

**Fiscal Expansions and Adjustments
in OECD Countries**

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June 1995
released October 1995

1994-95 Discussion Paper Series No. 754

dp 9495-754
page 2: 52

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First version: April 1995

Revised: June 1995

Prepared for the Economic Policy Panel, April 1995. We thank our discussants Francesco Giavazzi and Tryphon Kollintzas, Olivier Blanchard, Guido Imbens, Fabio Schiantarelli, Charles Wyplosz and other panel participants for useful comments and suggestions. We are particularly grateful to Marianne Fay for providing some data and for several helpful conversations. Our debt towards her goes beyond the usual acknowledgment: she was part of "the team" when we started this project, and discussed with us several ideas, but other commitments made it impossible for her to participate in the project. We thank Roberta Gatti for excellent research assistance.

Abstract

In several countries policymakers are striving to improve the budget balance. Trivially, this can be done by raising taxes and/or cutting expenditures. But the two strategies are not equivalent. In this paper, we investigate several issues referring to the relationship between the fiscal stance, i.e., loose or tight fiscal balance, and the composition of the budget, based on the experience of 20 OECD countries after 1960.

We find that large fiscal expansions typically are biased towards increases in expenditure, while large fiscal adjustments on average rely more on tax increases. However, we find a large and fundamental difference between fiscal adjustments that lead to permanent improvements in the fiscal balance and those that are reversed in a short time. The former are implemented mainly via cuts in two types of expenditure: transfer programs and compensation of government employees. The latter are carried out almost exclusively via tax increases. We also find that coalition governments, although they often try to make substantial fiscal adjustments, are much less likely than other governments to carry out the two types of expenditure cuts that make an adjustment successful.

Our findings convey a clear message: the composition of a fiscal adjustment is of fundamental importance in determining its success. A fiscal adjustment cannot have long-lasting effects unless it tackles two expenditures - government employment and social programs - often regarded as untouchable by policymakers and their advisors.

1 Introduction.

1.1 The questions.

Following the first oil shock, in the mid-seventies many OECD countries started accumulating large public debts; by the nineties, several countries exhibited debt/GDP ratios at levels historically observed after major wars, in some case beyond 100 percent (see Table 1). At the same time, the composition of government outlays underwent a major shift (see Table 2): while thirty years ago the largest fraction of government spending was "purchase of goods and services", currently in many countries transfer programs are quantitatively the single most important item of the budget.

These two tables viewed together suggest that there might be a relationship between the budget balance and the budget composition. Also, as a result of these two trends, it is becoming increasingly apparent that cuts in the "welfare state" will have to be a critical part of the necessary fiscal adjustments.

The standard macroeconomic literature on fiscal policy generally ignores issues of composition of the budget. In fact, in the majority of macroeconomic models government spending is viewed 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 a policymaker must improve the budget balance, he 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 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 programs and social expenditures a necessary components of successful adjust-

¹A partial exception is the "overlapping generations" literature, which focuses on intergenerational transfers, although not explicitly 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 1: Debt/GDP ratios.

	1965	1975	1990
Australia	N.A.	N.A.	25.53
Austria	19.37*	23.94	56.43
Belgium	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	.07	22.41	69.76
Netherland	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.
U.K.	81.77*	63.73	34.67
U.S.	52.10	42.69	56.22

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

Table 2: **Government consumption and transfers, as shares of GDP.**

	govt. cons. 1965	transf. 1965	govt. cons. 1990	transf. 1990
Australia	12.71	NA	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	NA	17.20	14.31
Italy	14.54	12.65	17.41	19.16
Japan	8.18	4.93	9.14	12.03
Netherland	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
U.K.	19.39	5.85	18.89	12.28
U.S.	10.64	9.14	13.65	17.37
		3		

Source: OECD. *: 1970.

ments?

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?

In addressing all these questions we choose a very simple approach. But even our simple data analysis paints a clear general picture.

1.2 The answers.

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 programs; 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, this last result on the average adjustment hides a fundamental difference between successful and unsuccessful adjustments. Successful adjustments (a minority of the total) rely mostly on cuts in transfer programs and in government wages and employment. Unsuccessful adjustments rely primarily on increase in taxes, leaving transfer programs and government wages and employment untouched, or even increased.

Third, in comparing single party governments and coalition governments, we find that the latter 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 success 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 (1989), Dornbusch (1989), Giavazzi and Pagano (1990), amongst others. Relative to these papers we emphasize more compositional issues, we follow a more disaggregated approach and we do not use a case study method but, instead, statistical evidence. A recent paper by deHaan, Sterks and deKam (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 line of research we relate to is the empirical work which studies whether budget deficits are primarily the result of increases in aggregate expenditure or cuts in aggregate taxation. For instance, Bohn (1992) 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.

