Fiscal Adjustments and Growth in Europe

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There's More Than One Way to Skin a Cat
– English Proverb

1. Introduction and Motivation

It seems that the Treaties of Maastricht and Amsterdam achieved to put in place what many European governments failed to do by themselves for decades, namely to put in place a high degree of fiscal discipline.

The growth and stability pact agreed in the Treaty of Amsterdam, imposes upon member states that their primary budget should converge towards at least a balanced situation in normal times so that automatic stabilisers can operate. It also urges stronger surveillance of medium-term fiscal positions. Keeping track of such an early warning signal should allow economies to go through harsh economic periods without having to violate the Maastricht reference value of a maximum of 3 percent primary deficit. In addition, the pact clarifies the provisions of the Excessive Deficit Procedure. Those governments tolerating a primary deficit that exceeds 3 percent of GDP will be fined if the fiscal excess is not eliminated within two years, unless it arose due to exceptional circumstances, carefully stipulated in the Treaty.

The stability and growth pact henceforth establishes a high degree of fiscal discipline in the long run. Yet, as a result of the Maastricht criteria, most countries are currently still in the process of reducing their overall debt to GDP ratio towards 60 percent. Box 1 illustrates the well-established result that when growth rates are lower than the interest rates, the only way of succeeding in this goal is to comply with an even *stricter* fiscal discipline: running a sufficiently large primary surplus.

Many governments thus either need to continue to cut back severely on expenses, or combine more moderate saving efforts with tax increases. With the Euro now being a fact, a very asymmetric and rigid policy system came consequently into existence. While monetary policy is decided at the central European level on the one hand, there has remained only little budgetary manoeuvring space for national governments to counterbalance economic shocks – let alone regional imbalances – on the other. From the current paper it will become clear that the difficult task and challenge for EMU member states is therefore not only *how* to comply with the stringent regulations implied by the Maastricht criteria and those of the growth and stability pact. An at least equally important question is *what types* of expenditures must (not) be reduced.

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This paper's aim is to take stock of how EU member states have coped with reducing their budget so far. In addition, we would like to assess the following question: what can we learn from the composition of those budget adjustments than can be classified as "successful tight fiscal policies"? Therefore we have organised the paper as follows. Some theoretical considerations are presented in the following section. Section 3 documents the actual evolution of the various components of budgets in the EU and section 4 provides the empirical exercises. Finally, section 5 summarises and concludes.

Box 1. The relation between primary surpluses and debt reduction

Consider the budget constraint for the government:

$$G_t - T_t + r \cdot B_t = \frac{dB}{dt} + \frac{dM}{dt}$$

in which G stands for government expenditure net of interest payments on the outstanding stock of debt, T denotes the tax revenue, r is the interest rate on the government debt B, and M is the level of high-powered money. The equation says that a primary budget deficit (G-T) and the interest payments on debt can be financed either by issuing debt (dB/dt) or by increasing the stock of money (dM/dt). In what follows, the time derivatives will be represented by a dot above a variable.

It will be convenient to express all the variables relative to GDP. In that way, b=B/Y denotes the debt to GDP ratio, and (G-T)/Y=(g-τ) is the primary deficit as a percentage of GDP. What we are interested in here is how the debt ratio will evolve. Consequently we need an expression for $\dot{b}$. From the definition of b, we have:

$$\dot{b}_t = \frac{\dot{B}_t}{Y_t} - B_t \cdot \frac{\dot{Y}_t}{Y_t^2} \ .$$

Substituting the first equation into the second finally leads to:

$$\dot{b}_t = (g_t - \tau_t) + (r_t - g_{Y_t}) \cdot b_t - \dot{m}_t$$

where $g_Y = \dot{Y}/Y$ is the growth rate of GDP, and $\dot{m} = \dot{M}/Y$ the amount of newly created money as a percentage of GDP. This equation says that the debt to GDP ratio remains constant ($\dot{b}=0$) when the right-hand side variables sum exactly up to zero. However, when the right hand side is positive, debt is accumulating. A debt reduction takes place when the right hand side is negative. Therefore, the dynamics of debt accumulation can only be stopped when the primary deficit (g-τ) is turned around into a surplus, or when the nominal growth rate of the economy exceeds the nominal interest rate. In the EMU context, creating a sufficiently large revenue from money creation ($\dot{m}>0$) is, of course, no longer an option for individual governments.

The optimal surplus for which the debt ratio remains constant can be easily solved for. Set $\dot{b}=0$ to obtain:

$$\tau_t - g_t = r_t - g_{y_t} \ . \ b_t - m_t$$

This implies that, once countries have achieved the EMU criterion of b=60 percent, and with 3.5 and 2 percent as reasonable guesses for r and g_Y, the primary surplus should be at least 0.9, say roughly 1 percent of GDP to keep the debt stable at that rate.

It is clear that this value is substantially higher if countries are still to reduce their debt. Let us take another example here. Presume that a country wants to reduce its debt from 120 percent to 60 percent of GDP in a decade. This is equivalent with a $\dot{b}$ of –6 percent per year. Maintaining the same values for the other variables leads consequently to the conclusion that a primary surplus of roughly 7.5 percent of GDP per year should be achieved.

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2. Fiscal policy and growth: some theoretical considerations

It should be clear from the outset that we are interested in the long-run effects of fiscal policy. This is why we will study whether, and what discretionary changes in nations' fiscal strategy are correlated with accelerations in average labour productivity over a sufficiently long period of time. This paper is thus not concerned with the short-run Keynesian effects (see e.g. Alesina and Ardagna, 1998, on this issue).

