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The Cost of Fiscal Retrenchment Revisited: How Strong is the Evidence?

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RESUME

L'impact des déficits publics sur la croissance est depuis longtemps l'objet de controverses entre les keynésiens, pour lesquels réduire *ex ante* les déficits publics a des effets défavorables sur la croissance, au moins à court terme, et les néoclassiques, pour lesquels l'activité est entièrement déterminée par l'offre, si bien que les déficits publics n'ont aucun effet sur l'activité. L'expérience danoise des années 1983 à 1986, celle de l'Irlande des années 1986 à 1989, au cours desquelles la réduction drastique des déficits publics ne s'est pas traduite par des pertes de croissance, ont amené à proposer des modèles théoriques qui font le pont entre ces deux approches antagonistes : selon ces modèles, l'économie serait plutôt keynésienne en temps normal, mais "anti-keynésienne" lorsqu'une crise budgétairemenace.

Ce papier vise à tester de manière systématique si une telle logique anti-keynesienne se manifeste au cours des épisodes d'ajustement et d'expansion de grande ampleur observés dans 17 pays de l'OCDE depuis le début des années 1970. Ces épisodes ont été sélectionnés de façon à correspondre à une période d'amélioration (ou de dégradation) continue du solde structurel primaire, et à inclure une sous-période pendant laquelle la variation de ce solde a été importante. Les 37 épisodes ainsi repérés font alors l'objet d'une analyse descriptive détaillée, dont le fil directeur est la recherche de facteurs susceptibles d'expliquer la grande variété des effets sur la croissance observés. La question de la mesure même de ces effets (à partir de la croissance observée ex post) est discutée, et différents indicateurs sont construits.

Quatre grandes catégories de facteurs sont examinées : (i) les conditions initiales et le contexte dans lequel l'épisode a pris place (situation des finances publiques, position initiale dans le cycle ...), (ii) les caractéristiques intrinsèques du pays (taille, degré d'ouverture...), (iii) la composition de l'ajustement (ou de l'expansion) budgétaire, (iv) la politique monétaire et de change ayant accompagné ces épisodes. En outre, afin d'examiner si les épisodes de grande ampleur diffèrent des ajustements (ou expansions) de moindre envergure, la même analyse est réalisée sur les épisodes de politique budgétaire 'normale' des mêmes pays sur la même période. Les conclusions de cette première partie de l'étude sont : (i) les ajustements de grande ampleur ont en général été entrepris face à une forte dégradation des finances publiques, alors que les expansions de grande ampleur répondent le plus souvent à un ralentissement de l'activité, (ii) les restrictions de grande envergure semblent avoir eu en moyenne un effet plus faible sur l'activité que les ajustements standards, une fois prises en compte les positions initiales dans le cycle ; en particulier, un nombre non négligeable de ces épisodes n'a pas été accompagné de pertes de croissance, (iii) s'il est vrai que les ajustements de grande ampleur ont été davantage le fait de petits pays plus ouverts, il n'apparaît en revanche aucune régularité en ce qui concerne les variations des taux d'intérêt et de change, ou en matière de composition des ajustements, (iv) seule la variation du taux d'épargne des ménages apparaît nettement corrélée à l'effet en termes de croissance de la politique budgétaire : les ajustements budgétaires 'anti-keynésiens' ont en général été accompagnés d'une baisse du taux d'épargne des ménages.

Un deuxième volet du papier est alors consacré à des tentatives de réconciliation des résultats de l'analyse descriptive avec les schémas keynésiens. Pour cela, deux aspects sont étudiés : est tout d'abord examiné et éliminé, le risque de biais dans la sélection des épisodes vers les ajustements 'réussis' en termes de croissance (qui pourrait exister si, par exemple, les restrictions budgétaires étaient immédiatement interrompues face à une dégradation de l'activité, de sorte que les seuls ajustements importants seraient ceux qui ont eu un coût en croissance plus limité). Dans un deuxième temps, on cherche à prendre en compte le bruit lié à l'existence durant les épisodes de chocs autres que les chocs budgétaires et au relativement petit nombre d'épisodes, ainsi que l'incertitude entourant le multiplicateur keynésien tel qu'il est estimé à l'aide de modèles macro-économétriques keynésiens pour tester si le multiplicateur moyen observé (qui est proche de zéro) est vraiment en contradiction avec les prédictions des modèles keynésiens. Le multiplicateur moyen observé n'apparaît pas significativement différent du multiplicateur théorique, ce qui ne contredit pas formellement les résultats des modèles macro-économétriques keynésiens, mais la distribution empirique n'est pas normale autour de cette moyenne, et comprend en particulier probablement trop de multiplicateurs négatifs pour être conforme aux résultats de ces modèles.

La dernière partie revient de façon plus approfondie sur le lien entre succès d'un ajustement et comportement de consommation. Pour cela, des estimations d'équations de consommation en coupe sur les différents pays sont réalisées, en introduisant comme variables explicatives communes les variables de politique budgétaire d'une part sur les épisodes de grande ampleur, et d'autre part en dehors de ces épisodes, et en contraignant ou non les autres coefficients à être identiques pour tous les pays. Les principaux résultats obtenus sont les suivants : (i) les variables de soldes budgétaires n'apparaissent significatives que pendant les épisodes de grande ampleur, et leur impact est plus élevé quand les coefficients des autres variables sont contraints (ii) quand on distingue de plus entre les épisodes 'keynésiens' et 'anti-keynésiens', la variable de solde budgétaire n'est significative que sur les restrictions budgétaires de grande ampleur anti-keynésiennes. Ainsi, les restrictions budgétaires anti-keynésiennes se seraient effectivement accompagnées d'une baisse du taux d'épargne des ménages supérieure à ce qu'auraient prédit des équations de consommation 'traditionnelles'.

Mots clés : Politique budgétaire, équivalence ricardienne, comportement de consommation.

SUMMARY

The impact of government deficits on growth has been, for long, the object of a controversy between the Keynesians, for whom an *ex ante* reduction of the government deficit has negative impacts on growth (at least in the m edium-term), and neo-classical economists, for whom activity is entirely determined by supply, so that government deficits do not have any effect on activity. The Danish experience of 1983 - 1986 and the Irish experience of 1986 - 1989, during which drastic reductions in the government deficits did not involve significant output losses, have led to theoretical models being proposed which build a bridge between these two antagonistic approaches. According to these models, the economy would be rather Keynesian in normal times, but "anti-Keynesian" in a period of budgetary crisis.

The goal of this paper is to test systematically whether such an anti-Keynesian behaviour does occur during the large-scale retrenchments and expansions experienced in 17 OECD countries since the early 1970s. The selected fiscal episodes are periods of continuous improvement (or deterioration) of the primary structural surplus, which include a sub-period when change was large. 37 episodes are thus listed, of which a careful descriptive analysis is then carried out, to look for factors that might explain the great diversity observed in their effects on activity. The very question of the measurement of these effects (based on growth observed *ex post*) is discussed, and several indicators are constructed. Four main categories of factors are investigated: (i) the overall context in which the episodes were undertaken (the fiscal situation, the initial position in the business cycle); (ii) some intrinsic features of the country (such as its size, openness); (iii) the composition of the fiscal adjustment (or expansion); (iv) the monetary and exchange rate policies during the episodes. Moreover, in order to examine whether large scale episodes exhibit specific features, the same analysis is carried out for more standard episodes of fiscal policy. The conclusions of this descriptive part of the study are: (i) large-scale retrenchments were generally undertaken in response to a large deterioration in the public finances, while large-scale expansions most often responded to a slowing-down of activity; (ii) large-scale adjustments frequently resulted in smaller proportional effects on the activity than standard ones, once accounting for the initial positions in the business cycles; in particular, a non-negligible number of such episodes did not lead to output losses; (iii) while large-scale retrenchments were indeed undertaken in smaller, more open countries on average, no regularity in changes in interest rates and exchange rates nor in the composition of retrenchments can be observed; (iv) changes in the household savings ratio appear to be clearly correlated to the effect of fiscal policy on the activity: 'anti-Keynesian' fiscal retrenchments were in general followed by a drop in household savings ratios.

The second part of the paper makes an attempt at reconciling the results of the descriptive analysis with Keynesian mechanisms. For this purpose, two possible channels that may account for the divergence between reality and the neo-Keynesian approach are studied. First, the risk of a bias in the selection of the episodes towards 'successful' adjustments in terms of growth (which could occur if, for instance, fiscal restrictions were immediately interrupted in the case of a slowing of the activity, so that the large-scale

retrenchments selected would only be those which had smaller output costs) is investigated and eliminated. Then, the noise due to the combination of small sample size and to shocks other than the fiscal policy over the episode, as well as the uncertainty surrounding the Keynesian multiplier, as embodied in simulations with Keynesian macro -econometric models, are taken into consideration to test whether the average observed multiplier (which is close to zero) really contradicts the predictions of Keynesian models. The average observed multiplier does not appear significatively different from the theoretical multiplier, which does not formally contradict the results of Keynesian macro-econometric models, but the empirical data are not normally distributed around this average, and probably include too many negative multipliers to be conform to the results of these models in particular.

The last part provides an econometric study of the link between the success of an adjustment and consumer behaviour. To this end, cross-section episode consumption regressions are run for the sample countries, using as common explanatory variables, fiscal policy both during large-scale episodes, and outside such episodes, and by setting other coefficients to be identical for all countries or not. The major results are the following: (i) fiscal balance variables are significant during large-scale episodes only, and their effect on consumption is higher when the coefficients of other variables are constrained; (ii) the fiscal balance variable is significant only for anti-Keynesian large-scale retrenchments when an additional distinction is made between 'Keynesian' and 'anti-Keynesian' episodes. Thus, anti-Keynesian fiscal retrenchments would indeed have been associated with a greater decline in the household savings ratio than would be explained by traditional, consumption-smoothing behaviour.

Key words: Fiscal policy, Ricardian equivalence, consumption behaviour.

THE COST OF FISCAL RETRENCHMENT REVISITED: HOW STRONG IS THE EVIDENCE?(*)

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1. INTRODUCTION

Most member states of the EU have undertaken large-scale budgetary adjustments in order to restore their public finances and to meet the Maastricht deficit criterion for participating in monetary union. According to the June 1996 OECD forecast (OECD, 1996), this policy priority has on average already led to a reduction in the general government's structural deficit from 5.3% of GDP in 1992 to 4.5% of GDP in 1995, and is forecast to further reduce it to 3.2% in 1997. If this adjustment is really carried out, it will be of unprecedented magnitude in Europe: never in recent history have the nations of the EU implemented a comparable simultaneous adjustment effort.

Persistent economic weakness in Europe has however given rise to criticism of the priority given to fiscal retrenchment. Opponents basically claim (i) that the output and employment costs of fiscal retrenchment are excessively high, especially as several countries undergo adjustment programmes simultaneously, and (ii) that this policy might be self-defeating, as output losses result in income shortfalls for governments. This view finds support in simulations with macro-econometric models, which generally suggest that fiscal adjustments involve non-trivial output and employment costs. Evaluations differ depending on the structure of the model and the target reduction in the deficit, but even the most 'optimistic' simulations conclude that as the short run fiscal multiplier is close to 1.0 for a large country, fiscal retrenchment will significantly dampen growth in several European countries in 1994-97. Furthermore, as cross-country fiscal multipliers under fixed exchange rates are generally considered positive, the same evaluations imply that by setting a common deadline, Maastricht will increase the cost of the fiscal retrenchment each country has to face (Hughes Hallett and McAdam, 1996; OECD 1996; Le Bihan, Mathieu and Sterdyniak, 1996)[1].

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1 In a Mundell-Fleming framework, the sign of cross-country fiscal policy spill-overs is ambiguous. In most multinational models, the impact of goods market linkages exceed that of capital market linkages, which implies that the cross-country multiplier is positive. If governments overlook these spill-over effects, fiscal retrenchment

Advocates of fiscal adjustment rely on a number of successful experiences to claim that fiscal retrenchment can be less painful than is widely believed, and could even turn out to be expansionary. Two widely quoted cases are the Danish experience of 1983-86 and the Irish experience of 1986-89 (Giavazzi and Pagano, 1990). In both cases, fiscal adjustment was badly needed, as the deficits were close to 10% of GDP, public debt was growing fast, and bond rates incorporated high risk premia. A major effort was undertaken (a reduction in the structural deficit of 3.1% of GDP *per year* in Denmark and of 2.1% *per year* in Ireland), which resulted in a deficit reduction of exceptional magnitude (12.5 percentage points for Denmark and 9.0 for Ireland), without apparently involving significant output losses. On the contrary, growth in both countries accelerated during the adjustment period and significantly exceeded the EU average. Such episodes are generally interpreted as illustrating that after a period of fiscal mismanagement, a government implementing a bold, credible fiscal adjustment programme can rely on expectation effects to compensate, or even to override the standard income effects of fiscal policy.

Quarrels between the Keynesian and anti-Keynesian views of fiscal policy have a long history that does not need to be reviewed here [2]. What is more interesting is to investigate whether the output effect of a fiscal retrenchment may be non-linear, contrary to what macro-econometric models basically assume. If this were to be the case, fiscal stress could conceivably give rise to anti-Keynesian behaviour, even though Keynesian behaviour remains the rule under more normal circumstances.

Recent research has taken some steps in this direction. A first strand of studies relies on Barro (1979) and examines the effects of fiscal adjust ments within the framework of neo-classical models with distortionary taxes and forward-looking consumers. In such a setting, taxes are endogenous, and what really matters is whether changes in expenditures are perceived as temporary or permanent: a *permanent* increase in government expenditures reduces output through the adverse supply-side effects of the (anticipated or actual) resulting tax increases. The effects of a given fiscal adjustment therefore depend on its impact on the permanent level of government expenditures. In such a framework, large-scale policy episodes are more likely to give rise to supply-side effects because their composition tends to be tilted towards permanently affecting the level of public expenditures. Building on this approach, Perotti (1996) distinguishes between « normal times », when fiscal adjustments essentially take the form of tax increases that validate a previous increase in public spending, and « bad times », when fiscal retrenchments are more likely to rely on permanent expenditure cuts and therefore to have positive supply-side effects.

Bertola and Drazen (1993) explicitly take into account non-linear behaviour. In their model, households are rational and Ricardian equivalence holds, but government expenditures are affected by a positive drift (which is not so bad a representation of fiscal

is non-cooperative, and therefore risks giving rise to a collective welfare loss. A dissenting view is however presented in Bartolini, Razin and Symansky (1995).

2 Hénin (1996) provides an updated survey of recent research on the sustainability of deficits and the impact of fiscal adjustments.

policy in industrialised countries over the last three or four decades). As monetisation and default are ruled out, agents know that such an unsustainable fiscal policy will eventually imply a cut in expenditures in order to restore government solvency. As long as the expenditure to GDP ratio remains low, a rise in government expenditures is almost completely offset by a decrease in household consumption, since private agents are Ricardian. But when government expenditures reach a higher level, any further increase in government spending raises the probability that an adjustment will occur (in Bertola and Drazen terminology, expenditures approach a 'trigger point' at which an adjustment has some probability of occurring). Since the adjustment is due to lead to a significant decline in government expenditures, the households' permanent income then begins to rise and so does consumption: households begin to behave in a seemingly Keynesian way [3]. Since the fact that an adjustment will occur is always uncertain, the actual occurrence of an adjustment leads to an incremental increase in household permanent income. In this case, expenditure cuts are accompanied by an increase in household consumption: then, households begin again to behave in a (seemingly) Ricardian way.

An interesting implication of this model is that consumption behaviour exhibits a Keynesian pattern before a stabilisation occurs and a Ricardian one when it occurs, as seems to have been the case in the Danish and Irish experiences. It has however the unappealing feature that consumption behaviour must also be Ricardian at low levels of public expenditures, which seems at odds with reality. The model proposed by Sutherland (1995) does not share this feature. On the contrary, consumers exhibit Keynesian behaviour in « normal times » and anti-Keynesian behaviour in « bad times ». The reason for this non-linearity is uncertainty about the distribution of future taxes across generations. In an overlapping generation setting in which consumers have finite lives, Ricardian equivalence does not hold. But when the public debt ratio approaches a critical point, agents realise that they will not be able to shift the tax burden onto the next generation. Therefore, they behave in a Keynesian way as long as public debt is low, and become increasingly anti-Keynesian as the probability of their being taxed increases. As in the model of Bertola and Drazen, non-linearities are related to the initial level of debt as a percentage of GDP.

These two models thus capture the intuition that there might be some non-linearities in the effects of fiscal adjustment policies [4]. Yet their empirical relevance is an open issue. The debate has prompted a number of empirical studies that aim at providing more systematic evidence on the actual effects of large-scale fiscal retrenchment programmes (Alesina and Perotti, 1995; Cour and Pisani-Ferry, 1995; Artus and Kaabi, 1996; Giavazzi and Pagano, 1995; IMF, 1996; OECD, 1996). These studies basically rest on a similar methodology, which consists in selecting recent 'episodes' of large-scale budgetary

3 Recall that in the model ricardian equivalence holds; so the seemingly Keynesian household behaviour appears only when one looks at the correlation between consumption and current government expenditures; this correlation should have exactly the opposite sign if one were able to substitute *permanent* government expenditures (which is generally an unobservable variable) for *current* government expenditures.

4 It is worth mentioning that the empirical literature on the growth effects of stabilisation policies has reached analogous conclusions. While reducing inflation normally involves an output loss, countries which stabilise from high inflation frequently have output expansions in the first years of stabilisation. For a recent survey, see Easterly (1996).

adjustment in OECD countries and in assessing their macroeconomic, financial and budgetary effects. Details differ, and different studies focus on different aspects of the issue. For example, Alesina and Perotti emphasise the differences between the consolidations that rely on tax increases and those which rely on expenditure cuts. Giavazzi and Pagano focus on the size and duration of the adjustment. The OECD concentrates on the macroeconomic environment of the programme. But by and large, a common conclusion of these studies is that though exceptionally favourable, the Danish and Irish cases cannot be considered as isolated. A number of other episodes seem to contradict the conventional view of fiscal policy. But there is little homogeneity in the experience of the countries in the samples, and little consensus on the factors that explain anti-Keynesian behaviour.

The evidence so far therefore seems disturbing enough to warrant doubts about the reliability of standard policy evaluations of the effects of fiscal consolidation programmes, but still too weak to substantiate strong policy conclusions as regards the feasibility and the conditions for success of large scale retrenchment packages. What research has now to produce is (i) more solid evidence on the prevalence of anti-Keynesian behaviour, (ii) a more consistent account of its main channels of action, and (iii) stronger conclusions on the conditions for a successful adjustment that could form the basis of policy recommendations.

This paper starts with the conclusion of previous empirical research, namely that there can be something peculiar in large-scale fiscal episodes, and it systematically investigates the robustness of available evidence. Section 2 presents the method used for selecting large-scale fiscal policy episodes (both expansions and consolidations) and provides an overview of their context and effects. Whether large scale episodes really differ from standard policy episodes is also examined. Section 3 explores whether a Keynesian approach could account for the growth effects of fiscal retrenchment that are observed. More precisely, the section discusses whether the evidence significantly departs from what Keynesian models would predict, and whether there could be a bias in the method of selection of the episodes. Section 4 is devoted to analysing possible reasons why some adjustment episodes are more successful than others. The role of country size, initial conditions, the composition and size of the adjustment, monetary policy, etc. are reviewed, and the focus is then carried on household consumption behaviour. Conclusions are drawn in Section 5.

2. THE EVIDENCE

The theoretical arguments surveyed in Section 1 suggest that non-linearities in the response to a fiscal policy shock can only arise if the shock is large enough to affect the expectations concerning long-term government spending, taxes and debt. Temporary changes in taxes or expenditures are in that respect irrelevant, because they are unlikely to have lasting effects. An attempt at testing for the existence of non-linearities has therefore to start with the selection of large-scale fiscal policy episodes. In this section, *large-scale fiscal policy episodes* (both adjustments and expansions) are first defined and selected (2.1). Next, a number of macro-economic and budgetary indicators are examined in order

to review the context and the effects of these policy episodes (2.2). Finally, large-scale fiscal policy episodes are compared with standard fiscal policy episodes (2.3).

