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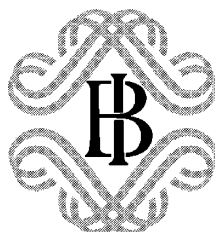
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The Economic Policy of Fiscal Consolidations:
The European Experience

by Andrea Zaghini

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THE ECONOMIC POLICY OF FISCAL CONSOLIDATIONS: THE EUROPEAN EXPERIENCE

by Andrea Zaghini[*]

Abstract

This paper investigates the relationship between fiscal contractions, permanent improvements in public finances and short-run economic performance. The empirical evidence gathered from the European experience over the last three decades shows clearly that the composition of fiscal adjustments and the length of the period over which they are implemented influence their likelihood of success. Adjustments that concentrate on the expenditure side and unfold over a relatively long time span (three or four years) are more likely to succeed in reducing the public debt/GDP ratio than tax-based or shorter adjustments. Furthermore, macroeconomic consequences are strictly related to the achievement of fiscal success. On average, successful contractions do not trigger economic slowdowns, but unsuccessful adjustments usually do. This evidence is interpreted via the theory known as the expectation view of fiscal policy.

Contents

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1. Introduction[1]

Fiscal discipline is currently one of the main issues on the agenda of policy-makers from all over the world. Since the late 1980s, after years of increasing budget deficits and growing debt/GDP ratios to levels historically observed only in particular circumstances (major wars, deep recessions, etc.), many countries have started to tackle the problem of high indebtedness by implementing harsh fiscal adjustments.

In Europe, in order to comply with the fiscal criteria established by the Maastricht Treaty, the majority of countries addressed the challenge of reducing the deficit/GDP ratio to the well-known 3% threshold within 1997. Since the early 1990s Europe has witnessed several major fiscal adjustments. Yet, not many consolidations in the last 20 years have succeeded in reducing public unbalances[2]. Moreover, regardless of the outcome on government finances, these adjustments affected the countries' short run macroeconomic performance differently: in some instances, private consumption and overall aggregate demand fell sharply, reducing the speed of economic growth; in other cases, drastic fiscal stabilisations were followed by vigorous increases in private demand, large reductions in interest rates and strong economic expansions. Giavazzi and Pagano (1990) referred to this kind of uncertainty about the final effects of fiscal contractions on the economy, especially on private spending, as a true "consumption puzzle".

The theoretical implications of fiscal consolidations differ substantially among economic theories. From the Keynesian point of view, reductions in government spending, as well as increases in taxation, will result in a decline in GDP. On the other hand, standard neo-classical models hold that public expenditure is a perfect substitute for private consumption: when the former grows, the latter decreases and vice versa. Furthermore, several recent

[2] See Masson and Mussa (1995) for an exhaustive survey on historical progress of public debt and deficit and Tanzi and Schuknecht (1995) for a discussion about the transformation of government budget composition in OECD countries from the beginning of the century

contributions have introduced the possibility of a non-linear relationship between fiscal policy and private spending (Bertola and Drazen, 1993; Sutherland, 1997). These works, relying on the theory known as the "expectation view of fiscal policy", state that private sector expectations about government's future fiscal stance may induce different responses to a given stabilisation policy. In fact, if a fiscal consolidation is viewed as a serious attempt to reduce public liabilities, it affects both the private and public sectors' intertemporal budget constraints and induces a wealth effect that boosts private consumption. On the other hand, if the political commitment is weak, consumers realise that their budget constraint is not affected by the current consolidation and the recessive Keynesian effect prevails.

This paper studies the consequences of a series of relevant fiscal adjustments implemented in the EU in the 1970-1998 period. More specifically, it discusses whether some properties of the consolidation plans increased the likelihood of a long lasting improvement in government finances and it assesses whether policy interventions that successfully reduce public unbalances (successful adjustments for short) are more likely to induce expansionary rather than contractionary effects.

Concerning the first point, the paper identifies two characteristics that seem to be crucial for a successful reduction of the public debt/GDP ratio. The recent European experience has taught that only adjustments that relied heavily on primary expenditure cuts and were implemented over a relatively long time span were able to achieve long lasting reductions in public liabilities. Indeed, during these consolidations tax increases (if any) amounted to a small fraction of the total adjustment. Furthermore, though successful stabilisations unfolded over a longer period than unsuccessful ones, the overall budget cuts were not larger.

As regards the macroeconomic impact, successful fiscal episodes tend to be associated with improved economic performance: during the adjustment period and in the following two years, the economies experienced strong consumption and investment growth, reduced unemployment, better international competitiveness and falling interest rates. On the other hand, during and after unsuccessful consolidations standard Keynesian effects prevailed: slower overall growth, negative investment rates, declining private consumption and increasing unemployment were registered. This empirical evidence can be interpreted

according to the expectation view theory: the characteristics of successful stabilisation plans are essential in signalling a commitment by public authorities to tackle the problem of growing public liabilities. Since a permanent reduction in public expenditure produces an equivalent reduction in the future tax burden, a serious consolidation can induce a positive wealth effect, stimulating private spending. On the contrary, unsuccessful adjustments are not considered sufficient to modify the intertemporal budget constraint; consequently, the recessive short-run effects dominate.

The paper is organised as follows. The next section critically reviews the theoretical arguments on which recent empirical works rely. The third section discusses the statistical evidence on significant fiscal episodes in the European Union over the last three decades. The fourth analyses the interplay between fiscal policy and economic performance by observing the behaviour of a set of main economic indicators in relation to the consolidation plans. The fifth section investigates the causality argument and the last section concludes.

2. Theoretical guidelines and previous works

In a seminal work, Giavazzi and Pagano (1990) analysed two major fiscal contractions that, unlike the standard Keynesian predictions of recession, induced astonishing economic expansions. Data from stabilisation plans in Denmark (1983-86) and Ireland (1987-89) showed that drastic reductions in the cyclically-adjusted deficit were followed by robust economic growth. Despite the large decline in the full employment budget deficit, consumption and investment grew vigorously in both cases. Since then, many other works have tried to identify the relevant characteristics that turn an episode of fiscal tightening into what is now known as an "expansionary fiscal consolidation". Although the main conclusions of this recent literature are often similar, the theoretical frameworks are quite different.

The standard Keynesian argument, based on sticky prices and given expectations about future investments, holds that fiscal stabilisations have short-run contractionary effects. According to this view, fiscal consolidations (either lower government purchases or higher taxes) reduce aggregate demand and income via direct effects and have a multiplied negative impact on output via indirect effects. The recent empirical literature has instead focused its attention on other channels that could lead to opposite results. Giavazzi and Pagano (1996),

relying on a finite horizon model of consumption in which Ricardian equivalence does not hold (Blanchard, 1985), suggested that the wealth effect on consumption may well offset the Keynesian recessive process triggered by a reduction in public spending. When a spending cut is perceived as long lasting, consumers anticipate a permanent increase in their life-time disposable resources and adjust their present and future consumption to the higher level of income. The empirical evidence supporting this theory is drawn from the analysis of the macroeconomic consequences of several large fiscal episodes implemented in 19 OECD countries over the period 1976-92. The main result is that for cumulative changes in the cyclically-adjusted primary deficit within a range of 5 percent of potential output, the relationship between private consumption and public spending is positively sloped. However, when the fiscal intervention falls outside this range, the relationship becomes negative.[3] In their opinion, in order to boost private demand, what matters most is the dimension of the adjustment: only large fiscal contractions can be expansionary since they signal a decisive change in the stance of fiscal policy. Small stabilisations have the opposite consequences because they are not able to induce the desired wealth effect on consumers.[4]

Sutherland (1997) introduced in the Blanchard model the hypotheses that government spending follows a random walk and that fiscal stabilisations are infrequent but very large when implemented.[5] In this framework, he showed that the positive wealth effect is stronger in periods of fiscal stress, i.e. when the debt/GDP ratio is very high or when there are rapidly growing budget deficits. The rationale behind this finding is that when the private sector perceives that current fiscal policies are unsustainable, consumers realise that sooner or later a major adjustment must occur. At low levels of fiscal unbalances, the usual Keynesian effects follow any fiscal intervention because the major stabilisation is expected to occur in the distant future, when many consumers may no longer be alive. As debt increases, the model exhibits non-Keynesian features: an increase in the fiscal deficit will be contractionary because

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[3] Although the authors could not find empirical evidence in favour of a symmetric relationship outside the 5 percent range, the negative correlation holds for the larger consolidations.

[4] Blanchard (1990) argued that even a tax increase could have the same expansionary effect if it generates expectations of less dramatic and disruptive future tax increases. A critique to this approach and to the expectation view of fiscal policy can be found in Barry and Devereux (1995).

[5] These two hypotheses were previously used by Bertola and Drazen (1993) in a standard neo-classical model to obtain the different effects of a fiscal adjustment as a function of the initial fiscal conditions.

consumers expect a large stabilisation to occur relatively soon, when they are still alive. Perotti (1999), taking into account the possible coexistence of liquidity constrained and unconstrained individuals, tested a similar model on a panel of OECD countries over the period 1965-94. His findings are consistent with the thesis that the higher the fiscal unbalance, the more likely that a consolidation will be successful.