The third line of work that is somehow connected to ours is the research on the political economy of budget deficits, which we 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, Masciandaro and Tabellini (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, Cohen and Roubini (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. Also, McKenzie (1993) 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 behavior 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 policymakers; 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 the difference between some actual measure of the budgetary position of the government and the level of the same measure that would prevail if the effects of the cycle could be partialled out by referring to some benchmark 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 problems: (i) How to define the benchmark situation to be used to adjust the actual measure? (ii) What parts of the budget should be adjusted to this benchmark, and how? For instance, should interest payments be adjusted for inflation, and how?

Addressing the first problem involves taking a stance on controversial conceptual and statistical issues. For instance, how to 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.²

In our view, 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.

Table 3: **Fiscal impulse measures.**

1. ΔPRIMARY:	$FI = (g_t - t_t) - (g_{t-1} - t_{t-1})$
2. THE BLANCHARD MEASURE:	$FI = (g_t(U_{t-1}) - t_t) - (g_{t-1} - t_{t-1})$
3. THE OECD MEASURE:	$FI = [(G_t - T_t) - (G_{t-1}(1 + \hat{y}_t) - T_{t-1}(1 + y_t))] / Y_{t-1}$
4. THE IMF MEASURE:	$FI = [(G_t - T_t) - (G_0(1 + \hat{y}_t) - T_0(1 + y_t))] / Y_{t-1}$

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.

The simplest possible definition of the fiscal impulse is the change in the primary deficit as share of GDP from the previous year, Δ PRIMARY.³ Thus, implicitly this measure takes the previous year as the benchmark year. The great advantage of this measure is its

²See McKenzie (1988) for more discussion on this point.

³The primary deficit is the total deficit less interest expenditure.

simplicity. Its disadvantage is that it ignores cyclically induced fluctuations in the primary deficit.⁴

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.

To implement this measure, we followed this procedure. For each country in the sample, we regressed social transfers as a share of GDP ($TRANSF$) on two time trends for 1960-75 and 1976-92 and on the unemployment rate (U):

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

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

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

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 derive 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.*

The third measure, frequently used by the OECD,⁵ defines the fiscal impulse as the difference between the current primary deficit and the primary deficit that would have

⁴Note, 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.

⁵See, for instance, Chouraqui, Hagenmann and Sartor (1990).

prevailed if expenditure in the previous year had grown with potential GDP and revenues had grown with actual GDP.⁶ This measure can be better understood by starting from the following expression for the cyclically adjusted budget balance (*CAB*):

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

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 OECD measure (also known as the "Dutch measure" of the fiscal impulse) can be obtained by taking the first difference of the *CAB*, and dividing by GDP in period $t - 1$. Thus, like the first two measures, the Dutch measure takes the previous year as the benchmark year. However, now the cyclically neutral expenditure is assumed to be unit elastic to potential output while the cyclically neutral taxation is still assumed to be unit elastic to actual output.

In our view, the advantage of the Blanchard measure over this one is that the former does not rely on estimates of potential output. Notice also that the OECD measure is 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 because 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" of the fiscal impulse) is similar to the OECD measure illustrated above. A disadvantage of the IMF 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. However, despite their conceptual and practical differences, all of these measures provide similar answers to the questions we investigate in this paper. In fact, in section 6, we show that the nature of our results does

⁶We are not quite sure about the motivation for this asymmetry.

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.

In this paper, we study the pattern of changes in the composition of the budget during *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 expenditure and revenue variables (defined precisely in the Appendix) from 1960 to 1992 for 20 OECD countries: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Japan, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, UK, and USA.

Our fiscal variables refer to 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, organizations 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 behavior 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 -.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
Neutral if $BFI \in (-.005, .005)$;
Loose or a Small expansion if $BFI \in (.005, .015)$;
Very loose or a Strong expansion if $BFI \geq .015$;
Tight or a Small adjustment if $BFI \in (-.015, -.005)$;
Very tight or a Strong adjustment if $BFI \leq -.015$.

According to this definition, a given year is characterized by a loose fiscal policy if the *BFI* has a value between .5% and 1.5% of GDP, i.e. if the unemployment-adjusted primary deficit has increased by between .5% and 1.5% of GDP relative to the previous year, and so on.

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.⁷

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

⁷Results on this point are available upon request.

Table 4: **Summary statistics on *BFI*.**

	obs.	average	stand. dev.
All	547	-0.008%	1.67%
Loose	124	0.93%	.28
Tight	121	-0.93%	.29%
Very loose	65	2.81%	1.79%
Very tight	66	-2.61%	1.46%

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

similar number of 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 expansions (column 1) and strong adjustments (column 2) that one obtains by applying Definition 1 to our sample. 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 80's, like Denmark and Ireland. Second, note the large number of strong expansions in the period 1974-76, clearly a response to the first oil shock. Every country except four (Greece, Ireland, Spain and U.K.) has had at least one strong expansion in this three-year period. Third, many countries display a typical "stop and go" behavior, with strong adjustments followed by strong expansions, and viceversa: for instance, Finland in the seventies and Portugal in the eighties. Finally, it is worth emphasizing again that the definition we use focuses on strong expansions and adjustments, and therefore it is not designed to 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%.