Budget deficits have many effects. They all follow, though, from the single initial implication: deficits reduce national savings, i.e. the sum of *private saving*, that is, the after tax income that households and firms decide not to consume and put into return yielding assets – and *public saving* – which is the tax revenue that governments do not spend. When the government runs a deficit, public saving is negative which reduces national saving below the private. The other side of the coin is that budgetary policies act a buffer. Consequently, running a temporary deficit may sometimes be considered if it can soften shocks that hit the economy. It is in the light of this context that the growth and stability pact in an EMU holds a potential danger: the embedded stringent fiscal discipline may hamper regional convergence. Let us explain this in a little more detail, keeping in mind that reducing a budget deficit can be done either by reducing expenditures, or by increasing taxes.

From the growth literature it is known that growth and convergence are largely driven by economic fundamentals such as investment in physical and human capital. Especially public investment (infrastructures, education, health, public order and safety, etc.) is often used as a strategy to deal with regional imbalances, although the impact of this regional policy is not straightforward (see e.g. Hurst et al, 2000, Martin, 2000, Vanhoudt et al, 2000). By investing, the government hopes to improve the economic structure, so that lagging areas can be put on a higher growth path. Governments may try to reach the conditions put forward in the growth and stability pact by reducing these variables, as they all constitute flows of expenses on which can be saved. However, when such expenditures happen to be part of some sort of regional policy, lagging areas will be more than proportionately affected by the stability pact, which burdens the process of regional convergence. Cutting back on these kinds of investment may thus contribute towards maintaining persistent regional imbalances.

Increasing taxes is another way of reducing budget deficits, which may be achieved either through enlarging the *tax base* or through raising the system of tax *rates.* The *tax base* refers to the total amount of resources that are eligible for taxation and is to a large extent endogenous. Other things being equal, the base will for instance increase when more people hold a job, when the wage level and value added created in the economy are higher, etc. The system of tax rates is, by contrast, within the direct control of the policy maker. Although it is hard to capture the system in one indicator, a widely used key-figure in macroeconomic studies is the *average* tax rate, computed as the ratio of total government receipts to GDP.

An interesting relation in this context is the Laffer curve, which says that there is an inverse U-shaped correlation between the average tax rate and the total fiscal receipts.

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Indeed, when the tax rate is zero, receipts for the governments will be nil. The same is true when the government taxes away all income, i.e. when the average tax rate amounts to 1. Consequently, there must exist an average tax rate for which the total government receipts reach a maximum. Total receipts will increase when the tax rate raises to the left of this maximum, and the opposite holds to the right. Although the Laffer curve is very much a *static* relation, growth models à la Barro and Sala-I-Martin, 1995, predict that there also exists an inversely U-shaped *dynamic* relation, i.e. one between *growth* of per capita income and the tax rate (or more generally, between growth and the primary deficit if the assumption of balanced budgets in the model is relaxed). To the left of the optimum, the higher tax revenues are used to finance additions to the public capital stock, which makes private physical capital more productive. To the right, the distorting effect of taxation on the after-tax marginal product of capital becomes dominant and will eventually lead to lower growth rates.

The *raison d'être* of these inverse U-shaped regularities is, in fact, the implicit relation between tax pressure and the pecuniary motivation behind economic activity, both for firms and employees. A first link here runs, of course, through labour demand and supply. Workers are motivated, at least in part, for the consumption they can finance from the income they earn; employers take on labour insofar as the value of that of labour exceeds its costs. Ceteris paribus, a permanent increase in labour taxes reduces after-tax real wage. Unions will then in principle demand higher pre-tax wages, which, in turn, will result in higher overall labour costs. Consequently, increasing taxes may have an adverse effect on competitiveness with trading partners – the relative unit labour cost rises – so that the long-run regional growth potential plunges. Together with downward rigid wages and substantial labour immobility in Europe, the reduction in potential output will then feed into unemployment so that the regional pattern becomes even more divergent. It is clear that in the absence of effective regional policies, the social security system will in that case largely function as the main transfer mechanism. Of concern for this paper is that the potentially higher level of unemployment and lower growth will induce raising social security expenditures and a reducing tax base, resulting in a less favourable primary budget.

Many governments are therefore thinking of social security reforms as a way to reduce the deficit. Yet – in our opinion – the concerned debates fail to address a rather important question, namely the one on what type of unemployment measures should be cut back on. In particular the distinction between active and passive labour market policies can be mentioned in this context. *Passive labour market policies* refer to income compensation schemes, including unemployment compensation and early retirement for labour market reasons. These policies are generally introduced for distributional or insurance reasons, but may also distort the incentive to work – broadly defined as the effort and time devoted to a job, job search, or home production (including childcare). Passive labour market policies are much more prevalent and costly than active labour market policies in most OECD countries, and the consensus view is that a too generous system – especially with regard to the length of the benefit – is counter productive for the economy. If unemployed stay on benefits too long, they risk that their skills depreciate fast. As a result, the system may force them into long-term unemployment rather than to provide them with a more optimistic future. Therefore, a*ctive labour market policies* are

often introduced for and directed at specific problems, and may be either broadly based or narrowly targeted. In this domain belong expenditures for public employment services, labour market training, youth measures, subsidised employment, and measures for the disabled. The rationale for active labour market policies is twofold: 1) to undo employment resulting from passive labour market policies and (possibly) to reduce the cost of the latter, and 2) to address possible market failures such as search externalities, capital market imperfections that may prevent workers from financing their own (re-)training, or insider-outsider distortions. With rather elevated labour immobility and substantial wage rigidities, passive labour market policies seem therefor to be a better candidate for cuts than active ones.