2.1. Large-scale fiscal adjustment experiences

Selecting large-scale fiscal adjustments for 17 OECD countries since the early 1970s[5], implies (i) choosing a measure of fiscal policy, and (ii) defining what « large-scale » precisely means.

(i) Since the analysis here is of fiscal adjustment that are the result of discretionary policy actions, the change in the *primary structural surplus* (PSS) of the general government (as a percentage of potential output)[6] is used as a measure of the fiscal stance. This indicator suffers from two obvious shortcomings: first, it relies on fairly simple methods to separate the effects of automatic stabilisers from those of discretionary policy actions; second, assessing the structural component of the deficit requires evaluating potential output, which is notoriously arduous. However, it remains the best systematic indicator of the fiscal stance available[7].

(ii) Large-scale adjustments are then defined as episodes of continuous improvement in the PSS[8], which include a sub-period of at most 3 years during which the adjustment effort was intense, that is during which the increase of the PSS was at least 3 percentage points of potential output[9].

This leads to a selection of nineteen retrenchment episodes (two other adjustments are still going on), which have taken place in thirteen different countries (Table 1). Symmetrically, eighteen large-scale fiscal expansions were selected using the same method. Table 1 highlights that some countries went through several successive expansion/adjustment episodes, whereas two countries (France and the United States [10]) never experienced any large-scale policy episode, and others (Germany, Austria, Spain) had only one experience of this type. This suggests significant cross-country differences in fiscal policy philosophy and/or institutional constraints on deficits, the reasons for which have been explored in the political economy literature, and will not be further investigated here.

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5 The 17 OECD countries considered here are the G7 countries, plus Australia, Austria, Belgium, Denmark, Finland, Ireland, Norway, the Netherlands, Spain and Sweden. Greece and Portugal, whose structural balances show a high degree of variability, and Norway, for which fiscal policy indicators are jolted by oil revenues, have not been retained in the sample.

6 More precisely, the primary structural budget surplus (PSS) is the structural budget surplus calculated by the OECD, to which debt interest payments were added, both as a percentage of potential output. Data correspond to those published in the OECD's *Economic Outlook* n° 58. We are grateful to the OECD's Economic Department for providing us the data.

7 See Blanchard (1990) or Chouraqui, Hagemann and Sartor (1990) for a discussion of various indicators of fiscal policy.

8 However, two adjustments -Spain (1990-1995) and the Netherlands (1990-1993) - are not perfectly continuous, and include a small, one-year reversal in the improvement of the PSS.

9 Sensitivity tests show that the selection is fairly robust with respect to the size of the adjustment and the period length. For instance, the intensity criteria in terms of threshold PSS improvement versus length of the period gives very similar results, with 3 points in 4 years, or 4 points in 4 years.

10 The Mitterrand reflation and the Reagan tax cut experiment of the early 1980s fail to qualify as large-scale according to the criteria defined here.

Table 1: Large-scale fiscal episodes[11]

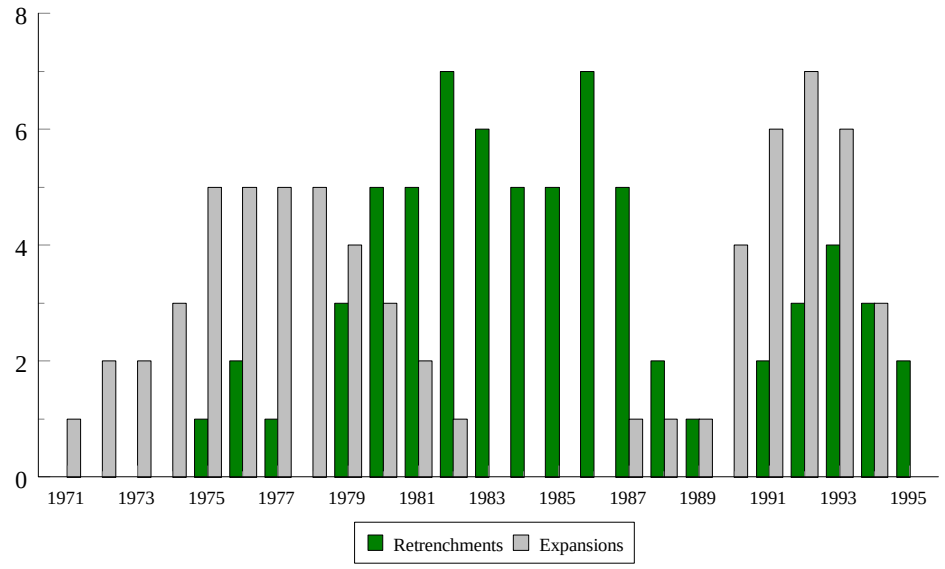
Country	N° of the episode	Fiscal retrenchments	Fiscal expansions
AUSTRIA	Aus		1974-1976
AUSTRALIA	Austr1		1975-1976
	Austr2	1980-1982	
	Austr3	1985-1988	
	Austr4		1991-1994
BELGIUM	Bel1		1980-1981
	Bel2	1982-1987	
	Bel3	1993-1994	
CANADA	Can1		1975-1978
	Can2	1979-1981	
DENMARK	Den1		1974-1977
	Den2		1979-1982
	Den3	1983-1986	
	Den4		1987-1994
FINLAND	Fin1	1975-1976	
	Fin2		1977-1980
	Fin3		1990-1992
GERMANY	Ger1	1980-1983	
ITALY	Ita1	1976-1977	
	Ita2	1982-1983	
	Ita3	1991-1993	
IRELAND	Ire1		1978-1979
	Ire2	1982-1984	
	Ire3	1986-1989	
JAPAN	Jap1		1975-1978
	Jap2	1979-1987	
	Jap3		1990-1994
NETHERLANDS	Net	1991-1993	
SPAIN	Sp	1992-1995	
SWEDEN	Swe1		1972-1974
	Swe2		1977-1979
	Swe3	1986-1987	
	Swe4		1990-1993
	Swe5	1994-1995	
UK	UK1		1971-1973
	UK2	1979-1982	
	UK3		1992-1993

Shaded episodes are characterised by a negative multiplier (see Section 2.2).

11 These episodes are almost the same as those selected in OECD (1996) which uses the structural surplus instead of the primary structural surplus, and a very similar criteria (see Appendix 1). In IMF (1996), the fiscal indicator is also the structural government balance, but fiscal consolidations are defined as two-year episodes during which the structural surplus increases by at least 1.5% of potential GDP over two years (and increases in both years) (see Appendix 1). This method leads to the selection of overlapping and truncated adjustment episodes. Alesina and Perotti (1995) define one-year and two-year large-scale adjustments and expansions based on the change in the primary structural surplus.

Not surprisingly, many large scale expansions took place in the early 1970s, as policy makers attempted fiscal reflation in response to the first oil shock and the resulting recession (Figure 1). The 1980s was overwhelmingly a period of fiscal retrenchment, as governments aimed at correcting inherited fiscal imbalances. In the 1990s, both adjustments and expansions took place simultaneously, but until 1993, expansions predominated[12].

Figure 1: Large-scale fiscal policy episodes, 1970-95



2.2. An overview of large-scale episodes

Tables A to Di in Appendix 2 provide detailed statistics on the large-scale policy episodes. This section examines (i) under what initial conditions government embarked on such episodes, (ii) what were their budgetary characteristics, (iii) what effects they had on output growth, and (iv) whether monetary policy was conducive to adjustment/expansion[13].

Anecdotal evidence suggests that expansions were frequently undertaken in response to adverse growth performance, while adjustments were generally initiated in order to restore the situation of public finances. Hence, some asymmetry in the initial conditions would be expected. This is documented in Table 2, which confirms that governments more frequently embarked on expansions in the context of deteriorating economic conditions at home or among the industrial economies, while they embarked on restrictions against the background of a severe deterioration in public finances.

12 The method used here overlooks episodes which started at the end of the observation period.
13 Although the degree of political support for fiscal retrenchment / expansion could also play a role, it is not covered in this research.

Table 2: Large-scale fiscal policy episodes: initial conditions

	Fiscal adjustments	Fiscal expansions
Government balance (t - 1)	-6.9	1.7
Public debt ratio (t - 1)	63.7	41.1
Change in the debt ratio (t - 1)	3.5	-0.7
Relative country growth (t-1)*	0.2	-0.4
Change in country growth (t)	-0.4	-0.7
Change in G7 growth (t)	-0.4	-0.9

in percentage points

** see Box 1 on the measurement of relative country growth*

On average, large-scale expansions and adjustments were of similar magnitude and duration. They were often very large in size: during adjustments, the primary structural surplus increased by 1.7 percentage points *per year* over the episodes, which were 3.5 years long on average; for expansions it was reduced by -1.6 percentage points per year. There are several cases in which the annual fiscal restriction impulse was above 2 percentage points of GDP. Both changes were on average steady during the episodes.

Adjustments eventually reached the goal of reducing the deficit and of restoring sustainability. This can be assessed by the ratio of the (*ex post*) change in the total government balance to the (*ex ante*) change in the primary structural surplus, which can be considered as an efficiency ratio. On average, the efficiency ratio is 0.6, which is high if one takes into account both output loss and debt accumulation effects. However, the variance in the efficiency ratio is high, as this ratio exceeds 1 in some countries, but is nil for Germany (1980-83) or negative for Spain (1992-95), where the general government balance deteriorated.

Expansions were generally very costly in budgetary terms, as they led on average to an increase in the deficit by 2 percentage points per year. All expansions resulted in a severe deterioration in the sustainability indicators. In comparison to adjustments, the « efficiency » ratio (which in this case measures the *ex post* deterioration in the budget balance associated with an expansionary impulse amounting to 1 percentage point of GDP) is higher (1.2 versus 0.6), which suggests either weak output growth or adverse debt accumulation effects.

A major issue in the design of any adjustment programme is to strike a balance between tax increases and expenditure cuts, as supply-side considerations suggest that composition matters. However, as taxes and expenditures are endogenous, both should be corrected for the effects of the cycle. For this purpose, the study relies on OECD data that are consistent with the structural deficit, and since taxes and expenditures are generally affected by an upward trend (at least in the European countries that constitute the bulk of the sample), de-trended structural taxes and expenditure, are also computed (Table 3). Although structural data would suggest that expansions were operated through rises in expenditure, and adjustments through rises in taxes, the de-trended measure provides a more balanced view.

Table 3: Large-scale fiscal policy episodes: revenues and expenditures

	Fiscal adjustments	Fiscal expansions
Change in current structural revenue	1.1	-0.2
Change in current structural expenditure	0.1	1.5
Change in de-trended current structural revenue	0.7	-0.6
Change in de-trended current structural expenditure	-0.5	0.8

Measuring the output effect of fiscal policy on an *ex post* basis raises significant methodological difficulties, because (i) trend output growth rates differ across countries and across time, and (ii) countries face non-fiscal policy shocks which may be correlated or idiosyncratic. These difficulties and the method adopted in this paper are detailed in Box 1. The method essentially relies on a 'corrected' (or 'relative') growth indicator which adjusts the observed performance for the G7 cycle and differences in trend output growth between the country and the G7 average. Such an indicator has the advantage of eliminating both the common business cycle component and differences in trend output growth. For example, measuring the growth effect in this way leads to considering the Irish retrenchment of 1986-89 as having a negative effect on growth. However, as initial growth conditions cannot be considered neutral, changes in the corrected growth indicator are also examined. As episodes are not distributed evenly over time, and since G7 growth has been affected by a downward trend over the observation period, the change in G7 growth is also considered (see Table 2).

Box 1: Measuring the output effect of fiscal policy with *ex post* data

Since the aim is to compare the impact on output of fiscal policies that took place in various countries and at different periods of time, the effects of other factors, exogenous to budgetary policy, that might have influenced output, should be removed. Observed output growth in a given country at a given time is the result of a number of factors, among which fiscal policy does not always prevail, even during periods of strong fiscal retrenchment (or expansion). This is the reason why various indicators are constructed that should reflect the impact of fiscal policy on output more accurately than the mere observed growth.

Since the null hypothesis is that fiscal policy operates through traditional Keynesian income channels, the predictions of Keynesian models can be used as a starting point. In a simplified Keynesian framework, the first difference in country i's output (dy_i) depends on:

- fiscal policy, measured by the change in the primary structural deficit (PSD = -PSS = dg_i)
- trend growth in country i ($d\tilde{y}_i$)

- exogenous shocks ($d\varepsilon = d\varepsilon^* + d\varepsilon_i$), that can be split into symmetric shocks that affect the whole area (for example here the G7) ($d\varepsilon^*$), and country-specific shocks ($d\varepsilon_i$),

$$dy_i = d\tilde{y}_i + m_i dg_i + m^*_i dg^* + d\varepsilon^* + d\varepsilon_i \quad (1)$$

Introducing G7 trend output growth, (1) can be rewritten:

$$dy_i = d\tilde{y}^* + (d\tilde{y}_i - d\tilde{y}^*) + m_i dg_i + m^*_i dg^* + d\varepsilon^* + d\varepsilon_i \quad (2)$$

that is,

$$dy_i - d\tilde{y}^* - b - d\varepsilon^* = m_i dg_i + m^*_i dg^* + d\varepsilon_i \quad (3)$$

where
- m_i is the Keynesian multiplier,
- $d\tilde{y}^*$ is trend output growth in the G7,
- m^*_i is the global cross-country Keynesian multiplier,
- dg^* is the change in G7 PSD,
- b is the difference between trend growth in country i and in the G7, and will be measured as the average difference between the observed growth rates in country i and in the G7 over the 1971-1995 period. Note that this term captures, for example, high growth rates for converging countries, or differences in growth due to demographic factors.

If country specific shocks ($d\varepsilon_i$)[14] are ignored, the Keynesian multiplier m_i may therefore be read as the ratio between the observed growth in country i, corrected of a number of exogenous factors, and the change in the PSD. The observed growth must hence be corrected for the potential growth of the G7, the difference between potential growth and the effect of symmetric shocks ($d\varepsilon^*$).

The first two correcting terms ($d\tilde{y}^*$ and b) are easy to compute. But the last one ($d\varepsilon^*$) is not directly available.
However, the aggregation of (1) for the G7 gives the following expression for the G7 growth (dy^*):

$$dy^* = d\tilde{y}^* + m^* dg^* + d\varepsilon^* \quad (4)$$

Equation (3) can be rewritten, using (4):

$$dy_i - (dy^* - (m^* - m^*_i)dg^*) - b = m_i dg_i + d\varepsilon_i \quad (5)$$

Observed growth should thus be corrected for differences in trend output growth and the observed growth of the G7, *excluding the impact of fiscal policy in the G7*. The problem is that $(m^* - m^*_i)dg^*$ is not much easier to evaluate than $d\varepsilon^*$.

[14] By construction, these shocks have a zero average over the set of countries.

In practice, the $(m^*-m^*_i)dg^*$ term is not taken into account and corrected growth is defined as:

$$\text{corrected growth} = dy_i - dy^* - b \qquad (6)$$

i.e. the observed growth is corrected for the G7 growth and the difference between potential growth rates.

Using (5), this is equivalent to:

$$\text{corrected growth} = m_i dg_i - (m^*-m^*_i)dg^* + d\varepsilon_i$$

An alternative would be instead to use corrected growth $cg' = dy_i - d\tilde{y}^* - b$, which is simply the difference between observed and potential growth in country i, minus the average difference of potential growth rates.
It then follows that: corrected growth $cg' = m_i dg_i + m^*_i dg^* + d\varepsilon_i + d\varepsilon^*$

None of these indicators is fully satisfactory, because the effects of overall fiscal policy in the G7 cannot be separated from symmetric shocks in the observed G7 growth. Moreover, these indicators rely on a very simplified Keynesian framework and ignore the influence of country specific shocks, which are supposed to equal zero (on average), but might play an important role in some cases.
However, it appears that the first indicator is not correlated (on average) with G7 growth during large scale episodes, whereas the second indicator is positively correlated with G7 growth. This suggests that the influence of exogenous symmetric shocks on growth in individual countries has been stronger on average than that of G7 fiscal policy, which seems plausible. This is why the first indicator of « corrected growth » is preferred as a measure of the growth effect of fiscal policy.

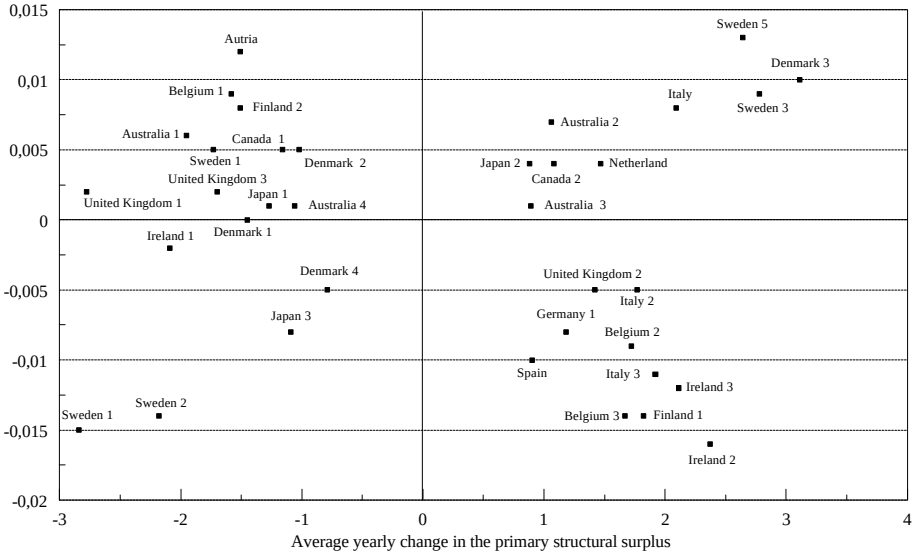
Table 4 presents several measures of the growth effect of large-scale fiscal episodes. They indicate that in spite of the size of fiscal policy actions, their output effect was on average very limited: the growth differential *vis-à-vis* the G7 remained close to its normal level. As indicated in Appendix 2 Tables C and Ci, the growth effect was clearly negative for some countries, but positive for others. Furthermore, there is no downward sloping relation between the intensity of the effort and its growth effect (Figure 2), as one would expect from a standard neo-Keynesian approach, and there are wide variations in the output costs across countries.

Table 4: Alternative measures of the output effect of large-scale fiscal policy episodes

	Fiscal adjustments	Fiscal expansions
GDP growth (a)	2.0	2.2
Corrected growth (a)	-0.2	-0.2
Change in corrected growth (b)	-0.1	0.1
Output cost / multiplier (c)	0.1	-0.1
Delayed output cost / multiplier (d)	0.4	-0.1
Output cost #2 (e)	-0.1	-0.1

(a) Average over the episode
(b) Average annual change over the episode
(c) Corrected growth / change in the PSS over the episode
(d) As (c), but with a one-year lag in output
(e) Change in corrected growth / change in the PSS over the episode

Figure 2: Growth effect of large-scale fiscal policy episodes



Note : Finland, which showed up a very negative effect on growth during the 1990-1992 expansion, was not shown, because data might be erratic.

Interest rates and exchange rates movements are natural candidates for explaining the apparent lack of relationship between fiscal policy and growth performance. On average, long term interest rates decreased over the periods of fiscal adjustment (See Appendix 2 Table D), but as inflation dropped even more, *ex post* real interest rates generally rose, leading to more stringent economic conditions. Moreover, with the clear exception of Denmark, which experienced a sharp drop in bond rates, the interest rate effect of the adjustment was generally limited in the short run: for the other countries, there is no clear evidence of front-loaded drop in bond rates that would signal a credibility effect (Appendix 2 Table D).

In the same way, the real effective exchange rate appreciated on average during periods of fiscal retrenchment. Thus, the restrictive effects of fiscal policy adjustments were generally not compensated by monetary policy. Yet, the standard deviation of the change in the real effective exchange rate indicates that the range of monetary policies was very wide. In several instances (in Italy and Spain for the most recent cases), fiscal retrenchment was accompanied by a devaluation under a fixed exchange rate system. More generally, the evolution of exchange rates may have some responsibility in the success of several fiscal adjustments. On average, large-scale adjustments which did not lead to a relative growth slow-down appear to have benefited from a depreciation of the exchange rate prior to, or at the beginning of, the adjustment programme, while those which led to a drop in activity were associated with an appreciation both before and in the early years of the programs[15].