Table 5: **Strong expansions and adjustments.**

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

One might also 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.

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 $BFI \in (\mu_i - .5\sigma_i, \mu_i + .5\sigma_i)$;
Loose or a Small expansion if $BFI \in (\mu_i + .5\sigma_i, \mu_i + \sigma_i)$;
Very loose or a Strong expansion if $BFI \geq \mu_i + \sigma_i$;
Tight or a Small adjustment if $BFI \in (\mu_i - \sigma_i, \mu_i - .5\sigma_i)$;
Very tight or a Strong adjustment if $BFI \leq \mu_i - \sigma_i$.

Thus, according to this definition a strong adjustment for a given country is a fall in our unemployment-adjusted measure of the primary deficit by more than one standard deviation from the average change for *that* country. All our results remain practically unchanged if Definition 1bis rather than Definition 1 is adopted.⁸ 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 typically are the results of increases in expenditure or cuts in taxation and, similarly, whether adjustments typically

⁸Results are available upon request.

occur on the expenditure side or on the tax side.

Table 7 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.⁹

An interesting feature that emerges from this table is that, on average, episodes of strong adjustments are the mirror image of episodes of strong expansions: 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 provides an important *ceteris paribus* condition for our analysis: specifically, it ensures that any significant asymmetry in the behavior of each particular type of expenditure or taxation 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 (.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 also on the expenditure side as well.

In summary, Table 9 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 only by .17% of GDP. In very tight years taxes are increased by 1.2% of GDP and spending is cut by .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 *EXP* and *REVEN* in the table.

A similar picture emerges from the regression analysis of Table 8. We regress the change

⁹Total expenditure and taxation are not unemployment-adjusted. Evaluating them at the previous year's unemployment rate, however, would not make any difference in our results.

of total expenditure and total taxation (as shares of GDP) on three economic controls and the five dummy variables which concern us. The three economic controls are: the change in the rate of inflation (ΔINF), the change in the unemployment rate (ΔU), and the change in the rate of growth of GDP (ΔGR). 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 Definition 1a, and similarly for the other dummy variables. The coefficient of each dummy variable therefore indicates by how much the dependent variable - as a proportion of GDP - would change, on average, under each type of fiscal impulse, if the economic determinants were all 0.

In the expenditure regression, we expect a negative coefficient on ΔINF : 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 ΔU because of the effects of built-in stabilizers like unemployment insurance, and a negative coefficient on ΔGR because many expenditures are fixed in advance at some level consistent with an "average" or "long-run" level of income. In the revenue regression, the sign of the coefficient of ΔINF 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 usually are 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 sizable 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. In the revenue regression, we also expect a negative coefficient on ΔU and a positive coefficient on ΔGR essentially because of the automatic stabilizing features of many taxes.

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 ΔU and ΔGR 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 '70's 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 .85% of GDP. On the other hand, both the coefficient of *TIGHT* in column (1) and of *LOOSE* in column (2) are practically 0.

A similar pattern emerges from a comparison of very loose and very tight episodes. In this case some adjustment in very tight years occurs also on the spending side, but the adjustment on the taxation side is considerably larger (-.73 against 1.26). In very loose years cuts in taxes are about one quarter of increases in expenditures (-.47 against 1.67).

One may argue that the economic controls are clearly endogenous and, particularly for the case of inflation, one may worry about reverse causation. We have two answers to this legitimate concern. First, even assuming that the estimates of all coefficients are biased as a result of this endogeneity problem, there is no reason why this bias should affect, say, the coefficient of the *TIGHT* dummy variable differently for expenditure and taxation regressions. 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:

- I.1)** The average increase in the unemployment-adjusted primary deficit during expansions (*BFI*) is very close to the average fall during adjustments.
- I.2)** Expansions are mostly the result of increases in expenditure; adjustments are mostly the result of increases in taxation.

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 of the different types of policy stance, Table 9 reports the average changes

of five different components of government expenditure, expressed as shares of GDP: public investment (IG), transfers (TRANSF), non-wage government consumption (CGNW), government wages (CGW) and subsidies (SUB). 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, remember, 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 percent 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 .09 and .16 percent 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 9 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 favor of transfer programs.

Interesting compositional effects emerge also on the taxation side, although now the pattern is slightly less clear-cut. Table 10 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 are 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 9 and 10 can be summarized as follows:

II.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, con-

centrated mostly on public investment, with virtually no cuts in transfer programs. The latter are implemented via large increases in transfers and wage government consumption. **II.2)** Non-wage government consumption is never a primary factor during episodes of changes in the fiscal policy 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. Therefore, we want to 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 - late eighties. Second, if we impose very high 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.¹⁰ Table 6 lists all the cases of successful adjustments.