A second reason why increasing taxes may adversely affect growth has to do with the credit supply channels. Raising the tax rate may possibly drain resources from private saving and may have, as such, an impact on agents' investment behaviour through a lower availability of, and a higher price for credit. As a result, investments will fall, which will lead to a slower expansion of economic activity.

Finally, one can make a plausible argument that the absence of a flexible budgetary system together with a central monetary policy may even *endogenously* contribute to regional divergence (see e.g. Obstfeld and Peri, 1998). The most important reason here is the common inflation target used by the central bank, which is based on an average price index. The spread around this average increases, however, with differences in sector composition and the degree of urbanisation. Since it can be realistically expected that these variables will evolve substantially due to regional specialisation brought about by the single market and the EMU, the inflation target – and thus the centrally decided interest rate – will be inappropriate for some regions and fit the "average" region at best. Together with downward rigid wages and substantial labour immobility, the fall in regional output will undoubtedly feed again into unemployment. It may thus very well be the case that the EMU contributes to ever-diverging regional unemployment clusters in the periphery next to an economically blooming core. Unless some sort of EU-wide approach can be applied to dampen this phenomenon, the lack of flexible national fiscal policies may thus not facilitate the process of convergence, on the contrary.

In sum, there are a few good reasons to believe that the diverse policy options to comply with the growth and stability pact and the Maastricht criteria may result in quite different outcomes of longer-term performances in an EMU.

Throughout the paper we will focus on changes in the *primary budget to GDP ratio* rather than on the *overall debt to GDP* one. As mentioned earlier, reductions in the overall debt levels require either that growth rates exceed interest rates. This is to a large extent exogenous to the policy maker. Countries with a large public debt and traditionally high interest rates, such as Italy for instance, clearly benefited from the convergence in interest rates brought about by the Maastricht Treaty. Their stock of debt would have shrunk substantially even without the condition to lower the primary deficit to at most 3 percent. Discretionary policy, by contrast, can reduce the overall debt-to GDP ratio by directly influencing the primary budget, i.e. by aiming at a sufficiently large surplus. Since few policy makers – if any – would like their economy to be mainly dependant on such

things as coincidence and luck, it is therefore of importance to know what works and what doesn't in terms of fiscal policy.

After having introduced the current budgetary situations in the member countries in the next section, we will therefore empirically investigate what type of fiscal policies will improve the probability of inducing economic growth.

3. Recent Trends in European Fiscal Policies.

What countries are currently complying with the conditions imposed by the growth and stability pact? In this section we will present a closer look at the budgetary situations in the EU member states. Our main data source is the revised Ameco Database from the Commission's DG Ecfin.

Appendix 1 introduces for each member state the graphical evolution of the receipts (T) and disbursements (G) of the general government as a percentage of GDP since 1960. Three messages appear from these graphs and table 1 below. Firstly, countries differ substantially regarding the level of the government disbursements, and hence regarding the required public finances. For instance, while governments in Denmark and Sweden spend currently some 55 percent of GDP, this is only roughly one third in Ireland, the UK and Spain. Secondly, virtually all EU members manage at the moment to run at least a balanced primary budget or to do better. Only Greece is unable to cover its expenses by its receipts (but stays above the Maastricht level). Note, however, that 9 out of the 15 countries were in that situation in 1990. Thirdly, the rates at which receipts and disbursements have changed over the past 10 years vary considerably. The largest change in the primary budget between 1990 and 1999 has been observed in Greece (about 9.25 percentage points), followed by Italy and Ireland (7.5 and 7.3 points respectively). The countries with the smallest changes in the budget relative to the GDP (in absolute terms) have been Germany, the UK and Austria.

Table 1: trends in receipts (T) and disbursements net of interest payments (G) as percent of GDP

	T		Evolution 1990-99 (av. an. gr. rate)	G in 1999		Evolution 1990-99 (av. an. gr. rate)	Current primary budget T-G (− = deficit)			
	1990	1999	%	1990	1999	%	80-84	85-89	1990	1999
Finland	51.38	52.77	0.30	42.24	45.95	0.94	6.78	7.28	9.15	6.82
Ireland	35.96	37.07	0.34	36.76	30.57	-2.03	-6.28	-4.28	-0.80	6.50
Denmark	55.13	57.90	0.55	54.91	52.87	-0.42	-2.56	3.27	0.22	5.03
Sweden	64.89	59.53	-0.95	58.35	55.04	-0.65	-0.12	4.28	6.54	4.49
Spain	39.84	40.26	0.12	38.10	36.38	-0.51	-0.11	1.03	1.74	3.88
UK	38.46	40.57	0.60	36.03	37.80	0.54	-0.65	0.70	2.43	2.77
Netherlands	49.91	45.96	-0.91	51.52	43.20	-1.94	-0.24	-0.34	-1.61	2.76
Belgium	47.56	50.32	0.63	51.20	48.33	-0.64	-6.28	-5.18	-3.64	1.99
Portugal	35.01	43.39	2.41	36.45	41.57	1.47	-9.71	-2.97	-1.44	1.81
Italy	42.80	47.12	1.08	48.53	45.32	-0.76	-6.51	-6.14	-5.74	1.80
France	48.17	50.27	0.48	45.74	48.64	0.68	1.40	1.37	2.43	1.64
Germany	43.25	46.53	0.81	41.96	44.91	0.76	1.59	2.31	1.30	1.61
Austria	47.79	49.68	0.43	45.56	48.11	0.61	3.20	2.02	2.23	1.57
Greece	32.93	39.90	2.16	42.48	40.20	-0.61	-3.61	-7.48	-9.55	-0.30
Luxembourg	N/A	44.60	N/A	N/A	N/A	N/A	8.28	N/A	N/A	N/A

Source: Ameco database, DG Ecfin.

