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The Impact of different Fiscal Policy Regimes on Public Debt Dynamics

This paper investigates the impact of compositional effects on public debt dynamics. Our contribution to the literature is twofold. First, we improve the methodology by explicitly accounting for public debt dynamics. Second, we empirically analyze the impact of compositional effects of the government budget in different fiscal periods. On this basis, we can generalize previous findings that reductions in government expenditures lead to a persistent decline in debt ratios across all fiscal policy regimes. Whilst we also confirm that expenditure cuts are more important for debt reductions than revenue increases, our findings contrast the literature as we obtain persistent debt augmenting effects of tax reductions.

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THE IMPACT OF DIFFERENT FISCAL POLICY REGIMES ON PUBLIC DEBT DYNAMICS

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Introduction

In a seminal publication investigating the success of fiscal consolidations, Alberto Alesina and Roberto Perotti (1995) find – among other things – consolidation policies to be most successful when they entail a reduction of government expenditures. Policymakers, heavily engaged in consolidating government budgets in recent years, have evidently been readily inspired by this finding.

These days, however, very few governments manage to balance, let alone consolidate their budgets. US budgets are exploding due to the war on terrorism, and several European economies (such as Portugal, Germany, and France) have surpassed the budget deficit ceiling set by the Treaty on European Union. We therefore think the time is ripe to broaden the analysis to include other fiscal policy regimes, namely fiscal expansions, excessive deficits and budgets close to balance; some of which will, of course, be more detrimental than others for the sustainability of public finances. We keep our analysis focused on the impact different fiscal policies have on the dynamics of public debt. Whilst the impact on debt dynamics may not, as such, be the primary target fiscal policymakers seek to achieve, we do think it is an important question, for two reasons. First, a high debt burden after a fiscal expansion will constrain policy in the future. Second, within a monetary union such as the euro area a high level of public debt will be a drag on financial markets in the entire union. It may drive up interest rates, thus pushing up the cost of servicing public debt, and it may discourage private investment, thus producing a welfare cost for all members of the monetary union.

Our contribution to the literature is twofold. First, we improve the Alesina and Perotti (1995) methodology by explicitly accounting for public debt dynamics. Indeed, Alesina and Perotti (1995) neglect the fact that it is easier to reach low public debt to GDP ratios when economic growth rates exceed interest rates whereas it is more difficult to do so when economic growth rates fall short of interest rates. By explicitly accounting for debt dynamics, we provide a fairer analysis of periods of fiscal consolidation and expansion before and after 1980, when the interest–growth differential reversed[1]. Moreover, Alesina and Perotti (1995) compare debt in percent of GDP at the end of the consolidation period with the debt position three years later. This approach is equivalent to comparing the debt ratio at the beginning of the consolidation period with the debt position three years later as adjusted for budget deficits accrued in the consolidation period. By contrast, we suggest to start with debt at the beginning of the consolidation period but to control for the impact of initial public debt and the current primary balance. Our definition thus differs from Alesina and Perotti (1995) insofar as we take adequate account of snowball effects on initial public debt and primary balances.

The second contribution of our paper is that we empirically analyze the impact of compositional effects of the government budget in all fiscal periods, not only during consolidations. We find that we can generalize the findings of Alesina and Perotti (1995) and the subsequent literature on the expenditure side. Reductions in government expenditures, in particular in government wage consumption, will lead to a dampening of debt dynamics across all fiscal policy regimes, without significant structural differences among regimes. Whilst we confirm the result that expenditure cuts are more important for debt reductions than revenue increases, our findings contrast the literature as we obtain persistent debt augmenting effects of tax reductions, again consistently across all regimes.

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[1] Around 1980, the interest–growth differential reversed as interest rates climbed and productivity slowed down globally.

The paper proceeds as follows. By way of introduction, we discuss the related literature, explaining how we differ, and describe how we identify different fiscal regimes, notably fiscal consolidations, fiscal expansions, excessive deficits and budgets close to balance. We then use the intertemporal budget constraint to identify a sensible unbiased criterion for the evolution of debt ratios. Following a brief discussion of the data and methodology, we present our empirical findings, which include both the general regression paths and model hypothetical debt paths for those European Union countries that have been found to have excessive deficits. We summarize our findings in the conclusions.

1. Related literature

Alesina and Perotti's seminal publication on the "Fiscal Expansions and Adjustments in OECD countries" (1995) revealed a gap in the standard macroeconomic literature on fiscal policy, namely the relevance of budget composition – changes in which can, of course, be extremely important from a policymaker's perspective. Alesina and Perotti show that the composition of adjustment measures fundamentally determines whether improvements in the fiscal balance will be successful in the long term or only in the short term; more specifically, that a fiscal adjustment cannot have long-lasting effects unless it tackles public expenditures. Performing a cross-country analysis of fiscal adjustments in the industrial countries, Alesina and Perotti conclude that while permanently successful and temporarily successful adjustments, on average, cause the unemployment-adjusted deficit to drop by the same amount, adjustments that turn out to last rely mostly on expenditure cuts, in particular on large cuts of government wage consumption and of transfers, whereas adjustments that will be reversed with a short period of time rely primarily on tax increases. Alesina and Ardagna (1998) and McDermott and Wescott (1996) confirm this finding by concluding that adjustments that were implemented by cutting government transfers and public wages have been much more persistent than those achieved by increasing taxes.

Alesina et al. (1995, 1996) and Giavazzi and Pagano (1990) prepared the ground for a whole literature strand, mainly interested in the search for non-linear effects of fiscal policy. Alesina and Perotti (1997) shifted the focus by analyzing the macroeconomic consequences of fiscal adjustments in successful and unsuccessful cases, respectively. They assume that the composition of government measures influences the macroeconomic performance given that the successful tightening periods were associated with accelerating real output, a shrinking unemployment rate and improved international competitiveness. Successful fiscal contractions, moreover, coincided with investment booms whereas the growth rate of consumption, by contrast, did not seem to vary with different types of adjustment. From this evidence Alesina and Perotti (1997) conclude that a successful fiscal contraction may lead to an economic expansion by generating an investment boom rather than a consumption boom. McDermott and Wescott (1997) also emphasize the importance of the composition of fiscal consolidation. Whereas they study the relevance of the composition of fiscal adjustments for the success of a fiscal consolidation with a logit model for the OECD countries, Alesina and Ardagna (1998) in a rather similar approach use probit models to evaluate the success of a fiscal contraction.

The success of a fiscal adjustment is usually defined as the ability of a fiscal policy tightening today to achieve a lasting debt reduction at some future point in time. The focus of related subsequent studies is on whether fiscal consolidations can be good for growth and whether non-Keynesian effects of fiscal contractions exist. Non-Keynesian effects of fiscal policy are apparently more likely to occur during successful than during unsuccessful fiscal consolidations. Successful adjustments will produce future debt stabilization, which is why only those adjustments are likely to induce the positive wealth and expectational effects that can drive the non-Keynesian effects of fiscal adjustments. A permanent reduction in government wage consumption reduces the present discounted value of taxation, thus generating a positive wealth effect for the private sector. Under specific circumstances (if these actions are expected to be permanent), this may translate into higher private consumption at the time of the adjustment.