McDermott and Wescott (1996) highlighted a second channel for non-Keynesian transmission of fiscal impulses in highly indebted countries: the "credibility" argument on interest rates. They claimed that a fiscal action viewed as necessary to restore government solvency can reduce the inflation and default risk premia required by financial markets on public debt bonds. The consequent decrease in interest rates, in turn, can increase the market value of the stock of wealth in consumers' portfolios and boost aggregate demand.[6] The empirical analysis used to test this hypothesis consisted of two steps. First, they singled out successful fiscal adjustments among what they called "episodes of significant fiscal consolidation" for 20 industrial countries from 1970 to 1995, the definition of success relied on the magnitude of the reduction of the debt/GDP ratio measured two years after the end of the fiscal tightening. Second, they determined the consequences of fiscal consolidations on a series of economic performance measures. They found that the extent of the adjustment is an important factor that seems to contribute to the success of fiscal contractions: a timid commitment to fiscal consolidation is more likely to fail than a strong one. Moreover, the empirical evidence suggests that efforts of fiscal consolidation are likely to fail when undertaken in the context of adverse world growth and rising interest rates. On the other hand, they found that although good timing in relation to the world business cycle helps, it does not guarantee success. As for the macroeconomic consequences, in contrast with the findings of Giavazzi and Pagano (1996), most of the growth registered after the successful cases seemed to be due to an increase in investment rather than in consumption, confirming the idea that the interest rates channel may stimulate aggregate demand more effectively than how the wealth effect stimulates private spending.

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[6] For a survey of the abundant literature on public debt management see Giavazzi and Spaventa (1988) and Dornbush and Draghi (1990). Two different empirical approaches to the evaluation of risk premia paid on public debt bonds are in Alesina, de Broeck, Prati and Tabellini (1992) and Favero, Giavazzi and Spaventa (1997).

The main goal of Alesina and Perotti (1995) was to fill what in their opinion was a gap in the standard macroeconomic literature on fiscal policy: the relevance of budget composition. They criticised the common practice of thinking about government spending as the vague item "purchases of goods and services": from a policy perspective, changes in the composition of the overall budget might be extremely important. By performing an empirical investigation on 20 OECD countries over the period 1960-92 they showed that fiscal consolidations based mainly on expenditure cuts are more likely to be successful than those implemented by tax increases. In particular, Alesina and Perotti concluded that the composition of the consolidation matters: in successful interventions - where again success is defined as bringing the ratio of debt to GDP on a sustained downward path - the largest share of deficit cuts tends to be in transfers, social security and government wages; in unsuccessful cases cuts in these categories are considerably smaller and instead, there is heavy reliance on tax increases and reductions in public investment. Thus, to succeed, a fiscal adjustment must tackle those components of public spending, like social security and government wages, that have a tendency to automatically increase.

In a later work, Alesina and Perotti (1997a) widened their research by looking at the macroeconomic consequences of fiscal adjustments in both successful and unsuccessful cases. Since the successful tightening programmes were associated with real output acceleration, reduction in the unemployment rate and improved international competitiveness, they suggested that the composition of a government intervention might also influence a country's macroeconomic performance. The most important channel that triggers or jeopardises an expansion is through unit labour cost. They distinguished between standard neo-classical effects and those emerging in unionised labour markets. In neo-classical models the labour supply is influenced by income and substitution effects. If both leisure and consumption are normal goods, the income effect positively affects the demand for both. Consider a reduction in income taxation: if the change in fiscal policy is expected to be permanent the wealthier individual is going to work less but to consume more. On the other hand, the substitution effect implies that the same tax cut should increase the supply of labour. Thus, a permanent spending cut accompanied by an equivalent reduction in income taxation has two opposite effects on labour supply: the income effect tends to reduce it while the substitution effect tends to increase it. Although it is usually assumed that for permanent increases in wealth the

income effect prevails, empirically it has been shown that neither effect on the individual labour supply is very large.[7] A much larger effect could be obtained possibly at the aggregate level in unionised labour markets. An increase in labour taxation reduces, *ceteris paribus*, the after-tax wages of workers, and thus leads unions to demand higher wages. If a monopolistic union can pass through its demand, then the increased wages will imply higher labour costs and loss of competitiveness for domestic firms. Alesina and Perotti documented that the size of this effect depends on the structure of the labour market and unions. When there is a high degree of centralisation, unions are large enough to fully internalise the tax manoeuvre and therefore ask for moderate wage increases in response to higher labour taxes. On the other hand, if unions are sufficiently strong to shift the burden of the increased taxation on firms, but not large enough to internalise the government budget constraint, then tax increases can have large effects on unit labour costs.[8]

A different approach was used by Alesina and Ardagna (1998) in their analysis of the consequences of discretionary fiscal episodes. Relying on the same data set used in Alesina and Perotti (1997a)[9], they divided all the government interventions into two groups: tight and loose fiscal policies. Then, they subdivided each group into expansionary and contractionary cases. Finally, they looked at a series of fiscal and macroeconomic variables for each of the four subsets. Their main finding is that a list of non-Keynesian results holds symmetrically for the episodes of tight and loose policies. As regards the magnitude of the adjustment, they showed that, with respect to the period immediately preceding the government intervention, the (positive) variation of the cyclically-adjusted budget is larger during expansionary episodes than during contractionary ones, in the case of tight policies. Exactly the contrary holds for loose policies, i.e. the (negative) variation is larger during contractionary episodes than during expansionary ones. As for the composition of different fiscal plans, in the tight set the (negative) variation of public purchases is larger during expansions while in the loose set

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[7] On this point see Pencavel (1986). For a complete treatment of the neo-classical approach of fiscal policy, see Barro (1989).

[8] For a seminal work on the relationship between macroeconomic performance and the degree of centralisation of wage bargaining systems in OECD countries see Calmfors and Driffill (1988). For a recent empirical assessment see Alesina and Perotti (1997b).

[9] Although they reported the incompleteness of several time series, the sample used consists of 20 OECD countries over the period 1960-94.

the (positive) variation is larger during contractions. Likewise, the reduction in total revenues is larger during contractions in the tight set, whereas its increase is larger during expansions in the loose set. Moreover, they did not find evidence for a positive relationship between the degree of fiscal stress before the adjustment and its economic consequences: both the level and the rate of growth of the ratio of public debt to GDP in the two years preceding the tight and loose policies were very similar. Alesina and Ardagna found that the remarkable differences in both composition and magnitude of fiscal episodes reported for expansionary and contractionary cases are consistent with both the wealth effect and labour markets arguments.

Other relevant contributions to the literature on fiscal policy have focused recently on several specific arguments or sub-groups of countries. Caselli and Rinaldi (1998), performing an empirical investigation of recent fiscal consolidations in EU countries, criticised the unit labour cost argument for loss of international competitiveness proposed by Alesina and Perotti (1997a). They hold that this channel of transmission of fiscal impulses can only work if a country is committed to a balanced current account position. Furthermore, they illustrated that the commonly referred economic policy indications coming from the Mundell-Fleming model with fixed and flexible exchange rate regimes have been surpassed by the insights of new open-economy models.[10] Zaghini (1999) extended and refined the empirical analysis in Caselli and Rinaldi by enlarging their data set and by introducing a different measure of fiscal performance. Alesina, Perotti and Tavares (1998) investigated whether there is evidence of systematic electoral penalties or decreasing popularity for governments that carry out large fiscal adjustments. They found that the evidence points to the opposite: governments that implement robust fiscal consolidations are usually rewarded at the ballot box and remain in office.

In the present paper I offer several improvements and extensions to the existing literature briefly summarised above. To begin, this work makes the two-step procedure proposed in McDermott and Wescott (1996) more reliable by adding a statistical rationale to the selection criterion of discretionary fiscal episodes. It also introduces a more accurate

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[10] See, for instance, Obstfeld and Rogoff (1995) for a flexible exchange rate framework and Caselli (1998) for a fixed one.

definition of fiscal success and a more refined measure of fiscal performance. Furthermore, it analyses the causality argument; namely it investigates whether the registered positive correlation between fiscal success and improved macroeconomic performance can be interpreted as the former causing the latter rather than vice versa. The sample considered for the empirical investigation comprises annual data from 1970 to 1998 for 14 European countries.

3. Fiscal episodes in EU countries

The worsening of fiscal imbalances over the 1970s and 1980s in industrial countries and in Europe in particular is attributable to the fact that growth in government expenditures exceeded that of both public revenues and the economy. Table 1 shows that in the European Union[11] the ratio of public expenditures to GDP rapidly increased from 35.4 percent in 1970 to 48 percent in 1980, remaining above this level until 1998. Although current receipts were growing as well over the same period, they were constantly lower than expenditures. The composition of government revenues has also changed over time: in 1970 the main source of receipts were indirect taxes, but starting in 1980 direct taxes proved to be the most important source of government funding. Social security contributions increased more than any other item over the period, both in absolute and relative terms.