Similar remarks can be made about large-scale expansions. Although the expansionary effects of fiscal reflation were in some cases dampened by exchange rate appreciation (the Japanese and Irish experiences of the 1970s are cases in point), in most instances monetary policy was accommodative and the real exchange rate depreciated in reaction to the fiscal expansion[16]. In particular, it is interesting to note that in several cases (Finland in the 90's, Sweden in the late 70's and in the 90's), the major fiscal expansions had a negative impact on growth, despite the expansionary shift in both fiscal and monetary policies.

Considering the evolution of interest rates and exchange rates altogether, as measured by the synthetic monetary index (3/4 of the change in short term interest rates plus ¼ of the change in real effective exchange rates, cf. Table D and Di, Appendix 2), it appears that among the 9 anti-Keynesian fiscal retrenchments, only 3 benefited from an easing of the monetary conditions.

The *prima facie* evidence from these episodes is thus that the average output cost of fiscal retrenchments is lower than indicated by standard model simulations. Observed adjustment experiences do not seem to confirm the vicious circle scenario suggested by some simulations, in which a sustained attempt at reducing the budget deficit is doomed to fail because (negative) automatic-stabiliser effects offset the gains from discretionary fiscal policy changes. Before drawing firm conclusions, however, large-scale fiscal policy episodes must be compared to standard ones.

15 Back of the envelope calculations however indicate that in a standard neo-Keynesian framework, exchange rate depreciation effects are far from able to offset the demand effect of fiscal adjustment: assuming that the price elasticities of foreign trade are of the order of magnitude of 0.5, a 4% depreciation of the real exchange rate would be needed to offset a 1 percentage point reduction in the PSS for an economy whose openness ratio is 25%. Actual depreciations were therefore not sufficient to account for anti-Keynesian effects.

16 This may be surprising, as the opposite effect would be expected in a Mundell-Fleming framework. However, capital controls were still present in several countries in the 1970s and the early 1980s.

2.3. Large-scale versus standard policy episodes

This sub-section investigates whether large-scale fiscal policy episodes really differ from more standard ones. For the purpose of this comparison, standard fiscal policy episodes will be defined as periods during which the PSS continuously increased (adjustment) or decreased (expansion) and that are not included in one of the large-scale episodes previously selected. Such episodes can be short-lived but also lasting, if the direction of fiscal policy is maintained for several years. On average, their duration was shorter than that of large-scale episodes (1.5 years versus 3.5), but they were more frequent: for all 17 countries in the sample, 223 years belong to standard retrenchments or expansions, while large-scale experiences cover only 130 years [17]. The corresponding average values and standard deviations of a number of indicators are presented in Table 5.

[17] As episodes beginning at the end of the period tend to be truncated, the last year of the sample has been excluded for the characterisation of the standard episodes.

Table 5: Large-scale versus standard fiscal policy years

	Retrenchments				Expansions			
	Large		Standard		Large		Standard	
Number of years	66		103		64		120	
	mean	STD*	mean	STD*	mean	STD*	mean	STD*
Initial conditions								
Government balance (t - 1) (b)	-6.6	4.8	-3.1	3.6	1.6	4.2	-2.7	3.8
Public debt ratio (t - 1) (b)	67.6	29.0	52.7	26.8	39.5	21.5	56.5	28.3
Change in the debt ratio (t - 1) (b)	3.8	4.7	2.0	4.0	-1.0	2.1	1.0	4.0
Relative country growth (t - 1) (d)	0.2	1.7	0.5	2.2	-0.5	2.1	-0.2	1.8
Change in G7 growth (t) (d)	0.1	1.8	-0.1	2.1	-0.1	2.1	0.0	1.9
Country characteristics								
Size (millions)	25	26	38	47	19	27	34	42
Indicator of openness (c)	33.2	22.1	27.3	16.4	26.9	11.8	29.0	16.3
Fiscal impulse								
Change in primary structural surplus (a)	1.6	1.1	0.8	0.6	-1.5	1.1	-0.8	0.7
Change in total budget surplus (b)	1.1	1.4	0.7	1.0	-1.9	1.7	-0.9	1.1
Efficiency ratio	0.7	0.8	0.7	2.1	1.4	1.5	1.0	2.1
Composition of fiscal policy								
Change in current expenditures (b)	0.2	1.6	0.3	1.3	1.6	1.8	0.8	1.4
Change in current revenues (b)	0.9	1.4	0.9	1.1	-0.2	1.2	0.0	0.9
Change in structural current expenditures (a)	-0.1	1.2	-0.1	0.8	1.3	1.2	0.8	1.0
Change in structural current revenues (a)	0.9	1.4	0.9	1.0	-0.2	1.2	0.0	0.9
Context in the G7								
Change in the G7 PSS (a)	0.2	0.4	0.1	0.5	-0.1	0.7	0.0	0.6
GDP growth in the G7 (d)	2.4	1.4	3.0	1.5	2.6	1.7	2.9	1.6
G7 output gap (a)	-0.8	1.9	-0.3	1.9	-0.2	2.0	-0.3	1.9
Monetary policy								
Change in monetary index (e)	0.5	2.6	0.3	1.9	-0.3	3.1	0.3	2.1
Growth effects								
GDP growth (d)	2.2	2.0	2.7	2.0	2.1	2.8	2.9	2.4
Corrected growth (d)	-0.2	1.6	-0.1	1.7	-0.3	2.4	0.1	1.9
Change in GDP growth (d)	0.0	2.4	-0.5	2.7	0.1	2.8	0.3	2.5
Change in corrected growth (d)	-0.1	2.2	-0.4	2.2	0.2	2.7	0.4	2.2
Components of demand								
External contribution to GDP growth (d)	0.4	1.6	0.0	1.4	0.7	1.7	0.0	1.4
Domestic demand contribution to GDP growth (d)	1.7	2.8	2.7	2.8	1.5	4.0	2.9	3.2
Change in external contribution to GDP growth (d)	0.0	2.0	0.2	1.7	0.2	2.3	-0.1	1.8
Change in domestic demand contribution to GDP growth (d)	-0.1	3.7	-0.8	3.8	0.0	4.3	0.5	3.6
Consumption behaviour								
Change in savings ratio (d)	-0.8	1.7	-0.5	1.4	0.7	2.0	0.3	1.4
Normalised change in the savings ratio (f)	-0.6	1.8	-0.3	2.6	-0.1	2.4	-0.6	2.7

** sample standard deviations*
(a) as a percentage of potential output
(b) as a percentage of GDP.
(c) defined as the share of imports in total domestic demand ..
(d) in percentage points.
(e) defined as a weighted average of the change in real short term interest rates and the relative change in real effective exchange rates, with weights of 3 to 1
(f) defined as the ratio of the change in the saving ratio to the change in the PSS.

As the sample standard deviations reported in Table 5 are often much larger than the differences between average values, these differences may seem insignificant. However, the standard deviation of the mean values is much smaller than the sample standard deviations around the means. The average values are thus often significantly different from each other (see Appendix 2, Table E for the corresponding Student T). Nevertheless, there are always many episodes for which the difference observed on average values does not apply. This should be kept in mind when drawing conclusions from these comparisons.

Taking the change in the fiscal stance as a yardstick, large fiscal episodes can (on average) be assessed to be twice as large as standard ones. Large-scale retrenchments were generally undertaken by smaller, more open economies, in response to a severe deterioration in the debt/deficit situation. In comparison to standard adjustments, they did not benefit from especially favourable economic conditions in the country or the G7. Large-scale expansions were also undertaken by smaller economies, and as Table 2 already suggested, this was generally done in response to a worsening economic performance in the country and in the G7. Large-scale fiscal retrenchments were not more efficient than smaller ones in improving the budgetary balance . Similarly, the difference in the efficiency ratio (i.e. the ratio of the *ex post* deterioration in the budget balance to the *ex ante* increase in the primary deficit) for standard and large-scale expansions is not statistically significant (see Table E in Appendix 2).

The composition of large scale fiscal episodes does not differ much from that of standard ones[18], whereas expansions and retrenchments clearly differ, as would be expected (adjustments were on average accompanied by a large increase in government revenue, and expansions by a large increase in expenditure and a small decrease in revenue). Differences between large-scale and standard adjustments remain limited when expenditures and revenues are adjusted for the business cycle. Differences appear to be more significant when structural receipts and expenditures are de-trended: large-scale retrenchments relied more on expenditure cuts, and large-scale expansions more on expenditure increases. Finally, when expenditures and revenues are broken down into their components, no significant differences appear between large and standard episodes[19].

Assessing the growth effect of fiscal policy episodes requires controlling for the effects of monetary policy and for the spill-over effects of fiscal policy abroad. In order to evaluate the role of monetary policy, a rough monetary condition index is used that gives a 25% weight to the effective exchange rate and a 75% weight to the nominal money market

18 With the exception of large expansions, which are characterized by a larger increase in the expenditure ratio than standard expansions.

19 These results differs from Alesina and Perotti's conclusions (1995). Two reasons may account for these differences: first, the episodes selected in the two papers arenot the same (see Appendix 1); second, Alesina and Perotti rely on a definition of expenditures and taxes of their own, whereas the current budget variables as defined in OECD (1996) are used here. Using Alesina and Perotti's aggregates on the sample selected heregives a conclusion closer to theirs: -expenditure only appears to decrease gives a during large-scale retrenchments, even though this decrease is clearly smaller than in Alesina and Perotti's paper. Yet, in addition, the decrease is only obtained when data that are de-trended and corrected for the business cycle are considered.

rate[20]. On this basis, monetary policy was on average more restrictive during large-scale retrenchment episodes than during standard ones, and was more accommodative during large-scale expansions than during standard ones. However, as there is considerable variance across episodes, these differences can hardly be considered significant. Table 5 also displays the aggregate fiscal impulse in the G7 (measured by the average change of the PSS for the G7 countries[21]). This indicator suggests that expansions as well as adjustments were weakly correlated with the G7's fiscal policy, but that this effect can be considered of minor quantitative importance. In any event, cross-country income spill - overs should have worsened the growth effect of large-scale adjustments and should have improved that of large-scale expansions.

The macroeconomic effects of fiscal policy can now be assessed. Table 5 indicates that growth was on average lower during both large-scale adjustments and expansions (in comparison to standard episodes), but this was chiefly an effect of the overall G7 cycle. The corrected growth measure does not indicate any major effect of fiscal policy, but fails to take into account differences in initial conditions. If the change in corrected growth is used instead, it is found that standard adjustments did reduce growth, but that large-scale adjustments did not. By the same yardstick, both large-scale and standard expansions increased growth, but in both cases by a meagre 0.2/0.4 percentage points. There are therefore indications of non-linearities in the output effect of fiscal policy, even though the differences are not very significant, as indicated by the standard deviations.

Additional evidence is presented in Figure 3, which displays the average time profiles of the PSS, G7 growth, and the corrected country growth measure for the four categories of episodes. As standard episodes are on average shorter than large-scale ones, the results are only given for dates t - 1 (noted 0 in Figure 3), which gives the initial conditions prior to the adjustments, t (noted 1), the first year of the adjustment, t + 1 and t + 2. The upper panel of Figure 3 illustrates the differences in initial budgetary conditions as well as in the pace of the adjustment / expansion. Not surprisingly, the (absolute values of) the intercept and the slope of the PSS schedules are significantly higher for large-scale episodes. The second panel illustrates that (as already mentioned) large-scale expansions were on average undertaken in response to a worsening G7 growth performance (a large number of expansions were initiated during the 1974-75 and the 1991-93 recessions), but on average G7 growth was lower during retrenchments. As standard episodes are more evenly distributed throughout the period, there is much less variation in the corresponding G7 context. Finally, the third panel depicts the time profile of the corrected growth. For standard episodes, the profiles broadly conform with the usual Keynesian story: corrected growth steadily increases as a result of fiscal expansions and decreases as a result of fiscal

20 Weights should in principle depend on the country's openness and reactions to interest rate shocks. The weights used here are roughly consistent with those of the IMF (IMF, 1996) and of Goldman Sachs (Goldman Sachs, 1996). The interest rate retained is the short term one, because it is a better proxy for the *ex ante* monetary policy than the long term interest rate. Yet, the monetary index gives a measure of the global move of an IS-LM equilibrium (thus indicating the *ex post* monetary policy) more than it gives the prior translation of LM curve (the *ex ante* monetary policy). As such, the monetary index overestimates the monetary component of the policy mix. As monetary policy *ex post* turns out not to compensate for fiscal policy, it means this should be even truer *ex ante*. In total, the accompanying monetary policy cannot explain, on average, the low-cost effects of fiscal adjustments.

21 Average G7 aggregates are calculated using OECD weights based on GDP.

restrictions. However, the same pattern of response cannot be found for the large-scale episodes: during retrenchments, growth drops in year t + 1 only, and starts to resume afterwards; for expansions, the usual multiplier effect does not appear at all [22]. Although the size of the sample is limited and the variance across episodes is large, this is taken as *prima facie* evidence of non-linear behaviour.

Figure 3a - Profile of the Primary Structural Surplus

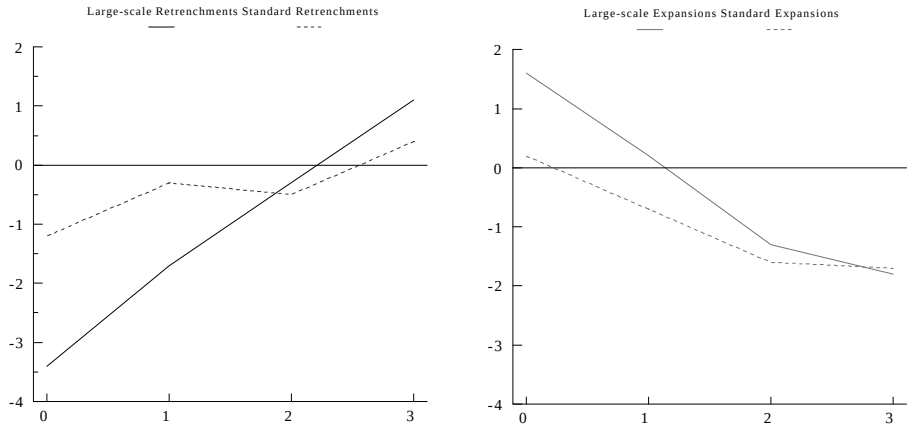
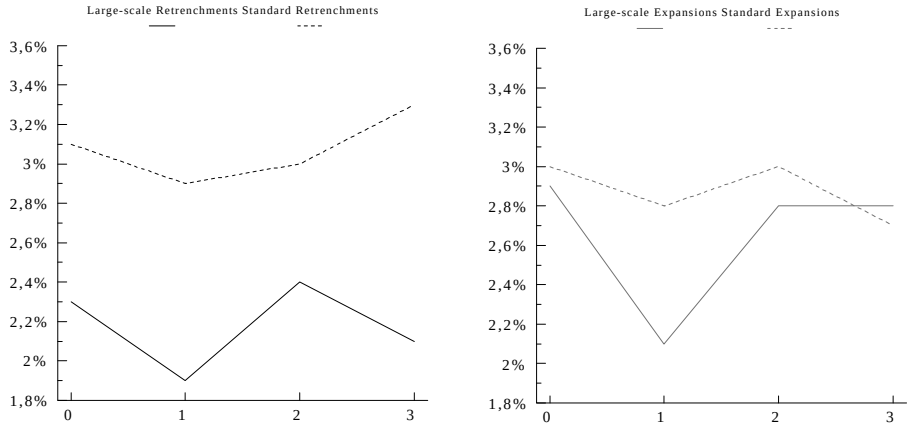
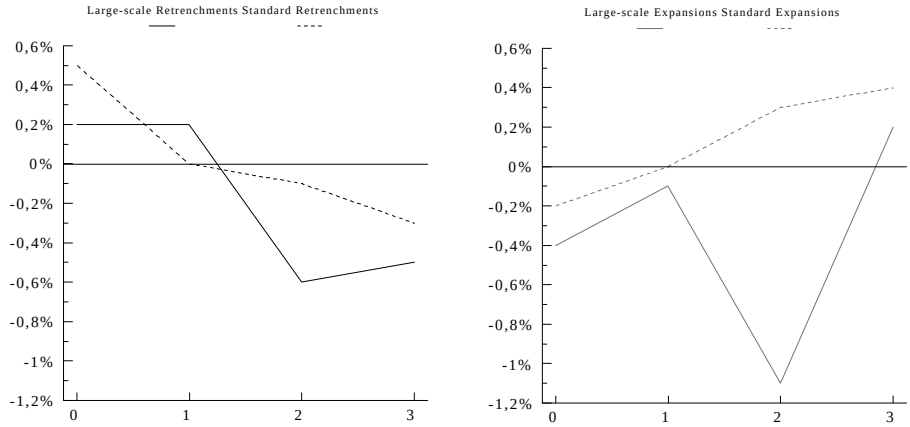


Figure 3b - Profile of the G7 Growth



[22] The drop of corrected growth in year t + 1 of the large-scale expansions is to a large extent due to the Finnish recession of 1991.

Figure 3c - Profile of the Corrected Growth



Looking more closely at the main components of demand, it is noticed that the contribution to growth of foreign trade was not higher during large adjustments than during smaller ones, while it was higher (and positive) during large expansions than standard expansions. This also does not conform with the standard Keynesian story, as it would be expected that the external contribution be positively correlated with the change in the PSS[23]. Furthermore, the foreign contribution to growth increased during small retrenchments (by 0.2 percentage points, see Table 5), but not during larger ones (0.0), whereas the contribution of domestic demand fell much more during standard adjustments (-0.8) than during large-scale retrenchments (-0.1). In a similar way, the contribution of domestic demand increased during standard expansions, but not during large scale expansions. These observations (i) confirm that large expansions were on average carried out in response to a worsening of domestic growth conditions, but failed to give rise to a significant increase in domestic demand, and (ii) suggest that domestic demand reacted to fiscal contraction in a very non-linear way.

The last rows of Table 5 confirm that consumption behaviour did not conform to the Keynesian story during large-scale episodes: as would be expected from any model, the households' saving rate rose during expansions and dropped during adjustments, but changes were more than proportional to the size of the adjustment, as indicated by the 'normalised saving rate' (change in the saving rate divided by the change in the PSS). This might indicate a partially Ricardian consumption behaviour and would be consistent with a non-linear model such as the one exposed in Sutherland (1995). This calls for a deeper analysis which will be conducted in Section 4.

Summing up, three conclusions emerge from this comparison: first, there is evidence of non-linearities in the response of the economy to fiscal shocks, as standard episodes tend to conform to Keynesian patterns, while large-scale episodes do not; second,

23 As mentioned in part 2.2, the monetary policy conducted during the various fiscal episodes cannot be held responsible for this non-Keynesian behaviour.

these non-linearities can neither be ascribed to monetary policy nor to cross-country spill-over effects; third, anti-Keynesian behaviour seems to arise from the consumer's response to large-scale adjustments.

3. IS THE EVIDENCE COMPATIBLE WITH KEYNESIAN BEHAVIOUR?

A striking feature of the evidence presented in Section 2 is the small average value of the growth effect of large scale fiscal episodes, as measured by the average corrected growth or by the average fiscal multiplier. Although the implied *ex-post* multipliers are certainly low in comparison to those obtained in simulations with macro-econometric models, standard episodes can by and large be assessed to be compatible with a Keynesian pattern. This is especially true if differences in the initial conditions are taken into account. But the evidence from *large scale* adjustments / expansions seems to contradict the predictions of Keynesian models.

However, before concluding that large-scale episodes do give rise to anti-Keynesian behaviour, alternative explanations should be examined. This section investigates whether the method used to select large scale fiscal episodes could be biased (3.1). Then, using a formal statistic testing procedure, it examines whether the observed average value of the multiplier calculated on a rather small sample of large-scale fiscal episodes is significantly different from the value of the multiplier of Keynesian macro-econometric models (3.2).