Based on sticky prices and given expectations about future investments, the standard Keynesian argument holds that fiscal adjustments have short-run contractionary effects. According to this view, fiscal consolidations (either a decrease in government expenditures or an increase in taxes) reduce aggregate demand and income via direct effects and have a multiplied negative impact on output via indirect effects. The traditional Keynesian view incorporates also the fact that consolidation periods go hand in hand with an increase in the debt ratio, because consolidation measures dampen growth. The fall in income works against the stabilization of the debt to GDP ratio in two ways: directly by reducing the denominator of the ratio, indirectly by triggering the automatic stabilizers, and thus adding to public debt. But as Giavazzi and

Pagano (1990) first suggested, the reverse might also occur - a drastic fiscal stabilization accompanied by a vigorous expansion, which helps to compress the debt to GDP ratio. The strand of empirical literature on non-Keynesian effects is based on theoretical work of Sutherland (1997), Blanchard (1985, 1990) and Bertola and Drazen (1993)) that draws the attention on other channels that could lead to results opposite to the Keynesian. In their models, non-linearities mainly arise from the influence of fiscal policy on private sector expectations, either through wealth effects (wealth rises when the future tax burden is expected to decline) or through credibility effects (when interest rates decline, credibility is restored and inflation or default risks abate). Both consumption and investment might rise. Zaghini (1999) labels this the "the expectational view of fiscal policy". Another view (supply side) developed in Alesina and Perotti (1997) and investigated also in Lane and Perotti (2003) emphasises the effects of adjustments on labour market institutions affecting labour costs. According to Alesina and Ardagna (1998), with respect to this channel three ingredients seem to be important for a successful, long-lasting and expansionary fiscal adjustment: spending cuts in transfers, welfare programmes and the governments wage bill; some form of wage agreement with the unions that ensures wage moderation; and a devaluation immediately before the fiscal tightening.

An overwhelming number of studies, such as Giavazzi and Pagano (1996), Perotti (1999), Zaghini (1999), Giavazzi, Japelli and Pagano (2000), van Aarle and Garretsen (2003), Hjelm (2002) – to name only a few – have looked at the empirical evidence of these non-Keynesian effects of fiscal policy. Hjelm (2003) finds that private consumption grows at a significantly lower rate in periods of fiscal contraction and at an (insignificantly) higher rate in periods of fiscal expansion than in non-contraction periods; and that neither the composition nor the size of fiscal contraction matters, nor the initial level of debt nor its growth rate. Conversely, van Aarle et al. (2002) find at best mixed evidence for the presence of non-linearities in the relation between fiscal adjustments and private spending.

Despite the growing body of literature, the profession has not yet reached a consensus on the effects of fiscal consolidation. This does not come as a surprise since the macroeconomic impact of fiscal policy continues to be a highly controversial issue among economists during "normal" times.

Whilst we cannot ascertain non-linear effects of fiscal policy for every single case, such as Denmark from 1983 to 1986 or Ireland from 1987 to 1989, we will investigate whether asymmetric effects are present on average, or whether specific consolidations systematically differ from other periods of fiscal policy.

The main purpose of our research, however, is to investigate the impact of each of the individual revenue and primary expenditure categories on debt dynamics, and to establish whether that impact differs with respect to the fiscal regime. Heylen and Everaert (2000) in using also a multivariate regression framework ask a rather similar question, however, for consolidations periods only. With their analysis they confirm some of the existing conclusions of the literature, but in sharp contrast to the mainstream reject the persistent impact of government wage cuts on the debt ratio.

2. Modelling the Fiscal Stance

The dynamic equation describing the evolution of public debt equals

$$B_t = (1 + i_t)B_{t-1} + P_t, \tag{1}$$

where i_t is the interest rate on public debt B_t, and P_t is the current primary deficit. Dividing both sides by GDP yields

$$b_t = \frac{1 + i_t}{1 + n_t} b_{t-1} + p_t, \tag{2}$$

where n_t is the nominal growth rate of GDP, small letters denote GDP shares, and we have corrected for nominal GDP growth n_t in existing debt. Our ambition is to establish how the debt dynamics are shaped by different periods of fiscal policy. In particular, we are interested in fiscal consolidations, fiscal expansions, excessive deficits, and budgets "close to balance or in surplus", which we must infer from the data. For excessive deficits, we may simply refer to the definition of the European Union, which defines an excessive deficit as a budget deficit d_t larger than 3%, or

$$d_t = b_t - \frac{1}{1+n_t} b_{t-1} = \frac{i_t}{1+n_t} b_{t-1} + p_t > 3\%^{2}, \quad (3)$$

where primary deficits are the difference between government social expenditures s_t, other government expenditures g_t, and government revenues τ_t,

$$p_t = s_t + g_t - \tau_t . \quad (4)$$

As we might see a radical improvement or deterioration in the fiscal position merely for cyclical reasons, it makes sense to look at the structural deficit. A structural deficit is a deficit that would have prevailed without changes in policy and without changes in the business cycle. Our sole indicator of the business cycle will be, in accordance with Blanchard (1993), the unemployment rate. During the course of a business cycle, both government expenditures and revenues may change. Lower levels of production imply a lower tax base, hence revenues will typically decline. On the other hand, lower levels of income imply a higher degree of social transfers (e.g. unemployment benefits), and therefore government expenditures typically increase. We will therefore estimate both revenues and expenditures as a function of the unemployment rate, and a time trend with a break in 1975. Tax revenues are estimated according to

$$\tau_t = \alpha_0 + \alpha_1 D + \alpha_2 u_t + \alpha_3 (1-D)t + \alpha_4 Dt + \varepsilon_t , \quad (5)$$

where the α*'s* are parameters, D is a dummy that takes the value zero until 1975 and the value unity thereafter, and t is a time trend. Similarly, social transfers s_t are estimated according to

$$s_t = \beta_0 + \beta_1 D + \beta_2 u_t + \beta_3 (1-D)t + \beta_4 Dt + \nu_t , \quad (6)$$

where the β*'s* once again are coefficients. We then compute an estimate for both revenues and social transfers on the assumption of an unchanged unemployment rate from the previous year,

$$\tau_t(u_{t-1}) = \alpha_0 + \alpha_1 D + \alpha_2 u_{t-1} + \alpha_3 (1-D)t + \alpha_4 Dt + \varepsilon_t , \quad (5')$$

and

$$s_t(u_{t-1}) = \beta_0 + \beta_1 D + \beta_2 u_{t-1} + \beta_3 (1-D)t + \beta_4 Dt + \nu_t . \quad (6')$$

Let us define the structural primary deficit, p_t*, as the primary deficit that would have prevailed without changes in the business cycle,

$$p_t^* = s_t(u_{t-1}) + g_t - \tau_t(u_{t-1}) . \quad (4')$$

Note that we assume in accordance with Blanchard (1993) that only government social transfers fluctuate with the business cycle, whereas other government expenditures g_t are set by authorities independently of the business cycle. We can then derive the structural budget deficit as interest payments on government debt plus the structural primary deficit, by modifying equation (3),

$$d_t^* = \frac{i_t}{1+n_t} b_{t-1} + p_t^* . \quad (3')$$

Close to balance is interpreted by the European Commission in terms of cyclically adjusted budgets being balanced with an error margin of 0.5 % of GDP,

$$d_t^* < 0.5\% . \quad (3'')$$

Our definition deviates slightly from that of the European Union as we apply a different estimation of the structural primary deficit. Whereas we use the Blanchard method (based on unemployment rates), the European Union uses the GDP gap (based on HP filtering or a production function approach). We consider the difference to be of only minor importance for the analysis at hand.

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[2] We abstain from taking into account any debt-deficit adjustments.