Since the mid 1980s many European countries have implemented large consolidation plans aimed at reducing fiscal deficits and bringing the debt/GDP ratio on a downward path. Some reached their fiscal targets; many others failed. Moreover, substantial adjustments often have been delayed for the widespread fear of a likely contractionary impact on economic performance. However, this has proved not to be the rule: during and after several robust fiscal consolidations aggregate demand increased and many economies witnessed vigorous expansions. Hence, two questions arise: 1) what makes a fiscal stabilisation successful? 2) why are some consolidations expansionary and others contractionary? This section of the paper tries to answer the first question; the next section deals with the second one.

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[11] Henceforth, when speaking of the EU, I refer to the following 14 countries: Austria, Belgium, Denmark, Finland, France, Greece, Germany, Ireland, Italy, Netherlands, Portugal, Spain, Sweden and UK.

Since the main interest of the present research concerns the impact of different discretionary policies, it is of great importance to correctly identify the relevant fiscal episodes. As suggested by the previously mentioned literature, the measure of the fiscal stance must not be influenced by the business cycle and it must avoid the discrepancies among countries resulting from different interest payments. For this reason, it is important to rely on a measure of the fiscal stance based on the yearly change in the primary balance since interest payment is not a variable under the direct control of policy-makers. Furthermore, using the first difference of the total balance to measure the fiscal impulse would add to the discretionary change an arbitrary value that differed from country to country and over time. Although a higher level of interest payment might signal the need for a larger contraction in order to lower government unbalances, in the present paper, as in all previous contributions on the argument, attention will be focused on primary balance changes.

Concerning the business cycle, it must be mentioned that, unfortunately, there is no universally accepted method of cyclical correction. For each country, the most important international organisations (IMF, OECD, European Commission, etc.) compute their own value of the so called "potential output" and then base their measures of fiscal stance on the difference between the value of the actual primary deficit and the primary deficit that would have prevailed had expenditures and receipts grown with potential GDP. Giavazzi and Pagano (1996) and McDermott and Wescott (1996) used the OECD cyclical correction in their empirical investigations; Caselli and Rinaldi (1998) employed the one proposed by the European Commission; Alesina and Perotti (1995, 1997a) and Alesina and Ardagna (1998) relied on a measure introduced by Blanchard (1993) that bases the cyclical correction of government outlays and revenues on yearly changes in the unemployment rate.[12]

In this paper I use both actual data and cyclically-adjusted values from the European Commission, so that the source of data is unique.[13] The measure of the fiscal impulse I use throughout this work is the first difference in the ratio of the cyclically-adjusted primary balance to GDP (CPB from now on). Furthermore, since the focus of the analysis is on significant changes in fiscal stance I disregard very small changes in CPB: since no cyclical

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[12] For a discussion of alternative methods of cyclical correction see Blejer and Cheasty (1993).

[13] See European Commission (1995) for the complete description of the procedure of cyclical correction.

correction is perfect, by considering only robust fiscal episodes, I further reduce the probability of being unduly influenced by cyclical factors.[14]

In order to attain a neat identification criterion of the significant fiscal impulses, which relies on existing data, the first step is to check whether the Normal distribution is a good proxy of the data. Thus, the 381 yearly changes in the CPB are subdivided into 7 main groups and the density of the actual distribution is compared to that of a Normal with mean 0.07 and standard deviation 1.51. Then, a Chi-square test is implemented: the empirical value obtained suggests that there is a good approximation between actual and theoretical data.[15] As a final consequence it is possible to refer to the intervals subdivision reported in Table 2.

Since the two central intervals can be considered "ordinary" government interventions I do not include them in the definition of significant fiscal episodes, which instead includes only very tight and very loose fiscal policies.

Definition 1: A period of very tight fiscal policy is such that one of the following holds:

1. the CPB improves by at least 1.6 percent over one year;

2. the CPB improves by at least 0.8 percent a year for two or more years.

Similarly a period of very loose fiscal policy is such that one of the following holds:

1. the CPB worsens by at least 1.4 percent over one year;

2. the CPB worsens by at least 0.7 percent a year for two or more years.

According to this definition, over the period 1970-1998, Europe witnessed 98 fiscal episodes equally divided into 49 tight and 49 loose policy interventions: Table 3 reports the

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[14] Note that an absolute measure (the first difference in the CPB) is used here to identify the significant changes in fiscal stance, whereas the relative improvement in the public debt/GDP ratio will be used to evaluate the success of each episode. The use of an absolute measure, which is easier to understand than a relative one, is preferable when referring to the budget balance, since the discrepancies of CPBs over the 1970-1998 period are less pronounced than those reported for public debt stocks.

[15] The value of 9.13 computed by comparing the two series of actual and theoretical data is smaller than both the 5% and 10% threshold of a Chi-squared distribution with 5 degrees of freedom (11.07 and 9.24, respectively).Then, the null hypothesis of coincidence of the two distributions cannot be rejected even at a level of significance of 10%.

full list and the magnitude of these episodes. From the table it is possible to see that the majority of tight episodes were implemented over a relatively long time-span: this means that European governments preferred a strategy of gradualism to the "cold turkey" option. This was especially true in the 1990s when, although the fiscal adjustments registered the highest efforts, the lengths of the stabilisation plans turned out to be the longest.

In fact, it is easy to verify that several episodes lasted more than two years: there are five fiscal expansions and ten stabilisations lasting three or more years. The procedure I introduced to identify the correct length of each fiscal episode marks a sharp difference with respect to previous works. Consider for example the identification definition proposed by McDermott and Wescott (1996). They suggest considering those fiscal consolidations that in two years induced a 1.5 percent improvement in the structural primary balance, provided that each variation was positive. This selection criterion has two major drawbacks: first, the length of the fiscal adjustment is subjectively set to two years; second, mechanical use of this definition might lead to an undue accumulation of significant episodes. As to the first drawback, the definition ignores all one-shot interventions and there seems to be no reason why a fiscal stabilisation should last for only two years.

As to the second drawback, consider the following example. Over the four years from 1986 to 1989 the Irish authorities implemented a robust consolidation: the CPB improved by more than 7 points with an average of 1.9 percent a year. Since any two consecutive years satisfy the condition of improving the budget by more than 1.5 percent, McDermott and Wescott reported three different adjustments (1986-87, 1987-88 and 1988-89) for this one stabilisation, thus subjectively multiplying and overlapping significant plans. This defective individuation of relevant fiscal episodes has another, and possibly more important, drawback involving the evaluation of the macroeconomic impact of different fiscal policies. Since in determining the short-run consequences of an adjustment it is common in the literature to refer to the values of several economic performance variables in the periods immediately before and after the tightening, the fact that there are several overlapping episodes will inevitably lead to confusion between the years in which each plan is implemented and the periods used in evaluating the impact. This in turn may undermine the reliability of the results and the soundness of the conclusions. This critique applies also to the works of Alesina and Perotti (1996) and Alesina and Ardagna (1998). By contrast, the selection criterion here

proposed is fully able to identify the correct length of any fiscal episode because it does not impose any temporal constraint.

Table 4 reports the average changes in the CPB and its fundamental components with respect to the full sample, the 49 episodes of fiscal loosening and the 49 of fiscal tightening. From the first column, which lists the number of yearly observations, one can see that the average length of fiscal expansions and contractions are quite similar: a loose policy lasts on average 1.7 years, while a tight policy lasts just a little longer, 1.8 years. The last column shows that the magnitude of the government interventions during both loose and tight policies is impressive: the average change in the CPB is above 1.8 percent of GDP in both instances. However, the most interesting insights come from the two middle columns in which the average composition of fiscal programmes is reported. From the full sample it emerges that although the fiscal impulse is on average close to zero, it is the result of an increase in both primary expenditures and receipts, the latter being the larger. Looking at the contractions and expansions, it is instead clear that the overall change in the CPB is the consequence of the opposite use of revenues and outlays. In fact, during loose policies the budget worsening is achieved mainly through increased public expenditures (1.28 percent of GDP), but during tight interventions it is achieved through much higher levels of taxation (1.36 percent).

Having identified the set of significant stabilisation programmes, the next step is to assess which of them were successful. In the recent literature on the subject it is possible to find several identification criteria but, even if they do not differ substantially from one another, none of them is thoroughly satisfactory. The two variables upon which the definitions of success usually rely are the ratios of public debt and structural primary deficit to GDP. As for the second indicator, consider for instance the definition used by Alesina and Perotti (1997a): a fiscal policy is successful if in the three years after the tightening the ratio of CPB to GDP is on average at least 2 percent of GDP below that registered in the last year of the tightening. Although appealing, the use of the structural budget in evaluating the success of an intervention cannot be justified in this framework. Since the cyclically-adjusted balance is already used to measure the fiscal stance of governments, it would be inappropriate to use it again as the indicator of success. Moreover, given that the identification criterion implemented by Alesina and Perotti suffers from the inconvenience of multiplying and overlapping public interventions, when several adjustments overlap or are simply consecutive

there might be the possibility that the same value of the CPB is first used as a measure of fiscal impulse and then used again in evaluating the success of a previous adjustment, thus making the success of a stabilisation plan depend only on the magnitude of successive fiscal consolidations.

