non exp.	Exp.		Non exp.	Exp.	
Primary CAB	2.9	2.8	0.8	1.7	1.6	0.2
Debt (level as a % of GDP)	65.4	75.1	-0.9	61.9	76.0	-1.5
Primary expenditure	0.0	-1.6	2.9**	0.1	-1.1	2.8**
Government investment	-0.2	-0.3	1.6	-0.1	-0.3	2.0**
Public employees compensation	0.0	-0.2	1.4	0.0	-0.2	1.9*
Total government revenues	2.3	1.0	4.1**	1.4	0.5	2.9**
Total cyclically adjusted government revenues	2.4	1.1	3.3**	1.3	0.4	2.6**

Notes: t test values labelled by * and ** refer, respectively, to cases in which the average value of variables during expansionary and non expansionary consolidations are statistically different at a 90 and 95 confidence interval.

Source: Commission services

Table 5 presents data characterising the macroeconomic environment preceding, during, and following consolidation periods. Several results emerge. First, consolidations are more likely to be expansionary after periods characterised by relatively low growth and by negative output gaps. Second, as expected, growth appears to accelerate during the consolidation year and during the following year for expansionary episodes, while in non-expansionary episodes growth is more likely to decelerate. Trend growth accelerates in expansionary consolidation periods when consolidation is defined according to persistence, while trend growth appears to be constant before and after consolidation when using a definition based on size. As for unemployment, it worsens during non-expansionary consolidations, while this is not the case for expansionary fiscal adjustments.

Third, both private consumption and business investment accelerate during expansionary consolidation periods, with investment registering a much higher acceleration. It is also to note that during non expansionary periods, investment decelerates and even drops after the consolidation (negative growth rates of investment).[16] Moreover, during consolidation periods an acceleration in TFP growth is recorded. Concerning the current account balance, while during non-expansionary consolidations a marked worsening of the current account is observed, this is not the case for expansionary consolidations.

Finally, during consolidation periods, both expansionary and non-expansionary, there is a reduction in nominal interest rates, irrespective of the definition of consolidation employed. This finding is consistent with the fact that in these periods the fiscal stance is meant to be

[16] It should be noted that, in spite of the greater variability of investment, the contribution of consumption changes to growth is always higher than that of investment, due to a larger weight on total aggregate demand.

contractionary. Moreover, falling short run nominal interest rates are a possible indication of concomitant monetary expansions or exchange rate devaluations.[17]

Table 5. Macroeconomic environment in expansionary consolidations: alternative definitions of consolidation

Criterion for fiscal consolidation	Size		Length	
Variables	Non exp.	Exp.	Non exp.	Exp.
Growth rate of real GDP (%)				
t-1	2.6	1.6	2.6	1.2
t	1.1	2.1	2.0	2.2
t+1	0.7	3.4	2.4	3.1
Output gap (% of trend output)				
t-1	0.4	-1.1	0.3	-1.8
t	0.2	-1.5	0.2	-1.6
t+1	-0.3	-0.8	0.7	-1.0
Trend GDP growth				
t-1	2.6	2.6	2.9	2.5
t	2.5	2.6	2.8	2.6
t+1	2.5	2.6	2.7	2.8
Growth rate of real private consumption (%)				
t-1	2.4	1.4	2.3	1.3
t	1.4	1.8	1.7	1.9
t+1	1.5	3.0	2.3	2.6
Growth rate of real business investment (%)				
t-1	3.5	0.3	5.4	0.6
t	-0.6	3.7	0.5	3.5
t+1	-3.3	6.7	-1.5	6.4
Growth rate in real current account surplus (%)				
t-1	3.0	0.1	3.1	0.0
t	-0.1	-0.2	-4.1	0.0
t+1	-0.2	0.4	-4.3	-0.5
Growth rate in TFP (% change)				
t-1	0.9	1	1.2	0.9
t	0.2	1.6	0.8	1.7
t+1	0.2	2.1	1.3	2.1
Unemployment rate (% of labour force)				
t-1	6.5	8.7	7	9.5
t	6.9	9	7.6	9.4
t+1	8.9	8.9	7.9	9.1
Short run nominal interest rates				
t-1	11.3	12.5	10.9	9.7
t	10.9	11.5	10.2	9.3
t+1	9.9	10.2	9.8	8.6

[17] Depending upon the evolution of inflation, falling nominal interest rates may not correspond necessarily to effectively monetary easing. However, in most of the cases, real interest rates also appear to fall between t and t-1, both during expansionary and non-expansionary consolidations, while changes between t and t+1 show a less clear pattern (unreported). Concerning nominal exchange rates, it is found that during both expansionary and non-expansionary consolidations the exchange rate of the consolidationg country with respect to the US dollar tends to depreciate overall the whole period between t-1 and t+1 (unreported).

3.2.2 When is a fiscal consolidations expansionary?

The second exercise undertaken is that of analysing the robustness of the characteristics of expansionary fiscal consolidations with respect to different criteria to identify expansionary episodes.
To this purpose, the benchmark size-based definition of consolidation is kept constant and different definitions of expansion are used. Three alternatives to the benchmark expansion definition by Alesina et al. (2002) are proposed.
The first definition employs the notion of trend output growth as opposed to real GDP growth to identify expansionary episodes (see note to Table 6 for the formal definition). The idea in this case is that an episode of fiscal adjustment is meant to be expansionary provided it is associated with an acceleration of trend output. The second definition of expansion proposed is complementary to the previous one. According to this definition an episode of fiscal consolidation is expansionary provided it is associated with an increase in the difference between actual and trend output growth. The previous definitions of expansion permit to distinguish consolidation periods associated with positive developments in the economic cycle from those which are associated with positive output developments of a more structural nature. A final criterion proposed to define expansionary episodes defines as expansionary those fiscal consolidations that are associated with an increase in the difference between the growth rate in countries' GDP and the EU average GDP. The aim of this criterion is that of identifying those expansionary episodes which are associated with a growth acceleration which is not attributable to the EU-wide economic cycle.