3.1. Is there a bias in the selection of large-scale fiscal episodes?

A first possible explanation for the low average value of the observed multipliers might be the existence of a bias in the selection of large scale episodes. Assume, for example, that governments undertake fiscal adjustments, but interrupt them as soon as growth falls below a certain threshold. Then, sustained adjustments would be precisely those for which the output cost has been smaller, and the observed multiplier on these large scale episodes would be biased towards zero. In other words, the large-scale episodes which would have been selected would have been those very adjustments that benefited from favourable, exogenous conditions.

In order to test for the existence of such a selection bias, the first two years of large scale fiscal episodes are compared with the first years of standard episodes; next, the adjustments are investigated to see whether the growth performance was a determinant of the decision to stop adjustment, by examining whether growth was on average lower during the years preceding the end of an adjustment than during the other years of the adjustment episode.

As already mentioned, the (corrected) growth performance over the episode for countries undergoing large scale adjustments did not differ much from that observed during smaller ones. But higher growth during the first years of large-scale episodes could indicate a selection bias. However, Table 6 shows that growth was on average *lower* at the beginning of large scale adjustments in comparison to standard episodes (the same result applies, when looking at the output gap). Large scale expansions are characterised by a

lower rate of growth during the first years, which is consistent with the previous observation that large scale expansions were generally undertaken in response to a *deterioration* in output growth. Therefore, there might be a bias in the selection of large scale expansions, but not in the selection of large adjustments.

Table 6: Growth performance during the first years of fiscal policy episodes

	Retrenchments		*Expansions*	
variable	*large-scale*	*standard*	*large-scale*	*standard*
GDP growth during the first year	2.1% <	2.8%	1.9% <	2.8%
output gap during the first year	-0.1% <	0.2%	0.6% >	-0.2%
corrected growth during the first year	0.2% >	0.0%	-0.1% <	0.0%
output gap during the first two years	-0.4% <	0.3%	0.0% >	-0.2%
corrected growth during the first two years	-0.4% <	0.0%	-0.6% <	0.1%

Similarly, Table 7 compares growth performance during the last year before the end of a large-scale adjustment to the growth outcome during the other years of the adjustment period. Again, no significant differences can be derived from the results: growth and corrected growth were slightly lower before the end of an adjustment, but the output gap was on the contrary higher during the year preceding the end of an adjustment.

Table 7: Growth performance at the end of large-scale adjustments

Variable	Years preceding the end of an adjustment		Years for which the adjustment was pursued in the following year
GDP growth	2.5%	<	2.6%
corrected growth	-0.3%	<	0.0%
output gap	0.0%	>	-0.3%

It is therefore concluded that, on the one hand, there is no evidence of the presence of a selection bias that might explain the weakness of the average observed fiscal multiplier during large-scale retrenchments. On the other hand, the measure of growth effects during large-scale expansions is probably biased downwards, since fiscal reflations were generally undertaken when growth was deteriorating.

3.2. Does the evidence significantly depart from Keynesian models?

In the face of the empirical evidence reviewed here, a Keynesian economist would probably argue that since exogenous non-policy shocks have affected the economies during the selected adjustments, and since these episodes are not very numerous, the « noise » induced by these shocks could be the main reason for the small average value - and high variance - of the observed multipliers. To assess the plausibility of this argument, this section formally examines whether the observed multipliers significantly differ from Keynesian multipliers, when taking into account three factors: (i) the uncertainty surrounding the magnitude of the Keynesian multiplier, (ii) the fact that the selected episodes are not pure fiscal experiences and (iii) the small number of observations. In other words, the null hypothesis is that the fiscal multiplier of standard neo-Keynesian models is an unbiased estimator of the true multiplier, and the evidence of whether large-scale episodes lead to a rejection of this hypothesis is examined.

To this end, the following assumptions are made:

(H1) the multiplier derived from macro-econometric models is an unbiased estimate of the true Keynesian multiplier and is statistically independent of the fiscal impulse during the episode;

(H2) the Keynesian multiplier is (roughly) constant during an episode and starts to decline significantly only after the end of the episode;

(H3) the fiscal policy implemented *before* the beginning of the episode has no significant effect on the average output growth *during* the episode;

(H4) the decision by authorities to pursue restrictive fiscal policies is statistically independent from the growth outlook (that is, authorities do not choose periods of buoyant activity to implement restrictive fiscal policies).

Hypotheses (H2) and (H3) are obviously simplistic. However, on an annual basis, they do not depart excessively from the results of simulations using standard macro-econometric models (multipliers are indeed roughly constant over a couple of years in most of the macro-econometric models reviewed by Bryant *et al* (1988)). (H4) can seem more binding, but it is consistent with the evidence presented in the previous sections, at least as regards fiscal retrenchments. Furthermore, using corrected growth measures allows most of the effects of the business cycle to be removed.

Under these assumptions, the variance of the difference between the average multiplier over the M considered episodes $\left(\frac{1}{M} \sum_{k=1}^{M} \frac{dy_k - d\tilde{y}_k}{dg_k} \right)$ and the average Keynesian multiplier derived from a macro-econometric model ($\frac{1}{M} \sum_{k=1}^{M} \hat{a}_k^1$) is as follows

(see Appendix 3 for the derivation of this expression and a further discussion of hypotheses (H1) to (H4)):

$$
\begin{aligned}
&V\left[\frac{1}{M}\sum_{k=1}^{M}\frac{dy_k - d\tilde{y}_k}{dg_k} - \frac{1}{M}\sum_{k=1}^{M}\hat{a}_k^1\right] = \\
&\frac{1}{M^2}\sum_{k=1}^{M}\left[\frac{V(dy_k - d\tilde{y}_k - a_k^1 dg_k)}{dg_k^{\,2}} + V\left(\hat{a}_k^1\right)\right] \\
&+\frac{1}{M^2}\sum_{k=1}^{M}\sum_{\substack{j=1\\ j\neq k}}^{M}\delta_1(k,j)\frac{Cov(dy_k - d\tilde{y}_k, dy_j - d\tilde{y}_j)}{dg_k dg_j} \\
&+\frac{1}{M^2}\sum_{k=1}^{M}\sum_{\substack{j=1\\ j\neq k}}^{M}\delta_2(k,j)\,V\left(\hat{a}_k^1\right)
\end{aligned}
\qquad (1)
$$

where:
- the subscript k pertains to the episodes, and M is the number of large-scale episodes (M=37);
- $\hat{a}_k^1$ is the multiplier for the country associated with episode k as estimated by a Keynesian model;
- $\delta_1(k, j)$ is a dummy variable which is equal to 1 if episodes k and j refer to different countries but overlapping periods and which is equal to 0 otherwise;
- $\delta_2(k, j)$ is a dummy variable which is equal to 1 if episodes k and j refer to the same country and which is equal to 0 otherwise;
- $dy_k - d\tilde{y}_k$ is the average corrected growth during episode k;
- dg_k is the average change in the primary structural deficit during episode k.

This variance can be decomposed into 3 terms:

- the first one is the variance under the assumption that there is no correlation between episodes; it is therefore a weighted average of individual variances; each individual variance is itself the sum of two terms: the first term comes from the unconditional variance of output arising from exogenous shocks that are independent of fiscal policy; the second term is the variance of the estimated Keynesian multiplier of the macro model under consideration;

- the second term represents the correlation which can arise when countries undertake fiscal retrenchments at the same time;

- the third term corresponds to the correlation due to the fact that the Keynesian multiplier has been estimated with the same model when the episodes relate to the same country;

The empirical implementation requires the calculation of the several variances and covariances which appear in expression (1). The terms $\frac{V(dy_k - d\tilde{y}_k - a_k^1 dg_k)}{dg_k^2}$ and $\frac{Cov(dy_k - d\tilde{y}_k, dy_j - d\tilde{y}_j)}{dg_k dg_j}$ for the overlapping episodes can be estimated simply by the empirical variances and covariances. It is more tedious to estimate $V(\hat{a}_k^1)$. Two different ideas can be put forward to this end.

A first possibility is to use stochastic simulations performed with Keynesian macro - econometric models, which provide information on the variance of the multiplier that stems from the uncertainty surrounding the estimated coefficients of one particular model. For this purpose, stochastic simulations performed on different models have been gathered (Fair (1994) and Meersman (1991)). Another possibility consists in using model comparisons as those of Bryant *et al* (1988) and Whitley (1992). In this case, the uncertainty which is measured arises from the choice of particular specifications rather than from the uncertainty surrounding the true coefficients. Table 8 presents estimates obtained with both methods.

Table 8: Standard deviation of the Keynesian multiplier

year	1	2	3	4	5
1) stochastic simulations					
a) Fair (1994), US economy					
- purchase of goods & services	0.15	0.3	0.3	0.3	
- indirect business tax rate	0.3	0.5	0.5	0.4	
b) Meersman (1991)					
- France	0.45	1	0.8	0.7	0.7
- Germany	0.1	0.3	0.4	0.7	0.7
- United Kingdom	0.2	0.25	0.3	0.3	0.25
2) models comparisons					
a) Bryant *et al* (1988)					
- USA	0.6	0.5	0.4	0.3	0.4
- rest of the world	0.5	0.7	0.8	0.8	0.9
b) Whitley (1992)					
- France	0.8	na	0.8	na	0.6
- Germany	0.8	na	0.6	na	0.5
- United Kingdom	0.7	na	0.9	na	0.8
- Italy	0.6	na	0.7	na	0.7

The stochastic simulations provided by Fair show that the uncertainty over the Keynesian multiplier depends on the nature of the fiscal shock. Since large scale fiscal episodes generally relied to a large extent on changes in goods and services expenditures or in households' direct taxes or in indirect taxes, the standard deviation arising from the « purchase of goods » shock performed in the other simulations is used as a benchmark. Comparative simulations with macro-econometric models suggest that the standard deviation of the multiplier is roughly constant over a 5-year period, and can be estimated to be in the range [0.5, 1] for the countries under scrutiny[24].

Since the uncertainty affecting the coefficients (measured through stochastic simulations) and the uncertainty on model specifications (measured through model comparisons) are of a different nature, a conservative estimate would be the sum of the variances from these two sources of uncertainty: this would lead to a variance of about 1.5 for the multiplier. However, this estimate overstates the true value of the variance for at least two reasons. First, models often incorporate minor particularities that are not strongly statistically significant. The uncertainty surrounding the corresponding coefficients may have a strong influence on stochastic simulations and, since these effects are not really significant, one can expect them not to be present only in some models and absent in others: the corresponding variance is therefore included in the two calculated variances, and is then redundant in their sum. Second, results from various models do not only differ because of different specifications, but also because of differences in periods and methods of estimation, which are already taken into account in the variance estimated through stochastic simulations. Furthermore, some of the models used in comparison exercises embody non-Keynesian features (e.g. partial Ricardian equivalence) which should lower the average multiplier and increase the variance. A less conservative estimate for $V(\hat{a}_1)$ would therefore be of the order of magnitude of 0.75.

Replacing the variances and covariances in expression (1) by their estimated values leads to the following expression for the standard deviation of the multiplier:

$$\hat{\sigma} = \sqrt{0.35 + 1/37^2 * (37 + 2*19) V(\hat{a}_1)} \qquad (2)$$

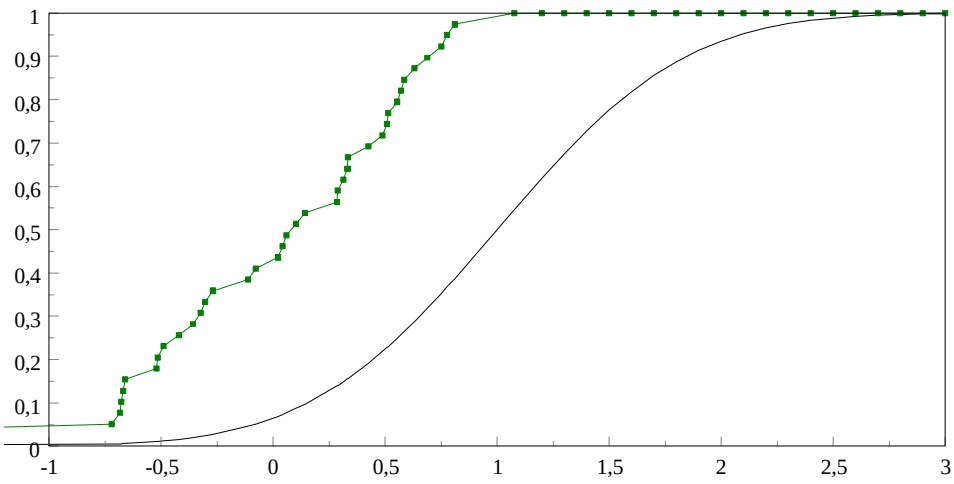
The value of $\hat{s}$ is not very dependant on the value chosen for $V(\hat{a}_1)$. For instance, for a value of $V(\hat{a}_1)$ of 1.5, the calculated standard deviation ($\hat{s}$) is 0.66; with a less conservative value of 0.75 for $V(\hat{a}_1)$, the calculated standard deviation is only reduced to 0.63. In other words, the main source of uncertainty around the observed multiplier is the presence of non-policy exogenous shocks, rather than the variance of the theoretical multiplier. This greatly reduces the problem arising from the non-availability of simulation results for small countries.

[24] Given the scarcity of the available results, the assumption will be made that the standard deviation is the same for all the countries of the sample. At first sight, this assumption seems rather strong, especially as regards smaller countries for which comparative simulations are not available. But it shall be seen that it turns out to be of minor importance.

The conclusion can now be drawn. If the average Keynesian multiplier is supposed to be equal to one (which is approximately the average multiplier over a five-year period according to the standard fiscal policy simulations presented in Bryant *et al* (1988) even though the textbook multiplier is in fact greater than one), then the confidence interval at the 95% level is [-0.3;2.3] and [-0.1;2.1] at a 90% level: therefore the null hypothesis that the observed average multiplier (which is equal to 0.1) is equal to the theoretical multiplier would be accepted, even at a 10% level. This result indicates that the empirical average value of the multiplier (0.1) can not be assessed as significantly different from the models' multiplier (1), when taking into account the relatively small number of episodes and the uncertainty surrounding the Keynesian multiplier as estimated in macro-econometric models.

Additional evidence is provided by the Kolmogorov-Smirnov test, which compares the whole empirical distribution with the theoretical one, and not only the average values. When assuming that the theoretical distribution is normal [25], this test leads to a strong rejection of the null hypothesis of two identical distributions (with a 0. 6 statistic far above 0.3, the 1% critical level), which means that the empirical multiplier is not normally distributed with a mean of 1: the empirical distribution is probably too flat in comparison to a normal distribution. Figure 4 suggests that it is the large proportion of clearly negative multipliers in the empirical distribution that leads to a rejection of the test.

Figure 4: Empirical and theoretical distribution functions of the multipliers



These results indicate that the evidence from large-scale episodes can not be considered as fully inconsistent with the type of behaviour embodied in the neo-Keynesian models which are generally used for policy simulations. However, the number of clearly negative multipliers suggests that at least part of the episodes should be considered as anti-Keynesian. This paper can now turn to a closer examination of these episodes.

[25] which is indeed questionable,

4. TESTING FOR ANTI-KEYNESIAN BEHAVIOUR

The evidence reviewed so far raises two major questions. First, is there a common behavioural pattern that could explain why several large-scale adjustments did not result in significant output losses, but were accompanied by sustained growth? Second, why do the effects of large scale adjustments differ from those of standard ones?

A direct way to address the first question is to run cross-episode regressions. Thus, the growth performance during large-scale episodes is regressed on various variables which could *a priori* explain the observed differences in the growth outcome, such as the size and composition of the adjustment, the length of the episode, the initial conditions in terms of public finances, the size and openness of the country, the accompanying monetary policy, the average change in the G7 PSS over the period, etc. However, such a method did not prove to be fruitful, since very few variables turned out to be significant, or to have the expected sign[26] and a plausible magnitude[27]. In particular, these results seem to indicate that the favourable effect of the composition of the adjustment found for instance by Alesina and Perotti (1996), with a somewhat different set of countries and a different method of evaluation for the growth effect, may not be very robust. Neither do the effects of the initial conditions emphasised by Bertola-Drazen and Sutherland show up in a significant way.

In line with the evidence presented in Section 2, the only variable which was able to explain specificities in the growth effects of large-scale fiscal adjustments turned out to be the change in the household savings rate. Thus, consumption behaviour appears to be crucial for understanding both differences between standard and large-scale adjustments and differences among large-scale adjustments. However, this variable can clearly not be considered as exogenous. For these reasons, it was not proceeded further in this direction, and the focus was rather concentrated on consumption regressions. The econometric strategy that was adopted is presented in Section 4-1, and the two major questions expressed at the beginning of this section is then examined in the light of consumption equations. The focus will first be brought on the differences between standard and large-scale episodes(Section 4-2), and then on differences among large-scale episodes, between 'successful' and 'unsuccessful' adjustments (Section 4-3).

Estimating consumption functions

The most striking regularity which seems to emerge from the data is the negative relationship between the average output growth during large scale fiscal episodes and the variation in the household savings rate. At this stage, it is not clear however whether this relationship runs from the household savings rate towards output or whether some other factor might explain both household behaviour and output growth.

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26 For instance, the square of the change in the PSS turned out to be significatively positive, which would lead to the conclusion that large adjustments are relatively more costly than smaller ones, which is obviously in contradiction with the conclusions of previous sections and might be a fallacious result.

27 The change in the G7 PSS was found to have a positive effect on corrected growth, as expected, but with a very high coefficient value (1.6), which would mean that a fiscal adjustment in the G7 of 1% of GDP would have a dampening effet of 1.6% on other countries growth.

As illustrated by the debate on the econometric testing of Ricardian equivalence (see Seater (1993) for an overview), estimating the impact of fiscal retrenchment on savings behaviour raises some difficulties. A first possible strategy is to estimate a cross section consumption equation following Giavazzi and Pagano (1995) and to test whether this consumption function exhibits some kind of neo-Ricardian behaviour. However, constraining the coefficients to be identical across countries when the true coefficients are likely to be different, can lead to a spurious correlation between public deficits and consumption during large fiscal retrenchment. This is because constrained equations might have a poorer dynamic structure and fail to reproduce adequately country specific consumption behaviour, resulting in large positive residuals during retrenchment periods[28]. A second strategy is to allow for different specifications of the consumption function across countries, as regards the lag structure as well as the right-hand variables. Although this approach is not immune from data mining, it allows for structural differences between countries in the determinants of household behaviour. This is the approach followed here, in addition to the first approach, to allow comparisons.

The starting point is a general specification of the consumption function (in the spirit of Davidson *et al* (1978))[29]:

$$\Delta c_t = a_0 + a_1 \Delta c_{t-1} + a_2 \Delta yr_t + a_3 \Delta yr_{t-1} + a_4 (c_{t-1} - yr_{t-1}) + a_5 \Delta U_t + a_6 \Delta pc_t + a_7 \Delta pc_{t-1} + a_8 \Delta ISR_t + a_9 ISR_{t-1} + a_{10} \Delta ILR_t + a_{11} ILR_{t-1} + \text{Fiscal policy variables} \quad (3)$$

where:

- all variables beginning with a lower case character denote variables taken in logarithm;

- ΔX is the first difference of the variable X (ΔX is therefore approximately the rate of growth of X);

- C is household consumption;

- YR is household real disposable income;

- U is the unemployment rate;

- PC is the consumption price index;

- ISR is the real short term interest rate;

- ILR is the real long term interest rate;

28 For example, differences across countries in the stringency of liquidity constraints should lead to different coefficients of the current income in consumption regressions.

29 For each country, expression (3) was used as a starting point, and a «general to specific » approach was used to identify the significant dynamic terms for each country.

- fiscal policy variables are either dummy variables or the total budget surplus (or the PSS), measured as a share of household disposable income and introduced both in the short run dynamics and in the long run target[30].