The other measure commonly used in the literature to asses the fiscal success of an adjustment is the public debt/GDP ratio. McDermott and Wescott (1996) suggest labelling as successful those discretionary government interventions that achieved a reduction of at least 3 percentage points in the ratio of gross public debt to GDP within two years after the end of the two year fiscal tightening. Alesina and Ardagna (1998) require a more demanding condition be satisfied: within three years, the debt/GDP ratio must be at least 5 percentage points below the level registered in the last year of the adjustment. The rationale behind this kind of requirement is that, in order to be considered a success, a fiscal consolidation must produce an immediate reduction in the public debt and force it to remain on a declining trend after the adjustment. Since I am in agreement with this reasoning, in this work I propose two refinements to the above definitions of success: the first concerns the choice of the public debt/GDP value to which one should refer in order to compute the improvement in the ratio; the second takes into account the differences among European countries in their initial conditions of indebtedness. Since the selection criterion here implemented makes it possible to find consolidations that lasted more than two years, it might be possible that in a long lasting adjustment early evidence of the desired effect of debt reduction becomes visible during the implementation of the intervention. If this were the case, the public debt/GDP ratio in the last year of the tightening might be poorly representative of the value of the public debt during the whole adjustment. Thus, in this context, the average of the debt/GDP ratio over the full span of the stabilisation plan is likely to be a better reference level of public liabilities. Moreover, since the conditions of indebtedness differ across countries and also over time, a yearly reduction in public debt of, say, four percentage points of GDP might be considered an impressive improvement in Finland but just an ordinary variation in Belgium or Italy, whose level of indebtedness is definitively worse. Likewise, a reduction of five points would represent an improvement of 10% in today's Ireland but it would have weighted only four percent in the same country in 1987, when the debt/GDP ratio was well above the 100%

threshold. Therefore, I have used the relative magnitude of the reduction of public liabilities to obtain the following definition of fiscal success.

Definition 2: A period of tight fiscal policy is successful if three years after the end of the adjustment the public debt/GDP ratio has been reduced by at least 5% relative to the average value of the same ratio computed during the whole consolidation period.

The 12 cases of successful adjustments identified by the above definition are listed in Table 5. The first column reports the average value of the public debt during the adjustment period, the second the value of the debt three years after the end of the fiscal episode and the third the percentage improvement. As for the length of successful adjustments, it is easy to see that there is only one consolidation of one year, five of two years, three of three years, and three of four years. Moreover, the percentage reduction in the public debt/GDP ratio measured after three years differs sharply among stabilisation plans: ranging from the modest improvement for the Netherlands in 1993 (just above the 5% threshold) to the impressive achievement of Swedish authorities in 1986-87 with a reduction in public liabilities of more than 27 percent.[16]

Because of the stringent deadline (1997) for entrance in stage three of the EMU, almost all European countries implemented robust fiscal adjustments in the 1990s. Among them there were 5 successful stabilisation plans that ended in 1997 or 1998: Austria 1996-97, Greece 1996-98, Italy 1995-97, Spain 1996-97 and the UK 1995-98. For these consolidations the values of the public debt needed to implement Definition 2 are drawn from the Autumn 1998 forecasts of the European Commission. Furthermore, since the latest available debt forecast is for the year 2000, only a two-year period after the end of the adjustment has been considered for Greece and the UK. Comparing Table 4 with Table 5, it emerges that, among those tightenings implemented in the second half of the 1990s, only the 1995-97 French

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[16] Note that only 16 out of 49 adjustments achieved a reduction of the public debt/GDP ratio after three years. Among them, Greece (1993-93), the Netherlands (1991), Sweden (1971) and the UK (1980-81) did not reduce public indebtedness sufficiently to breach the 5% threshold.

tightening did not end successfully. As regards the other successful consolidations, four were implemented in the first half of the 1990s and three in the 1980s.[17]

If the percentage reduction in the public debt/GDP ratio were measured with respect to the last year of the adjustment, two plans would no longer be successful: Austria 1996-97 and Denmark 1983-86. The exclusion of the latter consolidation clearly shows the inappropriateness of a definition of success based on the value of the debt in the last year of the tightening. The stabilisation plan implemented by Danish authorities in the four years from 1983 to 1986 obtained a noteworthy improvement in both the structural budget and public debt.[18] Public liabilities were reduced from over 70 percent in 1983 (73.4) to less than 60 percent in 1987 (59.6): the change in the debt dynamics was so rapid that the value of the debt/GDP ratio in the last year of the adjustment (63.7) was seven points below the average over the whole period (71.1). The three-year after improvement computed with respect to the last year would then be a modest 4.7 percent, while the "average" improvement is a brilliant 14.6 percent.

Using an absolute criterion instead of a relative one would not change the results if the improvement required to classify as a success were set to four points of GDP; however a five percent threshold would exclude the Austrian - by few basis points - and the Dutch adjustments. Note that a definition based on an improvement of four percentage points is more (less) stringent than a relative 5% when the debt/GDP ratio is below (above) 80 percent, whereas a five percentage points criterion is more (less) stringent than Definition 2 when the debt/GDP ratio is below (above) 100 percent. Table 6 displays the magnitude and the composition of the 49 fiscal consolidations divided into successful and unsuccessful policies. The great difference between the two groups of adjustments is immediately clear. Although the magnitudes were identical (a reduction in the structural primary balance of about 1.9 percent of GDP), the tightenings that satisfy Definition 2 were implemented with broad-based spending cuts (1.4 percent) and a much smaller increase in taxation (0.4 percent); however unsuccessful consolidations were based mainly on robust tax increases (1.9

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[17] In the six successful consolidations for which a period of more than three years has already elapsed, no other fiscal adjustments have been implemented since the relevant discretionary action; hence, the reduction in the public debt/GDP ratio is fully attributable to the selected stabilisation programmes.

[18] See Giavazzi and Pagano (1990) for an extensive analysis of this large fiscal consolidation.

percent), leaving the expenditures side of the budget almost untouched. The lengths of the two sets of tightening programmes also differed significantly: on average, successful adjustments lasted 2.7 years, while unsuccessful consolidations were implemented over a much smaller time period, 1.6 years. Among the 12 successful cases there were 6 adjustments of more than 2 years (exactly 50 percent of the total) whereas just one was implemented in a single year (8 percent). By contrast, only 4 out of the 37 unsuccessful consolidations (11 percent) lasted more than two years, the majority being implemented in one year (54 percent). Thus, there seems to exist strong evidence in favour of a positive correlation between the length of the adjustment and the probability of achieving a fiscal success.[19] It is important to emphasise that, since the identification criteria implemented in previous works only examine a fixed two-year scenario, the analysis of the length of fiscal episodes has been neglected in the literature until now.

To compare the role of duration, size and composition of the 49 fiscal consolidations, a Probit specification model is estimated. The goal of this econometric investigation is to predict the probability that the debt/GDP ratio will decline by at least 5 percent within three years, conditional on the information about the characteristics of the contraction. This is a binary outcome problem, the dependent variable assuming only two values: 1, when the fiscal episode is successful; 0, otherwise. The three relevant characteristics that might influence the probability of success are: the length of the adjustment, *DURATION*, the total improvement in the cyclically adjusted primary balance, *SIZE*, and the relative weight of the expenditures cut measured as a percentage of the overall budget improvement, *COMPOSITION*.

Table 7 displays the results of two Probit specifications. In the first estimation the roles of the three independent variables are evaluated jointly. From the *T-Ratios* it is possible to verify that *SIZE* is not significant, while the other two variables are both significant, *COMPOSITION* performing better than *DURATION*. In the second estimation *SIZE* is omitted. Both the goodness of fit and the value of the Pseudo-R-squared remain unchanged, suggesting the irrelevance of the dimension of the adjustment in determining the probability of

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[19] The difference in the average length of consolidation programmes has been also tested via an *F-test* and a *T-test*, leading to the rejection of the null hypothesis of mean equivalence with an astonishing 1‰ degree of significance.

fiscal success. On the other hand, *DURATION* and *COMPOSITION* are highly significant and their coefficients do not differ substantially from those in the first Probit specification. How these two characteristics independently influence the success of an adjustment is computed in Table 8.

Reading the table by columns shows how an increase in the length of the adjustment influences the probability of success, for any given composition of the contraction. For example, looking at the last column one can see that the probability of implementing a successful consolidation increases from 5 percent to over 40 percent when its length increases from 1 to 4 years. This implies that, for any reduction in the CPB, even if the average yearly effort is smaller, the probability of reaching a fiscal success will be much greater for longer-period adjustments.

Reading the table by rows shows how the probability of success changes as the relative weight of the reduction in public expenditures increases. Looking at the last row, one can see that the probability of reaching a success is more than doubled when shifting from a taxation-based adjustment (40 percent of the contraction achieved by expenditure cuts and 60 percent by tax increases) to one based fully on public expenditure cuts.

The findings of the empirical investigations proposed in this section provide enough evidence to try to answer the first question posed at the beginning of this section concerning the characteristics that make a fiscal stabilisation successful. First, the striking difference in the composition of the two sets of adjustments induce the conclusion that fiscal consolidations that concentrate on the expenditure side are more likely to achieve a long-lasting reduction in the public debt/GDP ratio than tax-based adjustments. Second, the statistical evidence seems to suggest that the length of a stabilisation plan might be more important than its magnitude in determining the outcome of an adjustment. Even for plans of equal magnitude, the longer the duration of a plan, the more likely it is to succeed in reducing the debt ratio. Third, in contrast with the findings of McDermott and Wescott (1996), there is no evidence of a possible positive correlation between the magnitude of a fiscal effort and its likelihood of achieving a significant improvement in government finances.

