Fiscal expansions and adjustments in OECD countries

Alberto Alesina and Roberto Perotti

Harvard University, NBER and CEPR; Columbia University

1. INTRODUCTION

1.1. The questions

Following the first oil shock, in the mid-1970s many OECD countries started accumulating large public debts; by the 1990s, several countries exhibited debt/GDP ratios at levels historically observed after major wars, in some cases beyond 100% (see Table 1). At the same time, the composition of government outlays underwent a major shift (see Table 2): while 30 years ago the largest fraction of government spending was 'purchase of goods and services', currently in many countries transfer programmes are quantitatively the single most important item of the budget. These two tables viewed together

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suggest that there might be a relationship between the budget balance and the budget composition. They also suggest that cuts in the 'welfare state' will have to be a critical part of the necessary fiscal adjustments upcoming.

The standard macroeconomic literature on fiscal policy generally ignores issues of composition of the budget. It is fairly common practice to think of government spending as 'purchase of goods and services', a component which is becoming less and less important empirically.[1] From a policy perspective, instead, changes in the composition of the budget are extremely important. When policy-makers must improve the budget balance, they can raise taxes and/or cut expenditures. But which of the two sides should be used? Which component of expenditure can and should be cut? Which taxes should be raised?

The first question which we address is the relationship between the

Table 1. Debt/GDP ratios (%)

	1965	1975	1990
Australia	n.a.	n.a.	25.53
Austria	19.37*	23.94	56.43
Belguim	67.49	61.06	131.18
Canada	58.79	43.09	71.91
Denmark	11.30	11.92	59.46
Finland	17.70	8.57	16.77
France	53.05*	41.08	46.64
Germany	17.34	25.08	43.58
Greece	14.15	22.43	88.73
Ireland	n.a.	64.37	101.74
Italy	35.41	60.40	100.48
Japan	0.07	22.41	69.76
Netherlands	52.21	41.38	76.12
Norway	47.02*	44.75	39.12
Portugal	n.a.	n.a.	n.a.
Spain	n.a.	n.a.	46.81
Sweden	30.48	29.52	44.23
Switzerland	n.a.	n.a.	n.a.
UK	81.77*	63.73	34.67
USA	52.10	42.69	56.22

Note: Debt is gross. *1970.
Source: OECD.

[1] A partial exception is the 'overlapping generations' literature, which focuses on intergenerational transfers, although not explicity on the composition of the budget. Some of the new political economy literature focuses on the redistributive role of fiscal policy and therefore, indirectly, on budget composition. For a survey of this literature, see Alesina and Perotti (1995a).

Table 2. Government consumption and transfers, as shares of GDP (%)

	Government consumption	Transfers	Government consumption	Transfers
	1965		1990	
Australia	12.71	n.a.	17.24	10.40
Austria	13.36	14.93	17.79	20.19
Belgium	13.68*	14.61*	15.13	20.49
Canada	14.38	6.17	20.03	13.19
Denmark	16.41	6.98	25.22	20.50
Finland	13.66	7.61	21.05	12.28
France	14.36	15.70	17.92	23.30
Germany	15.20	13.71	18.38	19.53
Greece	11.72	6.89	21.08	14.59
Ireland	14.37	n.a.	17.20	14.31
Italy	14.54	12.65	17.41	19.16
Japan	8.18	4.93	9.14	12.03
Netherlands	15.40*	16.41*	14.47	27.85
Norway	15.05	9.13	21.03	20.61
Portugal	12.28	3.53	16.73	13.24
Spain	8.47	6.25	15.47	15.92
Sweden	17.76	9.87	27.36	21.52
Switzerland	16.68	7.70	19.97	12.10
UK	19.39	5.85	18.89	12.28
USA	10.64	9.14	13.65	17.37

*1970.
Source: OECD.

fiscal stance, i.e. loose or tight budget balance, and the composition of expenditures and revenues. We discuss whether fiscal expansions and fiscal adjustments rely on specific items of the budget more than on other items.

The second, related, question is whether the composition of fiscal adjustments influences the likelihood of success, defined as a relatively permanent consolidation of the budget. Do successful adjustments rely primarily on expenditure cuts or tax increases? Are cuts in transfer programmes and social expenditures a necessary component of successful adjustments?

Third, we ask several politico-economic questions. Which types of government are more likely to follow loose or tight fiscal policies? Are coalition governments or single-party governments more likely to accomplish successful adjustments? Are there significant differences between left-wing and right-wing governments? Are loose policies typically followed in an election year?

1.2. The answers

Loose policies are the result of sharp increases in government expenditure, particularly transfer programmes; conversely, tight policies are carried out through increases in taxes

First of all, we find important asymmetries between loose and tight fiscal policies. On average, loose policies are the result of sharp increases in government expenditure, particularly transfer programmes; conversely, tight policies are carried out through increases in taxes, particularly direct taxes on households, rather than through reductions in expenditure.

However, and this is our second major conclusion, the previous result, concerning average adjustments, overlooks a fundamental difference between successful and unsuccessful adjustments. Successful adjustments (a minority of the total) rely mostly on cuts in transfer programmes and in government wages and employment. Unsuccessful adjustments rely primarily on increases in taxes, leaving transfer programmes and government wages and employment untouched, or even increased.

Third, in contrast with single-party governments, coalition governments are incapable of achieving a stable consolidation of the budget. They often try but systematically fail. On the other hand, we do not find much difference between left-wing and right-wing single-party governments in their ability to implement successful adjustments.

1.3. Relationship with the literature

Our paper is related to four lines of work. The first is the literature on fiscal adjustments, which includes, for instance, Alesina (1988), Dornbusch (1989), and Giavazzi and Pagano (1990). Relative to these papers we emphasize the detailed composition of public budgets, using not a case study method but, instead, statistical evidence. A recent paper by de Haan *et al.* (1992) discusses not only fiscal adjustments, but more generally, the evolution of fiscal policy (both on the expenditure side and on the taxation side) in Europe. While we share with that paper an emphasis on compositional issues, we have a less broadly descriptive and more specific purpose in mind.

The second related line of research studies whether budget deficits are primarily the result of increases in aggregate expenditure or cuts in aggregate taxation. For instance, Bohn (1991) addresses this issue with specific reference to the United States. While we touch upon this issue as well, our goal in this paper is much broader: first, we emphasize the composition of expenditure and taxation, not only their aggregate levels; second, we analyse several other important issues; third, our analysis covers almost all OECD countries.

A third line of relevant work concerns the political economy of budget deficits, recently surveyed in Alesina and Perotti (1995a). In particular, we touch upon issues related to empirical results by Roubini and Sachs (1989a,b) and Grilli *et al.* (1991) on the effects of coalition governments on the budget balance. These authors study the effects of different types of government on debt; we emphasize more the propensity to initiate fiscal adjustments and their likelihood of success. We also relate, in part, to the literature on political business cycles and, specifically, on the effects of the electoral cycle on fiscal policy, an issue recently addressed empirically for OECD countries by Alesina *et al.* (1993).

Finally, in defining our measure of discretionary fiscal policy we refer to the literature on how to 'adjust' standard measures of budget balance for the cycle. We found Blanchard (1993) particularly illuminating on this point. McKenzie (1989) provides a very useful broad discussion of the literature.

1.4. Summary

This paper is organized as follows. Section 2 discusses alternative measures of discretionary fiscal policy. We describe the measure which we use throughout the paper. Section 3 discusses the behaviour of aggregate expenditure and taxation in periods of loose and tight fiscal policy. Section 4 continues this analysis by disaggregating expenditures and taxes in several components. Section 5 provides a definition of successful versus unsuccessful fiscal adjustments and identifies several features which differentiate them. In section 6 we study the robustness of our results, along several dimensions. Section 7 addresses politico-economic questions, asking, in particular, which types of government are more likely to implement successful adjustments. Section 8 discusses various related points concerning possible alternative explanations of our findings and related issues. The last section concludes.

2. THE FISCAL IMPULSE

2.1. The discretionary component of fiscal policy

In this paper, we are mainly interested in those changes in fiscal policy that result from intentional actions by the policy-makers; we are less interested in those changes that derive from the effect of the economic cycle on expenditure and tax revenues. We define the *fiscal impulse* as the *discretionary* change in the budgetary position of the government. Roughly speaking, the fiscal impulse is designed to

eliminate the effects of business cycles on the budget. It is the difference between the actual budgetary position and what would prevail under a benchmark cyclical situation. Unfortunately, there is no universally accepted method of defining what part of the current budgetary position reflects an exogenous action on the part of the government and what part is merely a reflection of the cycle. Schematically, there are two types of problem: (1) How is the benchmark situation that is used to adjust the actual measure to be defined? (2) What parts of the budget should be adjusted to this benchmark, and how? For instance, should interest payments be adjusted for inflation, and if so, how?

Addressing the first problem involves taking a stance on controversial conceptual and statistical issues. For instance, how should we estimate potential output, to be used, in conjunction with Okun's law, to adjust the value of several expenditures sensitive to the cycle, like unemployment benefits? Addressing the second problem presents difficulties that are more practical in nature. For instance, to adjust unemployment benefits one would ideally need rather detailed information on replacement ratios. More generally, one would need a set of elasticities of the various types of taxes and expenditures to income, unemployment and inflation. In addition to these widely acknowledged issues, some authors, in particular Buiter (1983, 1985), have argued that a proper measure of the deficit and of the fiscal stance should take into account all changes in the public sector net worth. Thus, according to Buiter, a 'standard' cyclical adjustment of the deficit measure would not be enough (McKenzie, 1989, provides more discussion on this point).

A useful measure of the fiscal stance must be simple

A useful measure of the fiscal stance must be simple, even at the cost of ignoring relatively important considerations. Fortunately, for our purposes, simplicity does not come at a high price. First, we are only interested in *changes* in the budgetary position of the government. Therefore, for any year the benchmark can be safely assumed to be the *previous* year. This avoids the problem of choosing a base year when actual output was supposedly at its potential level. Second, we largely take care of the inflation-adjustment problem by excluding interest payments from our measures of the budgetary position of the government. Third, we focus on 'large' changes in the budgetary position, such that are unlikely to be caused by purely cyclical factors.