Different methods have been used, depending on the way fiscal policy variables are defined and on the constraints on the coefficients (a_i):

(i) country-by-country estimations of equation (3), without any fiscal variables, and calculation of the residuals during large-scale fiscal retrenchment episodes;

(ii) estimation of equation (3) with dummy variables for fiscal policy episodes;

(iii) same as (ii), except that the dummy variables are multiplied by the AR lag structure of the equation, to ensure that the effect of a fiscal retrenchment on the level of consumption takes place without delay;

(iv) pooled estimation of equation (3), with two fiscal policy variables, one being the variation in the total budget surplus deficit during the years of large scale retrenchment or expansion episodes, and the other being the same variable during the other years, with all coefficients (except the constant a_0) imposed to be the same across countries (and across episodes for the fiscal variables);

(v) same as (iv), except that all the coefficients (except those of fiscal variables) are free to vary across countries;

(vi) and (vii) same estimations as (iv) and (v), except that the primary structural surplus replaces the total budget surplus;

(viii) and (ix) same estimations as (iv) and (v), but estimated with instrumental variables.

Such a diversity of methods is required, first to allow comparison with other results, such as Giavazzi and Pagano (1995), and second, because some methods that provide more precise estimates are valid only under some restrictive conditions, while others are less precise, but remain valid under looser conditions. Methods (i) to (iii), which allow the effects of fiscal policy to differ across the episodes, and the other methods, which impose constraints on the coefficients are examples of such a trade-off.

Method (i) is in fact only valid if fiscal policy affects consumption exclusively through traditional channels (income, inflation, interest rates, etc.): if not, the estimated coefficients will be biased towards reducing the residuals over the estimation period; they will however result from a trade-off between reducing the residuals during the episodes and deteriorating them for the rest of the period, and it can therefore be expected that the corresponding residuals will remain large and correctly signed (that is positive over

30 All variables are taken from the OECD *Economic Outlook* data base.

episodes of fiscal retrenchment and negative over episodes of fiscal expansion). Methods (ii) and (iii) address the problem, but may fail to provide precise estimates of the effect of fiscal variables, since they do not take advantage of the multiplicity of fiscal episodes across countries. To that end, the following methods impose the (possibly excessive) constraint that fiscal policy affects equally all countries. Methods (iv), (vi) and (viii) impose the constraint that all variables affect all countries equally, whereas methods (v), (vii) and (ix) only impose restrictions upon fiscal policy variables. Methods (vi) and (vii) attempt at limiting the problems arising from the endogeneity of the total budget surplus by concentrating on the primary structural surplus: since a higher consumption leads to higher fiscal revenues, there is indeed a causality stemming from consumption to the budget surplus; a positive coefficient in the consumption regression could be the result of this reverse causality. The use of the primary structural surplus avoids this problem. Finally, another way of addressing the problem of the endogeneity of fiscal variables is to use instrumental variables, which is done in methods (viii) and (ix); the use of instrumental variables takes into account the endogeneity of income, inflation, unemployment, etc. All these methods have naturally the drawback, compared with methods (iv) and (v), to lead to some loss of statistical significance.

The focus is brought here on the results of methods (ii), (iii), (viii) and (ix), since the other methods lead to quite similar conclusions (detailed results are given in Appendix 4).

4.2. Are large-scale fiscal episodes really different?

Methods (i) to (iii) lead to converging results as regards deviation from usual household behaviour during large-scale fiscal retrenchments or expansions (neither method (ii) nor method (iii) is systematically better than the other, with method (ii) resulting in a smaller SER in some cases and method (iii) in other cases). Results are summarised in Table 9:

Table 9: Average values of static and dynamic dummy variables (ii) and (iii)

Static dummy variables (ii)	
Retrenchments	Expansions
-0.1%	-0.1%
Dynamic dummy variables (iii)	
Retrenchments	Expansions
0.3%	0%

No major differences between large-scale episodes and normal episodes appear in consumption behaviour: only regressions with dynamic dummy variables seem to indicate that large scale retrenchments were accompanied by a slightly higher growth of consumption (0.3%), whereas no symmetric result applies for large scale expansions. Equations (viii) and (ix) which introduce the total budget surplus (using instrumental

variables[31]) confirm this difference (see columns (viii) and (ix) in Table 10): the change in the total budget surplus appears significant only during large-scale episodes, whether or not the other coefficients are constrained to be the same for all countries. However, the related coefficient is higher when other coefficients are constrained (0.24 and 0.12). Yet, the effect of fiscal policy on consumption is significant only in the short run[32].

Table 10: Instrumental variable estimations of cross-country Consumption Equations

	Constrained estimations		Non-constrained estimations	
left-hand variable	ΔC_t	ΔC_t	ΔC_t	ΔC_t
Method	(viii)	(viii)	(ix)	(ix)
$\Delta\left(\frac{ST}{YR}\right)_0$ (outside large scale episodes)	0.22 (1.39)	0.17 (0.92)	0.04 (0.40)	0.03 (0.33)
$\Delta\left(\frac{ST}{YR}\right)_1$ (during large scale episodes)	0.24 (2.36)	-	0.12 (2.11)	-
$\Delta\left(\frac{ST}{YR}\right)_{11}$ (during large scale Keynesian episodes)	-	0.13 (0.54)	-	0.09 (0.50)
$\Delta\left(\frac{ST}{YR}\right)_{12}$ (during large-scale anti-Keynesian episodes)	-	-0.01 (0.26)	-	0.18 (2.23)
$\left(\frac{ST}{YR}\right)_0$	0.01 (0.10)	+0.18 (2.23)	0.05 (1.21)	0.05 (1.18)
$\left(\frac{ST}{YR}\right)_1$	-0.04 (0.70)	-	0.07 (1.81)	-
$\left(\frac{ST}{YR}\right)_{11}$	-	0.09 (2.12)	-	0.09 (2.12)
$\left(\frac{ST}{YR}\right)_{12}$	-	0.01 (0.58)	-	0.01 (0.58)

Values in parenthesis are Student t values

31 The instrumental variables used are: country dummies, lags 1 to 3 of :real long term interest rates and income growth, lags 1 and 2 of :real short term interest rates, growth of consumption, variation in unemployment rate, lags 0 to 2 of PSS, lag 1 of total budget surplus, lags 0 to 2 of PSS multiplied by large-scale episodes dummy variables, and finally, the error correction term.

32 Similar results are obtained when using the primary structural surplus instead of the total budget surplus, but the change in PSS is significant only when non-fiscal coefficients are constrained.

4.3. What makes some large-scale fiscal adjustments successful?

In order to determine whether non-linearities in consumption behaviour may account for the anti-Keynesian effects of some large-scale fiscal episodes, large-scale policy episodes are now distinguished between « Keynesian » episodes (that were accompanied by growth effects that conform to the Keynesian pattern) and « anti-Keynesian » ones. The threshold used for this distinction is the sign of the corrected growth effect.

Results obtained with equations (ii) and (iii) (Table 11) clearly indicate that « anti-Keynesian » retrenchments were characterised on average by a substantially higher rate of growth of household consumption than predicted by a standard consumption function [33], whereas « Keynesian » retrenchments were accompanied by a higher drop in consumption than would have been expected on the basis of usual determinants. The same result holds to a lesser extent for expansions.

Table 11: Average values of dummy variables in consumption equations

Static dummy variables (ii)			
Retrenchments		Expansions	
-0.1%		-0.1%	
Keynesian	Non Keynesian	Keynesian	Non Keynesian
-0.3%	-0.1%	0.1%	-0.4%
Dynamic dummy variables (iii)			
Retrenchments		Expansions	
0.3%		0%	
Keynesian	Non Keynesian	Keynesian	Non Keynesian
-0.2%	**0.7%**	0%	0.2%

Similar results are obtained with methods (viii) and (ix) when a distinction is made between Keynesian and anti-Keynesian episodes: in the short run, the total budget surplus is significant only during anti-Keynesian episodes (Table 10 above)[34].

Econometric estimates therefore tend to confirm what the descriptive analysis presented in Section 2 had suggested, namely: (i) that it is difficult to identify factors which may account for the anti-Keynesian effects of fiscal retrenchments; (ii) that if there are any, then consumption behaviour is the best candidate for explaining why large scale retrenchment programmes tend to be on average less Keynesian than smaller ones; (iii) that consumption behaviour is also a key factor in explaining the differences among large-scale episodes, and (iv) that fiscal expansions did not alter consumption behaviour to a comparable extent. However, the exact mechanisms through which consumption has been influenced by fiscal policy, during large scale episodes, remains to be ascertained.

[33] Method (i) based on the residuals of standard equations lead to very similar results.

5. CONCLUSIONS

Three questions were raised in the introduction of this paper: (i) whether there is solid evidence of anti-Keynesian responses to fiscal adjustment, (ii) through which channels they may operate, and (iii) what policy conclusions can be drawn from the successful adjustment experiences. The first two questions can now be answered, but unfortunately not the third one.

Both a careful descriptive examination of the large-scale fiscal adjustment experiences of the last 25 years, and more formal econometric tests indicate that such policy episodes frequently result in significantly smaller output losses than suggested by the standard Keynesian approach, as embodied in simulations with macro -econometric models. Neither a bias in the selection of the episodes nor the combination of small sample size and exogenous non-policy shocks is likely to be able to account fully for this divergence between reality and the neo-Keynesian approach. Furthermore, this anti-Keynesian behaviour is a specific feature of *large-scale* adjustments, and does not occur in more standard budgetary adjustments[35].

Unusual consumption behaviour, with regard to its traditional determinants, is a major reason for the anti-Keynesian effects of large-scale retrenchments. Large-scale adjustments generally resulted in a decline in the savings rate above what would be explained by consumption smoothing behaviour. On average, the short run increase in consumption associated with a reduction in the budget deficit by 1 percentage point of GDP can be assessed to be of the order of 0.2 percentage points, but it was much larger during some of the episodes. The reason for this behaviour remains to be ascertained. In addition to endogenous Ricardian behaviour, various factors may have played a role, including factors unrelated to fiscal policy, such as the liberalisation of financial markets that affected many countries during the eighties. A more detailed review of possible explanations is left for further research.

Finally, no single explanation seems to be able to account for the diversity of experiences within large-scale retrenchments. In some cases, an expansionary monetary policy or a depreciation of the exchange rate significantly contributed to boosting growth. A few countries, and especially Denmark in the second half of the 1980s, benefited from a front-loaded drop in long term interest rates. It cannot be excluded that the balance between tax increases and expenditure cuts may also have played a role in some countries. But it has not been possible to single out a combination of factors that could account for the differences in the output effects of large-scale adjustments. In short, the evidence presented here does not indicate exactly what policy decisions determine the success of a large-scale retrenchment programme. Experience unfortunately does not offer ready-to-use recipes for painless deficit cutting.

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[34] However, these results are more difficult to interpret since the long run coefficientof the total budget surplus is significant for Keynesian episodes only.

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35 The evidence is somewhat less conclusive for expansions. The apparent weakness of the growth effects during large scale expansions might in part be explained by the context of deteriorating growth, in the country, in which they were undertaken, as well as abroad.

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APPENDIX 1: LARGE-SCALE ADJUSTMENTS EPISODES RETAINED IN OTHER STUDIES

Table A: Episodes selected by the OECD (Economic Outlook, June 1996)

Country	Fiscal retrenchments
JAPAN	1980-1987
GERMANY	1980-1985
ITALY	1976-1977 1991-1995
UK	1979-1982
BELGIUM	1982-1987 1993-1995
AUSTRALIA	1980-1982 1986-1988
DENMARK	1983-1986
IRELAND	1982-1984 1986-1989
SWEDEN	1986-1987
FINLAND	1975-1976
GREECE	1994-1995

Table B: Episodes selected by the IMF (World Economic Outlook, May 1996)

Country	Last year of two-year periods of fiscal consolidation
Australia	81, 82, 87, 88
Austria	78, 81, 83, 84, 85, 86, 87, 93
Canada	81, 87, 95
Denmark	84, 85, 86
Finland	76, 89
France	80, 84
Germany	77, 82, 83, 94, 95
Greece	83,87,91,92,93,94,95
Ireland	83, 84, 87, 88, 89
Italy	77,83,92,93
Japan	81,82,84,85,87
Netherlands	82,83,88
New Zealand	86,87,92,95
Norway	85,86,95
Portugal	70,80,85,86,95
Spain	84,87
Sweden	76,84,87,95
United Kingdom	80,81,82,95
United States	77

APPENDIX 2: DETAILED RESULTS

Table A - Largescale fiscal retrenchment episodes: context of the retrenchment programmes

	Period	Initial openness ratio (1)	Country size (population, millions)	Yearly average growth of the G7 during the episode	Country corrected growth one year before (2)	Yearly average change in the G7 PSS over the period	Change in country growth, first year of the programme	Change in G7 growth, first year of the programme
Austr2	80-82	13,8%	10	0,8%	0,8%	0,4	-2,4%	-2,7%
Austr3	85-88	15,8%	11	3,5%	2,7%	0,1	-3,1%	-1,2%
Bel2	82-87	73,1%	7	2,8%	-2,1%	0,2	2,5%	-1,9%
Bel3	93-94	92,6%	7	2,2%	0,7%	0,2	-3,5%	-0,4%
Can2	79-81	20,8%	16	2,1%	-0,2%	0,4	-0,7%	-0,7%
Den3	83-86	34,4%	3	3,4%	3,9%	0,0	-0,5%	3,2%
Fin1	75-76	20,8%	3	2,3%	3,0%	-0,6	-2,0%	-0,5%
Ger1	80-83	22,1%	42	1,3%	0,6%	0,2	-3,2%	-2,7%
Ire2	82-84	40,1%	2	2,4%	0,3%	0,1	-1,0%	-1,9%
Ire3	86-89	47,2%	2	3,4%	-1,6%	0,3	-3,5%	-0,4%
Ita1	76-77	19,1%	36	4,4%	-2,1%	0,6	9,0%	5,0%
Ita2	82-83	20,9%	37	1,3%	-0,9%	0,0	-0,3%	-1,9%
Ita3	91-93	26,3%	39	1,6%	-0,1%	-0,2	-0,9%	-0,6%
Jap2	79-87	13,2%	81	2,5%	-0,3%	0,3	0,7%	-0,7%
Net	91-93	51,9%	10	1,6%	2,1%	-0,2	-1,8%	-0,6%
Sp	92-95	25,5%	27	2,1%	0,3%	0,2	-1,5%	-0,2%
Swe3	86-87	24,8%	5	3,0%	-0,2%	0,3	0,4%	-0,4%
Swe5	94-95	28,4%	6	2,8%	-2,6%	0,5	4,7%	1,8%
UK2	79-82	19,9%	36	1,5%	-0,1%	0,4	-0,7%	-0,7%
AVERAGE		32,1%	20,0	2,4%	0,2%	0,2	-0,4%	-0,4%
STANDARD DEVIATION		21,0%	20,6	0,9%	1,8%	0,3	3,1%	1,9%
MEDIAN		24,8%	10,4	2,3%	-0,1%	0,2	-0,9%	-0,6%

	Period	Initial debt ratio (%GDP)	Change in the debt ratio in the preceeding year (% points)	Initial primary structural surplus	Initial government balance	Initial expenditure ratio (%GDP)	Initial revenue ratio (%GDP)	Initial household savings rate
Austr2	80-82	*30,0%*	*0,7%*	-1,8	-2,3	30,3%	29,0%	12,3
Austr3	85-88	*30,0%*	*0,7%*	-1,2	-3,3	34,4%	32,1%	9,9
Bel2	82-87	92,9%	14,2%	-6,5	-13,0	58,8%	50,8%	19,5
Bel3	93-94	131,1%	0,9%	2,4	-7,1	54,5%	49,3%	20,5
Can2	79-81	46,4%	3,1%	-2,4	-3,2	36,8%	35,5%	12,6
Den3	83-86	67,0%	12,0%	-5,4	-9,1	57,4%	52,0%	18,7
Fin1	75-76	8,5%	-2,2%	3,6	5,1	28,5%	36,6%	3,7
Ger1	80-83	30,8%	0,8%	-3,3	-2,6	42,6%	44,6%	12,7
Ire2	82-84	75,9%	4,6%	-9,0	-12,7	43,8%	37,5%	12,1
Ire3	86-89	102,8%	3,1%	-2,8	-10,8	48,2%	41,6%	10,9
Ita1	76-77	57,6%	6,1%	-8,8	-12,9	36,4%	28,7%	29,5
Ita2	82-83	59,9%	2,1%	-6,6	-11,6	41,4%	34,4%	21,8
Ita3	91-93	106,4%	10,8%	-2,5	-10,9	48,4%	42,2%	18,2
Jap2	79-87	39,6%	6,4%	-4,8	-5,5	23,1%	24,5%	20,8
Net	91-93	78,8%	-0,3%	-1,9	-5,1	51,4%	49,0%	6,0
Sp	92-95	51,5%	1,2%	-3,4	-4,9	38,9%	38,6%	11,6
Swe3	86-87	66,7%	-0,3%	-2,0	-3,8	62,1%	59,5%	2,3
Swe5	94-95	76,0%	5,5%	-8,7	-13,4	68,0%	59,2%	7,9
UK2	79-82	57,6%	-2,5%	-2,8	-4,4	37,9%	37,0%	10,9
AVERAGE		63,7%	3,5%	-3,6	-6,9	44,4%	41,2%	13,8
STANDARD DEVIATION		30,6%	4,7%	3,4	5,0	12,1%	10,0%	6,9
MEDIAN		59,9%	2,1%	-2,8	-5,5	42,6%	38,6%	12,3

Anti-keynesian expansions are greyed.

Debt figures in italics indicate that for lack of data, values were inferred over the relevant periods.

Initial: the year preceeding the adjustment programme.

(1) openness ratio = share of imports in total domestic demand.

(2) corrected growth = growth differential vis-à-vis the G7, corrected by the average growth differential vis-à-vis the G7 over 1971-1994.

Source: authors calculations, based on OECD data.

Note: all indicators for public finances refer to the general government accounts (including local government and social security).

Table B - Large-scale fiscal retrenchment episodes: budgetary characteristics

	Period	Duration	Intensity (1)	Change in the government balance (%GDP)	Efficiency (2)	Total change in sustainability (3)	Change in structural government expenditure	Change in structural taxes on households
Austr2	80-82	3	1,1	0,6	0,6	1,9	0,2	0,6
Austr3	85-88	4	0,9	1,1	1,2	3,9	-0,1	0,2
Bel2	82-87	6	1,7	0,9	0,5	6,9	-0,6	0,0
Bel3	93-94	2	1,7	0,9	0,5	0,8	-1,0	0,4
Can2	79-81	3	1,1	0,6	0,5	2,4	0,2	0,3
Den3	83-86	4	3,1	3,1	1,0	14,4	-0,1	0,6
Fin1	75-76	2	1,8	1,5	0,8	3,0	3,0	1,7
Ger1	80-83	4	1,2	0,0	0,0	1,0	-0,4	0,1
Ire2	82-84	3	2,4	1,1	0,5	4,6	0,3	0,7
Ire3	86-89	4	2,1	2,2	1,1	8,6	-2,3	-0,1
Ita1	76-77	2	2,1	2,1	1,0	4,9	0,3	0,7
Ita2	82-83	2	1,8	0,4	0,2	2,2	0,7	0,3
Ita3	91-93	3	1,9	0,5	0,2	3,6	0,5	0,3
Jap2	79-87	9	0,9	0,7	0,8	6,2	0,4	0,3
Net	91-93	3	1,5	0,6	0,4	2,1	-0,1	0,5
Sp	92-95	4	0,9	-0,3	-0,3	-0,1	-0,1	0,1
Swe3	86-87	2	2,8	4,0	1,5	6,8	-1,1	0,8
Swe5	94-95	2	2,6	3,0	1,2	6,0	-0,3	0,1
UK2	79-82	4	1,4	0,5	0,3	2,7	0,5	0,0
AVERAGE		3,5	1,7	1,2	0,6	4,3	0,0	0,4
STANDARD DEVIATION		1,7	0,7	1,2	0,4	3,4	1,0	0,4
MEDIAN		3,0	1,7	0,9	0,5	3,6	-0,1	0,3

	Period	Change in structural government revenue	Change in structural government expenditure*	Change in structural taxes on households*	Change in structural government revenue*
Austr2	80-82	1,0	-0,3	0,5	0,5
Austr3	85-88	0,6	-0,6	0,1	0,1
Bel2	82-87	0,2	-1,1	-0,2	-0,2
Bel3	93-94	0,8	-1,4	0,2	0,4
Can2	79-81	0,9	-0,4	0,1	0,6
Den3	83-86	2,0	-1,1	0,2	1,4
Fin1	75-76	5,3	1,9	1,6	4,6
Ger1	80-83	0,1	-0,9	0,0	-0,2
Ire2	82-84	1,5	0,2	0,6	1,2
Ire3	86-89	-0,7	-2,4	-0,3	-0,9
Ita1	76-77	1,2	-0,4	0,5	0,5
Ita2	82-83	1,5	0,1	0,1	0,9
Ita3	91-93	1,4	-0,2	0,1	0,8
Jap2	79-87	0,9	-0,2	0,2	0,4
Net	91-93	1,1	-0,5	0,6	1,1
Sp	92-95	0,1	-0,9	-0,2	-0,6
Swe3	86-87	1,2	-2,2	0,8	0,7
Swe5	94-95	0,1	-1,3	0,0	-0,4
UK2	79-82	1,4	0,2	0,0	1,5
AVERAGE		1,1	-0,6	0,2	0,7
STANDARD DEVIATION		1,2	1,0	0,4	1,2
MEDIAN		1,0	-0,5	0,1	0,5

'Change' indicates yearly average change in the variable over the fiscal episode.