Alternatively, the relationship between the characteristics of successful adjustments and the reduction in public debt can be interpreted in terms of the soundness of the government in

charge. Indeed, it might be possible that those policy-makers that have the strength, technical expertise and political support to tackle the problem of growing public finance unbalances choose to implement fiscal contractions based on large reductions in public spending. By contrast, it might be easier for cabinets that lack strength to rely on tax increases to temporarily face the problem. If this were the case, the success of stabilisation programmes would directly reflect a government's ability to use the right policy-making instruments.

4. Macroeconomic consequences of fiscal consolidations

In the previous section the effectiveness of European fiscal consolidations has been measured through the induced changes in government indebtedness, thus making "effectiveness" coincide with "fiscal successfulness". A second way of assessing the effectiveness of a stabilisation plan consists in evaluating its macroeconomic impact by comparing the values of a series of economic performance indicators before, during and after the adjustment. Since both procedures are necessary for a complete understanding of the consequences of government tightening programmes, the next step of the analysis is to investigate the macroeconomic consequences of the 49 fiscal episodes already isolated.

Table 9 follows 10 macroeconomic variables for the full set of significant consolidations, reporting their average values during the whole fiscal episode, during the two years before the beginning of the tightening, and during the two years following the last year of the adjustment.[20] The fourth and fifth columns of the table compute the differences between the periods "during" and "before" and the periods "after" and "before", respectively.

A first look at the data reveals that the immediate impact of tight fiscal policies is very close to the situation described by standard Keynesian theory concerning a cut in government purchases or an increase in taxation. From the difference between the periods "during" and

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[20] In Table 9, 10 and 11: GDP is the gross domestic product real change on preceding year; Consumption is the private consumption real change on preceding year; Investment is the gross fixed capital formation real change on preceding year; Unemployment is the number of unemployed as a percentage of the civilian labour force; Current Transactions is the balance on current transactions with the rest of the world as a percentage of GDP; Inflation is the consumer prices general index percentage change on preceding year; Interest Rates (ST) and (LT) are the short-term and long-term interest rates, respectively; Exchange Rate is the nominal effective exchange rate percentage change on preceding year; ULC is the total economy nominal unit labour cost percentage change on preceding year. Sources: European Commission (1998a and 1998b).

"after", it emerges that the rate of GDP growth falls by close to half a point, the change in private consumption is negative and large as well, the unemployment ratio grows by more than 1 point, and interest rates decline. The major indications coming from the simple IS-LM model are fully satisfied. The robust increase in investment is also consistent with the Keynesian scheme: it is due to the *crowding-in* effect brought about by a reduction in public spending.

Furthermore, referring to the standard AD-AS model with variable prices and to the open economy Mundell-Fleming model with variable exchange rates, a neat correspondence to the theoretical tenets of Keynesian theory emerges again. During the adjustments there is a nominal devaluation of the domestic currency and consequently, an improvement in the current account balance and a marked decline in the inflation rate.

Yet, looking at the period immediately following the adjustments, it is possible to verify that while several variables maintain the same sign as in the previous period, others change sign and invert their trend. In particular, both GDP and consumption grow at a faster rate in the two-year period after the consolidation than in the period before the tightening, and the rate of growth of investment is too robust to be attributed to the *crowding-in* effect only. Since the evidence from Table 9 is not conclusive, the same 10 macroeconomic variables are reported separately for the two sets of successful and unsuccessful consolidations.

Table 10 reports the series of economic performance indicators for the successful policies, while Table 11 does the same for the unsuccessful cases. The difference in the behaviour of the economy during and after the two sets of adjustments is striking. During successful consolidations the rate of growth of GDP is 0.86 points higher than before the adjustment and the difference increases to 1.01 points in the two-year period after the stabilisation plan. During unsuccessful episodes the rate of growth of the economy decreases by almost a point, and it returns to the previous level only two years later. Private consumption follows a pattern similar to that of GDP in successful consolidations, but in unsuccessful cases, the scenario worsens: even in the immediate aftermath of the adjustment the rate of growth of private spending fails to return to the pre-existing level.

Private investment shows a true *boom* in successful cases: the rate of growth averages over 5 points both during the adjustment period and also in its the immediate aftermath. If

one considers a mean value of 2.7 years for the length of successful episodes, then the cumulative growth rate over the two periods "during" and "after" is about 26 percent. Conversely, during the implementation of unsuccessful policies investment shrinks and the cumulative growth rate is only 2 percent. The inflation rate does not behave differently in successful and unsuccessful cases: it decreases significantly in both.

The unemployment ratio also performs differently in the two sets of policies. During the consolidation period unemployment grows significantly in both cases, but after successful programmes, unemployment is lower than "before", and after unsuccessful adjustments, it increases even further.

Very interesting observations also emerge from the international relations indicators. As tables 9 and 10 show, both types of adjustments were preceded by substantial nominal depreciations of about the same magnitude. This observation, in conjunction with the reported similarity in the levels of both long-run and short-run interest rates in the two years preceding the fiscal tightening, might suggest that the stance of monetary policy alone is not a crucial factor in determining the success of a stabilisation plan. However, during and after successful cases the nominal exchange rate reverses its trend, and displays a small but significant appreciation, but in unsuccessful adjustments the nominal depreciation persists both during and after the stabilisation plan. In spite of the different behaviour of exchange rates and unit labour costs, the balance on current transaction shows a sizeable improvement in both cases: it switches to a surplus after successful consolidations but it improves the most after unsuccessful policies.

A final consideration concerns the behaviour of interest rates. Short-term interest rates are stable during unsuccessful policies but they decline greatly (2.5 percent) during successful consolidations. In the two-year period after the adjustments, though there is a significant reduction (1.3 percent) in unsuccessful cases, there is once again a bias in favour of successful plans, which strikingly reduce interest rates by almost 5 percentage points. Though the trend in interest rates is not dissimilar in the two sets of stabilisation plans, the reported reduction might depend on different circumstances: improved financial confidence and reduced risk-premia might lead to the decrease in successful consolidations, while weaker economic growth might cause the reduction in unsuccessful cases.

Although the statistical evidence gathered is very neat, particular attention must be paid when drawing the relevant conclusions, because of the broad volatility registered in the sample. However, the difference in the economic impact of stabilisation plans is indeed striking. During unsuccessful adjustments the macroeconomic context deeply deteriorates and only after two years the economy shows a partial recovery. In this kind of consolidation Keynesian effects prevail: budget improvements are associated with poor economic performance. On the other hand, the adjustments that achieve a sizeable improvement in government finances tend to be associated with better economic performance. During and after these consolidations higher consumption and investment boost aggregate demand and GDP growth.

The framework described above is fully consistent with the *expectation view* theory. Only those policies that are deemed credible by the private sector are able to modify the consumers' budget constraint. When a fiscal stabilisation is implemented over a relatively long period and relies mainly on spending cuts, leaving the tax side of the balance sheet unaffected, it creates a positive wealth effect: consumers perceive that their future resources are permanently increased and adjust their optimal consumption path to the higher level of permanent income. In addition, the regained credibility of the public sector allows a reduction in the risk-premia paid on government bonds, leading to an overall saving on debt servicing and to a further decrease in the present and future need for funding. Moreover, the consequent generalised reduction in interest rates boosts private investment; this effect might be even stronger than the wealth effect on consumption in raising aggregate demand.

The affirmation that successful consolidations are on average expansionary might cast doubt about the causality of the relationship between fiscal policy and economic growth. Indeed, it could be possible that successful plans are such because a positive business environment facilitates a reduction in public liabilities. In order to disentangle the various channels through which fiscal consolidations and economic growth mutually influence each other, the next section reports some stylised facts that emerge from the analysis of the period immediately preceding the implementation of successful and unsuccessful policies.

5. Fiscal consolidations and *ex-ante* conditions

Two possible factors may influence, though in different ways, the proper identification of successful stabilisation plans: the pace of economic growth and the condition of government liabilities. In this section I try to investigate whether these factors are binding for the present analysis.

Economic growth affects public finances in two major ways: first, a higher pace of growth implies larger revenues from taxation and reduced disbursements for social security; second, the ratios of public debt and deficit to GDP are reduced by the larger value of the denominator. Thus, even if authorities do not implement any discretionary adjustment, in a period of increasing growth, the ratio of public liabilities to GDP may automatically be reduced in the two above-mentioned ways. On the other hand, the empirical results of the preceding section show that only a particular type of adjustment appears to be followed by high growth, namely those consolidations that achieved long lasting improvement in the public debt/GDP ratio. It might be the case that in the three years after their implementation successful adjustments benefited from higher growth rates than those registered after other fiscal plans and in fact this larger GDP implied a lower level for the very index used to test their successfulness.