Table 6: **Successful adjustments.**

Australia 1987
Denmark 1984
France 1969
Ireland 1987, 88, 89
Norway 1979, 80
Sweden 1984, 87
United Kingdom 1969, 77, 88
U.S.A. 1976

A few observations are in order. First, notice how the Irish multiyear adjustment clearly stands out, with three consecutive years that satisfy our rather demanding definition. Second, the other well-known episode of fiscal reform of the mid-eighties, Denmark, is also represented, with one successful adjustment in 1988. Third, two years of budget adjustment in Sweden in the mid-eighties are also captured by our definition of success. In light of the more recent developments in the Swedish public finances, this observation 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. On the contrary, we argue below that it is the *composition* of the adjustment that makes an adjustment successful.

¹⁰The 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.

First, Table 11 shows that, 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 percent of the adjustment is on the expenditure side: in fact, spending is cut by 2.19% of GDP while taxes increase by less than .5% of GDP. In unsuccessful ones the size of tax increases is about three times the size of expenditure cuts: 1.28 against .49% of GDP.

Second, Table 12 shows striking asymmetries on the expenditure side. 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 percent of GDP, for a total of about 1.15 percent, a rather large amount for this kind of government outlays, 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.

Further evidence specifically on government employment is highlighted in Table 13. The two columns display the average change in government employment as a share of the labor 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 labor 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:

III.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.

III.2) Among expenditures, successful adjustments are characterized by large cuts in transfers and in wage government consumption. The limited expenditure cuts that occur during unsuccessful adjustments are concentrated mainly on public investment, while transfer programs 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 expenditures in successful and unsuccessful adjustments. Hence, the tables that follow should be compared to Table 12.¹¹

As we 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. All our results are qualitatively unchanged when the other definitions are used. 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, .38% of GDP, is close to that of Table 12, .52% of GDP.

Next, in Table 16 we deflate all nominal variables using the potential GDP rather than the actual GDP.¹² 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 policymaker, 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

¹¹These 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.

¹²We thank Francesco Giavazzi for this suggestion.

the debt/GDP ratio after three years is below the debt/GDP ratio at the time of the strong adjustment.¹³ As expected, all government expenditures during successful episodes fall by less than in Table 12, although the difference with respect to unsuccessful episodes remains substantial and significant. For instance, transfers fall by more than a third of a percentage point of GDP in successful adjustments, while they remains 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 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, again one would expect the difference between successful and unsuccessful adjustments to fall. Indeed, as before the average fall of all types of expenditures is now slightly smaller than in Table 12, but once again the difference between successful and unsuccessful adjustments is large and significant.

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, center and left-wing governments. Second, we distinguish between single party, coalition and minority governments. Both indices are taken from Woldendorp, Keman and Budge (1993) who classify each post-war government in 20 parliamentary democracies along several dimensions.¹⁴

Our ideological index is derived from the series on "Ideological complexion of government", that classifies governments into five categories, from the most-right wing to the most

¹³Recall that in Definition 2 we required that the debt/GDP ratio after three years be at least five percentage points below the initial one.

¹⁴Our source does not have data for Portugal, Spain, Switzerland, and the U.S. For these countries, we constructed the indices using various yearbooks.

left-wing: "governments with right-wing dominance", i.e. with a "share of seats of right and center parties in government and their supporting parties in Parliament larger than 66.6 percent"; "governments with right-center complexion", i.e., with a "share of seats of right and center parties in government and their supporting parties in Parliament between 33.3 and 66.6 percent"; "balanced situation", i.e. governments with a "share of center larger than 50 percent 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-center 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-center complexion" into the . Similarly, our "left-wing governments" include "governments with left-wing dominance" and "governments with left-center complexion". Our category "center government" coincides with the original category "balanced situation" in Woldendorf, Keman, and Budge (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 "center", 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 6 types of governments: "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 stances in each of the government types described above. For instance, the first cell in column (2) gives the probability that a single party government 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 upper panel we classify governments according to the fractionalization dimension. Columns (2) and (3) 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 include also caretaker governments, that are often given a specific mandate to clean up fiscal policy before a political government takes over.

The striking difference appears in columns (4) and (5), 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 2 were successful, which corresponds to a success rate of only 8.7%. By comparison, the success rates of single-party governments and minority governments is 64.3% and 53.3%, respectively.

These results are generally consistent with the empirical findings of Roubini and Sachs (1989a,b) and Grilli, Masciandaro and Tabellini (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 policies needed to make the 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 lines 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 percent, against more than 15 and 12 percent in center 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 6 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 to adjust 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 governments. Presumably, the left achieves success by an agreement with the unions which allows the government to carry out those types of expenditure cuts needed for success. The right presumably achieves 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 lines of Table 20 display the probability that a government 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 favorable to the traditional "political business cycle" model a' la 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, Cohen and Roubini (1993)) which emphasize "rational" political budget cycles. These arguments suggest that voters' rationality and politicians' reputation in a repeated game would pose a limit to how much 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 by Alesina, Cohen and Roubini (1993) on a sample of 20 OECD countries is consistent with this prediction of the theory, and so are our results.