Table 3 describes four widely used measures of the fiscal impulse. It is worth mentioning at the outset that the qualitative conclusions of our analysis are not sensitive to the choice of the measure, as we show

in section 6. The simplest possible definition of the fiscal impulse is the change in the primary deficit as a share of GDP from the previous year (the primary deficit excludes interest expenditures). Implicitly this measure takes the previous year as the benchmark year. The great advantage of this measure is its simplicity. Its disadvantage is that it ignores cyclically induced fluctuations in the primary deficit.[2]

Blanchard (1993) suggests a very attractive way of addressing this problem without sacrificing simplicity. His measure still takes the previous year as the benchmark year, but recognizes that government outlays can be *negatively* related to GDP, because of built-in stabilizers like unemployment compensation. Similarly, revenues can be *positively* related to GDP: for instance, because of the progressivity of the tax system. For both reasons, the deficit tends to rise endogenously during recessions. To correct for this, without at the same time resorting to estimates of potential output of dubious reliability, Blanchard suggests estimating what government outlays and revenues would be in any given year if the unemployment rate had remained the same as in the previous year.[3]

The third measure, frequently used by the OECD (Chouraqui *et al.*, 1990) and also known as the 'Dutch measure', defines the fiscal impulse as the difference between the current primary deficit and the primary deficit that would have prevailed if expenditure in the previous year had grown with potential GDP, and revenues had grown with actual GDP. Thus, like the first two measures, the Dutch

[2] Note, however, that if the endogenous component of all revenues and expenditures were unit elastic to actual GDP, this measure would identify all and only discretionary changes in fiscal policy. Thus, this measure is not a bad approximation as long as expenditures and revenues are close to being unit elastic to GDP.

[3] This measure is implemented as follows. For each country in the sample, we regress social transfers as a share of GDP (*TRANSF*) on two time trends for 1960–75 and 1976–92 and on the unemployment rate (U):

$$TRANSF_t = \alpha_0 + \alpha_1 TREND1 + \alpha_2 TREND2 + \alpha_3 U_t + \epsilon_t \qquad (1)$$

We then estimate what transfers would be in period t if unemployment were the same as in the previous year.

$$TRANSF_t(U_{t-1}) = \hat{\alpha}_0 + \hat{\alpha}_1 TREND1 + \hat{\alpha}_2 TREND2 + \hat{\alpha}_3 U_{t-1} + \hat{\epsilon}_t \qquad (2)$$

where the $\hat{\alpha}_i$'s are the estimated coefficients in regression 1 and $\hat{\epsilon}_t$ is the estimated residual in the same regression. We follow the same procedure for total revenues T_t, to obtain $T_t(U_{t-1})$. Having constructed $TRANSF_t(U_{t-1})$ and $T_t(U_{t-1})$, we can compute the primary deficit that would have prevailed in period t had the unemployment rate been equal to period $t-1$'s unemployment rate. The measure of the fiscal impulse is then constructed as the difference between this unemployment-adjusted measure of the primary deficit and the previous year's primary deficit.

measure takes the previous year as the benchmark year. However, now the cyclically neutral expenditure is assumed to be proportional to *potential* output, while the cyclically neutral taxation is assumed to be proportional to *actual* output.[4] In comparison, the advantage of the Blanchard measure is that it does not rely on estimates of potential output. The OECD measure is also sensitive to the rate of inflation in a rather subtle way. Suppose that all prices increase between period $t-1$ and t by 10%, while all real variables remain constant. Therefore, actual and potential GDP and all nominal expenditures and tax revenues increase by 10%, while all ratios remain constant. Clearly, the discretionary position of the government has not changed. Yet, if the budget is initially in deficit, the fiscal impulse measure will increase, because all nominal expenditures and revenues in both periods t and $t-1$ are divided by GDP in period $t-1$.

The fourth measure, often advocated by the IMF, differs from all the others in that it assumes as the benchmark year not the previous year, but a reference year where potential output was close to actual output. Aside from this difference in the treatment of the benchmark year, this measure (also known as the 'German measure') is similar to the OECD measure illustrated above. A disadvantage of the IMF

Table 3. Fiscal impulse measures

1. Δ Primary	$FI = (g_t - t_t) - (g_{t-1} - t_{t-1})$
2. The Blanchard measure	$FI = (g_t(U_{t-1}) - t_t) - (g_{t-1} - t_{t-1})$
3. The OECD measure	$FI = [(G_t - T_t) - (G_{t-1}(I + \hat{y}_t) - T_{t-1}(1 + y_t))]/Y_{t-1}$
4. The IMF measure	$FI = [(G_t - T_t) - (G_0(1 + \hat{y}_t) - T_0(1 + y_t))]/Y_{t-1}$

Notes: G_t: total current expenditure plus gross capital accumulation less interest payments; T_t: total revenues; g_t and t_t represent the same variables, but as shares of GDP; Y_t: nominal GDP; y_t: rate of growth of nominal GDP; $\hat{y}_t$: rate of growth of nominal potential GDP; G_0: value of G in base year, when actual output is equal to potential output; T_0: revenues in base year; U_t: unemployment rate.

[4] Formally, start from the following expression for the cyclically adjusted budget balance (*CAB*):

$$CAB = (G_t - T_t) - (\hat{g}_{t-1}\hat{Y}_{-t} - t_{t-1}Y_t) \tag{3}$$

where $\hat{g}_{t-1}$ is the ratio of government expenditure to potential GDP in period $t-1$, t_{t-1} is the ratio of taxation to actual GDP in period $t-1$, and $\hat{Y}_t$ and Y_t are potential and actual GDP in period t, respectively. The measure is obtained by taking the first difference of the *CAB*, and dividing by GDP in period $t-1$. We are not quite sure about the motivation for the asymmetric treatment of spending and income.

measure is the degree of arbitrariness in the choice of the base year.

Because of its greater simplicity, in the remainder of this paper we focus our presentation on results obtained using the Blanchard measure. In section 6, we show that our results do not change when the other three measures are used. The reason is that, since we focus on relatively large changes in the budgetary position, the details of the cyclical adjustment do not affect the nature of our results. We view this result as quite reassuring.

2.2. Loose and tight fiscal policies

We focus on large discretionary fiscal impulses, positive and negative

We focus on *significant* changes in the fiscal position of the government. Thus, not only are we not interested in cyclical fluctuations of the budget balance, but also we want to disregard very small discretionary changes in fiscal policy. Instead, we want to focus on relatively large discretionary fiscal impulses, positive and negative. Our sample includes yearly observations on expenditures and revenues (defined precisely in the Appendix) from 1960 to 1992 for twenty OECD countries: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Japan, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, UK and USA. We consider the general government, rather than the central government. This has one advantage and one disadvantage. The advantage is that the definition of general government is more comparable across countries. In fact, according to the OECD, the general government includes 'all departments, offices, organisations and other bodies which are agencies or instruments of the central, state or local public authorities', including 'all social security arrangements for large sections of the population imposed, controlled or financed by a government', and 'government enterprises which mainly produce goods and services for government itself or primarily sell goods and services to the public on a small scale'. Using general government data therefore avoids the problem of allocating expenditures to, say, state rather than local governments, or to the central administration rather than to social security funds, which sometimes can be difficult and unreliable in a cross-country comparison. The disadvantage of working with general government data is that the fiscal manoeuvres we focus on are typically carried out through the central government budget. As a consequence, fluctuations in the general government balance may reflect effects coming from local governments which are unrelated to the kind of issues we are investigating here. While in the future we

intend to explore the behaviour of the different levels of governments along the lines we follow here for the general government, at present the much larger availability of data for the general government makes us prefer the approach we take in this paper.

We have a total of 547 observations on our measure of the fiscal impulse, which we label *BFI*, for 'Blanchard Fiscal Impulse'. The sample average of *BFI* is −0.008% of GDP, with a standard deviation of 1.67% of GDP. We classify the *fiscal stance* according to the value of the fiscal impulse, as follows:

Definition 1. The fiscal stance

In any given year, the fiscal stance is:	when BFI is (% of GDP):
Neutral	between −0.5 and 0.5
Loose or a small expansion	between 0.5 and 1.5
Very loose or a strong expansion	larger than 1.5
Tight or a small adjustment	between −1.5 and −0.5
Very tight or a strong adjustment	less than 1.5

In defining the cut-off points of Definition 1, we are trading off two opposite requirements. On one hand, we need to make sure that very loose or very tight policies are really different from 'business as usual', and that they are not unduly influenced by cyclical factors, despite our correction for unemployment. This consideration would require setting high cut-off points for these policies. On the other hand, in order to have enough power for our tests, we need to have a sufficient number of observations for each type of policy. In general we find that our results change in an intuitive way when we experiment with different cut-off points: for instance, if we define very loose or very tight fiscal policies more restrictively, the differences between these policies and 'normal' times become larger.[5]

The numbers of loose and tight cases, and of very loose and very tight cases are similar

Table 4 provides some summary information on the four types of fiscal policy stance generated by the cut-off points of Definition 1. Note from the first column that we have a very similar number of

[5] Results on this point are available upon request.

Table 4. Summary statistics on *BFI*

	Observations	Average (%)	Standard deviations (%)
All	547	−0.008	1.67
Loose	124	0.93	0.28
Tight	121	−0.93	0.29
Very loose	65	2.81	1.79
Very tight	66	−2.61	1.46

Note: The figures in the last column are the *sample* standard deviations for each type of fiscal stance.

loose and tight cases (124 and 121, respectively) and of very loose and very tight cases (65 and 66, respectively). Note also that the cut-off points for strong expansions and strong adjustments correspond closely to the average of the *BFI* plus or minus one standard deviation, respectively.