We can also use the definition of primary structural deficits to identify the fiscal stance and subsequently a fiscal consolidation and a fiscal expansion. The fiscal impulse is defined in line with Alesina and Perotti (1995) as

$$f_t = p_t^* - p_{t-1}, \tag{7}$$

where we can use the definition of the primary deficit, equations (4) and (4') respectively, to obtain

$$f_t = \left[s_t(u_{t-1}) + g_t - \tau_t(u_{t-1})\right] - \left[s_{t-1} + g_{t-1} - \tau_{t-1}\right]. \tag{7'}$$

Substitution of (5') and (6') yields,

$$\begin{aligned} f_t &= [(v_t - v_{t-1}) + (g_t - g_{t-1}) - (\varepsilon_t - \varepsilon_{t-1})] + \\ &+ [(\beta_3 - \alpha_3)(1-D) + (\beta_4 - \alpha_4)D]. \end{aligned} \tag{7"}$$

The first three elements in this definition are the discretionary measures in fiscal policy, namely the discretionary change in social expenditures, other expenditures, and revenues. The second component measures the difference in the trend behavior of expenditures and revenues before and after the break in 1975. If the parameters differ, the primary balance has a tendency to be in surplus or in deficit. We should still consider this as part of the discretionary policy, as policymakers have set this spending and revenue path irrespective of the business cycle. In order to get a better understanding of the fiscal impulse, we can use (7) to decompose the current primary deficit into three components,

$$p_t = p_{t-1} + (p_t - p_t^*) + f_t, \tag{7"'}$$

where the first element is the previous primary deficit, the second element is the change in the primary deficit for cyclical reasons, and the last element is the discretionary policy change reflected in the fiscal impulse. Substituting the definition for the primary deficit (4) and the structural primary deficit (4') into equation (7"') and rearranging terms yields,

$$f_t = (p_t - p_{t-1}) - (\beta_2 - \alpha_2)(u_t - u_{t-1}), \tag{7""}$$

which states that the fiscal impulse equals the change in the primary balance, corrected for changes in the business cycle (represented by changes in unemployment rates).

A reduction in the fiscal impulse implies that, controlling for cyclical influences, government tightens fiscal policy. By analogy, an increase in the fiscal impulse implies that government loosens fiscal policy. This may occur due to a specific policy of expansion or consolidation, or by mere chance. In order to separate arbitrary from intended expansions or consolidation, we require a fiscal consolidation to exhibit a fiscal impulse below one standard deviation σ, or

$$f_t < -\sigma, \tag{8}$$

and a fiscal expansion to exhibit a fiscal impulse above one standard deviation of the fiscal impulse for that country,

$$f_t > \sigma. \tag{8'}$$

Together with the definitions for excessive deficits (3) and budgets close to balance (3"), the definitions for fiscal consolidations (8) and fiscal expansions (8'), this summarizes the selection of periods under investigation in our analysis.

3. Debt Dynamics

Fiscal policy is supposed to achieve a number of goals (Musgrave 1959). We will restrict our analysis to the medium to long run fiscal position only. In particular, we will focus on the performance of fiscal periods with respect to public debt. For consolidation periods (both tight fiscal policy and budgets close to balance), we will investigate which specific policies reduce debt most. For expansionary periods (both loose fiscal policy and excessive deficits) we will ask which policies are sustainable, keeping debt contained, and which are not. In that respect, we will expand the analysis of Alesina and Perotti (1995) in several dimensions. According to their definition, 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 brief, the Alesina and Perotti success criterion can be summarized as

$$b_{t+3} - b_t < -0{,}05\,, \tag{9}$$

which we may generalize to

$$b_{t+r} - b_t < -x\,. \tag{9'}$$

The first concern with this definition is that a reduction in the deficit today will have little or no impact on success in the future. This is because we measure the difference between debt at the end of the period in question (t) with the debt position r years ahead. A consolidation will therefore improve both b_t and b_{t+r}. Hence, we consider a more sensible criterion that evaluates fiscal regimes by the change in public debt at the beginning of the fiscal episode (b_{t-1}) to the public debt share r periods ahead (b_{t+r}). To make our point more precise, we can reformulate (9'), noting that the current public debt equals growth-adjusted previous debt and the current budget deficits (3), yielding

$$b_{t+r} - b_t = b_{t+r} - b_{t-1} - d_t + \frac{n_t}{1+n_t} b_{t-1} = b_{t+r} - b_{t-1} - \frac{i_t - n_t}{1+n_t} b_{t-1} - p_t < -x \tag{9"}$$

An increase in budget deficits will facilitate success according to the Alesina-Perotti criterion (9) compared to our measure ($b_{t+r} - b_{t-1}$). By contrast, a reduction in budget deficits (or an increase in budget surpluses) will render success more difficult for the Alesina-Perotti criterion. Alesina and Perotti (1995) may have excluded the current budget deficit (which is the sum of interest payments on existing public debt and the primary deficit) from their criterion for good reasons. First, an increase in interest payments on public debt will ceteris paribus facilitate success according to their criterion (9), which is apparently an unpleasant feature. Second, considering the decomposition of the primary deficit (7"'), we find that high primary deficits are the result of the past (p_{t-1}), current economic conditions (reflected in the cyclical component), and the size of the fiscal impulse. As we are interested in the effects of the composition or of the individual components of the primary deficit and not of the size of the primary deficit, it may be reasonable to eliminate primary balances as well[3]. Whilst Alesina and Perotti implicitly control for the impact of primary balances and interest payments on existing debt, they fail to account for the impact of economic growth on the existing debt ratio.

In order to fully understand which elements influence the success of consolidations that have not been accounted for in Alesina and Perotti and that are not the result of discretionary policy measures, we next systematically investigate what causes the public debt ratio at the beginning of the consolidation period (b_{t-1}) to change to the public debt ratio r periods ahead (b_{t+r})[4]. For this purpose, we will develop the difference, using the equation of motion for public debt (2). We start out with the equation of motion (2) in time $t + r$ and subsequently substitute the equation of motion for the previous public debt ratio, until we have reached bt-1. This yields after collecting terms,

$$b_{t+r} - b_{t-1} = \left[\prod_{j=0}^{r} \frac{1+i_{t+j}}{1+n_{t+j}} - 1\right] b_{t-1} + \sum_{i=1}^{r} \left[\prod_{j=i}^{r} \frac{1+i_{t+j}}{1+n_{t+j}}\right] p_{t+i-1} + p_{t+r}. \tag{10}$$

This equation allows a systematic interpretation of the reasons for success of programmes to reduce debt ratios. First, the existing debt ratio matters. It increases the debt to GDP ratio if interest rates exceed

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3 We are indebted to Reinhard Neck for drawing our attention to this point.

4 Note that we can always reconstruct the generalized Alesina-Perotti criterion (9') by subtracting the current budget deficit d_t.

economic growth rates on average during the period in question, and decreases it otherwise. This is clearly unintended, as we shall not judge a consolidation or expansion by its past. Moreover, it treats situations where the interest–growth differential is positive very differently from situations where it is negative. We should therefore eliminate effects of the initial debt ratio from the generalized Alesina-Perotti criterion (9').

Second, primary balances matter. Primary surpluses in the period under investigation and in all subsequent periods improve the debt situation. Indeed, the success criterion not only includes the impact of discretionary fiscal policy measures in period *t*, but additionally the impact of the today's fiscal policy on subsequent years. A consolidation, for instance, will be more successful if it also succeeds in dampening future primary deficits or if it facilitates reaching future primary surpluses.

Third, the interest–growth differential matters both for the impact of existing debt as well as for primary balances. Primary surpluses will have a bigger impact on debt reduction if interest rates exceed growth rates in all subsequent periods.