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 lines of Table 21 show that very tight fiscal policies initiated in non-recession years are twice as likely to be successful than those initiated during recessions. This finding makes intuitive sense: the key ingredients to successful adjustments are cuts in transfer programs and in public

employment, precisely the two types of spending cuts that are politically very costly during a recession.

We can summarize the main results of this section as follows:

IV.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 cuts 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.

IV.2) Left- and right-wing governments are just about equally likely to carry out successful adjustments.

IV.3) Closeness to elections does not influence the likelihood of strong adjustments, nor their success rates. 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, particularly on growth and employment, of very tight fiscal policies. 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 degree of success of a fiscal adjustment, with the associated differences in composition described above, influences the macroeconomic consequences of the adjustment. A suggestive hypothesis is that the different composition of the adjustment, which influences 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

is consistent with this argument.

First of all, we show that "hell does not break loose" even after major multi-year fiscal adjustments. On the contrary, we find that in a majority of cases of multi-year fiscal adjustments unemployment is lower after the adjustment than it was before. We also do not find that growth is systematically lower. These results are generally consistent with those of Giavazzi and Pagano (1990) on the fiscal adjustment in Denmark and Ireland. We also document a significant differences in the growth and unemployment performance of economies in the aftermath of successful and unsuccessful adjustments. Growth is much higher and unemployment lower after the former rather than after the latter.

This finding raises difficult issues of causality which are relevant also for the results presented in this paper. One view is that the composition of the adjustment determines its success and its macroeconomic consequences. The alternative view is that success is largely determined by the (exogenously given) rate of growth. However, if one takes this view, it is difficult to explain the correlation between the growth outcome and the *composition* of successful versus unsuccessful adjustments, which we document in this paper.

In other words, the argument that holds that growth determines success, must also imply that the correlation between success and composition of adjustments is spurious. On the other hand, the argument which views the composition as the initial cause of success and growth performance can explain all these correlations. As we argued above, the correlation between composition and success is easily explained. Only adjustments that tackle those components of spending that have a tendency to increase automatically are likely to succeed. 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 (see Tanzi (1993) for some considerations along these lines). The correlation between the composition of adjustment on one side and growth and unemployment on the other, can be explained by several arguments. One is the "crowding in effect" analysed in Giavazzi and Pagano (1990) and Bertola and Drazen (1993). A second argument relies on supply effects. For instance, Alesina and Perotti (1994) and (1995c) show that tax increases (particularly labor 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.

A related point concerns the monetary and exchange rate policy aspects of fiscal adjustments. One may argue that 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, indeed, successful fiscal adjustments, but not unsuccessful ones, are associated with major improvements in competitiveness. 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, like the Irish one. However, this interpretation would imply once again that the correlation we uncover 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 labor 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 labor 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 their composition? A relatively large literature shows that macroeconomic conditions (in particular, growth and unemployment) influence electoral outcomes.¹⁵ 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. As one can see, these are all important issues, which deserve much more attention and a deeper empirical investigation.

¹⁵For results on OECD countries, see in particular Lewis-Beck (1988). For results on the U.S., where the literature on this point is particularly large, see Alesina and Rosenthal (1995) and the references therein.

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 programs and government wages. As public debt increased, interest payments obviously accumulated as well.

Fiscal adjustments that relied primarily on tax increases, especially direct taxes on household, typically failed to permanently stop 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 governments wages and employment. The successful adjustment (at least thus far) of Ireland is an excellent example of this. Between 1986 and 1990, transfer programs 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 amongst coalition members and the fragility of coalition governments make it difficult to maintain a "tough" fiscal stance, particularly when politically sensitive programs, 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 policymakers facing the prospect of a fiscal adjustment. In summary, the a successful fiscal adjustment: (i) is started during a period of relatively high growth; (ii) and does not raise taxes but, rather, cuts transfer programs 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, one cannot achieve permanent results by relying on more politically palatable policies. The good news is that major fiscal adjustments do not cause major recessions. Politicians and their advisors must stop thinking of just about everything on the expenditure side of government budgets as untouchable.

References.

Alesina, A., (1988): "The End of Large Public Debts," in F. Giavazzi and L. Spaventa, eds.,: *High Public Debt: The Italian Experience*, Cambridge University Press, pp. 34-79.

Alesina, A., G. Cohen, and N. Roubini, (1993): "Electoral Business Cycles in Industrial Democracies," *European Journal of Political Economy*, Vol. 23, pp. 1-25.

Alesina, A, and A. Drazen, (1991): "Why Are Stabilizations Delayed?" *American Economic Review*, Vol. 82, December, pp. 1170-88.

Alesina, A. and R. Perotti, (1994): "The Welfare State and Competitiveness", NBER working paper No. 4810.