Table 5 lists all the cases of strong expansion and strong adjustment obtained with Definition 1. The table suggests several interesting observations. First, our definition captures quite well some well-known episodes of strong and prolonged fiscal adjustments in the mid-1980s, like Denmark and Ireland. Second, the large number of strong expansions in the period 1974–6 are clearly a response to the first oil shock. Every country except four (Greece, Ireland, Spain and UK) has had at least one strong expansion in this three-year period. Third, many countries display a typical 'stop and go' behaviour, with strong adjustments followed by strong expansions, and vice versa: for instance, Finland in the 1970s and Portugal in the 1980s. Finally, as we focus on strong expansions and adjustments, we do not capture periods of progressive deterioration of the budget without major jumps in the discretionary component of fiscal policy. For instance, from 1974 onward Italy shows only two years of major expansion, despite a change in the debt/GDP ratio from about 50% in 1974 to the current 125%.

Many countries display a typical 'stop and go' behaviour

One might argue that the criterion of Definition 1 fails to capture an important difference between countries: an increase in the primary deficit by 1.5% of GDP may represent a large expansion for Germany, but little more than 'business as usual' in, say, Italy. To address this issue, we have computed the mean and standard deviation of the *BFI* separately for each country, and we have modified Definition 1 as follows:

Definition 1bis. The fiscal stance

In any given year, the fiscal stance is:	when, relative to the national average, *BFI* is:[6]
Neutral	between plus half and minus half a standard deviation
Loose or a small expansion	between plus half and plus one standard deviation
Very loose or a strong expansion	above plus one standard deviation
Tight or a small adjustment	between minus one and minus half a standard deviation
Very tight or a strong adjustment	below minus one standard deviation

[6] Let μ_i and σ_i be the average and the standard deviations of the change in the unemployment-adjusted primary deficit for country i. In any given year, the fiscal stance in country i is neutral if $BFI \in [\mu_i - 0.5\sigma_i, \mu_i + 0.5_i]$; loose if $BFI \in [\mu_i + 0.5\sigma_i, \mu_i + \sigma_i]$; very loose if $BFI > \mu_i + \sigma_i$; tight if $BFI \in [\mu_i - \sigma_i, \mu_i - 0.5\sigma_i]$; very tight if $BFI < \mu_i - \sigma_i$.

Table 5. Strong expansions and adjusments

	Strong expansions	Strong adjustments
Australia	1975, 76, 91, 92	1974, 77, 87
Austria	1967, 75	1977, 84
Belgium	1975, 81	1982, 84
Canada	1975, 82, 91	1981
Denmark	1975, 87, 88	1983, 84, 85, 86
Finland	1963, 74, 75, 78, 87, 90, 91, 92	1964, 67, 73, 76, 84, 88
France	1975, 81, 92	1969
Germany	1974, 75, 90	1969, 73, 76, 89
Greece	1981, 85, 88, 89	1982, 86, 87, 90, 91, 92
Ireland	1978	1984, 87, 88, 89
Italy	1965, 71, 72, 75, 81	1967, 74, 76, 80, 89, 92
Japan	1975	1984
Netherlands	1975, 87	1985, 91
Norway	1970, 76, 77, 86, 91	1979, 80, 83, 84, 89, 90
Portugal	1963, 74, 75, 81, 83, 87	1967, 77, 80, 82, 84, 89
Spain	1982	1986, 87
Sweden	1974, 77, 79, 88, 91	1971, 76, 83, 84, 87
UK	1971, 72, 90, 91, 92	1969, 77, 88
USA	1967, 75	1969, 76

All our results remain practically unchanged if Definition 1bis rather than Definition 1 is adopted.[7] In the remainder of the paper, we present results based on Definition 1.

3. AGGREGATE EXPENDITURES AND TAXATION AND THE FISCAL STANCE

In this section we ask the question of whether expansions are typically the results of increases in expenditure or cuts in taxation and, similarly, whether adjustments typically occur on the expenditure side or on the tax side.

Table 6 reports sample statistics for our measure of the fiscal impulse, and for its two main components, total expenditure (net of interest payments) and total taxation, under the different types of fiscal stance. Total expenditure and taxation are not unemployment-adjusted; evaluating them at the previous year's unemployment rate, however, would not make any difference in our result. An interesting feature that emerges from this table is that, on average, episodes of strong adjustment are the mirror image of episodes of strong expansion: in fact, the average increase in the adjusted deficit during the former (2.81% of GDP) is very close, in absolute value, to the average fall during the latter (2.61% of GDP). This means that any significant asymmetry in the behaviour of each particular type of

On average, episodes of strong adjustment are the mirror image of episodes of strong expansion

Table 6. *BFI*, aggregate expenditure, aggregate taxation (standard deviations)

	Observations (1)	*BFI* average (2)	Expenditure average (3)	Revenue average (4)
All	547	−0.008	0.51	0.42
		(0.071)	(0.058)	(0.046)
Loose	124	0.93	1.04	0.02
		(0.025)	(0.089)	(0.085)
Tight	121	−0.93	0.05	0.83
		(0.026)	(0.075)	(0.072)
Very loose	65	2.81	2.25	−0.17
		(0.230)	(0.204)	(0.173)
Very tight	66	−2.61	−0.79	1.20
		(0.177)	(0.172)	(0.166)

Note: In parentheses are standard errors of the mean, not of the sample.

[7] Results are available upon request.

expenditure or taxation that may emerge between the two fiscal policy stances is due to a genuine qualitative difference in the working of fiscal policy during strong expansions and strong adjustments, and not to different sizes of the change. Similarly, the average fall in the adjusted deficit during small adjustments (0.93% of GDP) is identical to the average increase during small expansions, even though this similarity is less surprising, given the nature of our definitions.

Aggregate expenditure (column (3)) and aggregate taxation (column (4)) also present an important asymmetry. Expansions result mainly from increases in expenditure, adjustments from increases in taxation. This is particularly evident when comparing loose and tight fiscal policies, but also very loose and very tight fiscal policies, although in this last case some adjustment occurs on the expenditure side as well.

In summary, Table 6 suggests that in loose years there are virtually no changes in taxes, and in tight years there are virtually no changes in spending. In very loose years, spending increases on average by 2.25% of GDP, while taxes are cut by only by 0.17% of GDP. In very tight years taxes are increased by 1.2% of GDP and spending is cut by 0.79% of GDP. These results suggest that increases in expenditure during loose fiscal stances tend to be permanent and set the stage for subsequent tax increases. Note that in this table, as in those that follow, the algebraic sum of the average change in expenditures and taxation does not equal the *BFI* measure. This is because the definition of the primary deficit used in constructing the *BFI* measure includes some minor items, like consumption of fixed capital and net capital transfers, that do not appear in the variables used in the tables.

A similar picture emerges from the regression analysis of Table 7, where we ask how total expenditure and total taxation (as shares of GDP) change according to the general fiscal stance. To answer this question, we partition all the observations into the five categories corresponding to Definition 1, and we regress the change in expenditures and incomes on the corresponding five dummy variables as well as three macroeconomic variables expected to affect fiscal policy outcomes over and beyond the particular regime prevalent at the time. The three macroeconomic variables are: the change in the rate of inflation, the change in the unemployment rate, and the change in the rate of growth of GDP. The five dummy variables define the fiscal policy impulse in that year: for instance, *Tight* takes the value 1 in periods of tight fiscal policy according to

Table 7. How expenditure and revenues respond

	Expenditure (1)	Revenues (2)
Change in inflation	−0.05	−0.02
	(−2.99)	(−1.03)
Change in unemployment	0.47	0.15
	(10.04)	(3.17)
Change in growth rate	−0.14	−0.12
	(−8.65)	(−7.16)
Neutral	0.27	0.28
	(3.88)	(3.85)
Loose	0.81	−0.06
	(9.47)	(−0.70)
Tight	0.09	0.86
	(1.03)	(9.99)
Very loose	1.67	−0.47
	(13.24)	(−3.67)
Very tight	−0.73	1.26
	(−6.43)	(10.90)
Observations	547	547
R^2	0.53	0.25
see	0.93	0.94

Note: OLS. *t*-statistics in parentheses.

Definition 1, and similarly for the other dummy variables. The coefficient of each dummy variable measures the effect of the fiscal stance on public spending or revenues – as a proportion of GDP. Column (1) looks at expenditures. We expect a negative coefficient on the inflation variable: when inflation increases, government expenditure as a share of GDP decreases because in the short run several expenditures are fixed in nominal terms or not perfectly indexed to the price level. We also expect a positive coefficient on the unemployment variable because of the effects of built-in stabilizers like unemployment insurance, and a negative coefficient on the growth variable because many expenditures are fixed in advance at some level consistent with an 'average' or 'long-run' level of income. Column (2) presents the results for revenues. The sign of the coefficient of inflation is a priori ambiguous. On one hand, a rise in inflation tends to increase income tax revenues relative to GDP because, at the rates of inflation prevailing in OECD countries, the bracket creeping effect arising from imperfect indexation of income tax brackets clearly prevails over the Olivera–Tanzi effect. On the other hand, a rise in inflation tends to decrease the share of social security contributions in GDP, since social security contributions are

Table 8. Expenditure averages

	Expenditure	Government investment	Transfers	Non-wage government consumption	Wage government consumption	Subsidies
	(1)	(2)	(3)	(4)	(5)	(6)
All	0.51	−0.03	0.34	0.04	0.13	0.02
	(0.058)	(0.014)	(0.029)	(0.011)	(0.018)	(0.014)
Loose	1.04	0.05	0.49	0.15	0.25	0.09
	(0.089)	(0.034)	(0.055)	(0.025)	(0.034)	(0.028)
Tight	0.05	−0.07	0.12	−0.03	0.06	−0.02
	(0.075)	(0.023)	(0.038)	(0.017)	(0.031)	(0.021)
Very loose	2.25	0.13	1.15	0.26	0.53	0.18
	(0.204)	(0.039)	(0.118)	(0.039)	(0.068)	(0.053)
Very tight	−0.79	−0.28	−0.09	−0.14	−0.16	−0.11
	(0.172)	(0.025)	(0.079)	(0.029)	(0.060)	(0.056)

Note: Standard deviations in brackets.

usually paid only on those parts of the wage below a certain maximum value, which is usually not indexed to the price level. Because social security contributions are a sizeable share of total revenues, and the largest single source in several countries including France, Germany, the Netherlands and Spain, this second effect can be quite substantial. We expect a negative coefficient on unemployment and a positive coefficient on growth essentially because of the automatic stabilizing features of many taxes.