In order to adjust for influences from the past on the evolution of the debt ratio, we eliminate the effects of the initial debt ratio and of initial primary balances (including the effects of compounding) in equation (10) to obtain a modified Alesina-Perotti criterion (MAPC),

$$b_{t+r} - \left[\prod_{j=0}^{r}\frac{1+i_{t+j}}{1+n_{t+j}}\right]b_{t-1} - \left[\prod_{j=1}^{r}\frac{1+i_{t+j}}{1+n_{t+j}}\right]p_t = \sum_{i=2}^{r}\left[\prod_{j=i}^{r}\frac{1+i_{t+j}}{1+n_{t+j}}\right]p_{t+i-1} + p_{t+r}. \qquad (10')$$

Instead of arbitrarily setting a success criterion (as in Alesina and Perotti, 1995), we simply follow the evolution of the left-hand side of the modified Alesina-Perotti criterion (10') over time identifying differences between different policy regimes with respect to their performance in the MAPC. These time paths can be interpreted as quasi-cumulated impulse response functions for the evolution of public debt if the economy had started without initial public debt and if its initial primary deficit had been acquited. Note that the two adjustments do exactly that. They remove the burden of initial debt and the initial primary deficit, evaluated at the end of the period under investigation (*r*), using the interest–growth differential as a compounding factor.

What we actually measure with this indicator is of course the right-hand side of equation (10'), which allows us to interpret the MAPC as the accumulated compounded primary deficits from period *t+1* to *t+r*. Apart from the interest–growth differential, which serves as a compounding factor, we will observe an improvement in the debt position if structural deficits decline, and if subsequently the fiscal impulse is low, or if a consolidation or expansion period has prompted policymakers to resort less to the fiscal impulse in the future.

To sum it up, we have adjusted the Alesina-Perotti criterion for three reasons. First, instead of observing the criterion only over a period of three years, we will follow a time path for $r = \{1, 2, \ldots 6\}$. The rationale for choosing six periods lies in a compromise between gains for the assessment of discretionary measures on the sustainability of public finances and losses of accuracy when the time horizon between the fiscal policy regime and its subsequent consequences for the evolution of public debt becomes too long.

Second, and most important, we have adjusted for debt dynamics, so that the Alesina-Perotti criterion is no longer influenced by the initial debt ratio and the interest-growth differential. We consider this important, as otherwise periods before 1975, when the interest–growth differential was negative, are treated different from periods thereafter. Indeed, the Alesina-Perotti criterion is biased in favor of periods with a positive interest-growth differential.

Third, we have eliminated current primary deficits as we are interested in the effects of the composition or the individual components of the primary deficit and not the size of the primary deficit. An additional advantage is that this renders the MAPC independent from current primary deficits; hence we can use the composition of the current primary deficit without econometric problems as explanatory variables.

Note that the MAPC is equivalent to Alesina and Perotti (1995), if the initial public debt is zero (and hence interest payments on public debt are zero) and $i_t = n_t$ in all years. If interest rates exceed growth rates, the criterion is (sensibly) less strict, whereas it is stricter if growth rates exceed interest rates. In the empirical exercise that follows, we compute the left-hand side of equation (10') and track that indicator for the first six years, $r = \{1, 2, \ldots 6\}$.

We can modify equation (10) by subtracting the deficit and adding the growth adjusted initial debt ($b_{t-1}n_t/(1+n_t)$) on both sides to obtain the generalized Alesina-Perotti criterion (9'),

$$b_{t+r} - b_t = \left[\prod_{j=1}^{r} \frac{1+i_{t+j}}{1+n_{t+j}} - 1\right]\left[\frac{1+i_t}{1+n_t} b_{t-1} + p_t\right] + \sum_{i=2}^{r}\left[\prod_{j=i}^{r} \frac{1+i_{t+j}}{1+n_{t+j}}\right] p_{t+i-1} + p_{t+r}. \qquad (10")$$

Now the current primary deficit only does not matter only if interest rates and growth rates are identical, with signs changing according to the interest–growth differential. The reason is that Alesina and Perotti (1995) do not compound primary deficits to the end of the observation period, but use the beginning of the period instead. Similarly, the initial level of debt will still matter for the evolution of public debt during a particular fiscal regime, unless interest rates and growth rates are identical. As the initial debt ratio (which cannot be influenced by policymakers) should never matter for evaluating fiscal regimes, the generalized Alesina-Perotti criterion (9') will be biased.

4. The Data

Our sample includes the EU countries, USA, Norway, Australia and Canada for the period 1960-2002; Japan was excluded from the analysis because of data unavailability. Fiscal data as well as macroeconomic variables (GDP and unemployment rates) are taken from the AMECO database. For most of the countries included, debt data are only available from the 1970s onwards. We have a total of 774 observations for our estimations. The calculation of the fiscal impulse and the definition of consolidation and expansion episodes are very similar to Alesina and Perotti (1995). According to equation (8) and (8') we classify consolidation and expansion episodes by taking the average of the Blanchard Fiscal Indicator (BFI) plus or minus one standard deviation as cut-off points (calculated separately for the individual countries).

According to equations (3) and (3"), periods of excessive deficits are defined as years in which the actual budget deficit exceeded 3% of GDP, whereas a close-to-balance budget regime means that the cyclically adjusted budget deficit (however, calculated on a BFI basis) remained below 0.5% of GDP in a given year. Table 1 lists the number of observations for every fiscal regime and provides a sample statistics with the means and standard errors of the mean of changes in current revenues and primary expenditures for the two main aggregates under the different types of fiscal regimes.

Table 1

Means and standard errors of the means of changes of total current revenue and total primary expenditure in % of GDP in different fiscal policy episodes

	All observations	Consolidations	Expansions	Excessive deficits	Close to balance
Indirect taxes	0,04	0,30	-0,09	0,07	0,03
	(0,022)	(0,058)	(0,078)	(0,039)	(0,041)
Direct taxes	0,14	0,68	-0,43	0,09	0,23
	(0,031)	(0,075)	(0,121)	(0,045)	(0,059)
Direct taxes of households	0,03	0,20	-0,04	-0,07	0,07
	(0,042)	(0,107)	(0,142)	(0,070)	(0,081)
Direct taxes of corporations	0,07	0,56	-0,55	0,05	0,11
	(0,045)	(0,154)	(0,210)	(0,049)	(0,120)
Social Security contributions	0,14	0,10	0,19	0,11	0,17
	(0,020)	(0,049)	(0,071)	(0,032)	(0,041)
Total current revenue	0,39	1,12	-0,28	0,30	0,52
	(0,046)	(0,103)	(0,161)	(0,071)	(0,097)
Government consumption	0,17	-0,38	0,85	0,13	0,15
	(0,029)	(0,063)	(0,077)	(0,045)	(0,046)
Government wage consumption	0,06	-0,27	0,45	0,02	0,09
	(0,018)	(0,047)	(0,058)	(0,032)	(0,031)
Government non-wage consumption	0,12	-0,12	0,44	0,11	0,09
	(0,038)	(0,038)	(0,060)	(0,029)	(0,077)
Social transfers	0,16	-0,29	0,92	0,24	0,10
	(0,028)	(0,081)	(0,094)	(0,051)	(0,039)
Subsidies	-0,01	-0,10	0,19	-0,02	0,00
	(0,015)	(0,030)	(0,051)	(0,030)	(0,019)
Public investment	-0,03	-0,18	0,17	-0,04	-0,03
	(0,012)	(0,030)	(0,041)	(0,021)	(0,019)
Total primary expenditure	0,33	-1,25	2,47	0,37	0,20
	(0,068)	(0,135)	(0,190)	(0,111)	(0,118)
Observations	774	86	79	267	226

5. Methods

The empirical part comprises two different methodological approaches. We will first present descriptive statistical results (means and standard errors) for the modified Alesina-Perotti criterion (MAPC) in different fiscal policy regimes. Remember that in equation (10') we have shown that the MAPC is equivalent to the accumulated compounded primary deficit ratios and also equivalent to the level of the debt ratio in period $t+r$, corrected for the compounded influence of existing debt at the beginning of period t and the primary balance in period t.[5]

Unlike Alesina and Perotti (1995) and the subsequent comparable literature, we do not differentiate with respect to success and failure of specific fiscal policy regimes with an arbitrary ad-hoc measure, namely a 5 percentage point change in the debt ratio between t and $t+3$. Instead, with the MAPC, we show hypothetical debt paths for different fiscal policy regimes based on actual realizations in the past.