A closer look at the data in table 1 reveals that three categories of countries can be distinguished: those that increased their primary surplus since 1990, those that reduced it, and those that reduced the primary deficit, as presented in table 2. Moreover, we learn from that table that different strategies have been applied to come to these final results. Recall, however, that there may be a good reason for different approaches in tax policies if countries are asymmetrically situated vis-à-vis the optimum in the Laffer curve.

Table 2: Policies compared: there's more than one way to skin a cat…

Period: 1990-99		Strategy	
Result:	Countries:	↑T	↓G
increased surplus	Denmark	-	−
	Spain	-	−
	UK	-	-
	Germany	-	-
reduced surplus	Sweden	−	−
	Finland	-	-
	France	-	-
	Austria	-	-
reduced deficit	Ireland	-	−
	Belgium	-	−
	Italy	-	−
	Greece	-	−
	Portugal	-	-
	Netherlands	−	−

Source: *Ameco database, DG Ecfin.*

Both Denmark and the UK increased for instance their surplus. Yet while Denmark opted mainly for reductions in general government spending, the UK raised taxes and

disbursements, implying, of course, that tax-revenues – as a percentage of GDP – have gone up faster than the expenditures. Among those countries that reduced their deficit, most of them did so by saving on general government expenditures and by increasing tax receipts over the considered time span. Portugal and the Netherlands stand out. While the Netherlands reduced its expenditures faster than its taxes the opposite was true in Portugal. Thus, different strategies have been used to implement fiscal policies. Are there any particularities within the disbursements and revenues that are worth mentioning?

Although data on sub-categories are in general not readily available, the charts in appendix 2 provide a more detailed look at the main categories of the receipts – where on hand – such as indirect and direct taxes, social security contributions, and "other" current receipts. The next two appendices provide graphs on the main categories for the disbursements. To be more precise, appendix 3 shows the final consumption expenditures as a percentage of GDP – i.e. general public services, defense, public order and safety, education, health, community amenities, transport and communication, social security payments, and "other" current expenditures – and appendix 4 provides information on gross fixed capital formation by the general government.

These charts reveal, in fact, four messages. Firstly, social security receipts are far less volatile than the related expenditures. Obviously, this reflects the fact that the largest trunk of social security expenditures are passive labour market funds – mainly unemployment benefits thus as described earlier. These flows follow by and far the unemployment series, which is the main reason why the social security expenditures show, in general, a steep upward trend with cycles. Social security revenues, by contrast, are determined by the stock of people employed, their productivity (wages), and the tax rate applied to them. Although these receipts also show an upward trend, they are far less volatility than the expenditures. Together with the direct income taxes, social security revenues constitute the largest share of the receipts in most of the countries.

Secondly, whereas in virtually all the Southern European countries expenditures for education have increased substantially, these outlays have been reduced in the Northern ones such as e.g. Denmark, the Netherlands, Germany and the UK. A remarkable contrast here is the fact that in countries for which we have observations, even after the end of the "cold war" expenditures for defense as a percentage of GDP have remained rather constant.

Thirdly, after the social security expenditures, the second and third largest expenditure posts are usually "transport and communication" (i.e. public roads and their maintenance) and "health" (i.e. public hospitals and medical staff). From the broader picture it appears that in the most advanced countries, governments have been able to cut drastically back on transport expenditures whereas those for health seem harder to control.

Finally, gross fixed capital formation – public investment – has known a downward trend in virtually all European countries, although the trends have clearly been reversed in the

recent past within the cohesion countries – Greece, Ireland, Portugal and Spain – and Italy. Also the UK –the country with consistently the lowest public investment share since 1995 – appears to be moving again towards a higher public investment path.

Thus, whereas social security and health expenditures are in general hampering a reduction of the budget, tightening general government expenditures has been mainly achieved trough reducing public investment, diminishing outlays for transport and communication, and falling education expenditures in the North. At the revenue side, direct taxes and social security contributions have grown fastest in most of the countries.

Consequently, a natural question is which way is best to go? Given that the largest share of the European countries has been trying to tighten the budget on their way towards EMU, what's the anatomy of a successful tight fiscal policy? What should governments (not) save on? This is precisely the subject of the subsequent section.

4. The anatomy of a "successful" "tight" fiscal policy mix.

The main research question in this section thus is to discover the recipe for a "successful" "tight" fiscal policy. This requires, of course, definitions and clarifications.

Following Alesina and Perotti, 1997 we focus upon periods of relatively large budget adjustments. By "tight" fiscal policies, we therefore mean a year during which the primary *deficit*, as a percentage of GDP, fell by more than 1 percentage point, or, a period during which the primary *surplus*, again as a percentage of GDP, increased by more than 0.5 percentage point. The main motivation behind this asymmetry in the threshold levels is that in times of budget surpluses, pressure from lobby groups will make it more difficult for policy makers to remain a strict fiscal discipline than in periods of deficits. In fact, it is an easily additional testable hypothesis whether or not the probability of success is higher during times of deficits. Applying this definition over the time span 1960-2000 will yield N observations of "tight" fiscal policies, spread among the various countries. As the cut-off rates are, admittedly, arbitrary we will complement the regressions – where possible – by similar ones based upon even stricter limits (2 and 1 percentage point changes in the deficit and surplus respectively, i.e. double the original ones). Obviously, this sensitivity analysis will affect N, i.e. the size of our basic sample.