When unemployment increases or growth decreases, governments react by increasing expenditure; taxation also rises

The coefficients of the economic determinants of expenditure in column (1) of Table 8 have all the expected signs and are highly significant. In column (2), the coefficients of unemployment and growth have the wrong sign. This suggests the following explanation: when unemployment increases or growth decreases, governments react by increasing expenditure (relative to GDP); taxation also rises in order to keep up, at least partially, with the increase in expenditure. For instance, during the recession of the mid-1970s, budget deficits rose everywhere, but in most countries taxation increased relative to GDP.

Our focus is, however, on the remaining five dummy variables. The pattern of the coefficients clearly confirms the results of Table 7. Expansions are very much the mirror image of adjustments: during expansions, most of the action is on expenditure, while during adjustments, it is on taxation. In fact, the coefficient of *Loose* in column (1) is almost identical to the coefficient of *Tight* in column (2); on average, total expenditure during small expansions and total

taxation during small adjustments increase by the same amount, about 0.85% of GDP. On the other hand, the coefficients both of *Tight* in column (1) and of *Loose* in column (2) are practically zero. A similar pattern emerges from a comparison of very loose and very tight episodes. In this case some adjustment in very tight years also occurs on the spending side, but the adjustment on the taxation side is considerably larger (−0.73 against 1.26). In very loose years, cuts in taxes are about one-quarter of increases in expenditures (−0.47 against 1.67).

There is a risk that the macroeconomic variables used in these regressions, particularly inflation, are affected by fiscal policy rather than the other way round, as implicitly assumed. We have two answers to this legitimate concern. First, even if this is the case and, therefore, the estimates of coefficients of all macroeconomic variables are biased, there is no reason why this bias should affect, say, the coefficient of the *Tight* dummy variable differently for expenditure and taxation. In other words, it is difficult to imagine why reverse causality should induce the asymmetry in the estimated coefficients of the fiscal stance dummy variables in columns (1) and (2). Second, the coefficients of the fiscal stance dummy variables in Table 8 imply average changes that are very close to the sample averages displayed in Table 7. This suggests that the effects of unemployment, inflation and growth are not of primary importance for the issues we are concerned with here.

The main findings of this section can be summarized as follows: (1) the average increase in the unemployment-adjusted primary deficit during expansions (*BFI*) is very close to the average fall during adjustments; (2) expansions are mostly the result of increases in expenditure, while adjustments are mostly the result of increases in taxation.

During loose and very loose fiscal policies, mainly transfers and government wages increase. During tight and very tight fiscal policies, expenditure cuts fall primarily on public investment

4. DISAGGREGATING EXPENDITURE AND TAXATION

In this section, we disaggregate total expenditure and taxation, and analyse how their individual components behave in the different types of fiscal stance. For each policy stance, Table 8 reports the average changes of five different components of government expenditure, expressed as shares of GDP: public investment, transfers, non-wage government consumption, government wages and subsidies. A clear pattern emerges. During periods of loose and very loose fiscal policy, it is mainly transfers and government wages that increase. During tight and very tight fiscal policies, cuts in

expenditure (which are a small part of the adjustment) fall primarily on public investment.

The average increase in transfers during loose and, particularly, very loose years is quite remarkable. In the latter case, transfers increase by more than 1.15% of GDP! Government wages also increase substantially during very loose years, by more than one half of a point of GDP. By contrast, government transfers and wages fall only slightly during very tight years, by about 0.09% and 0.16% of GDP, respectively. The share of non-wage government consumption (together with subsidies) shows the least interesting and significant movements. Paradoxically, government consumption typically receives the most attention in the academic debate on the macroeconomic effects of fiscal policy. The data of Table 8 obviously help explain the long-run change in budget composition documented in Table 2 above. Since loose fiscal policies are mainly implemented by increasing transfers, rather than consumption of goods and services, and very tight policies simply raise taxes, in the long run the composition of the budget is bound to tilt in favour of transfer programmes.

During adjustments, all taxes increase, especially taxes on households and indirect taxes

Interesting compositional effects also emerge on the taxation side, although the pattern is slightly less clear-cut. Table 9 presents a breakdown of revenues. In loose and very loose years, direct taxes on businesses and indirect taxes are slightly cut. By contrast, taxes on households are either slightly increased (in loose years) or unchanged (in very loose years). Remember, however, that total tax cuts in loose years are very small. During adjustments, all taxes increase, with the largest increases being on taxes on households and indirect taxes. Taxes on business increase substantially only in very tight years, but are virtually untouched in tight years. Social security contributions have a 'life of their own' somewhat unrelated to the overall stance of fiscal policy. In particular, social security contributions *increase* significantly during expansions. This suggests that the contemporaneous increase in social expenditure makes increases in social security contributions more politically acceptable.

The main messages of Tables 8 and 9 can be summarized as follows: (1) On the expenditure side, there is an important asymmetry between adjustments and expansions: the former are implemented with very small total cuts in expenditures, concentrated mostly on public investment, with virtually no cuts in transfer programmes. The latter are implemented via large increases in transfers and wage government consumption. (2) Non-wage government consumption is never a primary factor during episodes of change in the fiscal policy

Table 9. Revenue averages

	Revenue	Direct taxes paid by households	Direct taxes paid by business	Indirect taxes	Social security taxes
All	0.42	0.16	0.01	0.05	0.19
	(0.046)	(0.027)	(0.022)	(0.023)	(0.020)
Loose	0.025	0.10	−0.10	0.11	0.15
	(0.085)	(0.062)	(0.030)	(0.048)	(0.034)
Tight	0.83	0.27	0.08	0.21	0.24
	(0.072)	(0.044)	(0.026)	(0.037)	(0.042)
Very loose	−0.17	−0.01	−0.31	−0.13	0.30
	(0.173)	(0.112)	(0.118)	(0.085)	(0.070)
Very tight	1.20	0.31	0.36	0.36	0.13
	(0.166)	(0.093)	(0.087)	(0.079)	(0.075)

Note: Standard deviations in brackets.

stance. In particular, very loose fiscal policies are engineered through much bigger changes in transfers and wage government consumption than non-wage government consumption.

5. SUCCESSFUL AND UNSUCCESSFUL ADJUSTMENTS

Governments incur the economic and political costs of implementing strong adjustments in order to correct for excessive existing deficits and debts. It is then important to investigate how successful strong adjustments have been in correcting these fiscal problems on a permanent basis. This is why we isolate episodes of very tight fiscal policy which have led to a 'long-run' consolidation of the budget, as opposed to episodes which have soon been reversed. We face two data constraints in picking the criterion. First, in order to define a success, we cannot look very far into the future after the year in which the strong adjustment occurred, since most adjustments take place in the mid to late 1980s. Second, if we impose very high

Table 10. Successful adjustments

Australia	1987
Denmark	1984
France	1969
Ireland	1987, 88, 89
Norway	1979, 80
Sweden	1984, 87
United Kingdom	1969, 77, 88
USA	1976

standards in defining a success, we are left with very few observations. We have tried with several different definitions. In the text we present results obtained using Definition 2 below. As we show in section 6, our results are quite robust to changes in the definition.

Definition 2. Successful adjustments

A *successful adjustment* in year t is defined as a 'very tight' fiscal stance in year t such that the gross debt/GDP ratio in year $t+3$ is at least 5 percentage points of GDP lower than in year t.

In our sample we have 14 successful adjustments and 38 unsuccessful ones. The sum of successful and unsuccessful adjustments, 52, is less than the total of very tight fiscal policies, 66, because 14 episodes of very tight fiscal stance occurred between 1990 and 1992, and therefore cannot be classified as successful or unsuccessful according to our criterion. Table 10 lists all the cases of successful adjustments.

A few observations are in order. First, the Irish multiyear adjustment clearly stands out, with three consecutive years that satisfy our rather demanding definition. Second, the other well-known case of fiscal reform of the mid-1980s, Denmark, is also represented, with one successful adjustment in 1984. Third, two years of budget adjustment in Sweden in the mid-1980s are also captured by our definition of success. In light of the more recent developments in the Swedish public finances, this observation

Table 11. Successful and unsuccessful adjustments: total expenditure and revenues

	Fiscal impulse	Expenditures	Revenues
Successful adjustments	−2.74	−2.19	0.44
	(0.282)	(0.326)	(0.385)
Unsuccessful adjustments	−2.18	−0.49	1.28
	(0.101)	(0.188)	(0.181)

Note: This table displays the averages of the *BFI* measure and of the changes in the GDP shares of total expenditure (exclusive of interest payments) and of total revenues (exclusive of interests received) during successful and unsuccessful adjustments. A very tight fiscal policy in period t is successful if $by(t+3) - by(t) < 0.05$, where by is the debt/GDP ratio. Standard deviations in brackets.

highlights how short-run success (captured by our definition) does not necessarily coincide with success defined over a longer horizon.

Table 11 shows that the average fall in the fiscal impulse (*BFI*) as a percentage of GDP is 2.18 for unsuccessful adjustments, and 2.74 for successful ones. Thus, successful adjustments are slightly larger, but not very much. In other words, it appears that it is not the *size* of the adjustment that sets aside successful ones from unsuccessful ones; rather it is its *composition.*

This is further analysed in Table 12, which looks at the details. First, while in successful adjustments almost all the action comes from expenditure cuts, in unsuccessful ones almost all the action comes from an increase in taxes. In successful cases, about 80% of the adjustment is on the expenditure side: in fact, spending is cut by 2.19% of GDP, while taxes increase by less than 0.5% of GDP. In unsuccessful ones, the size of tax increases is about three times the size of expenditure cuts: 1.28 against 0.49% of GDP. Second, in successful adjustments the lion's share of the cuts is on transfers and government wages. Each of these categories is cut more than one half per cent of GDP, for a total of about 1.15%, a rather large amount for this kind of government outlay, typically thought of as politically too sensitive to be touched. By contrast, in unsuccessful adjustments the change in transfers and government wages is minimal, and insignificantly different from 0. Rather, public investment falls by as much as all other expenditures combined. This is one of the most important results of the paper. It sends a rather clear message to the policy-maker: any fiscal adjustment hoping to be successful cannot avoid dealing with cuts in the welfare state and in government wages and employment.