[5] We use the compounding factors as identified in equation (10').

In the second part of our analysis, we present estimates for the evolution of debt dynamics (measured by the MAPC) induced by changes in the primary expenditure and revenue ratios. We will use ordinary least square regressions in first differences in order to eliminate problems of autocorrelation. We differ from the empirical literature that uses logit or probit estimators (cf. Alesina and Ardagna, 1998, and McDermott and Wescott, 1996) for the success criterion by using the full information of debt dynamics instead of a dummy defined with an arbitrary cut-off point. We also differ methodologically from Heylen and Everaert (2000), who use first differences for the independent series, but not for the dependent series.

Our focus goes beyond the related empirical literature as we study not only fiscal consolidations but also fiscal expansions, excessive deficits and budgets close to balance or in surplus (defined on the basis of the BFI); and by the fact that we apply this approach also for all observations. In the literature, the method of choice to investigate the impact of fiscal policy measures on public debt dynamics is sustainability simulations, which typically hold future primary balances constant at the current level. With our method, by contrast, we acknowledge the fact that the current composition of the primary balance may exhibit systematic changes on future primary balances [6].

We analyze the MAPC for period *t+1* to *t+6*, which is twice as long as the three year period usually found in the literature. The rationale for choosing six periods lies in a compromise between gains of accuracy with regard to assessing discretionary measures on the sustainability of public finances and losses of accuracy when the time horizon between the fiscal policy regime and its subsequent consequences for the evolution of public debt becomes too long. Whilst the explanatory power of the composition of the primary balance in period *t* on the accumulated compounded primary deficit ratios in period *t+1* is presumably large, the impact of the composition of current primary balances on later accumulated compounded primary deficit ratios will be more and more influenced by potential policy actions taken in subsequent periods.

6. Main Results

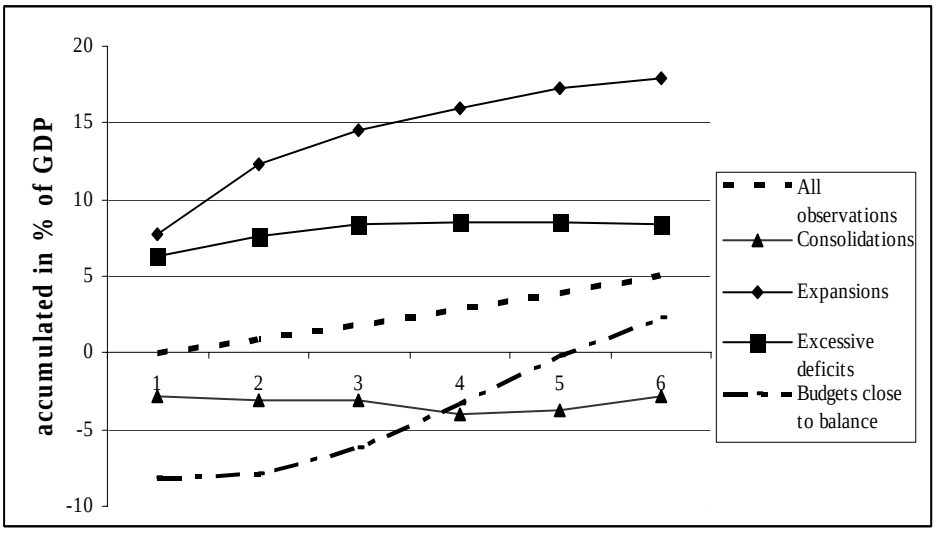
According to our descriptive statistical method the graph below considers the evolution of the mean of the modified Alesina-Perotti criterion (MAPC) for all observations in our sample, all fiscal consolidations (as defined in equation 8), all fiscal expansions (as defined in equation 8"), all excessive deficits (as defined in equation 3) and all budgets close to balance or in surplus (as defined in equation 3") [7]. Note that we have normalized neither with respect to the size of the fiscal impulse nor to the size of the initial primary balance (p_t) of the different fiscal policy regimes. Instead, we use the mean values over the actual observation periods, which are typically positive for expansions and negative for consolidations. Similarly, budget deficits are on average larger than 3% for excessive deficits and smaller than 0.5% (structurally adjusted) for budgets close to balance or in surplus.

6 As an example, suppose that a reduction in government wage consumption may be long lasting, whereas a reduction in subsidies will exhibit only transitory effects on the primary balance. This would imply that a primary balance with a high wage component will yield different (worse) future primary balances than one with a high subsidy component, thus leading to a very different path of public debt, not accounted for in sustainability simulations.

7 Means and the corresponding errors of the mean for all different fiscal policy regimes can be found in table A1 in the appendix.

Figure 1

Debt Dynamics (MAPC)



The increasing straight line for all observations between the start value (t) and the end value ($t+r$) merely reflects the fact that on average debt ratios have increased over time, even correcting for the impact of interest payments and initial primary balances.[8] This line defines the benchmark for the analysis of specific fiscal policy regimes. The evolution of debt dynamics in contractionary fiscal policy regimes may indicate that consolidations on average have a long-lasting impact on the reduction of the debt ratio. In contrast, episodes of budgets close to balance do not seem to exhibit a comparable degree of persistence.[9] Note that a large number of this kind of fiscal episode occurred in initial parts of our sample, maybe by mere chance due to a negative interest–growth differential. However, we cannot take into account those budgets close to balance that were induced by explicit policy rules of EMU because of a lack of observations for the MAPC in subsequent years. In line with our expectations, the MAPC for expansionary episodes highlights potentially unfavourable impacts on the evolution of public debt as a share of GDP. Much of the debt increase is obviously due to the impact in the first two years, whereas the evolution runs in parallel to the benchmark afterwards, maybe because expansionary regimes are short-lasting or because expansions on average may be successful in stimulating economic growth and thereby reducing debt ratios. Finally, excessive deficits, whilst obviously also leading to an increase in the first few years, seem to be followed by subsequent counteracting measures, implying a comparably lower increase in the MAPC than the benchmark.

In a second step we ask whether compositional effects – as emphasized by Alesina and Perotti (1995, 1996), McDermott and Wescott (1996) among others – matters for debt dynamics in general (without specifically focusing on consolidation or expansion episodes). In order to investigate this issue we run an OLS regression as mentioned above, where we use the individual revenue and primary expenditure categories as a share of GDP (i.e. the composition of primary budget) as explanatory variables and the MAPC as the dependent variable. In order to eliminate the impact of the cycle we use real GDP growth as a control variable.

Table 2 below presents the coefficients of a one percentage point increase of the individual explanatory variable, measured as a share of GDP, on the MAPC. Each column represents a separate estimation for the respective MAPC for $t+r$, with $r = \{1,2,..,6\}$. t-values are presented below the individual coefficients.

Due to a limited number of observations for direct taxes on households and direct taxes on corporations, we first estimated the regressions with the total direct taxes in % of GDP as an explanatory variable. We have replaced this aggregate category with the two sub-categories. All coefficients are taken

[8] Indeed, what we do is to merge the change in the adjusted debt ratio over all periods and countries into a sequence of six observations.