Alesina, A., and R. Perotti, (1995a): "The Political Economy of Budget Deficits", *IMF Staff Papers*, March, 1-37.

Alesina, A., and R. Perotti, (1995b): "Reducing Budget Deficits", mimeo, Harvard University.

Alesina, A., and H. Rosenthal, (1995): *Partisan Politics, Divided Government, and the Economy*, Cambridge University Press.

Bertola, G. and A. Drazen, (1993): "Trigger Points and Budget Cuts: Explaining the Effects of Fiscal Austerity", *American Economic Review*, Vol. 83, No. 1, 11-26.

Blanchard, O., (1993): "Suggestions for a New Set of Fiscal Indicators", unpublished.

Bohn, H., (1991): "Budget Balance through Revenue or Spending Adjustments?" *Journal of Monetary Economics*, 333-359.

Chouraqi, J.C., R. Hagemann and N. Sartor, (1990): "Indicators of Fiscal Policy, a Re-assessment," *OECD Working Paper*.

DeHaan, J., Sterks, G., and C. deKam (1992): "Toward Budget Discipline: An Economic Assessment of the Possibilities for Reducing National Deficits in the Transition to EMU," *EEC Economic Papers*.

Dornbusch, R. (1989): "Credibility Debt and Unemployment: Ireland's Failed Stabilization," *Economic Policy*.

Emerson, M. (1988): *What Model for Europe?* MIT Press.

Giavazzi, F., and M. Pagano (1990): "Can Severe Fiscal Adjustments be Expansionary?" *NBER Macroeconomic Annual*.

Grilli, V., D. Masciandaro, and G. Tabellini (1991): "Political Monetary Institutions and Public Finance Policies in the Industrial Democracies", *Economic Policy*, No. 13.

Hughes, G., and S. Smith (1991): "Economic Aspects of Decentralized Government: Structure, Functions and Finance," *Economic Policy* Vol. 13, (1991).

Lane, P., and R. Perotti, (1995): "Profitability, Fiscal Policy, and Exchange Rate Regimes", mimeo, Harvard University.

McKenzie, G. (1988): "Are All Summary Indicators of Stance of Fiscal Policy Misleading?" *IMF Staff Papers*, December.

Nordhaus, W., (1975): "The Political Business Cycle", *Review of Economic Studies*, April.

Poterba, J. (1994): "State Responses to Fiscal Crises: Natural Experiments for Studying the Effects of Budgetary Institutions" *Journal of Political Economy*.

Roubini, N., and J. Sachs (1989a): "Political and Economic Determinants of Budget Deficits in the Industrial Democracies", *European Economic Review*, Vol. 33 (May), pp. 903-33.

Roubini, N. and J. Sachs, (1989b): "Government Spending and Budget Deficits in the Industrialized Countries", *Economic Policy*, Vol. 8 (April 1989), pp. 99-132.

Spolaore, E., (1993): "Policy Making Systems and Economic Efficiency: Coalition Governments versus Majority Governments", unpublished.

Tanzi, V., (1993): "Fiscal Issues in Adjustment Programs", in: J. De Melo and R. Faini, eds.: *Fiscal Issues in Adjustment in Developing Countries*, MacMillan.

Von Hagen, J., (1992): "Budgeting Procedures and Fiscal Performance in the European Community", unpublished.

Woldendorp, J., H. Keman, and I. Budge (1993): "Political Data 1945-1990: Party Governments in 20 Democracies", *European Journal of Political Research*, Vol. 24, No. 1, July.

Table 7: *BFI*, aggregate expenditure, aggregate taxation.

	Nobs.	<i>BFI</i> avg. (st. dev.)	Exp. avg. (st. dev.)	Rev. avg. (st. dev.)
ALL	547	-.008 (.071)	.51 (.058)	.42 (.046)
LOOSE	124	.93 (.025)	1.04 (.089)	.02 (.085)
TIGHT	121	-.93 (.026)	.05 (.075)	.83 (.072)
VERY LOOSE	65	2.81 (.230)	2.25 (.204)	-.17 (.173)
VERY TIGHT	66	-2.61 (.177)	-.79 (.172)	1.20 (.166)

Standard errors in parentheses are standard errors of the mean, not of the sample.

Table 8: Total expenditure and revenues.

	(1) Exp.	(2) Rev.
$\Delta INFL$	-.05 (-2.99)	-.02 (-1.03)
ΔU	.47 (10.04)	.15 (3.17)
$\Delta GROWTH$	-.14 (-8.65)	-.12 (-7.16)
<i>NEUTRAL</i>	.27 (3.88)	.28 (3.85)
<i>LOOSE</i>	.81 (9.47)	-.06 (-.70)
<i>TIGHT</i>	.09 (1.03)	.86 (9.99)
<i>VERYLOOSE</i>	1.67 (13.24)	-.47 (-3.67)
<i>VERYTIGHT</i>	-.73 (-6.43)	1.26 (10.90)
nobs	547	547
R^2	.53	.25
<i>see</i>	.93	.94

OLS. t-statistics in parentheses.