(1) Intensity: Average yearly change in the primary structural surplus (%GDP)

(2) Efficiency: Change in the general government balance / Change in the primary structural surplus.

(3) Change in the sustainability: change over the period in the gap between the primary surplus and the primary surplus which would stabilize the debt ratio at the current level with a 5% real interest rate and a growth rate equal to the average growth rate of the country on the 1971-1994 period.

* corrected by the trend of the variable for the country over the 1971-1995 period.

Source: authors calculations, based on OECD data.

Note: all indicators for public finances refer to the general government accounts (including local government and social security).

Table C - Largescale fiscal retrenchment episodes: real effects on the domestic economy

	Period	Growth effect (1)	Output cost (2)	Delayed output cost (3)	Change in the household savings ratio (4)	Relative effect on savings (5)	Change in the investment rate	Relative effect on investment (5)
Austr2	80-82	0,7%	-0,7	0,4	-1,4%	-1,3%	0,8%	0,8%
Austr3	85-88	0,1%	-0,1	0,0	-0,8%	-1,0%	0,2%	0,3%
Bel2	82-87	-0,9%	0,5	0,6	-0,8%	-0,5%	0,2%	0,1%
Bel3	93-94	-1,4%	0,8	0,1	-0,4%	-0,2%	-0,7%	-0,4%
Can2	79-81	0,4%	-0,4	0,6	0,9%	0,9%	1,6%	1,4%
Den3	83-86	1,0%	-0,3	-0,1	-3,5%	-1,1%	1,0%	0,3%
Fin1	75-76	-1,4%	0,8	2,2	-0,4%	-0,2%	-0,2%	-0,1%
Ger1	80-83	-0,8%	0,6	1,0	-0,4%	-0,4%	-0,1%	-0,1%
Ire2	82-84	-1,6%	0,7	1,1	0,4%	0,2%	-1,2%	-0,5%
Ire3	86-89	-1,2%	0,6	-0,5	-0,9%	-0,4%	0,1%	0,0%
Ita1	76-77	0,8%	-0,4	0,2	-1,5%	-0,7%	-0,1%	0,0%
Ita2	82-83	-0,5%	0,3	1,0	0,2%	0,1%	-0,8%	-0,4%
Ita3	91-93	-1,1%	0,6	0,6	-0,8%	-0,4%	-0,9%	-0,5%
Jap2	79-87	0,4%	-0,5	-0,5	-0,7%	-0,8%	1,0%	1,1%
Net	91-93	0,4%	-0,3	-0,1	-1,7%	-1,1%	-0,4%	-0,3%
Sp	92-95	-1,0%	1,1	1,1	-0,3%	-0,3%	-0,3%	-0,4%
Swe3	86-87	0,9%	-0,3	0,0	-2,6%	-0,9%	0,3%	0,1%
Swe5	94-95	1,3%	-0,5	-0,9	-0,7%	-0,3%	1,5%	0,6%
UK2	79-82	-0,5%	0,3	0,1	0,1%	0,1%	0,0%	0,0%
AVERAGE		-0,2%	0,1	0,4	-0,8%	-0,4%	0,1%	0,1%
STANDARD DEVIATION		0,9%	0,6	0,7	1,0%	0,5%	0,8%	0,5%
MEDIAN		-0,5%	0,3	0,2	-0,7%	-0,4%	0,0%	0,0%

	Period	Change in the unemployment rate	Contribution of internal demand to growth	External contribution to growth	Change in the external contribution to growth	Change in the internal demand
Austr2	80-82	0,3	2,7%	-0,8%	-0,3%	-1,7%
Austr3	85-88	-0,5	3,5%	0,5%	-0,2%	-0,4%
Bel2	82-87	0,2	1,3%	0,1%	-1,0%	1,4%
Bel3	93-94	1,3	-0,2%	0,5%	0,6%	-0,4%
Can2	79-81	-0,3	3,7%	-0,9%	-0,8%	0,6%
Den3	83-86	-0,5	4,4%	-0,7%	-0,5%	0,7%
Fin1	75-76	1,1	-1,5%	-0,2%	2,1%	-6,7%
Ger1	80-83	1,2	-0,4%	0,9%	0,1%	-0,7%
Ire2	82-84	1,9	-1,3%	2,6%	0,9%	-0,7%
Ire3	86-89	-0,6	2,4%	0,9%	-0,7%	1,5%
Ita1	76-77	0,6	4,6%	0,3%	-0,8%	3,7%
Ita2	82-83	0,7	0,4%	0,2%	-0,5%	0,7%
Ita3	91-93	-0,4	-1,0%	1,2%	1,7%	-2,8%
Jap2	79-87	0,1	3,4%	0,5%	0,0%	-0,1%
Net	91-93	0,2	0,7%	0,8%	0,2%	-1,5%
Sp	92-95	1,6	0,2%	1,0%	0,1%	0,1%
Swe3	86-87	-0,2	3,1%	-0,4%	0,2%	0,4%
Swe5	94-95	-0,3	1,4%	1,4%	-0,5%	3,6%
UK2	79-82	1,3	0,5%	-0,2%	-0,1%	-0,4%
AVERAGE		0,4	1,5%	0,4%	0,0%	-0,1%
STANDARD DEVIATION		0,8	2,0%	0,9%	0,8%	2,2%
MEDIAN		0,2	1,3%	0,5%	-0,1%	-0,1%

'Change' indicates yearly average change in the variable over the fiscal episode.
(1) Growth effect: Average yearly growth differential vis-à-vis the G7 over the adjustement period, corrected by the average growth differential vis-à-vis the G7 over 1971-1994.
(2) Output cost / multiplier: Growth reduction required to improve the primary structural surplus by one point, (2)=(1)/(1 of Table B).
(3) Delayed output cost / multiplier: As (2), but with a one-year delay for the output.
(4) Effect on savings: yearly average change in the households savings rate.
(5) Relative effect on savings (investment): Effect on savings (investment) scaled by the fiscal effort, i.e. divided by the average yearly change in the primary structural surplus.
Source: authors calculations, based on OECD data.

Table D - Large-scale fiscal retrenchment episodes: monetary conditions

	Period	LT interest rate (average level)	Change in long term interest rate	Change in short term interest rate	Short term risk premium (1)	Long term risk premium (2)	Change in inflation	Change in the real effective exchange rate (3)	Monetary condition index (4)
Austr2	80-82	13,7	1,9	2,3	0,6	0,8	0,3%	5,6%	2,9
Austr3	85-88	13,2	-0,4	0,2	2,8	0,4	0,1%	-6,9%	-1,7
Bel2	82-87	10,9	-0,9	-1,4	0,6	0,0	-1,1%	-0,7%	-0,3
Bel3	93-94	7,5	-0,5	-1,8	0,1	0,1	0,5%	3,6%	-0,9
Can2	79-81	12,6	1,9	3,2	0,6	0,4	1,2%	0,9%	1,7
Den3	83-86	12,8	-2,8	-1,9	-4,9	-1,6	-1,8%	1,7%	0,4
Fin1	75-76	9,9	0,7	1,0	1,4	0,7	-3,2%	4,2%	4,2
Ger1	80-83	8,9	0,1	-0,2	-1,1	-0,3	-0,2%	-3,4%	-0,8
Ire2	82-84	15,2	-0,9	-0,7	-1,3	-0,1	-4,1%	3,3%	3,4
Ire3	86-89	10,2	-0,9	-0,5	0,3	-0,6	-0,2%	-1,2%	-0,5
Ita1	76-77	13,7	2,3	1,7	4,7	2,3	0,6%	-3,1%	0,0
Ita2	82-83	19,3	-0,5	-0,5	1,0	0,5	-1,6%	6,2%	2,3
Ita3	91-93	12,7	-0,7	-0,4	1,6	0,2	-0,5%	-4,5%	-1,1
Jap2	79-87	7,3	-0,1	-0,1	-0,1	-0,1	-0,5%	1,2%	0,6
Net	91-93	7,7	-0,9	-0,6	0,6	0,1	0,0%	0,9%	-0,3
Sp	92-95	10,7	-0,5	-1,0	-0,5	-0,1	-0,4%	-3,1%	-1,2
Swe3	86-87	11,1	-0,8	-2,4	0,1	0,1	-0,7%	-2,9%	-2,0
Swe5	94-95	9,9	0,9	0,2	1,4	0,7	-1,5%	0,1%	1,3
UK2	79-82	13,7	0,3	0,8	-0,8	-0,8	-0,2%	10,9%	3,5
AVERAGE		11,6	-0,1	-0,1	0,4	0,1	-0,7%	0,7%	0,6
STANDARD DEVIATION		3,0	1,2	1,4	1,9	0,8	1,3%	4,3%	1,9
MEDIAN		11,1	-0,5	-0,4	0,6	0,1	-0,4%	0,9%	0,0

'Change' indicates yearly average change in the variable over the fiscal episode.

(1) Short term risk premium: change in the risk premium (difference in short term interest rates relative to the G7) between the year before the adjustment programme was undertaken and the second year of the adjustment.

(2) Long term risk premium: total change in the risk premium over the episode.

(3) Change in the real effective exchange rate (unit labour costs in manufacturing) vis-à-vis EC12 (or industrialized countries in the case of Japan, Australia and Canada) over the period. A positive sign indicates an appreciation.

(4) Monetary condition index: weighted average of the change in the short term real interest rate and the change in the real effective exchange rate, with weights of 3/4 to 1/4 (inspired by WEO, May 1996). A positive sign indicates a restrictive monetary policy.

Source: authors calculations, based on OECD and European Commission data.

Table Ai - Large- scale fiscal expansion episodes: context of the expansion programmes

	Period	Initial openness ratio (1)	Country size (population, millions)	Average growth of the G7 during the episode	Country corrected growth one year before (2)	Yearly average change in the G7 PSS over the period	Change in country growth, first year of the programme	Change in G7 growth, first year of the programme
Austr1	75-76	15,8%	9	2,3%	1,5%	-0,6	0,7%	-0,5%
Austr4	91-94	17,9%	12	1,9%	-1,6%	-0,1	-2,8%	-0,6%
Aus	74-76	28,9%	5	1,7%	-1,0%	-0,3	-0,9%	-5,6%
Bel1	80-81	73,3%	6	1,3%	-1,0%	0,5	2,2%	-2,7%
Can1	75-78	21,0%	15	3,2%	3,5%	-0,4	-1,8%	-0,5%
Den1	74-77	33,7%	3	2,3%	-1,7%	-0,1	-4,6%	-5,6%
Den2	79-82	33,6%	3	1,5%	-2,2%	0,4	2,1%	-0,7%
Den4	87-94	35,7%	3	2,6%	1,4%	0,0	-3,3%	0,3%
Fin2	77-80	21,1%	3	3,2%	-4,2%	0,1	-0,2%	-0,8%
Fin3	90-92	24,1%	3	2,0%	2,8%	-0,5	-5,7%	-0,8%
Ire1	78-79	36,9%	2	4,0%	2,8%	-0,2	-1,0%	0,3%
Jap1	75-78	14,3%	77	3,2%	-1,8%	-0,4	3,5%	-0,5%
Jap3	90-94	14,3%	87	2,0%	0,7%	-0,2	0,1%	-0,8%
Swe1	72-74	21,3%	5	3,9%	-1,1%	-0,2	1,3%	2,0%
Swe2	77-79	23,7%	5	4,0%	-2,5%	0,0	-2,7%	-0,8%
Swe4	90-93	27,8%	6	1,8%	0,4%	-0,4	-1,0%	-0,8%
UK1	71-73	17,4%	35	4,8%	-0,5%	-0,3	1,5%	2,0%
UK3	92-93	25,6%	38	1,4%	-3,1%	-0,2	1,4%	-0,2%
AVERAGE		27,0%	17,7	2,6%	-0,4%	-0,2	-0,6%	-0,9%
STANDARD DEVIATION		13,6%	25,5	1,1%	2,2%	0,3	2,5%	2,0%
MEDIAN		23,9%	5,4	2,3%	-1,0%	-0,2	-0,6%	-0,6%

	Period	Initial debt ratio (%GDP)	Change in the debt ratio in the preceeding year (% points)	Initial primary structural surplus	Initial government balance	Initial expenditure ratio (%GDP)	Initial revenue ratio (%GDP)	Initial household savings rate
Austr1	75-76	*30,0%*	*0,7%*	0,7	0,9	25,8%	28,8%	15,2
Austr4	91-94	23,5%	-1,2%	2,1	0,6	33,9%	35,5%	6,8
Aus	74-76	17,5%	0,0%	1,7	1,3	33,3%	41,9%	8,1
Bel1	80-81	70,6%	4,0%	-3,3	-7,5	53,3%	50,2%	17,9
Can1	75-78	44,1%	-2,1%	2,3	1,9	32,8%	37,2%	11,3
Den1	74-77	*40,0%*	*2,2%*	3,8	5,2	37,8%	47,3%	7,1
Den2	79-82	*40,0%*	*2,2%*	-1,4	-0,4	46,5%	50,4%	6,8
Den4	87-94	73,4%	-3,2%	7,0	3,4	53,4%	59,1%	4,8
Fin2	77-80	8,3%	-0,8%	7,2	8,1	36,0%	47,2%	3,0
Fin3	90-92	18,2%	-1,4%	2,1	6,3	40,0%	48,3%	-0,6
Ire1	78-79	62,7%	-2,9%	-5,4	-7,2	0,0%	0,0%	0,0
Jap1	75-78	18,2%	0,5%	0,3	0,4	18,2%	24,5%	23,2
Jap3	90-94	69,3%	-2,1%	2,9	2,5	25,5%	33,4%	14,6
Swe1	72-74	30,9%	*0,4%*	4,1	5,2	39,8%	50,0%	4,1
Swe2	77-79	27,5%	-2,0%	1,7	4,5	48,3%	55,8%	2,4
Swe4	90-93	48,4%	-4,7%	2,7	5,4	57,7%	63,7%	-4,9
UK1	71-73	*77,1%*	*-3,4%*	5,4	3,0	31,8%	39,7%	9,1
UK3	92-93	40,6%	1,2%	-0,1	-2,6	37,8%	38,2%	10,1
AVERAGE		41,1%	-0,7%	1,9	1,7	36,2%	41,7%	7,7
STANDARD DEVIATION		21,6%	2,3%	3,2	4,2	13,8%	14,7%	7,0
MEDIAN		40,0%	-1,0%	2,1	2,2	36,9%	44,6%	7,0

Non-keynesian expansions are greyed.

Debt figures in italics indicate that for lack of data, values were inferred over the relevant periods.

Initial: the year preceeding the adjustment programme.

(1) openness ratio = share of imports in total domestic demand.

(2) corrected growth = growth differential vis-à-vis the G7, corrected by the average growth differential vis-à-vis the G7 over 1971-1994.

Source: authors calculations, based on OECD data.

Note: all indicators for public finances refer to the general government accounts (including local government and social security).

Table Bi - Large-scale fiscal expansion episodes: budgetary characteristics

	Period	Duration	Intensity (1)	Change in the government balance (%GDP)	Efficiency (2)	Total change in sustainability (3)	Change in structural government expenditure	Change in structural taxes on households
Austr1	75-76	2	-2,0	-2,1	1,1	-5,4	2,0	0,3
Austr4	91-94	4	-1,1	-1,2	1,2	-5,1	0,6	-0,3
Aus	74-76	3	-1,5	-1,7	1,1	-4,6	2,3	0,0
Bel1	80-81	2	-1,6	-2,7	1,7	-3,1	2,9	0,0
Can1	75-78	4	-1,2	-1,3	1,1	-4,5	1,1	-0,1
Den1	74-77	4	-1,4	-1,5	1,0	-6,4	1,5	-0,2
Den2	79-82	4	-1,0	-2,2	2,1	-6,4	2,3	0,3
Den4	87-94	8	-0,8	-0,9	1,1	-9,3	0,5	0,3
Fin2	77-80	4	-1,5	-1,3	0,9	-5,5	0,0	-1,0
Fin3	90-92	3	-2,1	-4,1	2,0	-12,4	3,4	0,1
Ire1	78-79	2	-2,1	-1,8	0,9	-2,9	1,8	-0,1
Jap1	75-78	4	-1,3	-1,5	1,2	-5,2	1,2	-0,2
Jap3	90-94	5	-1,1	-1,2	1,1	-6,5	0,4	0,0
Swe1	72-74	3	-1,7	-1,1	0,6	-3,6	1,8	0,1
Swe2	77-79	3	-2,2	-2,5	1,1	-7,4	2,7	0,1
Swe4	90-93	4	-2,8	-4,7	1,7	-18,3	1,0	-0,7
UK1	71-73	3	-2,8	-1,9	0,7	-5,7	1,1	-0,3
UK3	92-93	2	-1,7	-2,6	1,6	-5,4	0,8	-0,4
AVERAGE		3,6	-1,7	-2,0	1,2	-6,5	1,5	-0,1
STANDARD DEVIATION		1,4	0,6	1,0	0,4	3,7	0,9	0,3
MEDIAN		3,5	-1,5	-1,8	1,1	-5,5	1,4	0,0

	Period	Change instructural government receipts revenue	Change in structural government expenditure*	Change in structural taxes on households*	Change in structural government revenue*
Austr1	75-76	-0,1	1,5	0,1	-0,6
Austr4	91-94	-0,5	0,1	-0,4	-1,0
Aus	74-76	0,2	1,7	-0,1	0,0
Bel1	80-81	0,3	2,5	-0,2	-0,1
Can1	75-78	-0,4	0,5	-0,3	-0,7
Den1	74-77	0,2	0,5	-0,5	-0,3
Den2	79-82	0,3	1,3	-0,1	-0,2
Den4	87-94	0,0	-0,5	0,0	-0,6
Fin2	77-80	-1,6	-1,1	-1,1	-2,2
Fin3	90-92	1,5	2,3	0,0	0,8
Ire1	78-79	-0,2	1,7	-0,2	-0,4
Jap1	75-78	0,0	0,7	-0,3	-0,5
Jap3	90-94	-0,2	-0,2	-0,1	-0,7
Swe1	72-74	-0,2	0,8	0,1	-0,7
Swe2	77-79	0,5	1,7	0,1	0,0
Swe4	90-93	-1,0	0,0	-0,8	-1,5
UK1	71-73	-1,4	0,7	-0,3	-1,3
UK3	92-93	-1,0	0,5	-0,4	-0,9
AVERAGE		-0,2	0,8	-0,2	-0,6
STANDARD DEVIATION		0,7	1,0	0,3	0,7
MEDIAN		-0,2	0,7	-0,2	-0,6

'Change' indicates yearly average change in the variable over the fiscal episode.

(1) Intensity: Average yearly change in the primary structural surplus (%GDP)

(2) Efficiency: Change in the general government balance / Change in the primary structural surplus.