To be successful, fiscal adjustments must cut the welfare state and government wages and employment

Further evidence specifically on government employment is highlighted in Table 13. The two columns display the average

Table 12. Successful and unsuccessful adjustments: composition of expenditure

	Expenditures	Public investment	Transfers	Non-wage public consumption	Government wages	Subsidies
Successful adjustments	−2.193	−0.41	−0.54	−0.38	−0.58	−0.29
	(0.326)	(0.089)	(0.183)	(0.055)	(0.093)	(0.211)
Unsuccessful adjustments	−0.49	−0.26	−0.02	−0.09	−0.07	−0.08
	(0.188)	(0.046)	(0.102)	(0.038)	(0.071)	(0.047)

Note: Standard deviations in brackets.

Table 13. Government employment

	Government employment/ labour force (1)	Government employment/ total employment (2)
All	0.22	0.28
	(0.016)	(0.019)
Loose	0.28	0.37
	(0.031)	(0.033)
Tight	0.19	0.19
	(0.034)	(0.038)
Very loose	0.35	0.49
	(0.061)	(0.071)
Very tight	0.22	0.24
	(0.053)	(0.063)
Successful	0.09	−0.007
	(0.159)	(0.177)
Unsuccessful	0.25	0.30
	(0.059)	(0.074)

Note: Standard deviations in brackets.

change in government employment as a share of the labour force (column (1)), and as a share of total employment (column (2)), under the different types of fiscal stance. Public employment tends to increase always, including during very tight fiscal policies. But there is a fundamental difference between episodes of very tight fiscal policy that are successful and those that turn out to be unsuccessful: during the former, the share of public employment, both in the labour force and in total employment, remains essentially constant. During the latter, it increases at about the same rate as the whole sample average.

Table 14 shows the composition of tax increases in successful and unsuccessful adjustments. The small part of successful adjustments that is due to increases in taxes comes almost exclusively from direct taxes on business: direct taxes on households are actually cut during successful adjustments! During unsuccessful adjustments, instead, direct taxes on households and indirect taxes are increased substantially, by almost 1% of GDP in total.

In summary, the results of this section are quite clear-cut. We can summarize them as follows: (1) Successful and unsuccessful adjustments imply, on average, the same fall in the unemployment-adjusted deficit. However, the former rely mostly on expenditure cuts; the latter, on tax increases. (2) Among expenditures, successful adjustments are characterized by large cuts in transfers and in wage government consumption. The limited

Table 14. Successful and unsuccessful adjustments: composition of revenues

	Revenue	Direct taxes paid by households	Direct taxes paid by business	Indirect taxes	Social security taxes
Successful adjustments	0.44 (0.385)	−0.14 (0.249)	0.53 (0.256)	0.17 (0.119)	−0.14 (0.072)
Unsuccessful adjustments	1.28 (0.181)	0.44 (0.110)	0.20 (0.052)	0.43 (0.103)	0.17 (0.103)

Note: Standard deviations in brackets.

expenditure cuts that occur during unsuccessful adjustments are concentrated mainly on public investment, while transfer programmes and total government wages are essentially unchanged and government employment continues to grow.

During unsuccessful adjustments, expenditure cuts are concentrated mainly on public investment; transfer programmes and total government wages are essentially unchanged and government employment continues to grow

6. ROBUSTNESS OF THE RESULTS

In this section, we investigate how robust our results are, along several dimensions: first, the definition of the fiscal impulse; second, the use of actual GDP to deflate fiscal variables; third, the stringency of the criterion in Definition 2 to determine a successful adjustment; fourth, the criterion used to define a successful adjustment. To save space, in each case we only report the changes in the various types of expenditure in successful and unsuccessful adjustments. Hence, the tables that follow should be compared to Table 12.[8]

As discussed in section 2, there are several possible ways to define the fiscal impulse. Table 15 reports the results when the OECD measure of the fiscal impulse is used. Our results are qualitatively unchanged. The only substantial difference is that now transfers fall by less during successful adjustments, relative to our results using the *BFI* measure. However, they also increase substantially during unsuccessful adjustments, so that in the end the difference between the two types of fiscal stance, 0.38% of GDP, is close to that of Table 12, 0.52% of GDP.

[8] These are our calculations of the adjustment using the OECD criterion. We could not use directly the measures adjusted by OECD because the cyclically adjusted data on the individual categories of spending and revenues were not available.

Table 15. Successful and unsuccessful adjustments, OECD fiscal impulse: composition of expenditure

	Expenditures	Public investment	Transfers	Non-wage public consumption	Government wages	Subsidies
Successful adjustments	−1.25 (0.307)	−0.32 (0.090)	−0.13 (0.172)	−0.28 (0.075)	−0.42 (0.129)	−0.10 (0.068)
Unsuccessful adjustments	0.01 (0.215)	−0.25 (0.046)	0.25 (0.113)	−0.06 (0.038)	−0.09 (0.077)	−0.02 (0.042)

Note: This table is based on the OECD fiscal impulse measure, as defined in section 2. Standard deviations in brackets.

Next, in Table 16 we deflate all nominal variables using the potential GDP rather than the actual GDP.[9] The rationale for doing this is that in a recession the ratio of government expenditure to GDP may increase not because of an intentional action on the part of the policy-maker, but because the denominator falls. As one can see, the differences with Table 12 are minimal.

One would expect that, as the stringency of the criterion used to define a successful adjustment falls, the difference between successful and unsuccessful episodes should fall too. In Table 17, we define a successful adjustment as a very tight fiscal policy such that the debt/GDP ratio after three years is below the debt/GDP ratio at the time of the strong adjustment, while we previously (Definition 2) required that, after three years, the debt/GDP ratio be at least five percentage points below the initial one. As expected, all government expenditures during successful episodes fall by less than in Table 12, although the difference with respect to unsuccessful episodes

Table 16. Successful and unsuccessful adjustments: composition of expenditures as share of potential GDP

	Expenditures	Public investment	Transfers	Non-wage public consumption	Government wages	Subsidies
Successful adjustments	−1.98 (0.361)	−0.40 (0.090)	−0.140 (0.175)	−0.37 (0.058)	−0.53 (0.103)	−0.28 (0.211)
Unsuccessful adjustments	0.46 (0.182)	−0.26 (0.044)	0.03 (0.100)	−0.10 (0.036)	−0.07 (0.068)	−0.06 (0.045)

Note: All variables are divided by potential GDP rather than actual GDP. A very tight fiscal policy in period t is successful if $byp(t+3) - byp(t) < 0.05$, where byp is the debt/potential GDP ratio. Standard deviations in brackets.

[9] We thank Francesco Giavazzi for this suggestion.

Table 17. Successful and unsuccessful adjustments, alternative definition: composition of expenditure

	Expenditures	Public investment	Transfers	Non-wage public consumption	Government wages	Subsidies
Successful adjustments	−1.52 (0.295)	−0.35 (0.073)	−0.35 (0.140)	−0.24 (0.063)	−0.33 (0.102)	−0.24 (0.131)
Unsuccessful adjustments	−0.49 (0.226)	−0.25 (0.047)	0.03 (0.122)	−0.11 (0.038)	−0.11 (0.082)	−0.06 (0.055)

Note: A very tight fiscal policy in period t is successful if $by(t+3) - by(t) < 0$, where *by* is the debt/GDP ratio. Standard deviations in brackets.

remains substantial and significant. For instance, transfers fall by more than a third of a percentage point of GDP in successful adjustments, while they remain constant in unsuccessful ones.

Finally, in Table 12 we defined a successful adjustment with reference to the subsequent fall in the debt/GDP ratio. But another dimension of the success of a very tight fiscal policy is its impact on the budget *deficit*. Thus, in Table 18 we define an adjustment as successful if either the debt/GDP ratio after three years has fallen by at least 5% of GDP, or the average deficit in the next three years is below the initial deficit by at least 1.5% of GDP. Because this criterion is easier to satisfy than that of Definition 2, one would expect the difference between successful and unsuccessful adjustments to be less clear-cut. Indeed, as before the average fall of all types of expenditure is now slightly smaller than in Table 12, but the difference between successful and unsuccessful adjustments is large and significant.

Table 18. Successful and unsuccessful adjustments, alternative definition: composition of expenditure

	Expenditures	Public investment	Transfers	Non-wage public consumption	Government wages	Subsidies
Successful adjustments	−1.74 (0.262)	−0.37 (0.065)	−0.40 (0.137)	−0.27 (0.050)	−0.45 (0.071)	−0.25 (0.143)
Unsuccessful adjustments	−0.43 (0.216)	−0.25 (0.052)	0.03 (0.116)	−0.09 (0.043)	−0.03 (0.083)	−0.09 (0.054)

Note: A very tight fiscal policy in period t is successful if *either* $by(t+3) - by(t) < 0.05$ *or* $1/3\,defy(t+3) + 1/3defy(t+2) + 1/3defy(t+1) < defy(t) - 0.015$, where *by* is the debt/GDP ratio and *defy* is the unemployment-adjusted deficit/GDP ratio. Standard deviations in brackets.

Our main results are robust to various perturbations

Thus, our main results are robust to various perturbations in the way we define adjustments and success, and in the way we compute cyclically adjusted fiscal variables.