We differ from Alesina and Perotti, 1997, though, in our definition of a "successful" tight fiscal policy. This paper's main interest is to identify the impact of the composition of tight fiscal policies on *structural growth*, as opposed to long-lasting deficit reductions. Therefore, we will carry out the following exercise in which a tight fiscal policy is called successful when the average annual growth rate of (real) labour productivity is higher in the 5 years following the policy than in the 5 years preceding the change[1]. This criterion will provide us with n_1 (<N) cases of "successful" tight fiscal policies. Table 3 reports for instance the results of applying the above filters to the series of primary fiscal budget data.

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[1] However, as from 1995 the moving averages were taken over 4, 3 and 2 years respectively, in order not to loose interesting observations.

Also in the empirical methodology we follow a different path than Alesina and Perotti, 1997. In order to discover the successful policy mix we suggest and implement a *binary estimation technique*, rather than a descriptive approach. The research strategy is the following. Among those tight fiscal policies that were filtered out by applying the above-mentioned definition, we will denote a successful tight policy by 1 and a non-successful by 0. This series will be used as the dependent variable in a probit model. In such an approach, the regression results should be interpreted as the effect on increasing the probability of success, which is in this case equivalent with increasing a higher trend growth rate in the next 5 years.

Table 3: Successful tight fiscal policies w.r.t. growth performances 1960-99 based on particular cut-off rates

Country	"*Tight*" fiscal policies in	of which "*successful*" tight fiscal policies in
Belgium	1960, 63, 65, 69, 73, 81, 83, 86, 93, 94, 96, 97	1969, 86, 93, 96
Denmark	1961, 62, 65, 67, 69,72, 75, 82, 83, 84, 85, 95, 96, 97, 98	1975, 82
Germany	1960, 67, 68, 72, 75, 76, 83, 84, 88, 90, 97	1976, 83, 84
Greece	1960, 65, 67, 68, 71, 75, 78, 85, 90, 95, 96	1985, 90, 95, 96
Spain	1972, 86, 87, 96, 97, 98, 99	
France	1963, 68, 69, 75, 78, 79, 86, 94, 96, 98	1986, 96
Ireland	1965, 69, 75, 82, 83, 86, 87, 88, 93, 94, 95, 96, 97, 98	1965, 82, 83, 86, 87, 93, 94, 95, 96, 97
Italy	1966, 75, 92, 94, 96, 98	1975, 92,
Luxembourg	1960, 68, 69, 72, 73, 75, 76, 77, 81, 82, 84,	1968, 75, 76, 77, 81, 82, 84
Netherlands	1967, 72, 76, 84, 90, 95, 97, 98	1967, 90
Austria	1960, 63, 69, 70, 71, 76, 79, 83, 87, 91, 95, 96	1987, 95
Portugal	1961, 64, 68, 75, 81, 85, 87, 88, 91, 94, 95, 97	1985, 87
Finland	1963, 66, 69, 72, 74, 75, 79, 80, 83, 85, 87, 88, 93, 94, 96, 97, 98, 99	1966, 83, 85, 93
Sweden	1975, 82, 85, 87, 88, 94, 95, 96, 97	1982
UK	1960, 61, 63, 64, 65, 67, 68, 69, 87, 88, 94, 96, 97, 99	1965, 67, 68

Note: cut-off rates for tightness: a minimal reduction of 1 percentage point of the primary budget-to-GDP ratio in case of a deficit, and 0.5 percentage point for increases in the surplus. Data for Spain and Sweden not available before 1970. There is a gap in the data for Luxembourg between 87 and 95. To assess the successfulness of the fiscal policy, moving averages of the growth rate of income per worker were taken over 5 years. As from 1995 the moving averages were computed over rate 4, 3 and 2 years respectively.

Our first question is a rather general, but nonetheless important one: are successful tight fiscal policies obtained by manipulations on the receipts or expenditure side of the general government? Obviously, some factors need to be controlled for when examining this empirically, such as the level of the deficit, this level squared and the unemployment rate. As set out earlier, the probability of a successful impact on long-run growth rates will depend in an inverse U-shaped way on the level of the taxes and expenses – the deficit, thus – already in place. Let us call this controlling for a Laffer type of effect. Taking up the unemployment rate, in turn, controls for the fact that deficits may reduce automatically when unemployment rates go down as, in that case, simply less benefits have to be paid out – an example of a so- called automatic stabiliser. Moreover we have to discriminate between policies for tightening the budget when there is a deficit, and when there is a surplus. We will do so by multiplying the changes in the receipts and expenditures with the actual deficit in place. Finally, it is reasonable to expect that budget cuts are less effective if they only last one period and are not expected to have

lasting effects. Therefore we introduce 3 additional dummies. These variables are respectively one, when the *structural* (or cyclically corrected) primary budget remains at least equally favourable for maximum one period, for a maximum of two years or for a maximum of three years. The structural budget is obtained from the Commission's DG Ecfin. Results of this exercise are shown in table 4.

table 4: probit results for the basic specification

A **tight** fiscal policy is defined as a fiscal policy that reduces the deficit or increases the surplus according to specific cut-off rates. A policy is called **successfully** tight when the average annual growth rate of labour productivity over the 5 years following the policy is higher than the average annual growth rate during the 5 preceding years.