(3) Change in the sustainability: change over the period in the gap between the primary surplus and the primary surplus which would stabilize the debt ratio at the current level with a 5% real interest rate and a growth rate equal to the average growth rate of the country on the 1971-1994 period.

* corrected by the trend of the variable for the country over the 1971-1995 period.

Source: authors calculations, based on OECD data.

Note: all indicators for public finances refer to the general government accounts (including local government and social security).

Table Ci - Large-scale fiscal expansion episodes: real effects on the domestic economy

	Period	Growth effect (1)	Output cost (2)	Delayed output cost (3)	Change in the household savings ratio (4)	Relative effect on savings (5)	Change in the investment rate	Relative effect on investment (5)
Austr1	75-76	0,6%	0,3	-1,2	-1,4%	0,7%	-0,5%	0,2%
Austr4	91-94	0,1%	0,1	1,2	-0,8%	0,7%	-0,5%	0,4%
Aus	74-76	1,2%	0,8	0,1	0,8%	-0,5%	-0,4%	0,3%
Bel1	80-81	0,9%	0,6	0,1	0,8%	-0,5%	-0,5%	0,3%
Can1	75-78	0,5%	0,4	-0,1	0,3%	-0,3%	0,0%	0,0%
Den1	74-77	0,0%	0,0	-0,2	-0,3%	0,2%	0,0%	0,0%
Den2	79-82	0,5%	0,5	0,4	3,0%	-2,9%	-0,5%	0,4%
Den4	87-94	-0,5%	-0,7	-0,1	1,6%	-2,1%	-0,5%	0,6%
Fin2	77-80	0,8%	0,5	1,1	0,6%	-0,4%	-0,7%	0,5%
Fin3	90-92	-5,2%	-2,5	-2,5	2,6%	-1,3%	-2,2%	1,1%
Ire1	78-79	-0,2%	-0,1	-0,3	-1,0%	0,5%	1,6%	-0,7%
Jap1	75-78	0,1%	0,0	-0,2	-0,6%	0,5%	-0,7%	0,5%
Jap3	90-94	-0,8%	-0,7	-1,6	0,1%	-0,1%	-0,6%	0,6%
Swe1	72-74	0,5%	0,3	1,4	0,3%	-0,2%	0,4%	-0,2%
Swe2	77-79	-1,4%	-0,7	0,3	0,2%	-0,1%	-0,9%	0,4%
Swe4	90-93	-1,5%	-0,5	-0,5	3,2%	-1,1%	-1,2%	0,4%
UK1	71-73	0,2%	0,1	0,0	0,3%	-0,1%	-0,1%	0,0%
UK3	92-93	0,2%	0,1	1,0	0,6%	-0,4%	-0,5%	0,3%
AVERAGE		-0,2%	-8,2%	-7,0%	0,6%	-0,4%	-0,4%	0,3%
STANDARD DEVIATION		1,4%	76,1%	98,7%	1,3%	0,9%	0,7%	0,4%
MEDIAN		0,2%	8,0%	-5,7%	0,3%	-0,2%	-0,5%	0,3%

	Period	Change in the unemployment rate	Contribution of internal demand to growth	External contribution to growth	Change in the external contribution to growth	Change in the internal demand
Austr1	75-76	1,0	2,6%	1,6%	1,5%	0,1%
Austr4	91-94	0,7	2,3%	0,5%	-0,8%	1,6%
Aus	74-76	0,2	2,9%	-0,1%	-0,2%	0,1%
Bel1	80-81	1,3	-1,3%	3,0%	2,9%	-4,5%
Can1	75-78	0,8	3,8%	0,6%	1,0%	-1,0%
Den1	74-77	1,3	1,5%	0,2%	0,8%	-1,3%
Den2	79-82	0,6	-0,6%	1,9%	-0,2%	0,6%
Den4	87-94	0,5	0,2%	1,2%	0,2%	-0,1%
Fin2	77-80	0,2	3,4%	1,2%	-0,6%	2,7%
Fin3	90-92	3,2	-5,7%	1,3%	1,3%	-4,7%
Ire1	78-79	-0,9	9,2%	-3,2%	-1,6%	-0,4%
Jap1	75-78	0,2	3,7%	0,5%	-0,6%	1,9%
Jap3	90-94	0,1	1,9%	0,3%	0,1%	-1,0%
Swe1	72-74	-0,2	3,0%	0,2%	-0,9%	1,7%
Swe2	77-79	0,1	0,3%	1,0%	0,0%	0,9%
Swe4	90-93	1,7	-2,0%	1,1%	1,0%	-2,2%
UK1	71-73	-0,1	4,8%	-0,4%	0,0%	1,8%
UK3	92-93	1,0	1,2%	-0,3%	-0,6%	2,7%
AVERAGE		0,7	1,7%	0,6%	0,2%	-0,1%
STANDARD DEVIATION		0,9	3,1%	1,3%	1,1%	2,1%
MEDIAN		0,6	2,1%	0,5%	0,0%	0,1%

'Change' indicates yearly average change in the variable over the fiscal episode.

(1) Growth effect: Average yearly growth differential vis-à-vis the G7 over the adjustement period, corrected by the average growth differential vis-à-vis the G7 over 1971-1994.

(2) Output cost / multiplier: Growth reduction required to improve the primary structural surplus by one point, (2)=(1)/(1 of Table B bis).

(3) Delayed output cost / multiplier: As (2), but with a one-year delay for the output.

(4) Effect on savings: yearly average change in the households savings rate.

(5) Relative effect on savings (investment): Effect on savings (investment) scaled by the fiscal effort, i.e. divided by the average yearly change in the primary structural surplus.

Source: authors calculations, based on OECD data.

Table Di - Large-scale fiscal expansion episodes: monetary conditions

	Period	LT interest rate (average level)	Change in long term interest rate	Change in short term interest rate	Short term risk premium (1)	Long term risk premium (2)	Change in inflation	Change in the real effective exchange rate (3)	Monetary condition index (4)
Austr1	75-76	10,0	0,6	-1,9	1,1	0,5	-0,8%	-3,0%	-1,6
Austr4	91-94	9,1	-1,0	-2,2	-2,6	-0,4	-1,2%	-4,6%	-1,9
Aus	74-76	9,4	0,2	-0,8	-0,2	-0,5	0,0%	n.d.	n.d.
Bel1	80-81	12,7	1,9	2,1	0,1	0,0	2,4%	-6,3%	-1,8
Can1	75-78	9,0	0,1	-0,4	0,3	0,3	-0,7%	-4,8%	-1,0
Den1	74-77	15,6	1,0	n.d.	-1,4	0,6	-0,3%	n.d.	n.d.
Den2	79-82	19,9	0,8	n.d.	-0,9	-0,2	0,3%	-4,0%	n.d.
Den4	87-94	9,3	-0,3	-0,4	-0,6	-0,2	-0,1%	0,2%	-0,1
Fin2	77-80	10,1	0,1	0,0	0,3	-0,4	-0,5%	-3,6%	-0,5
Fin3	90-92	12,4	0,0	0,2	-0,6	0,1	-0,3%	-7,0%	-1,4
Ire1	78-79	13,9	1,1	2,4	1,6	0,8	0,4%	1,3%	1,8
Jap1	75-78	7,7	-0,5	-2,4	0,4	-0,3	-4,1%	6,5%	3,0
Jap3	90-94	5,5	-0,2	-0,6	0,8	0,1	-0,3%	4,6%	0,9
Swe1	72-74	7,7	0,2	n.d.	-0,6	-0,7	0,9%	n.d.	n.d.
Swe2	77-79	10,4	0,4	n.d.	1,5	0,3	-1,0%	-4,7%	n.d.
Swe4	90-93	10,6	-0,7	-0,8	-0,9	-0,2	-0,3%	-4,0%	-1,4
UK1	71-73	8,9	0,6	1,2	0,3	0,6	0,8%	n.d.	n.d.
UK3	92-93	8,3	-1,3	-2,8	-0,6	-0,3	-1,9%	-4,2%	-1,7
AVERAGE		10,6	0,2	-0,4	-0,1	0,0	-0,4%	-2,4%	-0,5
STANDARD DEVIATION		3,3	0,8	1,6	1,0	0,4	1,3%	4,0%	1,6
MEDIAN		9,7	0,1	-0,5	0,0	-0,1	-0,3%	-4,0%	-1,2

'Change' indicates yearly average change in the variable over the fiscal episode.

(1) Short term risk premium: change in the risk premium (difference in short term interest rates relative to the G7) between the year before the expansion programme was undertaken and the second year of the expansion.

(2) Long term risk premium: total change in the risk premium over the episode.

(3) Change in the real effective exchange rate (unit labour costs in manufacturing) vis-à-vis EC12 (or industrialized countries in the case of Japan, Australia and Canada) over the period. A positive sign indicates an appreciation.

(4) Monetary condition index: weighted average of the change in the short term real interest rate and the change in the real effective exchange rate, with weights of 3/4 to 1/4 (inspired by WEO, May 1996). A positive sign indicates a restrictive monetary policy.

Source: authors calculations, based on OECD and European Commission data.

Table E - Large-scale versus standard fiscal policy years, detailed results

	Retrenchments						
	Large-scale			Standard			
Number of years	66			103			
Variables	mean	sample STD	STD of the mean	mean	sample STD	STD of the mean	Student T*
Indicator of openess	33,2	22,1	2,7	27,3	16,4	1,6	1,87
Size (population, millions)	25,3	25,8	3,2	38,4	46,7	4,6	-2,3
PSS (t-1)	-3,4	3,3	0,4	-1,1	2,4	0,2	-4,7
Total budget surplus (t-1)	-6,6	4,8	0,6	-3,1	3,6	0,4	-5,0
Debt ratio (t-1)	0,7	29,0	3,6	52,7	26,8	2,6	3,3
Change in debt ratio (t-1)	3,8	4,7	0,6	2,0	4,0	0,4	2,6
Corrected growth (t-1)	0,2	1,7	0,2	0,5	2,2	0,2	-1,0
G7 output gap (t-1)	0,1	1,6	0,2	0,0	1,8	0,2	0,4
Change in G7 output gap	-0,4	1,4	0,2	0,2	1,6	0,2	-2,2
Change in G7 PSS	0,2	0,4	0,1	0,1	0,5	0,1	1,0
G7 GDP growth	2,4	1,4	0,2	3,0	1,5	0,2	-2,5
Change in G7 GDP growth	0,1	1,8	0,2	-0,1	2,1	0,2	0,5
Change in G7 GDP growth (t)	-0,4	1,9	0,2	-0,2	2,3	0,2	-0,8
G7 output gap	-0,8	1,9	0,2	-0,3	1,9	0,2	-1,7
Change in PSS	1,6	1,1	0,1	0,8	0,6	0,1	5,3
Change in total budget surplus	1,1	1,4	0,2	0,7	1,0	0,1	2,0
Change in structural surplus	1,4	1,1	0,1	0,7	0,6	0,1	4,7
Efficiency	0,7	0,8	0,1	0,7	2,1	0,2	-0,4
Change in debt ratio	2,4	4,4	0,5	1,0	2,6	0,3	2,4
Interest payments	4,3	3,1	0,4	2,3	2,4	0,2	4,4
Change in interest payments	0,2	0,5	0,1	0,1	0,3	0,0	1,4
Change in interest payments over change in PSS	0,0	0,9	0,1	0,3	0,7	0,1	-1,8
Public expenditures	43,9	11,3	4,0	41,4	9,1	2,9	0,5
Public revenues	42,3	9,4	1,2	41,9	8,9	0,9	0,3
Change in public expenditures	0,22	1,6	0,2	0,3	1,3	0,1	-0,4
Change in public revenues	0,93	1,4	0,2	0,9	1,1	0,1	0,3
Change in structural expenditures	-0,1	1,2	0,2	-0,1	0,8	0,1	0,0
Change in structural revenues	0,9	1,4	0,2	0,9	1,0	0,1	0,3
Change in detrended structural expenditures	-0,8	1,4	0,2	-0,3	0,9	0,1	-2,7
Change in detrended structural revenues	0,5	1,3	0,2	0,5	1,0	0,1	0,0
Change in households' taxes	0,3	0,7	0,1	0,3	0,7	0,1	-0,1
Change in business sector taxes	0,1	0,3	0,0	0,1	0,4	0,0	0,2
Change in indirect taxes	0,2	0,5	0,1	0,1	0,4	0,0	1,1
Change in Social Security revenues	0,2	0,6	0,1	0,2	0,5	0,0	0,0
Change in Social Security Expenditures	0,1	0,7	0,1	0,1	0,4	0,0	0,3
Change in wage expenditures	-0,1	0,4	0,1	0,0	0,5	0,0	-1,8
Change in non wage expenditures	0	0,3	0,0	0,0	0,3	0,0	-0,4
Change in structural households' taxes	0,3	0,7	0,1	0,3	0,7	0,1	-0,1
Change in structural business sector taxes	0,2	0,3	0,0	0,1	0,4	0,0	0,9
Change in structural Social Security revenues	0,2	0,6	0,1	0,2	0,5	0,0	-0,3
Output gap	-1,0	2,1	0,3	0,3	2,1	0,2	-3,7
GDP growth	2,2	2,0	0,2	2,7	2,0	0,2	-1,6
Corrected growth	-0,2	1,6	0,2	-0,1	1,7	0,2	-0,5
Corrected growth cg' (cf. Box 1)	-0,5	1,8	0,2	0,1	1,9	0,2	-2,1
Output cost	-0,3	2,4	0,3	-0,2	4,3	0,4	-0,2
Output cost'	0,1	3,2	0,4	-0,5	7,0	0,7	0,8
Change in households' saving rate	-0,8	1,7	0,2	-0,5	1,4	0,1	-1,2
Normalised change in saving rate	-0,6	1,8	21,7	-0,3	2,6	0,3	-1,0
Change in invetsment rate	0,1	0,9	0,1	0,2	0,7	0,1	-0,6
Normalised change in investment rate	0,4	1,7	0,2	0,2	2,5	0,2	0,8
External contribution to GDP growth	0,4	1,6	0,2	0,0	1,4	0,1	1,9
Domestic demand contribution to GDP growth	1,7	2,8	0,3	0,0	2,8	0,3	-2,3
Consumption contribution to GDP growth	1,3	1,4	0,2	1,5	1,3	0,1	-1,3
Change in GDP growth	0,0	2,4	0,3	-0,5	2,7	0,3	1,2
Change in corrected growth	-0,1	2,2	0,3	-0,4	2,2	0,2	0,9
Change in external contribution to GDP growth	0,0	2,0	0,3	0,2	1,7	0,2	-0,7
Change in domestic demand contribution to GDP growth	-0,1	3,7	0,5	-0,8	3,8	0,4	1,2
Change in long term interest rates	-0,2	1,6	0,2	0,2	1,2	0,1	-1,8
Change in short term interest rates	-0,2	2,4	0,3	0,4	2,4	0,2	-1,7
Change in real long term interest rates	0,4	1,9	0,2	-0,3	2,4	0,2	2,3
Change in real short term interest rates	0,5	2,1	0,3	0,0	2,8	0,3	1,3
Change in risk premium (nominal)	0,0	1,1	0,1	0,1	0,7	0,1	-0,7
Change in risk premium (real)	0,0	1,5	0,2	-0,3	1,9	0,2	1,2
Relative change in real effective exchange rate	0,5	7,4	0,9	0,8	4,8	0,5	0,3
Change in monetary index	0,5	2,6	0,3	0,3	1,9	0,2	-0,5

Expansions							
Large-scale			Standard				
64			120				Number of years
mean	sample STD	STD of the mean	mean	sample STD	STD of the mean	Student T*	Variables
26,9	11,8	1,5	29,0	16,3	1,5	-97,2	Indicator of openess
18,9	27,1	3,4	33,9	42,4	4,0	-2,9	Size (population, millions)
1,6	3,0	0,4	0,2	2,8	0,3	3,0	PSS (t-1)
1,6	4,2	0,5	-2,7	3,8	0,3	6,7	Total budget surplus (t-1)
39,5	21,5	2,7	56,5	28,3	2,6	-4,6	Debt ratio (t-1)
-1,02	2,09	0,26	0,98	4,01	0,37	-4,5	Change in debt ratio (t-1)
-0,38	2,07	0,26	-0,23	1,83	0,17	-0,5	Corrected growth (t-1)
0,9	1,3	0,2	0,0	1,5	0,1	4,5	G7 output gap (t-1)
0,2	1,6	0,2	0,1	1,5	0,1	0,3	Change in G7 output gap
-0,1	0,7	0,1	-0,1	0,6	0,1	-0,5	Change in G7 PSS
2,6	1,7	0,2	2,9	1,6	0,1	-1,0	G7 GDP growth
-0,1	2,1	0,3	0,0	1,9	0,2	-0,2	Change in G7 GDP growth
-1,0	1,8	0,2	0,0	1,9	0,2	-3,4	Change in G7 GDP growth (t)
-0,2	2,0	0,2	-0,3	1,9	0,2	0,4	G7 output gap
-1,5	1,1	0,1	-0,8	0,7	0,1	-4,7	Change in PSS
-1,9	1,7	0,2	-0,9	1,1	0,1	-4,3	Change in total budget surplus
-1,6	1,2	0,1	-1,0	0,7	0,1	-4,1	Change in structural surplus
1,4	1,5	0,2	1,0	2,1	0,2	1,4	Efficiency
3,4	5,4	0,7	1,9	3,5	0,3	2,0	Change in debt ratio
1,0	1,9	0,2	2,4	2,4	0,2	-4,5	Interest payments
0,1	0,4	0,1	0,1	0,4	0,0	-0,3	Change in interest payments
-0,1	0,6	0,1	-0,2	0,7	0,1	0,4	Change in interest payments over change in PSS
42,8	12,3	4,3	41,0	8,4	2,5	0,4	Public expenditures
44,4	11,2	1,4	40,5	8,0	0,7	2,5	Public revenues
1,6	1,8	0,2	0,8	1,4	0,1	3,2	Change in public expenditures
-0,2	1,2	0,1	0,0	0,9	0,1	-1,3	Change in public revenues
1,3	1,2	0,1	0,8	1,0	0,1	2,9	Change in structural expenditures
-0,2	1,2	0,1	0,0	0,9	0,1	-1,2	Change in structural revenues
0,5	1,1	0,1	0,0	0,0	0,0	3,6	Change in detrended structural expenditures
-0,7	1,1	0,1	-0,3	0,9	0,1	-2,0	Change in detrended structural revenues
-0,1	0,9	0,1	0,0	0,6	0,1	-0,6	Change in households' taxes
-0,2	0,5	0,1	0,0	0,3	0,0	-2,5	Change in business sector taxes
-0,2	0,6	0,1	-0,1	0,4	0,0	-1,4	Change in indirect taxes
0,1	0,5	0,1	0,1	0,5	0,0	0,4	Change in Social Security revenues
0,7	0,9	0,1	0,4	0,7	0,1	2,4	Change in Social Security Expenditures
0,3	0,6	0,1	0,1	0,4	0,0	2,9	Change in wage expenditures
0,1	0,3	0,0	0,1	0,3	0,0	1,7	Change in non wage expenditures
-0,1	0,9	0,1	0,0	0,6	0,1	-0,6	Change in structural households' taxes
-0,2	0,5	0,1	0,0	0,3	0,0	-1,9	Change in structural business sector taxes
0,1	0,5	0,1	0,1	0,4	0,0	0,4	Change in structural Social Security revenues
-0,2	2,6	0,3	-0,2	2,5	0,2	0,2	Output gap
2,1	2,8	0,3	2,9	2,4	0,2	-2,0	GDP growth
-0,3	2,4	0,3	0,1	1,9	0,2	-1,2	Corrected growth
-0,5	2,6	0,3	0,2	2,3	0,2	-1,7	Corrected growth cg' (cf. Box 1)
-0,4	2,4	0,3	-0,1	3,1	0,3	-0,7	Output cost
-0,6	3,2	0,4	0,2	5,3	0,5	-1,4	Output cost'
0,7	2,0	0,2	0,3	1,4	0,1	1,7	Change in households' saving rate
-0,1	2,4	0,3	-0,6	2,7	0,2	1,3	Normalised change in saving rate
-0,5	1,0	0,1	-0,1	0,8	0,1	-2,7	Change in invetsment rate
0,2	1,4	0,2	0,5	2,2	0,2	-1,0	Normalised change in investment rate
0,7	1,7	0,2	0,0	1,4	0,1	2,6	External contribution to GDP growth
1,5	4,0	0,5	2,9	0,0	0,3	-2,3	Domestic demand contribution to GDP growth
1,2	1,7	0,2	1,8	1,4	0,1	-2,6	Consumption contribution to GDP growth
0,1	2,8	0,4	0,3	2,5	0,2	-0,6	Change in GDP growth
0,2	2,7	0,3	0,4	2,2	0,2	-0,5	Change in corrected growth
0,2	2,3	0,3	-0,1	1,8	0,2	0,8	Change in external contribution to GDP growth
0,0	4,4	0,5	0,5	3,6	0,3	-0,8	Change in domestic demand contribution to GDP growth
0,1	1,3	0,2	-0,1	1,2	0,1	1,0	Change in long term interest rates
-0,5	2,3	0,3	-0,4	2,3	0,2	-0,5	Change in short term interest rates
0,5	2,9	0,4	0,4	2,2	0,2	0,4	Change in real long term interest rates
0,3	3,6	0,5	0,3	2,9	0,3	0,1	Change in real short term interest rates
0,0	1,0	0,1	-0,1	0,8	0,1	0,3	Change in risk premium (nominal)
0,3	2,8	0,4	0,2	1,8	0,2	0,3	Change in risk premium (real)
-1,6	6,9	0,9	-0,3	4,0	0,4	1,4	Relative change in real effective exchange rate
-0,3	3,1	0,4	0,3	2,1	0,2	1,4	Change in monetary index