Table 6 reports the number of fiscal consolidations identified and describes countries and periods for expansionary episodes.
Irrespective of the definition used to identify expansionary episodes, the number of expansionary consolidations is about 20, i.e. roughly half the total number of consolidation experienced in EU countries.
Adopting the narrower definition of 'pure' expansionary consolidation, i.e., excluding the expansionary consolidation periods likely to be associated with monetary expansions or exchange rate devaluations, the number of expansionary episodes reduces to about 10. Again, this result is fairly robust with respect to the definition of expansion used.
So, irrespective of the definition of expansion used, about half of the consolidation periods experienced by EU countries appear to be expansionary, and about one fourth appear to be 'pure' expansionary (not likely to be accompanied by expansionary monetary policies or devaluations).
Turning to the description of the expansionary consolidation episodes, all criteria used to identify expansionary episodes permit to isolate the experiences of Denmark (1983-1984) and Ireland (1987-1988) which, since Giavazzi and Pagano (1990), are known to be the classical examples of fiscal adjustment exhibiting possible non-Keynesian features. Expansionary fiscal consolidations are found in Spain and Portugal in 1986 as well as in West Germany in 1982. No expansionary episodes are instead found in France. Findings concerning Greece, Italy, Sweden and the UK depend quite crucially on the criterion chosen to define an expansionary adjustment. Concerning Finland, not surprisingly an expansionary period in 1993 is found using all criteria except that based on trend growth, since results are very much driven by the strong output contraction experienced in 1991.

Table 6. Expansionary consolidations: description of episodes with alternative definitions of expansion

	Growth	Trend growth	Actual minus trend growth	Actual minus EU growth
Number of consolidation episodes			49	
Number of expansionary. episodes	24	22	23	21
Number of 'pure' expansionary episodes	11	11	10	10
Description of expansionary episodes				
BE	1984, 1985	1984, 1985	1984, 1985	1984, 1993
DK	1983, 1984	1983, 1984	1983, 1984	1983, 1984
DE	1982	1982	1982	1982
EL	1982,1987, 1994, 1996	1986,1987, 1991, 1994, 1996	1982,1987, 1994, 1996	1982,1991, 1994, 1996
ES	1986	1986	1986	1986
FR	..	..	..	..
IE	1976, 1987, 1988	1987, 1988	1976, 1987, 1988	1987, 1988
IT	1976, 1977, 1993	1997	1976, 1977, 1993	1976, 1977, 1992, 1993
NL	1993	..	1993	1993
AT	..	1984	..	..
PT	1986	1986	1986	1986
FI	1993	..	1993	1993
SE	1983, 1987, 1995, 1998	1995, 1996, 1998	1983, 1987, 1995, 1998	1983, 1998
UK	1997	1980, 1997, 1998	..	..

Notes:
All fiscal consolidations are of the size-type (see note to table ?).
A 'pure' expansionary fiscal consolidation is an expansionary fiscal consolidation in which the average change in real short run interest rates between t-1 and t+1 is non-negative.

Definitions of expansionary fiscal consolidation

Growth:	average real GDP growth between t and t+2 greater than between t-1 and t-2.
Trend growth:	average trend growth between t and t+2 greater than between t-1 and t-2.
Actual minus trend growth:	average difference (actual real growth - trend growth) between t and t+2 greater than between t-1 and t-2.
Actual minus EU growth:	average difference (actual real GDP growth – EU average real growth) between t and t+2 greater than between t-1 and t-2.

Source: Commission services

Table 7. Correlation indexes among alternative indicators of expansionary consolidations

	Growth	Trend growth	Actual minus trend growth	Actual minus EU growth
Growth	1	..	..	..
Trend growth	0.63	1	..	..
Actual minus trend growth	0.98	0.60	1	..
Actual minus trend growth	0.76	0.51	0.78	1

Correlation indexes (reported in table 7) among expansionary consolidation indicators based on different definitions of expansion help to understand the extent to which alternative criteria tend to yield overlapping results. The benchmark criterion based on the acceleration of real GDP growth is highly correlated (0.98) with the criterion based on the acceleration of the cycle (actual minus trend growth), while the correlation with the trend growth criterion is more limited (0.63). The trend growth criterion has also a quite low correlation with the cycle criterion (0.6) and with that based on actual minus EU growth (0.51).
Table 8 reports average values and t tests for the characteristics of the fiscal consolidations identified, distinguishing according to the expansionary status of the consolidation and repeating the analysis for the different definitions of expansion.

Results are fairly robust with respect to alternative definitions of expansion (based on growth, trend growth, difference between growth and trend growth, difference between growth and EU average growth). In general, there is support for the view that the composition of adjustment is more significant to identify expansionary episodes than it is the size of adjustment. Consistently with the argument proposed by Alesina et al. (2002) it is also found that during expansionary consolidations there is a more marked reduction in expenditure on public employees' wage bill. However, this difference is significant (and highly so) only when a criterion of expansion based on trend growth is chosen. This finding is consistent with the idea that the link between the wage bill of public employees and real output is through higher profits and then greater investment. To the extent that investment affects both demand and supply conditions, one should expect trend output to be affected, while this is not the case if the link is a purely demand one.
Table 9 shows data illustrating the macroeconomic environment before, during, and after consolidations. It confirms the result that expansionary consolidations follow in general periods of low growth and negative output gaps.
Regarding the behaviour of aggregate demand components, again, both private consumption and business investment accelerate during expansionary consolidation periods, with investment registering a greater acceleration. The finding that during non-expansionary periods investment decelerates quite significantly is also confirmed and robust with respect to the notion of expansion adopted. Again, the level of short run nominal interest rates falls during fiscal consolidation, both expansionary and non-expansionary, irrespective of the definition of expansion used.
What seems to differ quite significantly depending on the definition of expansion adopted is the behaviour of the current account balance. When the expansion is measured by trend growth the current account balance worsens during expansionary consolidations, while the opposite is true when the other criteria for consolidation are used. This result is of interest. It indicates that a less unfavourable evolution of the current account balance helps to identify fiscal consolidation episodes leading to cyclical improvements, but not those associated with growth improvements of a structural nature. In the latter cases in fact the current account gives on average a negative contribution to the evolution of growth. The view that expansionary fiscal consolidations should be seen as a phenomenon mainly associated with exchange rate depreciations or devaluations and consequent current account improvements is thus not supported.