[9] In the following we will use “persistence” in the meaning of “long lasting”.

from the first regression; only the coefficients for direct taxes on households and corporations stem from the second regression. As shown in the table, all the variables included exhibit the expected sign.

Table 2

Impact of a change in individual budgetary categories on the MAPC[10]

	MAPC1	MAPC2	MAPC3	MAPC4	MAPC5	MAPC6
Indirect taxes	-1.48	-1.31	-1.35	-2.18	-1.32	-1.49
	(-4.330)	(-3.320)	(-2.970)	(-4.450)	(-2.440)	(-2.700)
Direct taxes	-1.80	-1.61	-1.46	-1.22	-0.91	-0.98
	(-7.430)	(-5.680)	(-4.490)	(-3.490)	(-2.390)	(-2.490)
Direct taxes on households	-2.48	-1.98	-1.73	-1.65	-1.63	-1.53
	(-5.310)	(-3.570)	(-2.770)	(-2.420)	(-2.190)	(-2.060)
Direct taxes on corporations	-0.30	-1.02	-0.95	-0.47	-0.72	-0.75
	(-0.630)	(-1.750)	(-1.350)	(-0.610)	(-0.860)	(-0.910)
Social Security contributions	-1.90	-1.68	-2.06	-2.52	-2.56	-2.08
	(-4.530)	(-3.450)	(-3.730)	(-4.230)	(-3.810)	(-3.010)
Gov't wage consumption	4.14	5.60	6.11	6.17	6.13	6.28
	(7.260)	(8.480)	(8.200)	(7.760)	(7.080)	(7.050)
Gov't non-wage consumption	1.80	1.22	0.79	0.96	0.29	0.59
	(3.270)	(1.920)	(1.110)	(1.260)	(0.350)	(0.690)
Transfers	1.42	0.91	0.84	0.40	0.71	0.42
	(3.990)	(2.230)	(1.840)	(0.810)	(1.330)	(0.760)
Subsidies	0.84	0.64	0.78	1.29	0.25	1.09
	(1.730)	(1.160)	(1.260)	(1.960)	(0.350)	(1.500)
Public investment	3.45	3.28	3.24	2.71	3.18	2.81
	(4.780)	(3.940)	(3.460)	(2.700)	(2.940)	(2.510)
R2	0.414	0.347	0.299	0.275	0.231	0.229

We find that increases of the individual revenue ratios tend to reduce the debt ratio (as measured by the MAPC), whereas an increase in the share of any government spending categories obviously causes the debt path to deteriorate. This is consistent with the neoclassical and the Ricardian view as well as with the non-Keynesian literature. In a Keynesian world, however, the effect is ambiguous and depends on the strength of the output growth on changes in expenditures or revenues.

[10] Estimated in first differences; note that one can interpret the estimated coefficients as the impact of 1 percentage point increase in GDP of a specific category on the MAPC (defined as accumulated primary deficit ratios).

Figure 2a

Debt dynamics (MAPC) by composition

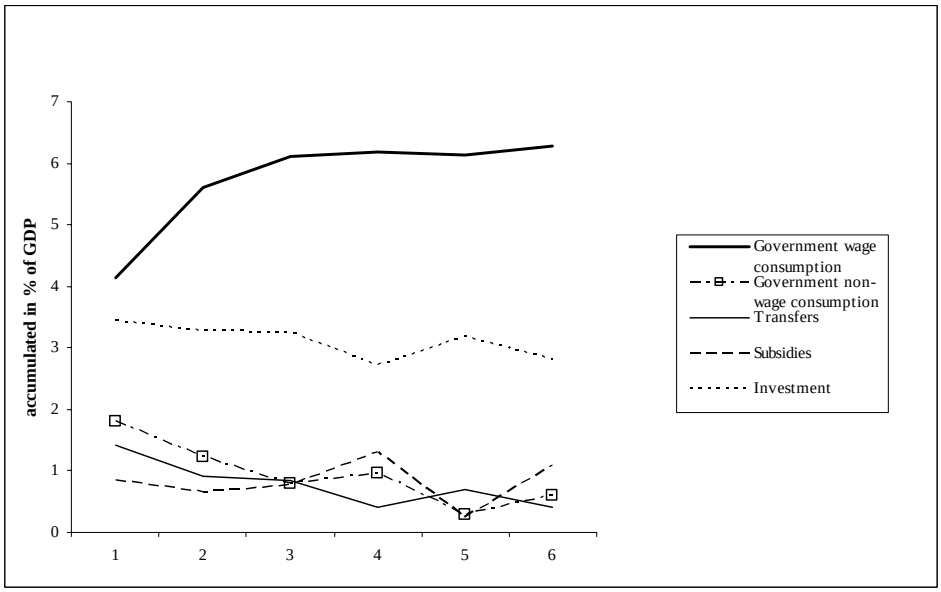
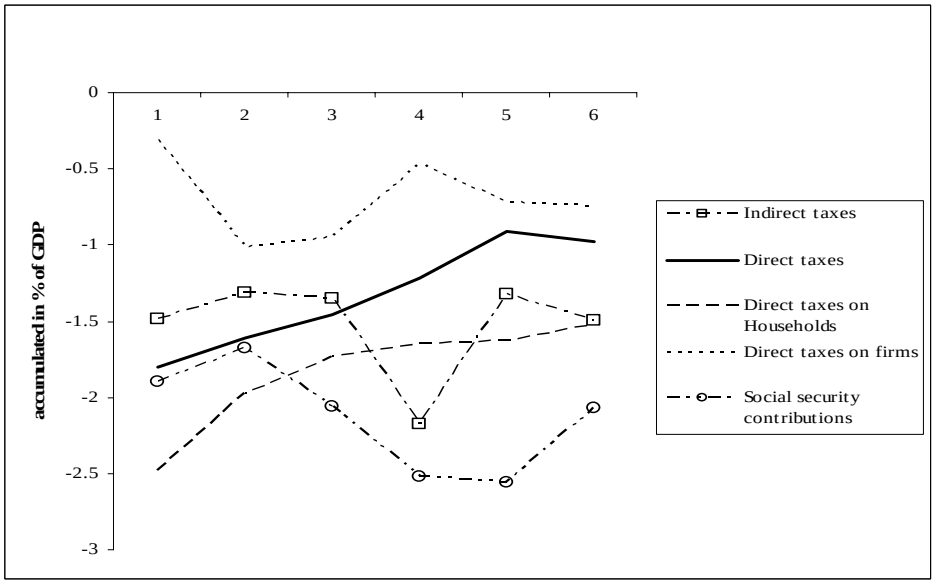


Figure 2b

Debt dynamics (MAPC) by composition



The hypothetical time path for the MAPC(1) to MAPC(6) can be thought of as a quasi-cumulated impulse response function following a one percentage point increase in individual government revenue and primary expenditure categories (computed in a rather different fashion) for the public debt ratio, starting at a hypothetical value of $b_t = 0$ (i.e accumulated compounded future primary deficits).

The strongest impact on debt dynamics can be observed for a change in government wages as a share of GDP. The impact is consistently strong over the entire observation period. This confirms the finding of Alesina and Perotti (1995, 1996) but is in sharp contrast to Heylen and Everaert (2000), who obtain a large and negative impact of government wage based consolidations.

Our results indicate that once realized, reductions of this expenditure category have a persistent effect on the debt ratio. However, we cannot confirm the second major result of Alesina and Perotti, which

states that cuts in social transfers are almost as important as a reduction in government wages. We do find a significant but much smaller and not persistent impact from a cut in transfers.[11] We are similarly surprised about the reaction of the debt ratio to changes in the public investment ratio. With respect to this category we expect that increases in public investment should foster economic growth and thereby have dampening effects on debt dynamics. However, the estimates indicate the opposite.