7. POLITICAL DETERMINANTS OF FISCAL EXPANSIONS AND ADJUSTMENTS

Which types of government are more likely to engage in strongly expansionary fiscal policies, and which types are more likely to carry out successful fiscal adjustments? We classify governments according to their ideological orientation and their degree of fractionalization. First, we compare right-wing, centre and left-wing governments. Second, we distinguish between single-party, coalition and minority governments. Both indices are taken from Woldendorp *et al.* (1993), who classify each post-war government in twenty parliamentary democracies along several dimensions. (Our source does not have data for Portugal, Spain, Switzerland and the USA. For these countries, we constructed the indices using various yearbooks.)

Our ideological index is derived from the series on 'Ideological complexion of government', which classifies governments into five categories, from the most right-wing to the most left-wing: 'governments with right-wing dominance', i.e. with a 'share of seats of right and centre parties in government and their supporting parties in Parliament larger than 66.6%'; 'governments with right-centre complexion', i.e. with a 'share of seats of right and centre parties in government and their supporting parties in Parliament between 33.3 and 66.6%'; 'balanced situation', i.e. governments with a 'share of centre larger than 50% in government and in Parliament; or, if left and right form a government together not dominated by one side or the other'; the definitions of 'government with left-centre complexion' and 'government with left-wing dominance' are symmetric to the first two types, respectively. In constructing our index, we combine the five categories above into three: our category 'right-wing governments' includes 'governments with right-wing dominance' and 'governments with right-centre complexion'. Similarly, our 'left-wing governments' include 'governments with left-wing dominance' and 'governments with left-centre complexion'. Our category 'centre government' coincides with the original category 'balanced situation' in Woldendorp *et al.* (1993). By and large these classifications are fairly unambiguous. Socialist and social democratic parties are classified as 'left', Christian democratic and similar parties are classified as 'centre', conservative parties are

classified as 'right'. We have not created our own classification, and given the results that follow we very much doubt that perturbations in the definitions due to the few uncertain cases would significantly change the results.

Our index of fractionalization is derived from the 'Types of government' series, which distinguishes six types of government: 'single-party', 'minimal winning coalition', 'surplus coalition', 'single-party minority', 'multi-party minority', 'caretaker' We combine these six categories into three: 'single party' (the first category), 'coalition' (the second and third), and 'minority' (the last three).

Table 19 summarizes our results. This table reports the probability of observing one of the four types of fiscal policy stance in each of the government types described above. For instance, the first cell in column (3) gives the probability that a single-party government will engage in a very loose fiscal policy. This probability is constructed as the ratio of the number of observations of very loose fiscal policy episodes carried out by single-party governments, divided by the total number of single-party governments.

In the first three rows, we classify governments according to the fractionalization dimension. Columns (3) and (4) suggest that coalition governments have a slightly higher tendency to engage in very expansionary fiscal policies. Somehow surprisingly, coalition governments and especially minority governments also have a high propensity to engage in very tight fiscal policies. As regards minority governments, this finding can probably be explained by the fact that they also include caretaker governments, which are often given a specific mandate to clean up fiscal policy before a political government takes over.

The striking difference appears in columns (5) and (6), which distinguish between successful and unsuccessful adjustments. Coalition governments are almost always unsuccessful in their adjustment attempts. Out of 23 strong adjustments initiated by coalition governments, only two were successful, which corresponds to a success rate of only 8.7%. By comparison, the success rates of single-party governments and minority governments are 35.7% and 46.7%, respectively.

Coalition governments are almost always unsuccessful in their adjustment attempts

These results are generally consistent with the empirical findings of Roubini and Sachs (1989a,b) and Grilli *et al.* (1991); these authors find that coalition governments follow looser fiscal policies than single-party governments. Our results have a different emphasis: we show that coalition governments do try to be fiscally responsible, but they are unable to implement the types of policy needed to make the

Table 19. Political factors

Type of government (1)	Number of observations (2)	Probability of very loose fiscal policy (%) (3)	Probability of very tight fiscal policy (%) (4)	Probability of successful adjustment (%) (5)	Probability of unsuccessful adjustment (%) (6)
Single-party	177	8.5	10.2	35.7	64.3
Coalition	223	12.1	13.0	8.7	91.3
Minority	109	10.1	15.6	46.7	53.3
Right	313	8.6	10.9	26.9	73.1
Centre	65	15.4	10.8	0.0	100
Left	129	12.4	17.8	35.1	64.9

adjustment last. As we showed in section 5, substantial cuts in social expenditure and in government employment seem to be a prerequisite for a lasting adjustment. However, these are precisely the two types of expenditure that coalition governments are least likely to be able to cut. The reason is that coalition governments are more likely to succumb to intra-coalition fighting over the distribution of the costs of fiscal adjustments, as discussed theoretically by Spolaore (1993).

The next three rows of Table 19 illustrate the fiscal performance of right-wing, centrist and left-wing governments. Four interesting results emerge. First, the probability of observing very loose fiscal policies is lower with right-wing governments: less than 9%, against more than 15% and 12% in centre and left-wing governments, respectively. Second, somewhat surprisingly, left-wing governments are actually more likely to carry out a very tight fiscal policy than the other two types of government. Third, centrist governments are much more prone to engage in very loose fiscal policies, and when they try a strong adjustment they seem to be completely unable to do what it takes to succeed: their success rate is 0, out of six attempts. A plausible explanation is that centrist governments are typically coalition governments of (moderate) right-wing and left-wing parties. Thus, in a sense, this result is perfectly consistent with our previous observation on the difficulty of coalition governments adjusting successfully. Fourth, left- and right-wing governments are about equally likely to make successful fiscal adjustments. One may conjecture that the political means of achieving this success is, however, quite different for the two types of government. Presumably, the left achieves success by an agreement with the unions which allows the government to carry out those types of expenditure cut needed for success. The right presumably achieves

Very loose fiscal policies are less likely with right-wing governments; left-wing governments are more likely to carry out a very tight fiscal policy

success by imposing these measures. In future research, it would be interesting to study whether this hypothesis is empirically valid, and whether the successful adjustments of left- and right-wing governments differ once an even finer disaggregation of government expenditures is used.

Common wisdom and the 'political business cycle' theory argue that, for obvious reasons, the budget is particularly vulnerable in election years and in recession years. We investigate these issues in the next two tables. The first two rows of Table 20 display the probability that a government will engage in very tight and very loose fiscal policies in election and non-election years. As one can see, these probabilities are very similar. Also very similar are the probabilities of success in election and non-election years, as displayed in the last two lines. These results are not very favourable to the traditional 'political business cycle' theory favoured by Nordhaus (1975), which suggests that politicians will engage in massive expansionary policies in election years. Our results, on the contrary, are not inconsistent with more recent theories (Rogoff and Sibert, 1988) and empirical evidence (Alesina *et al.*, 1993) which emphasize 'rational' political budget cycles. These arguments suggest that voters' rationality and politicians' craving for reputation limit the extent to which politicians can and want to expand fiscal policy in election years. The theory suggests that electoral budget cycles (i.e. loose policies in election years) should be observed only occasionally and should not be very large. The empirical evidence of Alesina *et al.* (1993) on a sample of twenty OECD countries is consistent with this prediction of the theory, and so are our results.

Electoral budget cycles should be observed only occasionally and should not be very large

Table 20. Elections

	Electoral years	Non-electoral years
Probability of very loose (%)	12.3	10.7
Probability of very tight (%)	10.4	13.3
Probability of success (%)	28.6	26.3
Probability of no success (%)	71.4	73.7

Note: Probability of very tight in electoral years: (Number of very tight fiscal stances in electoral years)/(Number of electoral years). Probability of very loose in electoral years: (Number of very loose fiscal stances in electoral years)/(Number of electoral years). Probability of success in electoral years: (Number of successful fiscal stances in electoral years)/(Number of very tight fiscal stances in electoral years). Probability of no success in electoral years: (Number of unsuccessful fiscal stances in electoral years)/(Number of very tight fiscal stances in electoral years). Probabilities in non-electoral years are defined similarly.

Table 21. The business cycle

	Recession years	Non-recession years
Probability of very loose (%)	20.4	6.2
Probability of very tight (%)	6.8	15.4
Probability of success (%)	12.5	29.5
Probability of no success (%)	87.5	70.5

Note: Probability of very tight in recession years: (Number of very tight fiscal stances in recession years)/(Number of recession years). Probability of very loose in recession years: (Number of very loose fiscal stances in recession years)/(Number of recession years). Probability of success in recession years: (Number of successful fiscal stances in recession years)/(Number of very tight fiscal stances in recession years). Probability of no success in recession years: (Number of unsuccessful fiscal stances in recession years)/(Number of very tight fiscal stances in recession years). Probabilities in non-recession years are defined similarly.

Finally, we turn to the issue of whether it is easier or more difficult to initiate a strong adjustment during recessions or expansions. We define a recession as a year when the rate of growth of GDP is at least 1% below the average of the previous two years. Table 21 shows that governments are three times more likely to initiate a very loose fiscal policy in recession years than in non-recession years. Conversely, during a recession governments are about 2.5 times *less* likely to carry out a strong adjustment. The last two rows of Table 21 show that very tight fiscal policies initiated in non-recession years are twice as likely to be successful as those initiated during recessions. This finding makes intuitive sense: the key ingredients of successful adjustments are cuts in transfer programmes and in public employment, precisely the two types of spending cut that are politically very costly during a recession.

We can summarize the main results of this section as follows: (1) Coalition governments are as likely as other governments to try very tight fiscal policies. However, they seem to be unable to carry out the types of expenditure cut that are needed to make a strong fiscal adjustment long-lasting. As a result, their success rate is drastically lower than that of both minority and single-party governments. (2) Left- and right-wing governments are just about equally likely to carry out successful adjustments. (3) Closeness to elections does not influence the likelihood of strong adjustments, or their success rates. (4) However, it is much harder to initiate a successful fiscal adjustment during a recession than during an expansion.