Table 8. . Size and composition of expansionary consolidations: alternative definitions of expansion

Criterion for expansion	Growth			Trend growth			Actual minus trend growth			Actual minus EU growth		
	Average values		t test for	Average values		t test for	Average values		t test for	Average values		t test for
Variable (change as a % of GDP)	(1) Non exp.	(2) Exp.	(1)≠(2)	(3) Non exp.	(4) Exp.	(3)≠(4)	(5) Non exp.	(6) Exp.	(5)≠(6)	(7) Non exp.	(8) Exp.	(7)≠(8)
Primary CAB	2.9	2.8	0.6	2.9	2.8	0.2	2.9	2.8	0.3	2.9	2.7	0.7
Debt (level as a % of GDP)	65.4	75.1	-0.9	63.9	77.7	-1.6	64.8	76.2	-1.2	61.6	81.1	-2.2**
Primary expenditure	0.0	-1.6	3.2**	0.0	-1.8	3.6**	-0.1	-1.6	3.0**	-0.4	-1.4	1.7*
Government investment	-0.2	-0.3	1.9	-0.2	-0.3	-0.13	-0.2	-0.3	1.8*	-0.2	-0.3	0.0
Public employees compensation	0.0	-0.2	1.6	0.1	-0.4	4**	0.0	-0.2	1.3	0.0	-0.2	1.2
Total government revenues	2.3	1.0	3.9**	2.2	0.9	4.1**	2.2	1.0	3.4**	2.0	1.1	2.8**
Total cyclically adjusted government revenues	2.4	1.1	3.3**	2.6	0.8	4.9**	2.3	1.1	2.9**	2.1	1.2	2.1**

Note: t test values labelled by * and ** refer, respectively, to cases in which the average value of variables during expansionary and non expansionary consolidations are statistically different at a 90 and 95 confidence interval.

Source: Commission services

Table 9. Macroeconomic environment in expansionary consolidations: alternative definitions of expansion

Definition of expansion	Growth		Trend growth		Actual minus trend growth		Actual minus EU growth	
Variable	Non exp.	Exp.	Non exp.	Exp.	Non exp.	Exp.	Non exp.	Exp.
Growth rate of real GDP (%)								
t-1	2.6	1.6	2.2	2.0	2.6	1.6	2.8	1.1
t	1.1	2.1	1.2	2.1	1.2	2.1	1.3	2.0
t+1	0.7	3.4	1.6	2.7	0.8	3.4	1.3	3.1
Output gap (% of trend output)								
t-1	0.4	-1.1	0.9	-1.9	0.3	-1.1	0.0	-0.7
t	0.2	-1.5	0.1	-1.6	0.1	-1.5	-0.3	-1.1
t+1	-0.3	-0.8	-0.2	-1.0	-0.3	-0.8	-0.2	-1.0
Trend GDP growth								
t-1	2.6	2.6	3.1	2.0	2.6	2.6	2.6	2.5
t	2.5	2.6	2.9	2.2	2.5	2.6	2.6	2.5
t+1	2.5	2.6	2.8	2.3	2.5	2.6	2.6	2.6
Growth rate of real private consumption (%)								
t-1	2.4	1.4	2.1	1.7	2.5	1.3	2.3	1.4
t	1.4	1.8	1.2	2.0	1.5	1.7	1.8	1.3
t+1	1.5	3.0	1.5	3.1	1.5	3.0	1.9	2.6
Growth rate of real business investment (%)								
t-1	3.5	0.3	0.4	3.4	3.7	0.0	4.5	-0.8
t	-0.6	3.7	-0.6	4.1	-0.3	3.6	1.8	1.2
t+1	-3.3	6.7	-2.6	6.8	-2.7	6.5	-0.7	4.9
Growth rate in real current account surplus (%)								
t-1	3.0	0.1	0.3	2.6	2.8	0.1	2.2	0.3
t	-0.1	-0.2	0.1	-0.4	-0.1	-0.3	0.0	-0.4
t+1	-0.2	0.4	0.0	0.2	-0.2	0.4	0.0	0.2
Growth rate in TFP (%)								
t-1	0.9	1	0.7	1.2	0.9	1	1.3	0.4
t	0.2	1.6	0.5	1.4	0.3	1.6	0.2	1.7
t+1	0.2	2.1	0.8	1.5	0.2	2.2	0.4	2.0
Unemployment rate (% of labour force)								
t-1	6.5	8.7	6.2	7.9	6.5	8.7	6.6	8.8
t	6.9	9	7	8	6.9	9.2	6.9	9.4
t+1	8.9	8.9	7.5	8	7.4	9	7.2	9.4
Short run nominal interest rates								
t-1	11.3	12.5	12.4	11.4	11.0	12.8	10.3	13.2
t	10.9	11.5	12.0	10.5	10.6	11.8	9.5	12.7
t+1	9.9	10.2	10.8	9.3	9.7	10.5	8.9	11.2

Source: Commission services

Summary of findings

The analysis carried out in this paper leads to a number of findings that can be summarised as follows.

- Fiscal consolidation episodes exhibiting non-Keynesian features can be found in Europe also relying upon alternative definitions of fiscal consolidation and on different criteria to identify

expansionary fiscal adjustments. After about half of the consolidation episodes some measure of growth appears to accelerate. Moreover, after roughly one fourth of the consolidation periods there is an improvement in growth indicators even controlling for changes in real interest rates. Hence, there is an indication that roughly half of the expansionary fiscal consolidations are unlikely to be attributable to concomitant monetary policy easing or devaluations.