variable	Results with cut-offs: 1 and 0.5		Results with cut-offs: 2 and 1	
	A	B	A	B
$DG*(T-G)$	+0.033 (0.015)**	+0.039 (0.014)**	+0.047 (0.022)**	+0.047 (0.021)**
$DT*(T-G)$	−0.018 (0.022)	−0.022 (0.018)	−0.045 (0.032)	−0.044 (0.032)
T-G	−0.057 (0.034)*	−0.116 (0.029)*	−0.046 (0.027)*	−0.042 (0.030)*
$(T-G)^2$	+0.009 (0.005)*	+0.006 (0.005)*	+0.005 (0.004)	+0.005 (0.004)
U	−0.046 (0.027)*	−0.020 (0.029)	−0.075 (0.039)*	−0.040 (0.059)
MAX1	−1.763 (0.397)**	−1.703 (0.399)**	−1.346 (0.452)**	−1.447 (0.459)**
MAX2	−1.166 (0.544)**	−1.671 (0.537)**	−1.312 (0.468)**	−1.375 (0.505)**
MAX3	+0.320 (0.268)	+0.442 (0.228)*	+0.832 (0.502)*	+0.818 (0.500)*
maastricht	–	−0.590 (0.310)*	–	+0.489 (0.533)
Log likelihood	-65.77	-64.12	-25.74	-25.45
Unsuccessful	104 obs	104 obs	50 obs	50 obs
Successful	48 obs	48 obs	20 obs	20 obs

Note: QML (Huber/White) robust standard errors in parenthesis. *: significance at the 10 percent level or better; **: significance at the 5 percent level or better.

The results in table 4 clearly support our intuition. Let us start with discussing the estimated coefficients on the conditioning variables, of which the signs and significance are as expected. The regression results indicate that the probability of obtaining a successful tight fiscal policy is higher when there is a current deficit (i.e. T-G<0) than when there is a surplus (i.e. T-G>0), which confirms – at least in part – the earlier made hypothesis. Also, the dynamic Laffer curve comes out neatly, as the probability of increasing structural growth is in an inverse U-way related to the deficit (G-T). In addition, the probability of a successful tight policy decreases with the magnitude of the unemployment rate in place, which can be explained as follows. Other things being equal, an increase in the unemployment rate implies that government expenses on labour market policies will swell. This comes at an opportunity cost as it means that there will have to be cut back on other, possibly growth enhancing expenses, or that taxes will have to be raised – two scenarios which are not particularly promising for the creation of economic growth. Finally, a tight policy has more chances of being successful in terms of

generating trend growth only if it improves the *structural* budget for more than 2 succeeding periods. Credibility of the policy may be key here. Tightening the structural budget often requires that governments tackle delicate components of the budget – public employment, social security programs and the like – and their respective eligibility criteria. By affecting the structural budget for more than one period, policy makers may henceforth signal that they are really serious about fiscal reforms. When well thought of, these reforms can be of such a nature that they result in an enhanced economic environment to foster sustained growth.

Budget cuts in times of deficits (T<G) are more likely to have a positive impact on the average growth rate when it they are brought about by a reduction of the current expenditures than when they are achieved through increasing taxes. We learn this from the positive sign on the interactive term $\Delta G*(T-G)$, and the smaller (in absolute terms) but non-significantly estimated coefficient on $\Delta T*(T-G)$. Recall that in times of a deficit, ΔG must according to the estimates be strictly smaller than 0 and ΔT strictly greater than zero to increase the probability of success. By contrast, in times of surpluses (T>G) a successful tight fiscal policy will also allow for increases in government spending, and compensate through higher revenues. Furthermore it becomes clear from the second part in table 3 that the conclusions are not very sensitive to changes in the cut-off rates. Focussing on even tighter fiscal policies by restricting the relevant parameters reduces substantially the number of useful observations, but the broad picture remains unaffected.

Note, finally, that the impact of the Maastricht Treaty is not quite clear. We find that the effect of the Treaty is – if any – rather negative. What goes behind this result possibly is that the pressure on governments to reduce their debt and deficits rapidly after 1993 forced them to ignore composition effects of the necessary restrictive policies.

The main message of this first exercise – tight fiscal policies that have a lasting effect on the structural budget are more successful in generating sustained growth when they focus on reducing expenditures rather than at increasing taxes – is very much in line with the conclusion put forward by Alesina and Perotti, 1999, even though we have followed a different empirical approach. Consequently, we think that this conclusion can be taken as fairly robust and as a stylised fact.

What can we say about the composition of the policies? In order to answer this multifaceted question we follow a similar methodological path. For reasons of comparability with Alesina and Perotti, 1999 (table 12), we will use the following decomposition:

Category	Abbreviation
public investment	PUBINV
transfers	TRANSF
general government wages	WAGES
subsidies	SUBS
non-wage general government consumption	CONS

Total current general government expenditures will also be split up according to the categories in appendix 3. These are:

Category	Abbreviation
general public services	GEN
defense	DEF
public order and safety	ORDER
education	EDU
health	HEALTH
housing, community amenities, recreational, cultural and religious affairs	COMMUNITY
transport and communication	TRANSPORT
social security and welfare	SSEC
other	OTHER

Unfortunately, the poor availability of the data on these categories does not allow us to do a sensitivity analysis here. Finally, we will focus on the composition of the receipts, where we will discriminate between:

Category	Abbreviation
indirect taxes	TINDIR
direct taxes	TDIR
social security contributions	SSEC
other current receipts	OTHER

which are the categories presented graphically in appendix 2.

Dissecting the expenditure side as in table 5 suggests the following. Except for very tight policies (right part of the table), the probability of success during periods of deficit (T-G<0) is rather unaffected by cutting back on public investment, as we learn from the statistically insignificant estimates on this variable. Far more important are reductions in government wages (public employment), government consumption in general and subsidies, and the probability on success increases again if those policies have a lasting structural impact on the budget. The figures suggest that it takes an impact on the structural budget for at least two periods, before a tight policy increases the probability of fostering growth.