A first possible way to check the relationship between fiscal polices and economic performance is to use an index of success that does not depend on actual GDP. Note that in Section 3 the measure of public liabilities used to isolate successful adjustments (the ratio of current debt to current GDP) depended on the phase of the business cycle of the economy. A better measure would be obtained if the value of public debt during and after each adjustment could be divided by potential GDP. Unfortunately, this ratio is not directly available from any

of the major international organisations. However, given the availability of an output gap measure, it is possible to compute the desired index indirectly.[21]

The results obtained by computing, as in Definition 2, the percentage improvements in the government debt/structural GDP ratio with respect to the average value registered during each adjustment are reported in Table 12. There are 16 significant fiscal episodes that ended in a reduction of the cyclically-adjusted debt/GDP ratio. The 12 adjustments that brought about the larger reduction are exactly the successful consolidations isolated in Section 3. The table shows that from the 1986-87 Swedish fiscal contraction to the 1991 Dutch stabilisation plan, the improvement induced in public liabilities breaches the 5 percent threshold. Among the fiscal contractions that were labelled as successful by means of current measures, only the Greek adjustment implemented in the second half of the 1990s does not satisfy the required condition for cyclically-adjusted successfulness. However, although the Greek improvement in government finances has been measured on the basis of a two-year period only, instead of the usual three-year period because of the missing availability of debt projections for years after 2000, the value registered after 2 years is not far from 5 percent. There are four other adjustments that achieved an improvement in government finances, but, as in the case of non-structural variables, the reduction in the cyclically-adjusted index was significantly below the 5 percent threshold.

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[21] The measure of the output gap provided by the European Commission is the difference between actual and potential GDP divided by potential GDP. Then, defining Y_A the actual GDP, Y_P the potential GDP, D the public debt and OG the output gap, in any period the following relations must hold:

[1] $$OG = \frac{Y_A - Y_P}{Y_P};$$

[2] $$\frac{D}{Y_P} = \frac{D}{Y_A}\frac{Y_A}{Y_P}.$$

From [1] it is easy to get the ratio of actual to potential GDP:

[3] $$\frac{Y_A}{Y_P} = 1 + OG.$$

Then, the requested cyclically-corrected measure of public liabilities can be written as a function of available values only:

[4] $$\frac{D}{Y_P} = \frac{D}{Y_A}\left(1 + OG\right).$$

A second step in trying to isolate the effect of fiscal policies from the macroeconomic context is to look at the business cycle phase in the period immediately preceding the implementation of each fiscal plan. Given the presumption that only successful policy interventions are able to produce an acceleration in growth, there should be a relation of independence between the economic context before the adjustment and the success of the stabilisation. Thus, I would expect that in half of the cases the economy is in a boom phase and in the other half in a slump. Defining the first year of the adjustment implementation as t, Table 13 reports the economic phase in year t and in t-1, the year preceding each successful fiscal contraction.

The cyclical phase in either of the two year is measured by the sign of the first difference of the output gap. A "minus" indicates that the gap between actual and potential GDP is decreasing if positive and increasing in absolute value if negative, thus attesting that the economy is on a downward trend; a "plus" denotes the opposite, hence an upward trend. The table shows that there are five cases (Austria, Belgium, Ireland, Netherlands and Portugal) in which both signs are minus: a clear phase of recession. On the other hand, there are four adjustments (Denmark, Italy and Sweden in the 1980s and the UK) that were implemented after at least two years of high growth. Finally, there are 3 cases of alternate signs: in two the business phase moved from a recession to an expansion and in one the opposite took place. Hence, the statistical evidence shows six periods in which the economy witnessed growth close to or above average and six episodes in which the cyclical outlook was the opposite.

Summarising, on the one hand the use of a measure of public liabilities that is independent of the business cycle shows that the consolidations labelled as successful are such not because of a higher rate of growth; on the other hand, the analysis of the cyclical phase indicates that half of the successful consolidations were implemented after a period of low growth while the other half after a period of high growth, suggesting again the independence of fiscal results from the economic outlook. Thus, although the procedure of cyclical adjustment might not be perfect due to the fact that only the denominator of the ratio has been corrected and the analysis of the business phase in the period immediately before the implementation of fiscal contractions is only indicative, it is possible to maintain the previously stated conclusion that the characteristics of successful adjustments (composition,

persistence, and size) are essential in determining the positive economic performance reported in the immediate aftermath of stabilisation plans.

The second factor that might influence the success of a fiscal contraction is the condition of government liabilities before the implementation of the adjustment. As mentioned in the second section, when fiscal stabilisations are infrequent in time but robust once implemented, the private sector's expectation that a large fiscal restriction may soon occur is stronger in the presence of high public debt/GDP ratios or when budget deficits have been rapidly growing (Bertola and Drazen, 1993; Sutherland, 1997). If a credible fiscal contraction is then implemented, it is easier for consumers to suppose that the future tax burden will be lower and consequently they adjust the level of present and future consumption to the higher permanent income. This in turn boosts aggregate demand and output growth.

Table 14 shows the condition of government finances, through several indicators of "fiscal stress", for successful and unsuccessful policies. The average values of public debt, change in public debt and actual budget balance are reported for the two years preceding the tightening plans and for the whole period of adjustment. The differences in the two sets of fiscal contractions are again remarkable. Before successful policies the level of public debt was almost two times larger than that reported before unsuccessful consolidations, 81.4 and 48.4 percent relative to GDP respectively. Furthermore, the public debt increased at a much faster rate: 3.7 points a year versus the 2.8 points in unsuccessful cases. Also the budget deficit was in a much worse position: before successful episodes it was over 7 percentage points of GDP, while it was just below 5 percent before unsuccessful adjustments.

Things changed dramatically during the implementation of the fiscal episodes. Although the level of public debt was higher during than before successful policies, the average change over the period of adjustment was negative, meaning that public liabilities already started to decline. On the other hand, during unsuccessful episodes the stock of public debt was higher in absolute value and the rate of growth accelerated. Also the actual deficit behaved differently in the two sets of policies: while it is improved substantially (almost 3 percent of GDP) during successful consolidations it did not show a relevant change during unsuccessful plans.

The possibility of a non-linear relationship between public indebtedness and fiscal successfulness is not ruled out by the evidence gathered from the sample of European consolidations. On the contrary, it is possible to favour the hypothesis that the worse the government liabilities, the more likely a tightening program is to succeed.

6. Conclusion

The experience of European fiscal policy shows that in the last three decades only 12 stabilisation plans out of 49 induced a significant reduction in government liabilities. Moreover, the large majority of tightening programmes caused deteriorating economic performance. However, the economy's reaction to fiscal contractions differed greatly over time. Although the stabilisation of the debt/GDP ratio might not have been the direct target of discretionary adjustments implemented in the 1970s, given the relatively low level of public debt, none of the consolidations implemented in those years were successful. In the 1980s only three adjustments achieved the double result of reducing public unbalances and stimulating aggregate demand: for a while they represented more an economic *curiosum* than the statistical evidence of possible non-Keynesian effects of the fiscal policy. Things changed in the 1990s: pushed by the need to comply with the Maastricht criteria for fiscal soundness, several countries succeeded in bringing debt on a downward path without dampening economic growth. From 1990 to 1998 twenty adjustments were implemented, nine of which were successful. In the second half of the decade, the ratio of successful consolidations is even higher: seven plans out of eight achieved a permanent reduction in government liabilities. However, it should be noted that these successful plans were often accompanied by *una tantum* measures devised to assure the achievement of the fiscal target. Furthermore, the possibility that in the future many countries might need to implement strong fiscal contractions at the same time might undermine the triggering of the virtuous process, due to negative spillover effects.[22]

The most important conclusion to be drawn from the analysis presented in this paper is that successful adjustments are, on the whole, not recessionary: during and in the immediate

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[22] See Buti, Franco and Ongena (1997) and Eichengreen and Wyplosz (1998) for possible perverse implications of the application of the "Stability and Growth Pact".

aftermath of their implementation the country's economic performance on average improves. This in turn implies that the very characteristics of successful consolidations are relevant in influencing the likelihood of an expansion. The statistical evidence gathered from a comparative analysis of the modalities of implementation of 49 significant fiscal episodes shows neatly that the main factors contributing to the occurrence of a success are the composition and the persistence of the adjustment. In fact, only those consolidations that were mainly based on the expenditures side of the budget were able to achieve a long-lasting reduction of public liabilities. In particular, in the 12 successful episodes, almost 80 percent of the overall reduction in the structural primary deficit was brought about by a reduction in public expenditures. On the other hand, unsuccessful episodes relied almost entirely on the tax side: 98 percent of the budget improvement is attributable to a tax increase, while only a mere 2 percent is due to an expenditures reduction. This finding supports the Alesina and Perotti (1997a) view that "how" to cut a deficit matters in determining a stabilisation plan's success.