- Irrespective of the definition of fiscal consolidation or expansion employed, expansionary fiscal consolidations are more likely to be based on expenditure cuts than on tax increases. Expansionary fiscal adjustment periods also appear to be associated with initial high levels of debt, while the size of adjustment is not significantly different from that of non-expansionary consolidations. Consistent findings are found in previous studies (Alesina and Ardagna, 1998, Alesina et al., 2001). The result that expansionary consolidations are more likely to be based on cuts in wage expenditure is instead quite fragile with respect to the definition of fiscal consolidation or expansion used.
- The macroeconomic environment preceding expansionary consolidation periods is characterized by slow growth and negative output gaps compared with that characterizing non-expansionary consolidations. This finding appears robust with respect to the definition of consolidation used and the definition of expansion adopted.
- There is evidence that the acceleration in growth following fiscal consolidations may have either a structural nature (trend growth is affected) or a cyclical one, or have both a structural and a cyclical component. During expansionary consolidations both consumption and investment accelerate. The behaviour of business investment seems especially helpful in distinguishing between expansionary and non-expansionary episodes. Irrespective of the definition of consolidation and expansion used, while in non-expansionary cases investment falls, in expansionary periods there is a strong acceleration in this component of aggregate demand.

It is to recall that the above results are to be interpreted with caution. As mentioned in section 3.1., cross-country empirical analysis on fiscal consolidations are subject to a series of problems and limitations. In particular, in interpreting results referred to the short-run, it is quite difficult to understand to what extent consolidations affect growth or it is actual and expected output growth to affect budget balances and budget policies.[18] Moreover, it is quite difficult to isolate the effect of external factors (such as monetary and exchange rate policies) that shape the links between fiscal consolidations and economic activity.

An ideal way to overcome the above difficulties in interpreting empirical evidence would be that of creating an artificial policy experiment in which a fiscal policy shock occurs in isolation from other policies and from other types of shocks to macroeconomic variables. Though real-world policy experiments are not feasible, the use of applied macroeconomic models help to understand how such hypothetical policy experiments would work in reality. The next section presents simulations on the effects of alternative types of fiscal consolidations from the DG ECFIN QUEST model.

[18] The possibility of a mistaken interpretation of results is somehow supported by the fact that expansionary consolidations are more likely to occur after weak growth and when output gaps are negative. The growth pick-up observed after expansionary consolidations may therefore be related to some extent to independent cyclical developments. However, even restricting the analysis to relatively homogenous cases from the viewpoint of cylical conditions the evidence still seems potentially consistent with the hypothesis of consolidations with non-Keynesian effects. By limiting the sample to fiscal consolidations episodes (according to the benchmark definition) occurring when output is within 2 percentage point from potential (which is the case for about 80 per cent of the cases), average growth is 1.7, 1.4 and 1.8, respectively in the year before, during and after consolidation.

4. A model-based assessment of the effects of fiscal consolidations: simulation results from the QUEST model

Introduction

In order to analyse the effects of alternative types of fiscal consolidations model simulations with the European Commission's QUEST model are presented here. QUEST is a macroeconomic model whose foundations can be characterised as a modern version of the neoclassical-Keynesian synthesis. Behavioural equations in the model are based on intertemporal optimisation of households and firms with forward-looking expectations.[19] Prices adjust sluggishly and the nominal wages response is delayed because of overlapping wage contracts. The model has Keynesian features in the short run, but the effectiveness of fiscal policy is more limited than in the traditional econometric models because of the built-in intertemporal budget constraints. Since planning horizons are finite there is no complete tax discounting and Ricardian equivalence does not hold. Moreover, total consumption is represented as the aggregation of the responses of two groups of households, one forward-looking group that follows the optimal consumption rule given by the life cycle/permanent income hypothesis and a liquidity-constrained group whose consumption depends on current disposable income.

$$C_t = (1-\lambda) * \delta [H_t + F_t] + \lambda * Ydis_t \qquad (1)$$

where λ is the share of liquidity constrained consumption, *H* human wealth, *F* financial wealth and *Ydis* current real disposable income.

Consumption and saving behaviour of the first group is based on the concept of intertemporal utility maximisation of households under a finite planning horizon. Consumers decide how much to consume and how much to save each period by maximising the present discounted expected utility from the consumption stream subject to their intertemporal budget constraint. Human wealth *H* is the present discounted value of the entire future stream of after-tax income (including unemployment benefits *U.ben*)

$$H_t = E_t \sum_{j=0}^{\infty} b_{tj} \left[(1-t_l) L_{t+j} w_{t+j} + U_{t+j} ben_{t+j} \right]$$

and financial wealth *F* equals the sum of total equity wealth *V*, bonds and net foreign assets *NFA*

$$F_t = V + B + M + NFA$$

The second group of consumers is 'liquidity constrained' and cannot achieve intertemporal optimisation. Hence, their consumption is represented as a function of current real disposable income ('rule-of-thumb' consumers).

[19] The model has a richer theoretical structure than most macroeconometric models. Moreover, compared with standard computable dynamic general equilibrium models it allows for adjustment costs and nominal rigidities. For a presentation of QUEST II model, see Roeger and in 't Veld (1997,2002).

Taxes are in general distortionary in the model and affect long term employment and capital formation and consumption decisions by private agents. Consolidations through tax increases have therefore long term negative consequences in the model. The only exception to this is lump-sum taxes, which do not create any distortions, but this is of limited practical relevance.

Many of the above mentioned factors that could rationalise non-Keynesian effects are present in the model. A reduction in government expenditure in QUEST affects consumption of the liquidity-constrained households who see their current disposable income decline if wages and employment are falling. However, the non-liquidity-constrained households could increase their consumption as interest rates fall and if they anticipate higher disposable incomes in the future. The removal of distortions that this entails could boost employment and output and already affect life time income in the short run. Expansionary effects through the consumption channel may occur in the medium term, but if a sizeable share of households is liquidity constrained, it is unlikely that in the short run already the boost to consumers' spending that might result from this will be strong enough to offset the negative impact of the reduction in government spending. Thus, the emergence of non-Keynesian effects of fiscal consolidations through consumers' spending crucially depends on the severity of credit constraints and on the degree of distortions associated with public intervention.

Besides the consumption channel, QUEST allows for the working of non-Keynesian effects through the investment channel. A reduction in public expenditure, in particular public employment, will raise unemployment and exert downward pressure on wages. This in turn tends to boost profits and raise investment spending. This is the investment channel emphasised, for instance, in Alesina et al. (2002).