8. DISCUSSION

An important question, which we have not addressed in this paper, concerns the consequences of very tight fiscal policies on growth and employment. Fiscal adjustments can have both negative and positive effects on the economy, as discussed, for instance, in Giavazzi and Pagano (1990). On the negative side, a standard Keynesian argument suggests that a reduction in aggregate demand would reduce growth and increase unemployment, at least in the short run. On the positive side, a vigorous fiscal adjustment can bring about a 'credibility effect' on interest rates, reducing risk premia and improving investors' expectations. The result could be a 'crowding in' of private investment that would compensate, or even more than compensate, the fall in aggregate demand due to the reduction in government spending and the increase in taxation. Moreover, as emphasized by Giavazzi and Pagano (1990) and Bertola and Drazen (1993), a fiscal adjustment brought about by a fall in expenditure can crowd in private consumption as well, by reducing the present discounted value of tax payments. A related question is whether the particular mix of fiscal instruments which has been found to affect the chance of successful adjustments also influences the macroeconomic consequences of the adjustment. Could it be, for instance, that the likelihood of success also determines the level of the 'credibility premium' and therefore the growth and unemployment consequences of the adjustment? In a companion paper (Alesina and Perotti, 1995b) we present evidence that this might well be the case.

'Hell does not break loose' even after several years of fiscal adjustments

First of all, we show that 'hell does not break loose' even after several years of fiscal adjustments. On the contrary, we find that in a majority of cases of multiyear fiscal adjustments, unemployment is lower after the adjustment than it was before. We do not find either that growth is systematically lower, confirming the findings of Giavazzi and Pagano (1990) on Denmark and Ireland. We also find that growth is much higher and unemployment lower in the aftermath of successful than after unsuccessful adjustments. This finding raises the issue of causality. Is it the composition of adjustment which determines its success and macroeconomic consequences, or rather is it the (exogenously given) rate of growth which makes success achievable? If it is growth that determines success, the correlation between success and composition of adjustments that we have found above must be spurious. That correlation, however, is easily explained: to succeed, fiscal adjustments must tackle those components of spending that have a

tendency to increase automatically. In addition, reducing government employment, rather than government wages, is likely to have much longer-lasting effects, both because employment cuts are difficult to reverse and because they send a stronger signal (on this point, see Tanzi (1993)). As for the correlation between the composition of adjustment on one side and growth and unemployment on the other, it can be explained by both the 'crowding-in effect' and supply-side effects. For instance, Alesina and Perotti (1994 and 1995c) show that tax increases (particularly labour and social security taxes) lead to a fall in competitiveness, as wage demands increase to compensate for the increased fiscal pressure. By contrast, a cut in social transfers could actually improve competitiveness, by reducing the bargaining power of the unions.

Successful fiscal adjustments are associated with major improvements in competitiveness

Second, the macroeconomic consequences of fiscal adjustments will depend on whether they are accompanied by devaluations and expansionary monetary policies. In Alesina and Perotti (1995b) we show that successful fiscal adjustments are associated with major improvements in competitiveness, while this is not the case for unsuccessful ones. One interpretation of this result is that a fiscal adjustment that is accompanied by a devaluation might be more likely to be both politically acceptable and successful according to our definition. Certainly, devaluations have been important aspects of many fiscal adjustments, for instance in Ireland. However, this interpretation would imply once again that the correlation between composition of the adjustment and success is spurious. On the other hand, there is evidence that fiscal policy influences nominal exchange rates, relative unit labour costs and profitability in ways that are consistent with the other direction of causation *and* with the importance of the composition of the adjustment. For instance, Lane and Perotti (1995) show that falls in wage government consumption – but not in non-wage government consumption – tend to depreciate the nominal exchange rate; Alesina and Perotti (1994) find similar results for relative unit labour costs. All these arguments, however, are simply suggestive. Much more work is needed to understand better the effects of fiscal adjustments on macroeconomic variables, and the role of exchange rate and monetary policies.

Finally, in connection with the macroeconomic effects of fiscal adjustments, it is worth asking the question of their *political* consequences. Are the governments that implement tight fiscal policies less likely to be reappointed? Does the answer depend upon the degree of success of the adjustment, and on its composition? A

relatively large literature shows that macroeconomic conditions (in particular, growth and unemployment) influence electoral outcomes.[10] As we show in Alesina and Perotti (1995b), fiscal adjustments (particularly the successful ones) are not typically accompanied by major recessions, thus they do not necessarily have negative political consequences for the governments that implement them. However, in addition to their effects on aggregate macroeconomic variables, fiscal adjustments may influence elections via distributional effects. These important issues require more attention and a deeper empirical investigation.

9. CONCLUSIONS

In the last three decades, cyclically adjusted budget deficits in OECD countries have typically been the result of increases in government spending, particularly on transfer programmes and government wages. As public debt increased, interest payments accumulated as well. Fiscal adjustments that relied primarily on tax increases, especially direct taxes on households, typically failed to stop permanently the growth of public debt. On the contrary, successful adjustments are those that aggressively tackle the expenditure side, particularly the components of it which are always thought of as untouchable: social security and government wages and employment. The successful adjustment (at least thus far) of Ireland is an excellent example of this. Between 1986 and 1990, transfer programmes were cut from 17.6% of GDP to 14.3%, government employment fell from 307,000 to 269,000 and the debt to GDP ratio fell from 120% to 107%.

Coalition governments are generally unable to carry out successful fiscal adjustments. They often try, but, at least in our sample, never succeed. Our interpretation is that conflicts among coalition members and the fragility of coalition governments make it difficult to maintain a 'tough' fiscal stance, particularly when politically sensitive programmes, government employment and social security are involved.

This paper and its companion paper Alesina and Perotti (1995b) send a rather loud and clear message to policy-makers facing the prospect of a fiscal adjustment. In summary, a successful fiscal

[10] For results on OECD countries, see in particular Lewis-Beck (1988). For results on the USA, where the literature on this point is particularly large, see Alesina and Rosenthal (1995) and the references therein.

Permanently favourable results typically do not follow from politically palatable policies

adjustment: (1) is started during a period of relatively high growth; and (2) does not raise taxes but, rather, cuts transfer programmes and government wages and employment. There is bad news and good news in these results. The bad news is that one cannot avoid cutting transfers and government employment; quite simply, permanently favourable results typically do not follow from politically palatable policies. The good news is that major fiscal adjustments do not cause major recessions. Politicians and their advisers must stop thinking of just about everything on the expenditure side of government budgets as untouchable.

Discussion

Francesco Giavazzi

Università Bocconi, Milan

Policy-makers who look at textbooks on their shelves to find out the effects of fiscal policy actions are increasingly puzzled. Real-life experiments tell surprising stories. For example, when in 1982 the Irish government introduced a very tight budget, private consumption plummeted. The ensuing recession induced a worsening of the budget that more than offset the initial discretionary tightening. Two years later both the deficit and the debt–GDP ratio were higher. Ireland tried again in 1987. This time, however, output increased, amplifying the discretionary cut in the deficit, and the debt–GDP ratio fell substantially. When in 1990, essentially as a result of a tax reform, fiscal policy in Sweden became expansionary, it was accompanied by a deep recession. Denmark in 1984, Australia in 1987 and some of the other cases reported in Table 6 in the paper are further instances of 'surprising' outcomes of a turnaround in fiscal policy. This paper is an important step towards understanding some of these puzzles. It points to the composition of a fiscal contraction as an important determinant of its success, and carefully documents those items in the budget where the cuts are most likely to be associated with success. This an important finding but, as the authors recognize, it is just a first step.

Alesina and Perotti define 'success' by looking at what happens to the debt–GDP ratio a few years after the discretionary tightening of fiscal policy. A successful tightening is one that is accompanied, three years later, by a 5% reduction in the debt–GDP ratio. But we know that movements in the debt–GDP ratio are to a large extent

explained by movements in GDP, as the numerator is in fact strongly affected by movements in the denominator. The interesting question then is: what are the channels through which the budget cuts that the paper identifies as critical for 'success' induce an expansion in output?

It is not an easy question because large fiscal turnarounds rarely happen in isolation. Typically they are accompanied by a monetary stabilization which is often preceded by an exchange rate devaluation (as documented in the paper by Eichengreen *et al.* in this issue). The Irish adjustment of 1987 offers one of the cleanest examples, but the same would be true for the Israeli stabilization of 1985. It is difficult to isolate the individual contribution of each item in the policy package to the output expansion. Failing to separate out these effects, however, casts a cloud over the results in the paper. The alternative hypothesis is that the success 'stories' identified in the paper are really a product of the accompanying policies, and not (or not only) of the particular composition of the budget cuts. Admittedly, the authors recognize this point, and argue that the alternative explanation is less likely to be consistent with the data. This is why I see this article as only the first step in an important research agenda.

I have a final small point on the data used for one of the countries in the sample: Portugal. Table 5 shows a 'strong adjustment' in 1980, followed by a 'strong expansion' a year later. This episode, however, has nothing to do with fiscal policy impulses, but simply concerns the fact that in 1980 the Portuguese central bank revalued its gold reserves, and the revaluation was recorded among the revenues in the Treasury books.

Tryphon Kollintzas

Athens University of Economics and Business, CEPR and IMOP

Macroeconomists worry about the effects of changes in aggregate taxes, government consumption and government investment, ignoring the composition of these magnitudes. Public finance insists that the composition of these magnitudes has important implications for many microeconomic issues. The contribution of the present paper lies elsewhere: it shows that the composition also affects the efficacy of stabilization programmes. While I accept the basic validity of the authors' arguments, I wish to mention a number of problems with their methodology.

First, for a number of reasons, the *BFI* could be a poor measure of discretionary fiscal policy changes. In situations where there are long-

term discretionary fiscal policy changes, only the cycle component is considered to have a discretionary sub-component in the implicit trend-cycle decomposition. In addition, there exist situations where discretionary fiscal policy changes look like they are induced by business cycles. This would be the case, for instance, if past and present *discretionary* fiscal policy changes were correlated with the unemployment rate. Another reason for being concerned with the *BFI* is that the unemployment rate is typically lagging behind GDP. It means that the intended removal of all *contemporaneous* business cycle-induced fiscal policy changes may be incomplete. Tables 22 and 23, based on deviations of the data from their trend (obtained using the Hodrick–Prescott method), present evidence on the co-movements of government consumption (as a share of GDP) with GDP and the unemployment rate (see Fiorito and Kollintzas (1994) for details). With the exception of Canada, in all of the G7 countries the face of these co-movements is different. Finally, the *BFI* is also a relatively poor measure of international comparisons because the unemployment rate is measured differently from country to country.