* Student t of the difference between the average values on large scale and standard episodes: a Student T greater than 2 (in a
indicates that the average values of the variable are significantly different (at a 5% level) during standard and large scale

APPENDIX 3: DERIVATION OF THE VARIANCE OF THE DIFFERENCE BETWEEN THE AVERAGE OBSERVED MULTIPLIER AND THAT ASSOCIATED WITH A KEYNESIAN MACRO-ECONOMETRIC MODEL

A decomposition of the corrected growth, as it was calculated in Section 2, is at the heart of the analysis. According to a macro-econometric Keynesian model, and assuming that the model is almost linear around the reference path where output is at its potential, the output gap can be decomposed in the following way:

$$dy_k - d\tilde{y}_k = a_k^1 dg_k + \sum_{i=2}^{m} a_k^i (X_k^i - \tilde{X}_k^i) + \sum_{j=1}^{J} b_k^j \varepsilon_k^j \qquad \text{(A3\_1)}$$

where

- dy_k is the observed average growth during episode k,

- dg_k is the average change in the Primary Structural Deficit (the opposite of the PSS),

- $(X_k^2,...,X_k^m)$ are the shocks from the exogenous variables of the model, other than fiscal shocks, which affect output, on average over the considered episode,

- $(\varepsilon_k^1,...,\varepsilon_k^J)$ are the shocks from the residuals of the model, on average over the considered episode;

- a tilda over a variable means that the variable is evaluated on the reference path;

- a_k^1 is thus the Keynesian multiplier of the chosen macro-econometric model.

In the analysis, the reference path in the one where output grows at the same rate as in the G7, once the difference in potential output growth rates is taken into consideration. Notice that it has been assumed that the residuals were null on the reference path. This assumption is in accordance with this definition, provided that the chosen model has a long run solution and that this long run solution leads to the same potential output growth q_t^* as the one calculated in the previous sections. Relaxing this hypothesis would however not alter the results which follow: residuals would only have to be considered as far as they differ from their reference path.

The assumption was also made that the effect of fiscal shocks was constant over the episodes and that the effect of past fiscal policy actions are assumed to be null (assumption H2 and H3 in the text): in this case, an average reduction of 1% of the structural deficit ratio, in any year during the episode, has an effect of a_1 on average growth and the effect of previous fiscal policy action is null. This is a more binding hypothesis, particularly in

countries where episodes of fiscal retrenchment and expansion follow one another, for multipliers seem to be roughly constant over a long period of time in Keynesian models (between 5 and 10 years generally) and then decline quickly. However, this constraint is thought not to be too strong for most of the episodes considered.

The observed multiplier can be derived from (A3_1):

$$\frac{dy_k - d\tilde{y}_k}{dg_k} = a_k^1 + \sum_{i=2}^{m} a_k^i \frac{(X_k^i - \tilde{X}_k^i)}{dg_k} + \sum_{j=1}^{J} b_k^j \frac{\varepsilon_k^j}{dg_k} \qquad \text{(A3\_2)}$$

The difference between the observed multiplier and the one estimated from a macro-econometric model is thus:

$$\frac{dy_k - d\tilde{y}_k}{dg_k} - \hat{a}_k^1 = a_k^1 - \hat{a}_k^1 + \sum_{i=2}^{m} a_k^i \frac{(X_k^i - \tilde{X}_k^i)}{dg_k} + \sum_{j=1}^{J} b_k^j \frac{\varepsilon_k^j}{dg_k} \qquad \text{(A3\_3)}$$

Since the episodes have been determined exogenously, the condition on the variable dg_k is:

$$E\left[\frac{dy_k - d\tilde{y}_k}{dg_k} - \hat{a}_k^1 \middle| dg_k\right] = E\left[a_k^1 - \hat{a}_k^1 + \sum_{i=2}^{m} a_k^i \frac{(X_k^i - \tilde{X}_k^i)}{dg_k} + \sum_{j=1}^{J} b_k^j \frac{\varepsilon_k^j}{dg_k} \middle| dg_k\right] \qquad \text{(A3\_4)}$$

Moreover, under the null hypothesis that a Keynesian model is a true representation of reality (hypothesis H1 in the text), the estimated multiplier is unbiased($E\left[\hat{a}_k^1\right] = a_k^1$). So, under the assumption (H5) that $\hat{a}_k^1$ is independent from dg_k (that is the estimation of the multiplier has not been influenced by the episode under consideration):

$$E\left[\frac{dy_k - d\tilde{y}_k}{dg_k} - \hat{a}_k^1 \middle| dg_k\right] = \frac{E\left[\sum_{i=2}^{m} a_k^i (X_k^i - \tilde{X}_k^i) + \sum_{j=1}^{J} b_k^j \varepsilon_k^j \middle| dg_k\right]}{dg_k} \qquad \text{(A3\_5)}$$

Next it is assumed that there is no correlation between $\sum_{i=2}^{m} a_k^i (X_k^i - \tilde{X}_k^i) + \sum_{j=1}^{J} b_k^j \varepsilon_k^j$ and dg_k. This means that public authorities do not choose good times to pursue restrictive fiscal policies and bad times to pursue expansionary fiscal policies. This hypothesis (assumption H4 in the text) seems to be very strong at first sight but it is in part controlled by the correction which has been made to the output growth by the average G7 growth: the next part addresses this point more precisely. This last hypothesis allows for the following simplification:

$$\frac{E\left[\sum_{i=2}^{m} a_k^i (X_k^i - \tilde{X}_k^i) + \sum_{j=1}^{J} b_k^j \varepsilon_k^j \middle| dg_k\right]}{dg_k} = \frac{E\left[\sum_{i=2}^{m} a_k^i (X_k^i - \tilde{X}_k^i) + \sum_{j=1}^{J} b_k^j \varepsilon_k^j\right]}{dg_k} = 0 \qquad \text{(A3\_6)}$$

By construction: $E(X_k^i - \tilde{X}_k^i) = 0$ et $E(\varepsilon_k^i) = 0$.

So:

$$E\left[\frac{dy_k - d\tilde{y}_k}{dg_k} - \hat{a}_k^1 \middle| dg_k\right] = 0 \qquad \text{(A3\_7)}$$

Aggregation of expression (A3_7) over the M identified episodes is needed to benefit from the multiplicity of episodes:

$$E\left[\left(\frac{1}{M}\sum_{k=1}^{M}\frac{dy_k - d\tilde{y}_k}{dg_k} - \frac{1}{M}\sum_{k=1}^{M}\hat{a}_k^1\right)\middle|(dg_1,\ldots,dg_M)\right] = 0 \qquad \text{(A3\_8)}$$

Expression (A3_8) is the expression to be tested. An estimation of the variance of the expression within brackets is now necessary to perform the test.

Ignoring for notational convenience the conditioning, this variance can be written as follows:

$$\begin{aligned} V\left[\frac{1}{M}\sum_{k=1}^{M}\frac{dy_k - d\tilde{y}_k}{dg_k} - \frac{1}{M}\sum_{k=1}^{M}\hat{a}_k^1\right] &= \frac{1}{M^2}\sum_{k=1}^{M} V\left[\frac{dy_k - d\tilde{y}_k}{dg_k} - \hat{a}_k^1\right] \\ &+ \frac{2}{M^2}\sum_{k=2}^{M}\sum_{l=1}^{k-1} Cov\left(\frac{dy_k - d\tilde{y}_k}{dg_k} - \hat{a}_k^1, \frac{dy_1 - d\tilde{y}_1}{dg_1} - \hat{a}_1^l\right) \end{aligned} \qquad \text{(A3\_9)}$$

Substituting for equation (A3_1), the variances terms in the right hand side of expression (A3_9) can be expressed as follows:

$$V\left(\frac{dy_k - d\tilde{y}_k}{dg_k} - \hat{a}_k^1\right) = V\left(\frac{a_k^1 + \sum_{i=2}^{m} a_k^i (X_k^i - \tilde{X}_k^i) + \sum_{j=1}^{J} b_k^j \varepsilon_k^j}{dg_k} - \hat{a}_k^1\right) \qquad \text{(A3\_10)}$$

Under assumption H4 there is no correlation between $\sum_{i=2}^{m} a_k^i (X_k^i - \tilde{X}_k^i) + \sum_{j=1}^{J} b_k^j \varepsilon_k^j$

and dg_k. Taking into account that dg_k is assumed to be exogenous, expression (A3_10) then becomes:

$$V\left(\frac{dy_k - d\tilde{y}_k}{dg_k} - \hat{a}^1_k\right) = \frac{V(dy_k - d\tilde{y}_k - \hat{a}^1_k dg_k)}{dg_k^2} + V\left(\hat{a}^1_k\right) \qquad \text{(A3\_11)}$$

To calculate the covariances in expression (A3_9), two episodes k and l are considered. The assumption is made that they are zero for non-overlapping episodes concerning different countries: for two different countries, the estimated multipliers $\hat{a}_k$ and $\hat{a}_l$ have no reason to be dependent if, as it is usually the case, the econometric estimation of the respective equations of the corresponding models are independent; and, at different times, growth rates of two countries can be considered as independent.

So the covariances in expression (A3_9) are non-zero if:

- they apply to the same country at different times; in that case, $\hat{a}_k = \hat{a}_l$ and

$$Cov\left(\frac{dy_k - d\tilde{y}_k}{dg_k} - \hat{a}^1_k, \frac{dy_1 - d\tilde{y}_1}{dg_l} - \hat{a}^l_1\right) = V(\hat{a}^1_k) \qquad \text{(A3\_12)}$$

- they apply to different countries but the episodes are overlapping; in this case

$$Cov\left(\frac{dy_k - d\tilde{y}_k}{dg_k} - \hat{a}^1_k, \frac{dy_1 - d\tilde{y}_1}{dg_l} - \hat{a}^l_1\right) = Cov\left(\frac{dy_k - d\tilde{y}_k}{dg_k}, \frac{dy_1 - d\tilde{y}_1}{dg_l}\right) \qquad \text{(A3\_13).}$$

These assumptions lead to expression (1) in the text.

APPENDIX 4: CONSUMPTION REGRESSIONS, DETAILED RESULTS

This appendix describes the consumption regressions estimated by method (i) for each country. The other methods (ii to ix) use the same regressors as those reported here, supplemented by dummies or fiscal policy variables. Detailed results of these methods are not reported here for the sake of brevity. The variables are taken from OECD Economic Outlook 58 database and areas follows:

CPV = households real consumption
YDRH = households' real disposable income
PCP = consumption deflator
IRLR = real long term interest rate
IRSR = real short term interest rate
UNR = unemployment rate

For each regression, RSQ is the R^2 of the regression, CRSQ is the corrected R^2 of the regression, SER is the standard error of the regression, SSR is the sum of squared residuals, DW is the Durbin and Watson statistic, STER is the standard error of the coefficient and TSTAT is the Student statistic of the coefficient.

The regressions are the following:

Australia

DEL(LOG(CPV)) = 0.43 *DEL(LOG(YDRH)) -0.19 *(LOG(CPV(-1))-LOG(YDRH(-1)))
(5.23) (-1.94)
+0.015 -0.19 *DEL(LOG(PCP(-1)))+ 0.0027 *DEL(IRLR)
(2.43) (-1.58) (2.17)

RANGE: 1971 TO 1993
RSQ = 0.725496 ; CRSQ = 0.664495
SER = 0.008026 ; SSR = 0.00116 ; DW = 2.12537

Austria

DEL(LOG(CPV)) = 0.45 *DEL(LOG(YDRH)) -0.59 *(LOG(CPV(-1))-LOG(YDRH(-1)))
(3.75) (-4.53)
-0.039 + -0.0051 * ISR - 0.0051 *DEL(IRSR)
(2.80) (-4.11)

RANGE: 1971 TO 1993
RSQ = 0.737156; CRSQ = 0.695655
SER = 0.011295; SSR = 0.002424; DW = 2.02917

Belgium

DEL(LOG(CPV)) = -0.33 *DEL(LOG(CPV(-1)))+ 0.57 *DEL(LOG(YDRH))-
(-2.50) (6.98)
0.67*(LOG(CPV(-1))-LOG(YDRH (-1))) -0.10-0.0164*DEL(UNR) -0.0015*IRSR
(-4.45) (-3.67)(-4.74) (-2.38)

RANGE: 1972 TO 1993
RSQ =0.863117; CRSQ =0.820342
SER =0.009016; SSR =0.001301;DW =1.51278

Canada

DEL(LOG(CPV)) = 0.60 *DEL(LOG(YDRH))+ 0.32*DEL(LOG(YDRH(-2)))
(7.67) (4.00)
-0.26*(LOG(CPV(-1))-LOG(YDRH(-1)))+ 0.002
(-4.53) (0.30)
-0.46 *DEL(LOG(PCP)) -0.008 *DEL(UNR) -0.0016 *IRSR
(-5.45) (-4.99) (-2.20)

RANGE: 1970 TO 1993
RSQ = 0.944864; CRSQ = 0.925404
SER = 0.006672; SSR = 0.000757; DW = 2.34376

Denmark

DEL(LOG(CPV)) = 0.48 *DEL(LOG(CPV(-1)))+ 0.45*DEL(LOG(YDRH))
(3.45) (5.01)
-0.18*(LOG(CPV(-1))-LOG(YDRH(-1))) -0.53 *DEL(LOG(PCP))
(-2.91) (-2.78)
+ 0.73 *DEL(LOG(PCP(-1))) - 0.0045 *IRLR -0.01 *DEL(UNR)
(3.32) (-3.53) (-3.19)

RANGE: 1970 TO 1993
RSQ = 0.855477; CRSQ = 0.804469
SER = 0.013923; SSR = 0.003296; DW = 2.52396

Finland

DEL(LOG(CPV)) = 0.54*DEL(LOG(YDRH)) -0.30*(LOG(CPV(-1))-LOG(YDRH(-1)))
(4.94) (-2.7)
-0.23*DEL(LOG(PCP)) -0.0090 *(IRLr(-1)) -0.0055 *DEL(UNR)
(-4.23) (-3.01) (-3.7)

RANGE: 1972 TO 1993
RSQ = 0.924472; CRSQ = 0.900869
SER = 0.010187; SSR = 0.001661; DW = 2.03216

Germany

DEL(LOG(CPV)) = 0.92 *DEL(LOG(YDRH))- 0.63 *(LOG(CPV(-1))-LOG(YDRH(-1)))
(17.18) (-3.01)

-0.07 -0.26 *DEL(LOG(PCP))
(-2.92) (-1.95)

RSQ = 0.948436; CRSQ = 0.940702
SER = 0.008693; SSR = 0.001511; DW = 1.86251

Italy

DEL(LOG(CPV)) = 0.56 *DEL(LOG(YDRH))+ 0.42 *DEL(LOG(YDRH(-1)))
(5.25) (2.90)
-0.11 *(LOG(CPV(-1))-LOG(YDRH(-1))) -0.01
(-3.00) (-1.92)

RANGE: 1973 TO 1993
RSQ = 0.796301; CRSQ = 0.760354
SER = 0.010767; SSR = 0.001971; DW = 1.68754

Ireland

DEL(LOG(CPV)) = 0.90 *DEL(LOG(YDRH))-0.64 *(LOG(CPV(-1))-LOG(YDRH(-1)))+0.0091
(3.50) (-3.15) (0.20)
-0.0035 * DEL(IRSR)
(-2.43)

RANGE: 1979 TO 1993
RSQ = 0.796202; CRSQ = 0.740621
SER = 0.015372; SSR = 0.002599; DW = 2.04544

Japan

DEL(LOG(CPV)) = -0.41*DEL(LOG(CPV(-1)))+0.99*DEL(LOG(YDRH))
(-3.7) (9.8)
-0.45*(LOG(CPV(-1))-LOG(YDRH(-1)))+ -0.04- 0.40*DEL(LOG(PCP(-1)))
(-4.41) (-2.92) (-4.40)

RANGE: 1971 TO 1993
RSQ = 0.856515; CRSQ = 0.82463
SER = 0.009217; SSR = 0.001529; DW = 1.96847

Netherlands

DEL(LOG(CPV)) = 0.43*DEL(LOG(CPV(-1)))+0.42*DEL(LOG(YDRH))
(2.90) (4.26)
-0.44*(LOG(CPV(-1))-LOG(YDRH(-1))) -0.03+ 0.01*IRLR(-1) -0.007*(IRSr(-1))
(-3.80) (-1.33) (2.52) (-3.40)

RANGE: 1979 TO 1993
RSQ = 0.891994; CRSQ = 0.83199
SER = 0.007482; SSR = 0.000504; DW = 1.94459

Spain

DEL(LOG(CPV)) = 0.24*DEL(LOG(YDRH)) -0.27*DEL(LOG(YDRH(-1)))
(2.17) (-2.31)
-0.58 *(LOG(CPV(-1))-LOG(YDRH(-1)))+ 0.016 -0.23*DEL(LOG(PCP))-
0.0022*(IRLR(-1))
(-5.60) (0.70) (-4.08) (-1.91)
-0.01*DEL(UNR)
(-6.32)

RANGE: 1972 TO 1993
RSQ = 0.942557; CRSQ = 0.91958
SER = 0.007805; SSR = 0.000914; DW = 2.51741

Sweden

DEL(LOG(CPV)) = 0.36*DEL(LOG(YDRH(-1))) -0.17*(LOG(CPV(-1))-LOG(YDRH(-1)))
(3.00) (-2.13)
+ 0.03+-0.30*DEL(LOG(PCP)) -0.0046 *IRLR
(3.80) (-3.00) (-2.00)
-0.0046*(IRLr(-1)-DEL(LOG(PCP(-1)))) -0.027*DEL(UNR)
(-1.92) (-8.10)

RANGE: 1972 TO 1993
RSQ = 0.817845; CRSQ = 0.760921
SER = 0.011008; SSR = 0.001939; DW = 2.71549

United Kingdom

DEL(LOG(CPV)) = 0.84*DEL(LOG(YDRH)) -0.45*(LOG(CPV(-1))-LOG(YDRH(-1)))-
(6.70) (-3.17)
-0.04 -0.01*DEL(UNR) -0.003*(DEL(IRSR)))
(-2.70 (-3.00) (-4.00)

RANGE: 1971 TO 1993
RSQ = 0.865886; CRSQ = 0.836082
SER = 0.011126; SSR = 0.002228; DW = 1.38945

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