The investment specification in the QUEST model is based on profit maximisation by firms, assuming that investment is subject to adjustment costs, which are a convex function of the rate of change of the firm's capital stock. The optimisation problem yields the following investment rule

$$I_t = \frac{1}{\phi}\left(\frac{q_t}{(PI_t / P_t)} - 1\right)K_t \qquad (2)$$

where ϕ is the adjustment cost parameter, K the capital stock and PI_t/P_t denotes the relative price of investment goods relative to the GDP deflator. The shadow price of capital q is equal to the marginal product of capital plus any anticipated future events which are expected to influence the marginal product after period t. It is a function of current and discounted future expected profitability, including adjustment costs, and adjusted for profit taxes tc and monopoly rents.

The investment channel emphasised in Alesina et al (2002) operates in the model through the wage setting specification which states that the real wage negotiated each period is the outcome of a Nash bargaining solution and depends on the reservation wage (value of leisure, unemployment benefits), labour productivity and a measure of labour market tightness (unemployment). If a fiscal consolidation affects the latter and puts downward pressure on wages, it will have a positive effect on investment by raising expected profitability.

The question arises whether the non-Keynesian channels described above could prevail over the traditional Keynesian channels and lead to expansionary fiscal consolidations. Moreover, if this is the case, it is relevant to understand which type of fiscal consolidations are more likely to be non-

Keynesian. These questions are addressed in this section by simulating fiscal consolidations with the QUEST model for Germany.

For comparability all scenarios are of equal *ex-ante* size and standardised to consolidations of 1 percentage points, i.e. permanent increases in taxation or reductions in expenditure of 1 per cent of (baseline) GDP [20]. This implies that two of the factors that are generally investigated in analysing fiscal consolidations, *i.e.* the size of the adjustment and the initial state of public finances, are not directly explored here. [21] The policy experiments are also applied to one country in isolation (Germany) and no attention is paid to possible cross-country spill-over effects. [22]

The default monetary policy assumption in the scenarios described below is based on a forward looking Taylor-type rule. The monetary authorities are assumed to set short-term interest rates at a level that depends both on the deviation of the forecast of inflation from the target inflation rate and on the magnitude of the output gap. To evaluate the impact of the monetary policy stance on the effects of fiscal consolidation, an alternative monetary policy rule, leading to a looser policy stance, is also considered.

The first set of scenarios assume that the fiscal consolidations are *permanent and credible*, i.e. private agents fully and correctly anticipate the effects of fiscal consolidation and do not expect the fiscal policies stance to be reverted in the future. Next we show that in case fiscal consolidations are perceived as non-credible (i.e., agents rationally expect that the policy will be reversed in the future) the instant negative impact on consumption and GDP will be higher, due to absent wealth effects.

The simulation results are presented as changes in levels of relevant macroeconomic variables. These results are equally interpretable as deviations from baseline steady-state levels.

Tax increases

With distortionary taxes, one would expect that a fiscal consolidation through tax increases has a negative impact on output in the model. The purpose of this section is merely to provide a comparison for the simulations of expenditure reductions and contrast the potential effects on output. The simulations presented in Tables 10, 11 and 12 are permanent tax increases of 1 per cent of GDP in labour income tax, corporate profit tax and VAT respectively.

All these scenarios show negative GDP effects in the short and medium run. The tax rises increase the distortions in the economy and lower output. Labour income tax and VAT affect consumption more than investment, and they both reduce employment. In contrast, the consolidation through an increase in the corporate tax rate has the largest impact on capital formation, which falls sharply on impact, while the increase in unemployment is only of temporary nature. On the whole, these negative output effects come as no surprise and broadly confirm the findings in the previous section that consolidations through tax rises are seldom expansionary.

[20] The simulated fiscal consolidations have an impact on the size and evolution of public debt. In the simulations the debt is stabilised at a 10 per cent lower level as a percentage of GDP through reductions over time in labour income taxes.

[21] The non-linearities in the model are not substantial enough to analyse the importance of larger versus smaller fiscal consolidations, and the model results are close to proportional for larger adjustments than the standardised consolidations of 1 percentage point considered here. Nor are we exploring here the significance of the initial state of public finances. Instead we focus our attention on the composition of fiscal adjustments and look at the effects for different tax and expenditure categories.

[22] Note that as the simulations are performed under an existing EMU framework, there is also no role for an exchange rate channel, a potentially important channel in some of the episodes studied in the previous section.

Table 10. Increase in labour income tax of 1% of GDP

% change from baseline	1st year	2nd year	3rd year	4th year	5th year	10th year
GDP	-0.36	-0.47	-0.6	-0.71	-0.8	-1.09
Consumption	-0.9	-1.1	-1.19	-1.25	-1.31	-1.42
Investment	-0.29	-0.57	-0.86	-1.09	-1.29	-1.91
Real wage costs	0.7	0.94	0.71	0.56	0.58	0.19
Real effective exch. rate	0.14	0.08	-0.01	-0.1	-0.16	-0.42
Absolute change from baseline						
Short term interest rate	-0.08	-0.06	-0.05	-0.05	-0.05	0.01
Real short term int. rate	-0.04	-0.09	-0.09	-0.07	-0.07	0
Unemployment rate	0.28	0.75	0.98	1.07	1.15	1.38
Debt (% of GDP)	-0.37	-1.21	-1.92	-2.59	-3.29	-7.63
Deficit (% of GDP)	-1	-0.83	-0.74	-0.73	-0.82	-0.86

Source: Commission services.