Alesina and Perotti (1995) obviously do not find persistent effects from revenue-led consolidations. On the revenue side, if anything, they suggest increases in direct taxes on business, but reductions in direct taxes on households and social security contributions. Using the full sample, our regression results do show a significant impact on government debt ratios, with the exception of a change in the ratio of direct taxes on firms. We suspect that the induced reductions of the after-tax profits of companies from the latter measure might discourage investments and encourage relocations of firms, thus leading to reductions in the growth rates of GDP and therefore counterbalance the effect on debt. Overall we obtain quantitatively smaller effects from revenue-side measures than from expenditure-side measures. This is once again a confirmation of the idea that expenditure-led consolidations are more likely to succeed in reducing debt ratios over time than revenue-led consolidations.

In the next step, we shift our attention to specific fiscal policy regimes. Our intention was to check whether the reaction of debt dynamics due to changes in individual revenue and primary expenditure categories during fiscal consolidations, fiscal expansions, excessive deficits and budgets close to balance were substantially different from all times. Following the discussions in the literature, we would have expected a difference in the reaction of debt dynamics in specific fiscal policy regimes compared to all times, showing a potentially different reaction of economic agents to changes in individual revenue and primary expenditure categories. One interpretation of such a result would be that during a consolidation, agents are more willing to accept expenditure cuts without cutting or even increasing their consumption demand, thus supporting the non-Keynesian view on fiscal consolidations. Similarly, during an expansion, if investors react positively to an increase in government expenditures, we would also expect the debt dynamics to evolve differently, which would support the Keynesian view on fiscal expansions.

For this reason, we tested whether interaction terms between a consolidation dummy (taking the value one for a fiscal consolidation and zero otherwise) and the individual revenue and primary expenditure categories were statistically significantly different from zero. However, we had to reject this hypothesis. We repeated this exercise with fiscal expansions, excessive deficits and budgets close to balance as well, with no avail.

In accordance with Alesina and Perotti (1995 and 1996), our results confirm that composition matters. However, whereas they and the subsequent literature focused mainly on these effects in times of consolidation, we find that compositional effects matter not only during consolidations but in fact in all fiscal policy regimes alike. We conjecture that those measures (e.g. a cut in government wages) that reduce public debt ratios successfully during consolidations will exhibit a similarly strong opposite effect during a fiscal expansion. The only difference is a quantitative response of public debt ratios, given that expansions typically generate high primary deficits, whereas consolidations lead to high primary surpluses. Indeed, if the methodology of Alesina and Perotti had allowed them to analyze all periods, they should have obtained a similar result for all periods as for consolidations only, which was their focus of analysis.

Heylen and Everaert (2000) estimate coefficients for selected revenue and primary expenditure categories during consolidation periods only. Apart from econometrical problems of their method, the lack of an analysis of the full sample of observations poses the question whether their coefficients would be statistically different from all times. Our findings would suggest the opposite.

7. Debt dynamics and excessive deficits

In a thought experiment, we can use our results to derive a hypothetical debt path based on a given composition of revenues and primary expenditures. This seems particularly fruitful for those countries which have recently crossed the 3% budget deficit ceiling introduced in the Maastricht treaty and were found to have excessive deficits, namely Portugal in 2001 and Germany and France since 2002. In the

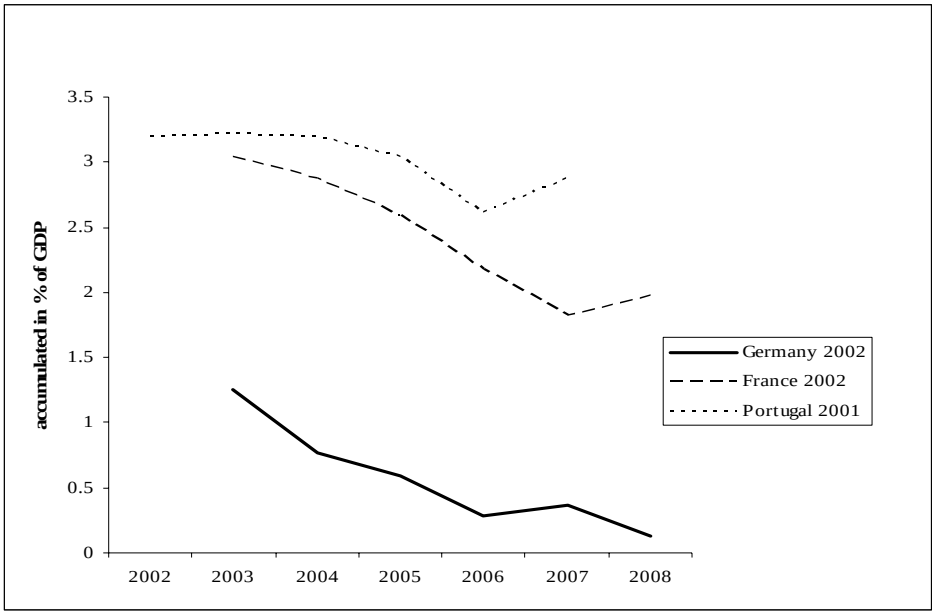
[11] For a lack of data we use only social transfers other than in kind, which might render our result less comparable to the finding of Alesina and Perotti. Note that also Heylen and Everaert (2000) in general do not find a significant effect of transfers either.

subsequent analysis, we are looking at the induced debt dynamics (for the following six years) stemming from the actual composition of the excessive deficits in Portugal in 2001 and Germany and France in 2002.

In this thought experiment, we abstract from any explicit policy measures, changing the composition of the excessive deficit in future years, and we do not adjust for the influence of the cycle. Moreover, we hold constant the snowball effect (i.e. the interest–growth differential) at the final year of our sample, which was 2002. What we do consider, however, is the fact that a different composition of an excessive deficit causes differences in the accumulated future compounded primary balances. One explanation for this phenomenon may be that according to our estimation results, a reduction in the government wage consumption will have a longer-lasting debt dampening impact, whilst a reduction in government non-wage consumption will be only transitory. The graph below shows that differences in composition actually matter for the accumulated future compounded primary balances in the three countries under investigation.

Figure 3

Hypothetical debt dynamics
(MAPC)



The explanation for the high level of persistence of the MAPC in France and Portugal, compared to Germany, can be found among others in the fact that both France and Portugal have increased the government wage bill considerably. Since we do not use cyclically adjusted series, the large increase in social transfers for Germany may be due to cyclical effects. Note that our estimation of the MAPC may take this into account with a low persistence of social transfers. Table 3 below summarizes the changes in the individual budgetary categories from the year before the excessive deficit to the year where it occurred. Compared to France and Portugal, the composition in Germany has obviously a less dramatic lasting impact, and the MAPC is almost at the initial level after only four years.[12]

[12] Note that we could apply the same methodology to evaluate the consequences for debt dynamics of fiscal reform programs, which countries in a deficit procedure according to the Stability and Growth Pact have to introduce.