The second single most important characteristic of successful adjustments is the length of their duration. On average successful consolidations last significantly more than others: they are implemented over a period of close to three years, while unsuccessful episodes last only one year and a half. Almost two thirds of the fiscal contractions implemented over three years or more were successful, but only one consolidation out of 20 implemented in a single year ended in success. The evidence of a positive correlation between the length and success of tightening programmes is new in the literature: the analysis of consolidation plans previously focused only on the size and composition of the adjustments. This was mainly due to the very mechanics of the selection procedures that were used. Typically, previous identification criteria only allowed for the selection of episodes lasting one or two years. Moreover, these episodes often turned out to be consecutive or even overlapping. Hence, the length of fiscal plans was arbitrarily limited and their number altered. On the contrary, given the absence of temporal constraints, the selection procedure introduced here is able to identify the correct length of each fiscal episode.

As for the magnitude of the adjustments, it emerges that the size of the fiscal contraction is not different in successful and unsuccessful episodes: although only slightly, the reduction in the primary deficit is even greater in unsuccessful cases. This evidence is confirmed by the Probit specification: the magnitude of fiscal adjustments does not influence

the probability of achieving a significative reduction in the debt ratio. Given the positive correlation between successful and expansionary episodes, the finding is in contrast with the positive relationship between the magnitude of the adjustment and the macroeconomic performance first suggested by Giavazzi and Pagano (1990) and later confirmed by McDermott and Wescott (1996). Yet, the statistical evidence that emerges from the European experience seems to support the "expectation view of fiscal policy": adjustments with the above-mentioned characteristics are able to "signal" a serious commitment on the part of the authorities towards a reduction of public liabilities. This reduction in turn implies that the intertemporal budget constraint of both the private and public sector is affected. Given the reduced public expenditures, government is expected to lower future taxation: the private sector senses a positive wealth effect and adjusts present and future consumption to the higher level of permanent income. Furthermore, the regained credibility of the policy-maker allows a reduction in interest rates, thus easing public borrowing and stimulating private investment.

A final word refers to the economic and fiscal context in the period immediately preceding the adjustments. Though the evidence is only partial, there is no clear sign of a relationship between the economic growth environment and the reduction in public liabilities. Moreover, even using a measure that takes into account the cyclical correction of the denominator of debt ratio, the results of the comparative analysis are the same. This lends further support to the hypothesis that it is the change in the fiscal stance that triggers the improvement in the macroeconomic performance.

A significant difference emerges instead from the indicators of a country's "fiscal stress". Before the implementation of successful episodes the condition of public liabilities is much worse than before unsuccessful cases: debt is over 30 points larger on average and accumulating at a faster rate and the actual budget deficit is more than 2 points bigger. This difference suggests the possibility of different responses of the economy to changes in government expenditures and revenues: in agreement with the models of Sutherland (1997) and Perotti (1999), when fiscal unbalances seem not to be out of government control ("good times" in Perotti's words) Keynesian effects prevail, while in times of high levels of indebtedness ("bad times") non-Keynesian effects take place.

Table 1

GOVERNMENT EXPENDITURES AND REVENUES IN THE EU
(in percent of GDP)

	1970	1980	1990	1998
Current Receipts	36.2	42.9	46.5	47.6
of which:				
Direct Taxes	11.2	13.6	15.2	15.7
Indirect Taxes	13.5	13.4	14.2	14.7
S.S. Contributions	8.6	12.1	13.0	13.3
Total Expenditures	35.4	48.2	49.0	48.8
Current Transfers	13.8	20.1	21.4	22.7
of which:				
to Households	11.2	16.3	17.8	19.2
Interest Payment	1.8	3.4	4.9	4.8

Source: European Commission.

Table 2

SUBDIVISION FROM NORMAL DISTRIBUTION

Interval	Value	Probability	Cumulative Probability
$(-\infty, \mu-\sigma)$	$(-\infty, -1.44)$	0.18	0.18
$(\mu-\sigma; \mu-\sigma/2)$	$(-1.44, -0.69)$	0.13	0.31
$(\mu-\sigma/2, \mu)$	$(-0.69, 0.07)$	0.19	0.50
$(\mu, \mu+\sigma/2)$	$(0.07, 0.83)$	0.19	0.69
$(\mu+\sigma/2, \mu+\sigma)$	$(0.83, 1.58)$	0.13	0.82
$(\mu+\sigma\backslash, +\infty)$	$(1.58, +\infty)$	0.18	1.00

Table 3

SIGNIFICANT FISCAL EPISODES IN THE EU
(1970-1998)

	Loose Policies	Tight Policies
Austria	1975-76 (3.2); 1982-83 (2.1); 1993-94 (2.4).	1977-78 (2.3); 1984 (2.6); 1992 (1.7); 1996-97 (3.4).
Belgium	1971-72 (2.5); 1976 (2.0); 1980 (2.2).	1982 (3.5); 1984-85 (3.9); 1993-94 (3.1).
Denmark	1972 (1.6); 1975-76 (3.7); 1982 (2.1);1988-90 (3.1); 1994 (1.8).	1983-86 (10.8).
Finland	1972 (2.4); 1978-79 (4.5); 1982-83 (3.0);1987 (3.5).	1975-76 (6.0); 1981 (1.9); 1984 (1.9); 1993 (1.7).
France	1978 (1.4); 1981-82 (2.1).	1979-80 (2.2); 1983-84 (1.8); 1995-97 (2.9).
Germany	1974-75 (3.1); 1990-91 (5.4).	1976-77 (1.8); 1982-83 (3.4); 1989 (1.6); 1992-93 (2.4).
Greece	1981(5.1); 1984-85 (3.3); 1988-89 (6.1).	1982 (2.9); 1986-87 (3.0); 1991(4.1); 1993-94 (4.6); 1996-98 (5.7).
Ireland	1974-75 (7.0); 1977-80 (5.5); 1990 (1.8).	1976 (6.1); 1982-84 (6.9); 1986-89 (7.4).
Italy	1972 (1.6); 1975 (1.4); 1978-79 (1.7).	1976-77 (3.4); 1982-83 (3.3); 1991-93 (6.2); 1995-97 (4.9).
Netherlands	1978-79 (2.3); 1986 (1.9); 1989-90 (3.5).	1977 (2.0); 1981-83 (4.2); 1991 (2.6); 1993 (2.2).
Portugal	1972-74 (4.7); 1976 (2.3); 1987 (1.5); 1990-91 (2.2); 1993 (2.9).	1982 (2.6); 1984 (6.4); 1992 (2.5); 1994-95 (1.8).
Spain	1974 (1.6); 1988 (1.6); 1990 (1.8).	1986-87 (2.1); 1992 (1.9); 1996-97 (3.5).
Sweden	1973-74 (3.8); 1978-79 (5.8); 1988 (2.2); 1990-93 (9.5).	1971 (2.3); 1976 (2.4); 1983 (2.5); 1986-87 (4.2); 1994-96 (7.3).
UK	1971-73 (8.6); 1978 (2.2); 1983-84 (2.5);1986-87 (2.0); 1990 (1.6); 1992-93 (3.6).	1980-81 (5.1); 1995-98 (6.2).

Variation of primary structural balance in parentheses.

Source: Elaboration on European Commission data.

Table 4

CHANGES IN CYCLICALLY-ADJUSTED FISCAL VARIABLES
(in percent of GDP)

	Observations	Expenditures	Revenues	CPB
Full Sample	381	0.35	0.42	0.07
		(1.624)	(1.643)	(1.513)
Loose Policies	82	1.28	-0.53	-1.81
		(1.546)	(1.577)	(0.940)
Tight Policies	92	-0.52	1.36	1.88
		(1.552)	(1.552)	(1.202)

Standard deviations in parentheses.

Source: Elaboration on European Commission data.

Table 5

SUCCESSFUL FISCAL EPISODES
(public debt/GDP ratios)

		Episode Average	Three Years after[1]	Percentage Reduction
Austria	1996-97	67.8	62.9	7.2
Belgium	1993-94	134.4	121.9	9.3
Denmark	1983-86	71.1	60.7	14.6
Greece	1996-98	110.1	102.9	6.5
Ireland	1986-89	110.3	92.3	16.3
Italy	1995-97	123.3	111.4	9.7
Netherlands	1993	81.2	77.1	5.0
Portugal	1994-95	64.9	57.8	10.9
Spain	1996-97	69.6	63.8	8.3
Sweden	1986-87	59.9	43.5	27.4
Sweden	1994-96	77.8	63.6	18.3
UK	1995-98	54.0	48.8	9.6

1) Two years after for Greece and UK.

Source: European Commission.

Table 6

FISCAL CONSOLIDATIONS
(in percent of GDP)

	Observations	Expenditures	Revenues	CPB
Successful Adjustments	32	-1.44 (1.187)	0.43 (1.327)	1.86 (1.054)
Unsuccessful Adjustments	59	-0.04 (1.350)	1.87 (1.461)	1.90 (1.185)

Standard deviation in parentheses

Source: Elaboration on European Commission data.