Table 11. Increase in corporate tax of 1% of GDP

% change from baseline	1st year	2nd year	3rd year	4th year	5th year	10th year
GDP	-0.34	-0.23	-0.23	-0.27	-0.31	-0.09
Consumption	0.85	1.38	1.37	1.3	1.25	1.47
Investment	-4.24	-5.29	-5.18	-5.01	-4.96	-3.96
Real wage costs	-0.13	-0.25	-0.25	-0.29	-0.4	-1.32
Real effective exch. rate	0.1	0.11	0.07	0.03	-0.01	0.03
Absolute change from baseline						
Short term interest rate	-0.05	-0.04	-0.03	-0.03	-0.01	0.03
Real short term int. rate	0.01	-0.03	-0.04	-0.05	-0.04	0.05
Unemployment rate	0.08	0.05	0.02	0.01	-0.01	-0.81
Debt (% of GDP)	-0.44	-1.63	-2.8	-3.95	-5.11	-9.56
Deficit (% of GDP)	-1.12	-1.16	-1.18	-1.22	-1.21	-0.66

Source: Commission services.

Table 12. Increase in VAT of 1% of GDP

% change from baseline	1st year	2nd year	3rd year	4th year	5th year	10th year
GDP	-0.14	-0.21	-0.34	-0.44	-0.51	-0.63
Consumption	-0.68	-0.23	-0.29	-0.36	-0.44	-0.51
Investment	-0.15	-0.51	-0.8	-0.97	-1.12	-1.33
Real wage costs	0.49	0.69	0.5	0.37	0.38	-0.06
Real effective exch. rate	-0.08	-0.18	-0.26	-0.31	-0.35	-0.43
Absolute change from baseline						
Short term interest rate	-0.06	-0.03	-0.02	-0.02	-0.02	0.03
Real short term int. rate	-0.09	-0.08	-0.06	-0.04	-0.04	0.03
Unemployment rate	0.16	0.46	0.61	0.68	0.73	0.74
Debt (% of GDP)	-0.49	-1.37	-2.15	-2.91	-3.71	-8.05
Deficit (% of GDP)	-0.93	-0.87	-0.82	-0.83	-0.9	-0.81

Source: Commission services.

Expenditure cuts

In the analysis in the empirical section it was found that fiscal adjustments based on expenditure cuts seem to have a higher probability to be expansionary than those based on tax increases. The scenarios presented in Tables 13, 14 and 15 are fiscal consolidations through alternative types of expenditure reductions: cuts in government purchases, in government transfers to households and in government employment respectively, all of 1 per cent of (baseline) GDP.

All these three policy experiments lead to negative GDP effects on impact, but a relatively fast reversal in the following years. The contractionary effects are short lived and reversed in the medium run. Permanent cuts in government purchases and government employment, which enter the GDP identity directly, have a larger effect on GDP but they can already boost consumption spending in the short run as forward looking households are anticipating higher disposable income in the future.[23] But this positive consumption effect is not strong enough to offset the negative impact from the consolidation and output falls on impact. However, there is a gradual reversal in output and GDP turns positive as in following years households gradually increase their spending by enough to offset the direct negative output effect of the fiscal contraction. When transfer payments to households (social security payments like pensions) are reduced, the impact is indirect through its effect on consumers' disposable income. The negative impact of lower transfer receipts today is only partly offset by a boost to spending in anticipation of lower tax liabilities in the future. Consumption remains below base, although investment spending gradually recovers.

A reduction in government employment can, from the second year on, increase investment spending. This scenario also displays the largest potential gains in terms of higher growth after the initial decline in the first year. The short term rise in unemployment puts downward pressure on real wages in the private sector and real wages fall sharply. This boosts profits for firms and firms respond by increasing their investment spending. Lower real wage costs also boost private sector employment again in the medium term and total employment recovers gradually. The empirical evidence on expansionary consolidations supports this view. It was found in the previous section that reductions in public employees compensation are more likely to be linked with expansionary consolidations when defined in terms of trend growth, while reductions in the wage bill are found to be significantly higher in expansionary than in non-expansionary consolidations when a persistence type definition of fiscal consolidations was adopted.

[23] Higher future disposable income is associated with the lower future taxes that become possible after the consolidation under the assumption that the debt ratio is stabilised at a 10 per cent of GDP lower level.

Table 13. Reduction in government purchases of 1% of GDP

% change from baseline	1st year	2nd year	3rd year	4th year	5th year	10th year
GDP	-0.33	-0.06	-0.04	-0.05	-0.04	0.41
Consumption	1.4	2.11	2.14	2.12	2.12	2.55
Investment	-0.63	-0.85	-0.86	-0.84	-0.81	0.15
Real wage costs	-0.07	-0.1	-0.05	-0.05	-0.1	-0.79
Real effective exch. rate	0.02	0.01	0.02	0.04	0.05	0.37
Absolute change from baseline						
Short term interest rate	0	0.02	0.02	0.03	0.04	0.07
Real short term int. rate	-0.04	0.01	0.02	0.02	0.03	0.1
Unemployment rate	0.11	0.05	0.02	0.01	-0.01	-0.82
Debt (% of GDP)	-0.47	-1.79	-2.97	-4.15	-5.34	-9.7
Deficit (% of GDP)	-1.13	-1.17	-1.2	-1.23	-1.22	-0.61

Source: Commission services.

Table 14. Reduction in government transfers to households of 1% of GDP

% change from baseline	1st year	2nd year	3rd year	4th year	5th year	10th year
GDP	-0.2	-0.15	-0.08	-0.06	-0.06	0.19
Consumption	-0.27	-0.27	-0.23	-0.22	-0.22	0.13
Investment	-0.65	-0.6	-0.49	-0.47	-0.48	-0.02
Real wage costs	-0.09	-0.14	-0.07	-0.04	-0.03	-0.58
Real effective exch. rate	0.08	0.15	0.18	0.19	0.19	0.34
Absolute change from baseline						
Short term interest rate	0.01	0.01	0	0	0.01	0.04
Real short term int. rate	0.08	0.04	0.01	0	0	0.07
Unemployment rate	0.04	0.04	0.03	0.03	0.03	-0.46
Debt (% of GDP)	-0.47	-1.48	-2.52	-3.54	-4.58	-9
Deficit (% of GDP)	-1	-1.02	-1.03	-1.07	-1.09	-0.71

Source: Commission services.