Table 3

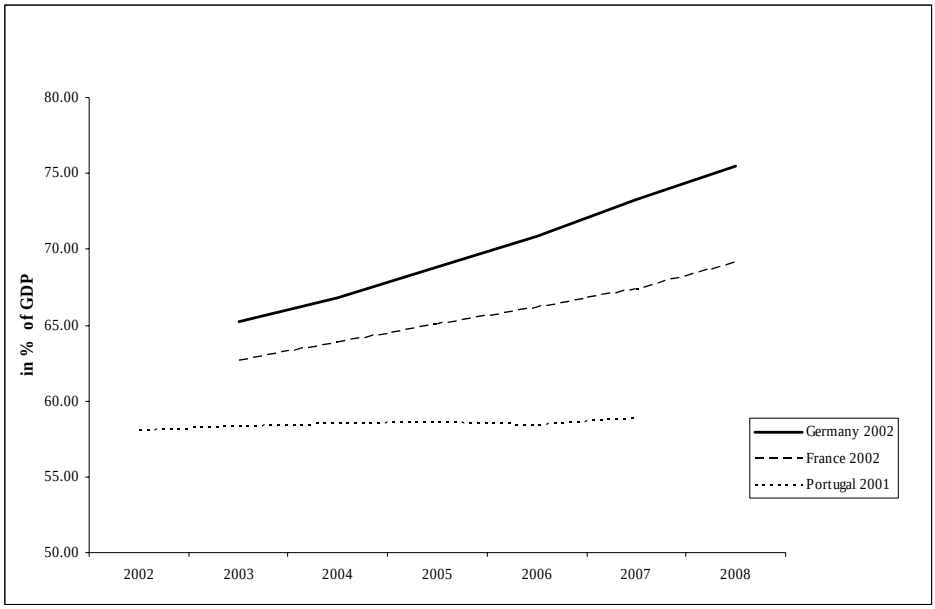
Changes in the composition of revenue and primary expenditure categories during excessive deficits

	Germany 2002	France 2002	Portugal 2001
Indirect taxes	-0.01	0.09	-0.08
Direct taxes	-0.33	-0.89	-0.58
Social Security contributions	-0.07	0.15	0.13
Government wage Consumption	-0.03	0.23	0.22
Government non-wage Consumption	0.19	0.40	0.05
Social transfers	0.58	0.36	0.12
Subsidies	-0.18	-0.05	0.27
Public investment	-0.10	-0.09	0.25

Does that imply that Germany does not have to worry about its debt development over the next years? In contrast to the evolution of the MAPC in the previous graph, the following graph exhibits the development of the induced hypothetical debt path for the three economies under investigation. We added the compounded primary deficit ratio in the year of the excessive deficit and the compounded initial debt ratio (according to equation 10') to obtain the overall hypothetical debt ratio, based on the assumption of a constant interest–growth differential for the compounding of these components. The initial debt ratios for Germany, France and Portugal were 59.5%, 56.8% and 53.3%, respectively. This is one reason why debt ratios are consistently higher for Germany than for the other countries. Despite the decline in the MAPC shown above, the situation deteriorates. The reason is that Germany suffers from the highest interest–growth differential among these three economies, with nominal interest rates exceeding nominal growth rates by about 3 percentage points, whereas the difference is only 2 percentage points for France and almost zero for Portugal.

Figure 4

Hypothetical debt ratios



If we apply the same interest–growth differential for all countries, all debt paths would exhibit a rather similar slope. This suggests that the macroeconomic environment is still the most important aspect in containing bad debt dynamics. Taking this into account it would indeed be of interest to investigate the growth effects of changes in individual revenue and expenditure categories. However, this is beyond the scope of the paper.

8. Conclusions and future research

This paper aimed at investigating the impact of compositional effects on public debt dynamics under different fiscal policy regimes. This analysis was motivated by the vast amount of recent literature on the significance of compositional effects for the success of fiscal consolidation episodes, initiated by a seminal publication of Alesina and Perotti (1995). When looking at the larger picture of consolidation periods, expansionary episodes, excessive deficits and budgets close to balance, we obtained the surprising result that compositional effects do not show statistically significant differences across these specific policy regimes, and indeed cannot be distinguished from all times.

At the same time, we find changes of individual revenue and primary expenditure categories in general to have an important, and above all different, impact on the debt dynamics. On the expenditure side, our results confirm the findings of Alesina and Perotti (1995, 1996) and the subsequent literature in that a reduction in government wage consumption indeed exhibits the strongest dampening impact on debt dynamics. Yet in contrast to much of the literature we find that an increase in government revenues will also lead to a persistent decline in debt ratios, although to a lesser extent than a decrease in certain expenditure categories.

Our contribution to the literature is that the very recipe that was found to bring debt ratios down in consolidation periods can in fact be relied on to keep public finances on a sustainable track at all times. Our findings suggest that policymakers should be particularly wary of increasing those spending categories that exhibit persistent worsening effects on debt dynamics, above all government wage consumption. The novel finding of our analysis is that tax cuts also exhibit a persistent and detrimental effect on the evolution of debt ratios.

Our method allows us to compute hypothetical paths of debt ratios, given changes in specific revenue and expenditure categories. We can show that compositional effects matter for the persistence of induced accumulated compounded future primary balances. However, we must acknowledge that the macroeconomic environment, in particular nominal interest rates and nominal growth rates, is more important, at least in the current environment of a positive interest–growth differential.

There are a number of reasonable extensions for further research. First, we used the Blanchard method to identify the fiscal impulse, mainly for consistency reasons, as this is the method Alesina and Perotti (1995) used. However, other methods to compute structural deficits may be superior, and should therefore be adopted – even though we would not expect this to alter our results. Second, it may be fruitful to estimate the compositional effects on debt dynamics on the basis of cyclically adjusted time series. Moreover, given that we focused only on the full sample, there may be reason to substitute the pooled regression (where we implicitly assume identical parameters over all countries and years) with panel estimations. Finally, given the importance of the macroeconomic environment, it may be reasonable to estimate a macroeconomic model or a structural VAR to accommodate for the influence of size and composition of primary deficits on the interest–growth differential.

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APPENDIX

Table A1

MAPC and Standard Errors in different fiscal policy regimes

	1	2	3	4	5	6
All observations	-0.04	0.78	1.78	2.77	3.8	4.95
	(0.531)	(0.706)	(0.873)	(1.036)	(1.190)	(1.334)
Consolidations	-2.82	-3.12	-3.14	-4.03	-3.71	-2.77
	(1.502)	(2.113)	(2.633)	(2.966)	(3.378)	(3.963)
Expansions	7.75	12.31	14.49	15.92	17.27	17.96
	(1.553)	(1.851)	(2.100)	(2.485)	(2.674)	(2.988)
Excessive deficits	6.25	7.57	8.33	8.49	8.51	8.4
	(0.740)	(1.007)	(1.258)	(1.500)	(1.742)	(1.995)
Budgets close to balance	-8.16	-7.94	-6.17	-3.39	-0.26	2.2
	(0.781)	(1.121)	(1.466)	(1.759)	(1.998)	(2.178)

Table A2

The consequences of excessive deficits

	2002	2003	2004	2005	2006	2007	2008
Germany 2002							
MAPC		1.26	0.77	0.59	0.29	0.37	0.13
Primary deficit		0.45	0.46	0.48	0.49	0.51	0.53
Debt(-1)		63.49	65.61	67.80	70.07	72.41	74.83
Hypothetical Debt		65.19	66.84	68.87	70.85	73.29	75.49
France 2002							
MAPC		3.04	2.87	2.59	2.18	1.82	1.97
Primary deficit		-0.05	-0.05	-0.06	-0.06	-0.06	-0.06
Debt(-1)		59.62	61.06	62.54	64.05	65.60	67.19
Hypothetical Debt		62.61	63.88	65.08	66.18	67.36	69.10
Portugal 2001							
MAPC	3.19	3.22	3.19	3.03	2.61	2.87	
Primary deficit	1.11	1.11	1.12	1.12	1.13	1.13	
Debt(-1)	53.73	53.95	54.18	54.41	54.63	54.86	
Hypothetical Debt	58.03	58.28	58.49	58.56	58.37	58.86	