Such results point into the direction of "Ricardian equivalence": two policies of the same magnitude can yield completely different expectations. For instance, when governments cut back on road maintenance, the public knows that this cannot be postponed forever. In such cases a tax increase will be expected later on, and economic behaviour and growth remains relatively unaffected. By contrast, reductions on subsidies by changing e.g. the criteria for eligibility are of a more permanent nature.

Except for the change on the coefficient for public investment, the results vary little when a stricter definition of tight fiscal policy is adopted.

table 5: expenditures cuts dissected – probit results

A **tight** fiscal policy is defined as a fiscal policy that reduces the deficit or increases the surplus according to specific cut-off rates. A policy is called **successfully** tight when the average annual growth rate of labour productivity over the 5 years following the policy is higher than the average annual growth rate during the 5 preceding years.

variable	Results with cut-offs 1 and 0.5 B	Results with cut-offs 2 and 1
DPUBINV*(T-G)	−0.031 (0.107)	+5.250 (2.144)**
DTRANSF*(T-G)	−0.040 (0.066)	+0.457 (0.465)
DWAGES*(T-G)	+0.568 (0.228)**	+6.002 (2.936)**
DSUBS*(T-G)	+0.082 (0.051)*	−0.274 (0.183)
DCONS*(T-G)	+0.413 (0.156)**	+3.717 (1.838)**
DT*(T-G)	−0.002 (0.024)	−0.163 (0.103)
T-G	−0.102 (0.054)**	−1.041 (0.411)**
(T-G)^2	−0.001 (0.008)	−0.026 (0.040)
U	−0.011 (0.037)	−1.175 (0.414)**
MAX1	−12.125 (1.323)**	−18.84 (4.843)**
MAX2	−9.370 (0.346)**	−13.312 (5.221)**
MAX3	+0.408 (0.344)	+10.474 (3.715)**
maastricht	−0.560 (0.374)	+ 0.053 (0.572)
Log likelihood	−43.35	−16.52
Unsuccessful	92 obs	45 obs
Successful	37 obs	14 obs

Note: QML (Huber/White) robust standard errors in parenthesis. *: significance at the 10 percent level or better; **: significance at the 5 percent level or better.

A different classification, implemented in table 6, yields two more interesting insights. Because of differences in availability of the data in the total sample we focused on each category separately and reported those regressions that yield a significant estimate on the considered variable. The table shows that a successful tight fiscal policy primarily reduces expenditures on defense, and on social security payments in periods of deficits. The sign and significance on the variable "public order and safety" is a little surprising and captures possibly more of a demand than of a supply effect. Again it is notable that the relation has not changed after the implementation of the Maastricht Treaty, and that the probability of success increases if the policies have an impact on the structural budget of at least 2 succeeding years.

table 6: expenditures further analysed – probit results

A **tight** fiscal policy is defined as a fiscal policy that reduces the deficit or increases the surplus according to specific cut-off rates. A policy is called **successfully** tight when the average annual growth rate of labour productivity over the 5 years following the policy is higher than the average annual growth rate during the 5 preceding years.

variable	Results with cut-offs 1 and 0.5		
	i=defense	i=soc. sec	i=order
$\mathbf{D}$category$_i$*(T-G)	+0.934 (0.529)[*]	+0.125 (0.059)[**]	−1.205 (0.662)[*]
$\mathbf{D}$other*(T-G)	−0.034 (0.030)	−0.144 (0.149)	−0.034 (0.037)
$\mathbf{D}$T*(T-G)	+0.082 (0.061)	+0.082 (0.067)	+0.206 (0.095)[**]
T-G	−0.267 (0.156)[*]	−0.239 (0.123)[*]	−0.369 (0.159)[**]
(T-G)^2	+0.027 (0.020)	+0.036 (0.029)	+0.029 (0.018)[*]
U	−0.014 (0.044)	−0.029 (0.041)	−0.053 (0.043)
MAX1	−9.466 (0.916)[**]	−10.978 (1.531)[**]	−11.315 (1.299)[**]
MAX2	−10.272 (2.284)[**]	−13.115 (3.601)[**]	−13.520 (2.506)[**]
MAX3	+0.299 (0.463)	+0.350 (0.476)	+0.359 (0.468)
maastricht	−0.317 (0.473)	+0.084 (0.509)	+0.531 (0.538)
Log likelihood	−22.347	−19.94	−17.51
Unsuccessful	37	35	32
Successful	19	18	15

Note: QML (Huber/White) robust standard errors in parenthesis. [*]: significance at the 10 percent level or better; [**]: significance at the 5 percent level or better.

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Let us now turn to the income side. Discriminating between the different tax policies yields the following results:

table 7: receipts analysed – probit results

A **tight** fiscal policy is defined as a fiscal policy that reduces the deficit or increases the surplus according to specific cut-off rates. A policy is called **successfully** tight when the average annual growth rate of labour productivity over the 5 years following the policy is higher than the average annual growth rate during the 5 preceding years.