Table 15. Reduction in government employment of 1% of GDP

% change from baseline	1st year	2nd year	3rd year	4th year	5th year	10th year
GDP	-0.93	-0.59	-0.2	0.02	0.16	0.63
Consumption	0.87	1.21	1.46	1.59	1.66	2.06
Investment	-1	-0.31	0.49	0.93	1.16	1.93
Real wage costs	-1.41	-1.97	-1.4	-1.04	-0.84	-1.12
Real effective exch. rate	0.01	0.29	0.53	0.69	0.79	1.2
Absolute change from baseline						
Short term interest rate	0.14	0.1	0.07	0.05	0.04	0.07
Real short term int. rate	0.28	0.26	0.17	0.12	0.08	0.11
Unemployment rate	1.48	0.65	0.23	0.07	0.02	-0.5
Debt (% of GDP)	0.28	-0.55	-1.64	-2.77	-3.92	-8.8
Deficit (% of GDP)	-0.52	-0.81	-1.01	-1.1	-1.16	-0.76

Source: Commission services.

Temporary vs. permanent cuts

One of the findings in cross-country comparisons of fiscal consolidations is that 'successful' consolidations, leading to a permanent reduction in debt, are more likely to produce expansionary effects than adjustments which are reversed in the subsequent years. All the QUEST simulations presented so far concerned fiscal consolidations resulting from permanent tax increases or expenditure cuts. Moreover, since the QUEST model builds upon the assumption of rational expectations, agents correctly anticipate the permanent reduction in government spending and anticipate lower tax liabilities even though these will only materialise in the future.

To test the importance of agents' expectations concerning the temporary vs. permanent character of fiscal consolidations the following simulations concern expenditure cuts of the same type and size as those considered previously (Tables 13-15) but that are now only temporary, i.e., that are reversed in the subsequent year. Crucially, in this case consolidations are *perceived* as temporary by economic agents. Results are reported in Table 16 and show that this tends to generate larger contractionary effects in the short-run. This is due to the fact that since these consolidations are reversed in the subsequent year, they do not allow for a reduction in future tax liabilities. Consequently, no offsetting wealth effects will materialise in this case.

In all the three cases considered (reduction of government purchases, in government transfers, in government employment), there is now an immediate reduction in consumer spending as current income declines and there is no rise in permanent income as in the credible permanent scenarios described previously. In contrast, investment spending is boosted as expected future profits are not significantly affected by the temporary budgetary adjustment.

The potentially large differences between the overall GDP effect for these temporary consolidations and those of credible permanent ones, shows the importance of expectations and credibility. A fiscal framework like the SGP could reinforce the credibility of budgetary adjustments and help to avoid the negative effects on GDP associated with consolidations that are perceived as being temporary.

Table 16. Temporary expenditure cuts (1% of GDP)

	1st year	2nd year	3rd year	4th year	5th year	10th year
Reduction in government purchases						
GDP	-0.75	0.14	0.07	0.04	0.03	0.14
Consumption	-0.12	0.09	0.07	0.05	0.06	0.17
Investment	0.58	0.33	0.08	-0.01	-0.01	0.23
Real sh term int rate	-0.17	-0.04	-0.02	-0.0	0.0	0.01
Reduction in government transfers						
GDP	-0.21	0.04	0.02	0.01	0.02	0.12
Consumption	-0.56	0.03	0.03	0.03	0.04	0.14
Investment	0.13	0.06	-0.00	-0.02	-0.01	0.22
Real sh term int rate	-0.04	-0.01	0.00	0.0	0.01	0.01
Reduction in government employment						
GDP	-1.21	0.21	0.23	0.14	0.09	0.12
Consumption	-0.36	0.09	0.17	0.11	0.09	0.13
Investment	0.45	0.63	0.42	0.22	0.11	0.18
Real sh term int rate	0.05	-0.04	-0.05	-0.03	-0.01	0.01

Source: Commission services.

Accommodating monetary stance

Another findings in the empirical analysis was that half the expansionary fiscal consolidations appeared to have been accompanied by a possible effective monetary relaxation (i.e., falling real interest rates). The scenarios described above were characterised by a rise in real interest rates ('pure' expansionary fiscal consolidations in terms of the episode analysis in the previous section). By contrast, the scenarios presented in Table 17 assume a monetary policy rule consistent with a small fall in real interest rates on impact. An alternative interpretation of these scenarios could be that the fiscal adjustments are associated with a reduction in risk premia. As pointed out in section 2, for highly indebted countries, a credible fiscal consolidation could lead to a reassessment of the markets' perceptions of the risks involved and lead to an elimination or at least a reduction of a risk premium on that country's bonds.

Whether linked to a monetary policy relaxation or an endogenous reduction in risk premia, the scenarios of consolidations in Table 17 are associated with falling real interest rates. This helps to reduce the negative impact of the fiscal consolidations and boosts growth in all cases considered. Households increase their consumption by more in case of cuts in purchases and government employment or reduce it by less in the case of a cut in transfers. Investment is also boosted further by the fact that real interest rates are lower in these scenarios. Interestingly, in the case of cuts in government purchases or transfers fiscal consolidations accompanied by a looser monetary stance appear to have expansionary effects already on impact in the first year.

Table 17. Expenditure cuts (1% of GDP) with accommodating monetary stance

	1st year	2nd year	3rd year	4th year	5th year	10th year
Reduction in government purchases						
GDP	0.26	0.4	0.25	0.16	0.09	0.32
Consumption	1.54	2.36	2.27	2.22	2.18	2.51
Investment	1	0.05	-0.22	-0.42	-0.57	-0.1
Real sh term int rate	-0.54	-0.04	-0.03	-0.02	-0.01	0.08
Reduction in government transfers						
GDP	0.35	0.30	0.21	0.17	0.11	0.17
Consumption	-0.15	-0.04	-0.1	-0.11	-0.14	0.11
Investment	0.84	0.26	0.17	-0.01	-0.16	-0.14
Real sh term int rate	-0.37	0.01	-0.02	-0.03	-0.02	0.05
Reduction in government employment						
GDP	-0.50	-0.36	-0.12	0.07	0.17	0.53
Consumption	0.95	1.31	1.47	1.58	1.63	1.97
Investment	0.17	0.05	0.68	1	1.18	1.66
Real sh term int rate	-0.2	0.22	0.15	0.10	0.07	0.10

Source: Commission services.