Table 9: **Expenditure averages.**

	<i>EXP</i> (st. dev.)	<i>IG</i> (st. dev.)	<i>TRANSF</i> (st. dev.)	<i>CGNW</i> (st. dev.)	<i>CGW</i> (st. dev.)	<i>SUB</i> (st. dev.)
ALL	.51 (.058)	-.03 (.014)	.34 (.029)	.04 (.011)	.13 (.018)	.02 (.014)
LOOSE	1.04 (.089)	.05 (.034)	.49 (.055)	.15 (.025)	.25 (.034)	.09 (.028)
TIGHT	.05 (.075)	-.07 (.023)	.12 (.038)	-.03 (.017)	.06 (.031)	-.02 (.021)
VERY LOOSE	2.25 (.204)	.13 (.039)	1.15 (.118)	.26 (.039)	.53 (.068)	.18 (.053)
VERY TIGHT	-.79 (.172)	-.28 (.025)	-.09 (.079)	-.14 (.029)	-.16 (.060)	-.11 (.056)

This table displays the averages of the changes in the GDP shares of total expenditure (exclusive of interest payments) and its main components. *IG*: government investment. *TRANSF*: transfers. *CGNW*: non-wage government consumption. *CGW*: wage government consumption. *SUB*: subsidies.

Table 10: **Revenue averages.**

	<i>REVEN</i> (st. dev.)	<i>TYH</i> (st. dev.)	<i>TYB</i> (st. dev.)	<i>TIND</i> (st. dev.)	<i>SSRG</i> (st. dev.)
ALL	.42 (.046)	.16 (.027)	.01 (.022)	.05 (.023)	.19 (.020)
LOOSE	.025 (.085)	.10 (.062)	-.10 (.030)	-.11 (.048)	.15 (.034)
TIGHT	.83 (.072)	.27 (.044)	.08 (.026)	.21 (.037)	.24 (.042)
VERY LOOSE	-.17 (.173)	-.01 (.112)	-.31 (.118)	-.13 (.085)	.30 (.070)
VERY TIGHT	1.20 (.166)	.31 (.093)	.36 (.087)	.36 (.079)	.13 (.075)

This table displays the averages of the changes in the GDP shares of total revenues (exclusive of interests received) and its main components. *TYH*: direct taxes paid by households. *TYB*: direct taxes paid by business. *TIND*: indirect taxes. *SSRG*: social security taxes.

Table 11: **Successful and unsuccessful adjustments:
Total expenditure and revenues.**

	<i>BFI</i> (st. dev.)	<i>EXPEN</i> (st. dev.)	<i>REVEN</i> (st. dev.)
SUCCESSFUL ADJUSTMENTS	-2.74 (.282)	-2.19 (.326)	.44 (.385)
UNSUCCESSFUL ADJUSTMENTS	-2.18 (.101)	-.49 (.188)	1.28 (.181)

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 $by(t+3) - by(t) < .05$, where by is the debt/GDP ratio.

Table 12: **Successful and unsuccessful adjustments:
composition of expenditure.**

	<i>EXP</i> (st. dev.)	<i>IG</i> (st. dev.)	<i>TRANSF</i> (st. dev.)	<i>CGNW</i> (st. dev.)	<i>CGW</i> (st. dev.)	<i>SUB</i> (st. dev.)
SUCCESSFUL ADJUSTMENTS	-2.193 (.326)	-.41 (.089)	-.54 (.183)	-.38 (.055)	-.58 (.093)	-.29 (.211)
UNSUCCESSFUL AJUSTMENTS	-.49 (.188)	-.26 .046	-.02 (.102)	-.09 (.038)	-.07 (.071)	-.08 (.047)

See notes to Table 9.

Table 13: **Government employment.**

	<i>EG/LF</i> (st. dev.)	<i>EG/ET</i> (st. dev.)
ALL	.22 (.016)	.28 (.019)
LOOSE	.28 (.031)	.37 (.033)
TIGHT	.19 (.034)	.19 (.038)
VERY LOOSE	.35 (.061)	.49 (.071)
VERY TIGHT	.22 (.053)	.24 (.063)
SUCCESSFUL	.09 (.159)	-.007 (.177)
UNSUCCESSFUL	.25 (.059)	.30 (.074)

EG: government employment. *LF*: labor force.
ET: total employment.

Table 14: **Successful and unsuccessful adjustments:
composition of revenues.**

	<i>REVEN</i> (st. dev.)	<i>TYH</i> (st. dev.)	<i>TYB</i> (st. dev.)	<i>TIND</i> (st. dev.)	<i>SSRG</i> (st. dev.)
SUCCESSFUL ADJUSTMENTS	.44 (.385)	-.14 (.249)	.53 (.256)	.17 (.119)	-.14 (.072)
UNSUCCESSFUL ADJUSTMENTS	1.28 (.181)	.44 (.110)	.20 (.052)	.43 (.103)	.17 (.103)

See notes to Table 9.