Table 7

PROBIT SPECIFICATIONS

```
                 PROBIT MAXIMUM LIKELIHOOD ESTIMATION (I)

*******************************************************************************
   Dependent variable is SUCCESS
   49 observations used for estimation from 1 to 49

*******************************************************************************
   Regressor           Coefficient       Standard Error      T-Ratio[Prob]
   CONSTANT             -2.84190              0.78925         -3.6007[.001]
   DURATION              0.74172              0.41894          1.7704[.083]
   SIZE                  0.00269              0.16938          0.0159[.987]
   COMPOSITION           0.01839              0.00707          2.6005[.013]

*******************************************************************************
   Factor for the calculation of marginal effects =  0.20704
   Maximized value of the log-likelihood function = -15.3452
   Goodness of fit  = 0.89796
   Pseudo-R-Squared = 0.43742

*******************************************************************************
                 PROBIT MAXIMUM LIKELIHOOD ESTIMATION (II)

*******************************************************************************
   Dependent variable is SUCCESS
   49 observations used for estimation from 1 to 49

*******************************************************************************
   Regressor           Coefficient       Standard Error      T-Ratio[Prob]
   CONSTANT             -2.84130              0.78874         -3.6023[.001]
   DURATION              0.74598              0.31839          2.3430[.024]
   COMPOSITION           0.01842              0.00699          2.6336[.011]

*******************************************************************************
   Factor for the calculation of marginal effects =  0.20686
   Maximized value of the log-likelihood function = -15.3453
   Goodness of fit  =  0.89796
   Pseudo-R-Squared =  0.43741

*******************************************************************************
```

Table 8

PROBABILITY OF SUCCESSFUL FISCAL CONSOLIDATION
(reduction in public expenditures)

Years	40%	60%	80%	100%
1	0	0	0	5.2
2	0	0	2.6	10.2
3	0	10.4	18.0	25.6
4	18.2	25.8	33.4	41.0

Table 9

MACROECONOMIC EFFECTS OF FISCAL CONSOLIDATIONS

	Before	During	After	Difference	
	(A)	(B)	(C)	(B-A)	(C-A)
Gross Domestic Product	2.23 (2.233)	1.81 (1.783)	2.50 (1.815)	-0.42	0.27
Private Consumption	2.28 (2.248)	1.72 (2.217)	2.30 (2.010)	-0.56	0.02
Investment	-0.01 (3.849)	0.95 (3.347)	2.61 (2.913)	0.96	2.62
Unemployment Rate	7.39 (4.967)	8.73 (4.513)	8.44 (4.475)	1.34	1.05
Balance on Current Transactions	-1.80 (3.377)	-0.97 (2.974)	-0.34 (2.615)	0.83	1.46
Inflation Rate	9.34 (2.967)	7.74 (2.638)	6.53 (3.293)	-1.60	-2.81
Short-Term Interest Rate	12.04 (2.561)	11.03 (2.726)	9.87 (2.794)	-1.01	-2.17
Long-Term Interest Rate	11.46 (3.504)	10.63 (3.239)	9.82 (3.832)	-0.83	-1.64
Nominal Effective Exchange Rate	-2.39 (2.790)	-1.16 (3.243)	-1.31 (3.509)	-	-
Unit Labour Cost	-0.62 (3.062)	1.03 (3.605)	-0.01 (3.483)	-	-

Standard deviations in parentheses.

Source: European Commission.

Legend: GDP is the gross domestic product real change on preceding year; Consumption is the private consumption real change on preceding year; Investment is the gross fixed capital formation real change on preceding year; Unemployment is the number of unemployed as percentage of civilian labour force; Current Transactions is the balance on current transactions with the rest of the world as percentage of GDP; Inflation is the consumer prices general index percentage change on preceding year; Interest Rates (ST) and (LT) are the short-term and long-term interest rates, respectively; Exchange Rate is the nominal effective exchange rate percentage change on preceding year; ULC is the total economy nominal unit labour cost percentage change on preceding year.

Table 10

MACROECONOMIC EFFECTS OF SUCCESSFUL FISCAL POLICIES

	Before	During	After	Difference	
	(A)	(B)	(C)	(B-A)	(C-A)
Gross Domestic Product	1.74 (1.677)	2.60 (1.455)	2.75 (1.480)	0.86	1.01
Private Consumption	1.43 (2.097)	2.33 (1.480)	2.16 (0.743)	0.90	0.73
Investment	-1.13 (3.592)	4.49 (3.335)	4.41 (2.578)	5.62	5.54
Unemployment Rate	9.20 (4.521)	9.82 (4.649)	8.64 (4.263)	0.62	-0.56
Balance on Current Transactions	-1.11 (2.287)	-0.50 (2.504)	0.23 (2.895)	0.61	1.34
Inflation Rate	5.79 (2.838)	3.87 (1.739)	2.89 (1.959)	-1.92	-2.90
Short-Term Interest Rate	11.25 (2.476)	8.80 (2.735)	6.49 (2.778)	-2.45	-4.76
Long-Term Interest Rate	11.04 (3.616)	9.29 (2.437)	7.18 (2.297)	-1.75	-3.86
Nominal Effective Exchange Rate	-2.74 (2.658)	0.68 (3.957)	0.38 (2.347)	-	-
Unit Labour Cost	-1.75 (3.842)	1.90 (3.903)	0.56 (3.373)	-	-

Standard deviations in parentheses.

Source: European Commission.

Legend: GDP is the gross domestic product real change on preceding year; Consumption is the private consumption real change on preceding year; Investment is the gross fixed capital formation real change on preceding year; Unemployment is the number of unemployed as percentage of civilian labour force; Current Transactions is the balance on current transactions with the rest of the world as percentage of GDP; Inflation is the consumer prices general index percentage change on preceding year; Interest Rates (ST) and (LT) are the short-term and long-term interest rates, respectively; Exchange Rate is the nominal effective exchange rate percentage change on preceding year; ULC is the total economy nominal unit labour cost percentage change on preceding year.

Table 11

MACROECONOMIC EFFECTS OF UNSUCCESSFUL FISCAL POLICIES

	Before	During	After	Difference	
	(A)	(B)	(C)	(B-A)	(C-A)
Gross Domestic Product	2.38 (2.360)	1.39 (1.799)	2.42 (1.902)	-0.99	0.04
Private Consumption	2.54 (2.229)	1.40 (2.463)	2.34 (2.266)	-1.14	-0.20
Investment	0.34 (3.557)	-0.95 (3.026)	2.04 (2.902)	-1.29	1.70
Unemployment Rate	6.81 (4.005)	8.15 (4.327)	8.38 (4.538)	1.34	1.57
Balance on Current Transactions	-2.01 (3.628)	-1.23 (2.168)	-0.52 (2.457)	0.78	1.49
Inflation Rate	10.46 (2.250)	9.81 (2.907)	7.68 (3.489)	-0.65	-2.78
Short-Term Interest Rate	12.31 (2.558)	12.26 (2.127)	11.00 (2.794)	-0.05	-1.31
Long-Term Interest Rate	11.60 (3.456)	11.41 (3.389)	10.73 (3.833)	-0.19	-0.87
Nominal Effective Exchange Rate	-2.27 (2.827)	-2.15 (3.623)	-1.85 (3.083)	-	-
Unit Labour Cost	-0.26 (3.743)	0.56 (3.906)	-0.19 (3.766)	-	-

Standard deviations in parentheses.

Source: European Commission.

Legend: GDP is the gross domestic product real change on preceding year; Consumption is the private consumption real change on preceding year; Investment is the gross fixed capital formation real change on preceding year; Unemployment is the number of unemployed as percentage of civilian labour force; Current Transactions is the balance on current transactions with the rest of the world as percentage of GDP; Inflation is the consumer prices general index percentage change on preceding year; Interest Rates (ST) and (LT) are the short-term and long-term interest rates, respectively; Exchange Rate is the nominal effective exchange rate percentage change on preceding year; ULC is the total economy nominal unit labour cost percentage change on preceding year.

Table 12

PUBLIC DEBT/CYCLICALLY-ADJUSTED GDP RATIOS
(percentage reduction)

Sweden	1986-87	25.5	Spain	1996-97	6.7
Denmark	1983-86	18.2	Austria	1996-97	6.3
Ireland	1986-89	16.4	Netherlands	1993	5.0
Sweden	1994-96	9.9	Greece	1996-98	4.1
Portugal	1994-95	9.6	Netherlands	1991	3.2
Italy	1995-97	9.1	Sweden	1971	1.9
Belgium	1993-94	8.8	UK	1980-81	1.8
UK	1995-98	8.8	Greece	1993-94	0.1

Source: Elaboration on European Commission data.

Table 13

SUCCESSFUL POLICIES AND BUSINESS CYCLE

Fiscal Episode		t-1	t	Fiscal Episode		t-1	t
Austria	1996-97	-	-	Netherlands	1993	-	-
Belgium	1993-94	-	-	Portugal	1994-95	-	-
Denmark	1983-86	+	+	Spain	1996-97	+	-
Greece	1996-98	-	+	Sweden	1986-87	+	+
Ireland	1986-89	-	-	Sweden	1994-96	-	+
Italy	1995-97	+	+	UK	1995-98	+	+

Source: European Commission.

Table 14

FISCAL INDICATORS
(in percent of GDP)

	Successful Episodes		Unsuccessful Episodes	
	Before	During	Before	During
Public Debt	81.4	85.5	48.4	56.2
Change in Public Debt	3.7	-0.1	2.8	3.9
Actual Budget Balance	-7.1	-4.3	-4.9	-4.8

Source: European Commission.

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