5. Conclusions and policy conclusions

The scenarios in this section have illustrated the real effects of fiscal consolidations and shown under what circumstances they could already in the short run be expansionary. A number of results emerge.

- While tax increases are unlikely to increase growth in the short run, expenditure cuts may exhibit non-Keynesian features in that the anticipated effects of higher future disposable income or profitability could already counterbalance the negative impact of the expenditure reductions.
- The immediate first year impact of a fiscal consolidation on output is likely to be negative. But the positive effects can come through relatively fast and in most scenarios growth already increases from the second year onwards. The immediate negative impact will be smaller in case of fiscal consolidations perceived to be permanent.
- The consumption channel is a major offsetting force to the standard Keynesian effects, but the investment channel can also be of great relevance for consolidations occurring through cuts in the government wage bill.
- The expansionary effects of fiscal consolidations occurring both through the consumption or the investment channel are likely to be reinforced when the fiscal consolidations are associated with a favourable monetary stance.

The analysis has a series of implications for the current situation in EMU. In the coming years, several large EU countries will need to carry out budgetary consolidations to conform to the Treaty and the SGP. This will not necessarily mean further aggravating the current slowdown. First, if the budgetary retrenchment is undertaken simultaneously in several euro area countries, this could help monetary policy to be supportive. Second, and more directly, non-Keynesian effects of budgetary consolidations may help short-run growth by restoring confidence and stimulating private consumption and investment. In this view, Member States would benefit by implementing budgetary policies aimed at reducing current government expenditure rather than raising taxes. Third, completing the consolidation while at the same time adopting the long needed structural reforms would substantially increase the positive growth effect of the budgetary consolidation. Such a type of fiscal adjustment would be perceived as credible, since it would signal preparedness to face the politically costly reforms and is more likely to deliver expansionary effects or, as a minimum, to avoid negative effects on GDP in the short run. Clearly, this message is particularly relevant for Germany, which is facing both budgetary problems and a difficult economic juncture. Provided that budgetary consolidation can credibly act on the expenditure side of the budget, fiscal rigour may not be inconsistent with better short-run growth prospects, in particular if combined with announced structural reforms.

References

Alesina, A. and S. Ardagna, (1998), 'Tales of fiscal adjustment', *Economic Policy*, 27, 489-45.

Alesina, A., R. Perotti, and J. Tavares, (1998), 'The political economy of fiscal adjustments', *Brookings Papers on Economic Activity*, 1, 197-266.

Alesina, A., S. Ardagna, R. Perotti, and F. Schiantarelli, (2002), 'Fiscal policy, profits, and investment', *American Economic Review*, 92, 571-89.

Bertola, G. and A. Drazen (1993), 'Trigger points and budget cuts: explaining the effects of fiscal austerity', *American Economic Review*, 83, 1170-88.

Blanchard, O., (1990), 'Comment on Giavazzi and Pagano', in *NBER Macroecomics Annual*, O. Blanchard and S. Fischer, eds., Cambridge Mass., The MIT Press.

Blanchard, O., (1985), 'Debt, deficits, and finite horizons', *Journal of Political Economy*, 93, 2, 223-47.

Cotis, J. P., Y. l' Horty, and R. Meary, (1998), 'Les stabilisateurs automatiques sont-ils encore efficaces: Le cas de la France dans les annees quatre-vingt-dix', *Revue d' Economie Financiere*, 45, 95-118.

Cour, P., E. Dubois, S. Mafhouz, and J. Pisany-Ferry, (1996), 'The cost of fiscal retrenchment revisited: How strong is the evidence?', Institut National de la Statistique et des Etudes Economiques, *Série des Documents de Travail*, G9612.

European Commission, (2002a), 'Public finances in EMU – 2002', *European Economy – Reports and Studies*, 3.

European Commission, (2002b), 'The EU Economy 2002 Review', *European Economy*, 6.

Feldstein, M., (1982), 'Government deficits and aggregate demand', *Journal of Monetary Economics*, 9, 1-20.

Giavazzi, F. and M. Pagano, (1990), 'Can severe fiscal contractions be expansionary? Tales of two small European countries', *NBER Macroeconomics Annual*, 5, 75-111.

Giavazzi, F. and M. Pagano, (1996), 'Non-Keynesian effects of fiscal policy changes: International evidence and the Swedish experience', *Swedish Economic Policy Review*, 3, 3, 67-103.

Giavazzi, F., T. Jappelli, and M. Pagano, (2000), 'Searching for non-linear effects of fiscal policy: Evidence for industrial and developing countries', *NBER Working Paper Series*, 7460.

Hemming, R., M. Kell, and S. Mahfouz, (2002), 'The effectiveness of fiscal policy in stimulating economic activity – A review of the literature', *IMF Working Paper*, 208.

IMF (1996), *World Economic Outlook*, Washington, IMF.

Krugman, P. and M. Obstfeld, (2001), 'International Economics', Boston, Addison Wesley Longman.

McDermott, C.J., and R.F. Westcott (1996), 'An empirical analysis of fiscal adjustment', *IMF Staff pappers 43*, 725-53.

OECD, (1996), *OECD Economic Outlook*, Paris, OECD.

Perotti, R., (1999), 'Fiscal policy in good times and bad', *Quarterly Journal of Economics*, 114, 1399-1436.

Roeger, W. and J. in't Veld, (1997), 'QUEST II: A multi-country business cycle and growth model', European Commission, *Economic Papers*, 123.

Roeger, W. and J. in't Veld, (2002), 'Some selected simulation experiments with the European Commission's QUEST model', European Commission, *Economic Papers*, 178.

Sutherland, A., (1997), 'Fiscal crises and aggregate demand: Can high public debt reverse the effects of fiscal policy?', *Journal of Public Economics*, 65, 147-62.

Von Hagen, J., A. Hughes Hallet, and R. Strauch, (2001), 'Budgetary consolidation in EMU', European Commission, *Economic Papers*, 148.