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

	<i>EXP</i> (st. dev.)	<i>IG</i> (st. dev.)	<i>TRANSF</i> (st. dev.)	<i>CGNW</i> (st. dev.)	<i>CGW</i> (st. dev.)	<i>SUB</i> (st. dev.)
SUCCESSFUL ADJUSTMENTS	-1.25 (.307)	-.32 (.090)	-.13 (.172)	-.28 (.075)	-.42 (.129)	-.10 (.068)
UNSUCCESSFUL ADJUSTMENTS	.01 (.215)	-.25 (.046)	.25 (.113)	-.06 (.038)	-.09 (.077)	-.02 (.042)

This table is based on the OECD fiscal impulse measure, as defined in Section 2.

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

	<i>EXP</i> (st. dev.)	<i>IG</i> (st. dev.)	<i>TRANSF</i> (st. dev.)	<i>CGNW</i> (st. dev.)	<i>CGW</i> (st. dev.)	<i>SUB</i> (st. dev.)
SUCCESSFUL ADJUSTMENTS	-1.98 (.361)	-.40 (.090)	-.40 (.175)	-.37 (.058)	-.53 (.103)	-.28 (.211)
UNSUCCESSFUL ADJUSTMENTS	-.46 (.182)	-.26 (.044)	.03 (.100)	-.10 (.036)	-.07 (.068)	-.06 (.045)

All variables are divided by potential GDP rather than actual GDP. A very tight fiscal policy in period t is successful if $byp(t+3) - byp(t) < .05$ where byp is the debt/potential GDP ratio.

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

	<i>EXP</i> (st. dev.)	<i>IG</i> (st. dev.)	<i>TRANSF</i> (st. dev.)	<i>CGNW</i> (st. dev.)	<i>CGW</i> (st. dev.)	<i>SUB</i> (st. dev.)
SUCCESSFUL ADJUSTMENTS	-1.52 (.295)	-.35 (.073)	-.35 (.140)	-.24 (.063)	-.33 (.102)	-.24 (.131)
UNSUCCESSFUL ADJUSTMENTS	-.49 (.226)	-.25 (.047)	.03 (.122)	-.11 (.038)	-.11 (.082)	-.06 (.055)

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

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

	<i>EXP</i> (st. dev.)	<i>IG</i> (st. dev.)	<i>TRANSF</i> (st. dev.)	<i>CGNW</i> (st. dev.)	<i>CGW</i> (st. dev.)	<i>SUB</i> (st. dev.)
SUCCESSFUL ADJUSTMENTS	-1.74 (.262)	-.37 (.065)	-.40 (.137)	-.27 (.050)	-.45 (.071)	-.25 (.143)
UNSUCCESSFUL ADJUSTMENTS	-.43 (.216)	-.25 .052	.03 (.116)	-.09 (.043)	-.03 (.083)	-.09 (.054)

A very tight fiscal policy in period t is successful if either $by(t+3) - by(t) < .05$ or $\frac{1}{3}defy(t+3) + \frac{1}{3}defy(t+2) + \frac{1}{3}defy(t+1) < defy(t) - .015$, where by is the debt/GDP ratio and $defy$ is the undemployment-adjusted deficit/GDP ratio.

Table 19: **Political factors.**

	(1)	(2)	(3)	(4)	(5)
	OBS.	Prob. of VERY LOOSE	Prob. of VERY TIGHT	Prob. of SUCCESS	Prob. of NO SUCCESS
SINGLE	177	8.5%	10.2%	35.7%	64.3%
COAL	223	12.1%	13.0%	8.7%	91.3%
MINOR	109	10.1%	15.6%	46.7%	53.3%
RIGHT	313	8.6%	10.9%	26.9%	73.1%
CENTER	65	15.4%	10.8%	0.0%	100%
LEFT	129	12.4%	17.8%	35.1%	64.9%

Table 20: **Elections.**

electoral years		non-electoral years	
Prob. of VERY LOOSE	12.3%	Prob. of VERY LOOSE	10.7%
Prob. of VERY TIGHT	10.4%	Prob. of VERY TIGHT	13.3%
Prob. of SUCCESS	28.6%	Prob. of SUCCESS	26.3%
Prob. of NO SUCCESS	71.4%	Prob. of NO SUCCESS	73.7%

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	
Prob. of VERY LOOSE	20.4%	Prob. of VERY LOOSE	6.2%
Prob. of VERY TIGHT	6.8%	Prob. of VERY TIGHT	15.4%
Prob. of SUCCESS	12.5%	Prob. of SUCCESS	29.5%
Prob. of NO SUCCESS	87.5%	Prob. of NO SUCCESS	70.5%

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.

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.

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:

$$PRIMDEF = EXP - REVEN - CFKG - KTRRG$$

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