Second, some of the observations about the stylized facts of 'loose', 'tight', 'very loose' and 'very tight' fiscal policy are a simple consequence of the classification procedure. For example, only in situations where the sample distribution is very asymmetric should one expect any differences between 'loose' and 'tight' policies under a classification procedure which is *based on standard deviations alone.* Observations based on a classification of these policies in terms of quintiles is probably more appropriate. Furthermore, the numbers of 'major adjustments' – seven – and the cases that support the conclusions – three or four – are rather small for the generalization

Table 22. Government consumption/GDP (Hodrick–Prescott deviations)

Country	Cross-correlations with GDP								
	−4	−3	−2	−1	0	1	2	3	4
Canada	0.42	0.36	0.00	−0.46	−0.83	−0.41	0.02	0.27	0.45
France	−0.02	−0.18	−0.36	−0.59	−0.76	−0.42	0.02	0.31	0.54
Germany	0.09	0.11	−0.12	−0.52	−0.56	0.04	0.42	0.36	0.22
Italy	−0.15	−0.30	−0.20	−0.27	−0.32	0.16	0.43	0.35	0.20
Japan	−0.07	−0.41	−0.61	−0.76	−0.78	−0.31	0.17	0.38	0.54
UK	0.30	0.24	−0.11	−0.55	−0.75	−0.35	0.17	0.35	0.26
USA	0.25	0.23	0.08	−0.19	−0.36	0.13	0.49	0.35	0.00

Note: Sample 1960–92, annual data.
Source: OECD, Main Economic Indicators.

Table 23. Government consumption/GDP (Hodrick–Prescott deviations)

Country	Cross-correlations with the unemployment rate								
	−4	−3	−2	−1	0	1	2	3	4
Germany	−0.26	−0.09	0.23	0.53	0.48	0.03	−0.21	−0.21	−0.15
France	0.16	0.35	0.54	0.70	0.66	0.23	−0.21	−0.45	−0.58
Canada	−0.44	−0.22	0.26	0.70	0.84	0.28	−0.25	−0.51	−0.52
Italy	0.21	0.00	0.06	0.26	0.10	−0.18	−0.11	0.01	0.08
Japan	0.04	0.24	0.36	0.57	0.43	−0.06	−0.26	−0.26	−0.25
UK	−0.21	0.00	0.41	0.66	0.48	−0.04	−0.43	−0.48	−0.32

Note: 1960–92, annual data.
Source: OECD, Main Economic Indicators.

made about the macroeconomic effects of these adjustments. And, lastly, the simultaneous presence of the changes in the unemployment rate and GNP in the right-hand side of the regressions, most likely creates multicolinearity problems. The 'wrong' signs in some of these regressions may be due to such problems.

All these problems with the possible exception of the first two could be easily taken into account using a better trend-cycle decomposition and a better real economic activity variable for the purposes of this paper. Both of these things could be achieved by using, for example, Hodrick–Prescott deviations of GDP.

My main complaint with the paper is that the authors do not carry their analysis to its logical end. They make a convincing case that the composition of aggregate government spending and taxes matters, but they do not use this decomposition to investigate the macroeconomic effects of 'major' adjustments.

General discussion

A significant part of the discussion related to the methodology employed by the authors for assessing the success of fiscal adjustment programmes. István Székely felt that, in practice, these programmes are motivated by a variety of objectives: for instance, they may be designed to control inflation, or to stabilize the currency markets. Their success or failure should be measured in relation to their own objectives, rather than to their achievement of a 5% reduction in the debt/GDP ratio. Further, while the strength of a fiscal stance was measured in terms of flow variables, its success was judged in terms of changes in a stock value. This left open the possibility that a fairly austere policy, even when it succeeds in cutting the deficit/GDP

drastically, is considered to be unsuccessful if its effect on debt/GDP is not large enough. David Begg, adding to this, stated that in the absence of an appropriate counterfactual – what the outcome might have been in the absence of the policy intervention – it is hard to assess the success of any policy under question. Mathias Dewatripont was surprised that the authors' definition of a successful adjustment looked only at the reduction in the debt/GDP ratio without any reference to the level from which the reduction took place. He felt the case for reducing the debt must be stronger in Belgium, which has a high debt/GDP ratio, than in Britain or France, where the levels are much lower. Roberto Perotti agreed that initial conditions do matter, but said that controlling for them would make the data too sparse for meaningful analysis.

David Begg drew attention to the fact that the analysis looked at the various determinants of the fiscal stance only one at a time. It could be that the underlying variables were related: for instance, countries with high debt could have a predilection for high transfer payments. Such correlations should be unscrambled. He also pointed out that, because the timing of fiscal adjustments tends to be endogenous – they are more likely to be initiated at the bottom of a slump – there is a sample selection bias if one does not control for the business cycle. Perotti conceded that cyclical adjustments were important, but maintained that they were hard to incorporate since one is never too sure of the precise adjustment procedure to use. Quite mindful of this problem, they had confined their attention to relatively large changes in the fiscal stance of the government, too large to be caused by cyclical variations alone. Georges de Menil felt it was important to include the monetary stance in the analysis, since it did have some effect on the impact of the fiscal stance. Giuseppe Bertola suggested disaggregating the unsuccessful fiscal adjustment programmes according to the underlying causes of failure; the possible reasons for failure might be varied – unanticipated increases in public expenditure or losses in tax revenues, growth being lower than expected, excessively high real interest rates, etc.

The empirical evidence presented by the authors also drew comments. Mathias Dewatripont felt that they had omitted at least some interesting episodes when tracing the fiscal history of the countries in their sample. For instance, they had not picked out 1987 as a period of strong fiscal adjustment in Belgium even though its budget deficit fell dramatically from 11% of GDP to 7% that year. Georges de Menil, adding to the list of missed fiscal incidents, drew attention to the strong adjustment in France in 1983, and the strong

expansions in the USA under Reagan, and in Germany in 1988 after the Bonn Summit.

Alessandra Casella felt less than sure about how to interpret the authors' results. Did they imply that increases in taxes are more contractionary than cuts in spending? Or was it that these two differ in their 'commitment properties': that, because cuts in spending were politically more expensive than an increase in taxation, willingness to cut spending must reveal a government to be tough? István Székely raised the issue of the political costs of embarking upon adjustment programmes, especially when they turn out to be unsuccessful, and felt the need for a clearer specification of the objective function of the policy-makers. David Begg wondered if changes in the prevailing wisdom, say the Keynesianism of the 1960s versus the real business cycle theories of the 1980s, had had a perceptible effect on the policy responses.

Reacting to earlier comments from Francesco Giavazzi, Roberto Perotti conceded that the exchange rate policy had considerable bearing on the success of adjustment programmes; he also pointed out that the burden of the 1984 fiscal adjustment in Ireland fell on taxes, while that of 1987–9 was borne by government employment, which fell by 10%. He thought that the Irish example supported their argument positively, while Italy supported it negatively.

APPENDIX

This appendix describes the fiscal variables used in the paper and in the tables. All variables are from OECD.

TRANSF: social security benefits + social assistance grants + unfunded employee pension and welfare benefits + transfers to the rest of the world + transfers to private non-profit institutions serving households + net casualty insurance premiums + other transfers.

IG: gross fixed capital formation.

CG: government consumption, divided into wage component (*CGW*) and non-wage component (*CGNW*).

SUB: subsidies to private industries and public corporations.

YPEPG: property income paid by government (interest, net land and royalties).

INTPG: interest paid by government.

TYH: direct taxes on households.

TYB: direct taxes on business.

IND: indirect taxes.

SSRG: social security contributions received by government.

CFKG: consumption of fixed capital.

KTRRG: net capital transfers received by government.

YPERG: property income received by government (withdrawals from public quasi-corporate enterprises, interests, dividends, net land rent and royalties).
INTRG: interest received by government.
MKT: Miscellaneous capital transactions (net purchases of lands, net purchases of intangible assets).

Total expenditure (*EXP*), total revenues (*REVEN*) and the primary deficit (*PRIMDEF*) are defined as follows:
$EXP = IG + TRANSF + CGNW + CGW + SUB$
$REVEN = TYH + TYB + TIND + SSRG$
$PRIMDEF = EXP - REVEN - CFKG - KTRRG + (YPEPG - INTPG) - (YPERG - INTRG)$

Until 1970, *INTPG* and *INTRG* are not available. Therefore, between 1960 and 1970 *PRIMDEF* is defined as:

$PRIMDEF = EXP - REVEN - CFKG - KTRRG$

Consumption of fixed capital: 'The value, at current replacement costs, of the reproducible fixed assets .... used up during a period of account as a result of normal wear and tear, foreseen obsolence and the normal rate of accidental damage.'

Direct taxes on income: 'Levies by public authorities at regular intervals, except social security contributions, on income from employment, property, capital gains, or any other source.'

Final consumption expenditure of government services: 'The value of goods and services produced for their own use on current account, that is the value of their gross output less the sum of the value of their commodity and non-commodity sales and the value of their own-account capital formation which is not segregated to an industry. The value of their gross output is equal to the sum of their intermediate consumption of goods and services, compensation of employees, consumption of fixed capital and indirect taxes.'

Government cross fixed capital formation: 'The outlays, purchases and own-account production of producers of government services on additions of new durable goods (commodities) to their stocks of fixed assets ... Excluded are the outlays of government services on durable goods for military use.'

Indirect taxes: 'Taxes assessed on producers in respect of their production, sale, purchase, or use of goods and services, which they charge to the expenses of production. Also included are import duties and the operating

surplus, reduced by the normal margin of profits of business units, of fiscal and similar monopolies of government'.

Social security benefits: 'Payments made to individuals under social security schemes, usually out of a special fund.'

Subsidies: 'All grants on current account made by government to private industries and public corporations.'

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