variable	Results with cut-offs 1 and 0.5		Results with cut-offs 2 and 1	
	A	B	A	B
DTDIR*(T-G)	+0.018	+0.018	−0.041	−0.039
	(0.040)	(0.041)	(0.052)	(0.053)
DTINDIR*(T-G)	−0.091	−0.087	−0.069	−0.070
	(0.045)**	(0.050)*	(0.038)*	(0.035)*
DSSEC*(T-G)	−0.024	+0.024	−0.147	−0.152
	(0.056)	(0.053)	(0.120)	(0.127)
DOTHER*(T-G)	−0.090	−0.099	−0.507	−0.539
	(0.077)	(0.081)	(0.165)**	(0.166)**
DG*(T-G)	+0.049	+0.049	+0.106	+0.109
	(0.018)**	(0.018)**	(0.034)**	(0.034)**
T-G	−0.035	−0.032	−0.091	−0.078
	(0.037)	(0.038)	(0.052)*	(0.052)
$(T-G)^2$	+0.010	+0.014	+0.014	+0.012
	(0.004)**	(0.006)**	(0.007)**	(0.007)*
U	−0.028	−0.003	−0.028	+0.061
	(0.029)	(0.032)	(0.059)	(0.082)
MAX1	−8.791	−9.012	−2.326	−2.752
	(0.604)**	(0.535)**	(0.717)**	(0.863)**
MAX2	−2.668	−2.567	−3.028	−3.513
	(0.460)**	(0.442)**	(0.827)**	(1.040)**
MAX3	+0.061	+0.221	+0.488	+0.360
	(0.287)	(0.309)	(0.655)	(0.696)
maastricht	–	−0.622	–	+0.067
		(0.331)**		(0.458)
Log likelihood	−53.73	−52.06	−17.91	−17.32
Unsuccessful	96 obs	96 obs	47 obs	47 obs
Successful	45 obs	45 obs	18 obs	18 obs

Note: QML (Huber/White) robust standard errors in parenthesis. *: significance at the 10 percent level or better; **: significance at the 5 percent level or better.

It is re-assuring to see again that the probability of a successful tight fiscal policy increases significantly during periods of deficits if governments cut back on expenditures. However, sometimes policy makers need to increase the receipts at the same time – compliance with the Maastricht Treaty and the growth and stability pact being currently an important reason for that. The results in table 7 clearly show that in general, the probability of a successful tight fiscal policy – thus, the possibility of creating higher growth – is not significantly positively affected by such decisions, except for increases in indirect taxes and – when we focus on very tight policies – also by other revenues that constitue a minor part of the income of general government.

5. Conclusion

Putting these findings together, what are our conclusions? Perhaps economists are not always the greatest in providing clear-cut advice on what works in the future. Yet sometimes they have a gut feeling about what doesn't. In this paper we have therefore implemented, in fact, nothing but a test of common economic sense rather than of a particular economic model. With this in mind, our results lead to the following observations:

- In some cases fiscal contractions can be expansionary, in the sense that they help in fostering medium to long-run growth. We have documented that policies that focus on reducing expenditures, rather than at increasing taxes, have a higher probability of being successful in this respect.
- Some key messages appear on the expenditures side: in case of tight fiscal policies, saving on government wages (government employment), subsidies and non-wage government consumption expenditures is preferable. In addition we have seen that reducing defense and social security outlays increases the probability of a successful tight policy. Cutting back on public capital formation is advisable only when the fiscal policy needs to be of an extremely tight nature.
- In any case, the policies have to result in a lasting impact on the *structural* budget to maximise the probability of fostering sustained growth later on. The findings indicate that there should be an impact for at least two succeeding years.
- In those cases that increasing taxes is unavoidably necessary to reduce the deficit sufficiently, increases in indirect taxes seem less harmful than rising other type of taxes, ceteris paribus. A not implausible reason for this result is that indirect taxes have presumably the least distortion on competitiveness in open economies.

We are aware, though, of the fact that we did not cover the question of what kind of monetary policy should accompany fiscal adjustments. Nonetheless, the results show that the relation obtained is rather robust. Moreover, the obtained findings for the sample of EU countries – based on a binary regression technique – are in line with those reported in earlier studies for OECD countries. It thus seems that even though monetary policy may or may not enhance growth further, fiscal adjustments should at least have the features described earlier.

The most important idea that we hope to communicate in this paper is that the composition of fiscal adjustments matters for the likelihood of fostering medium to long-run growth. In fact, the academic literature focuses too often on aggregate effects while impacts of the composition are virtually ignored – the seminal work by Alesina and Perotti being a clear exception. This short-sided view has obviously contributed to the fact that the discussion of the composition of fiscal adjustments in actual policy debates is, in general, of only minor importance. The growth and stability pact is in this respect no exception.

In our view, the growth and stability pact can therefore be criticised along two major lines. Firstly, it focuses on current deficits. From our analysis we have learned that fiscal policies can be more or less successful simply depending on the unemployment rate,

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and the taxes and expenditures already in place. Some components of these variables are highly cyclical. Thus, the deficit may fall and growth increases even though policy makers do nothing. A growth and stability pact should, however, focus on changes in discretionary, non-cyclical, factors. Admittedly, this imposes a methodological issue, but there are different ways of computing "structural" or "cyclically corrected" deficits (see e.g. McKenzie, 1989 for an overview). One such an indicator is estimated by and readily available from the OECD. The Commission provides another one – of which Table 8 gives an illustration. Obviously, it is thus a cyclically corrected measure that should be the one to consider in the light of the growth and stability pact. However, from our reading we understand that the pact – as agreed in the Treaty of Amsterdam – implicitly refers to the situation of the current deficit.

Table 8: cyclically adjusted versus current primary budgets, % of GDP.

	General government Net lending (+) or net borrowing (-)							
	adjusted for the cyclical component				current primary budgets			
	1996	**1997**	**1998**	**1999**	**1996**	**1997**	**1998**	**1999**
Belgium	-2.49	-1.58	-0.69	-0.34	-1.02	+1.04	+1.85	+1.99
Denmark	-1.53	-0.58	+0.11	+2.65	+1.29	+2.37	+3.04	+5.03
Germany	-3.02	-2.03	-1.20	-0.28	-0.04	+0.44	+1.39	+1.61
Greece	-7.04	-4.13	-2.97	-1.60	-5.00	-1.40	-0.60	-0.30
Spain	-4.07	-2.63	-2.32	-1.07	+0.13	+1.89	+2.83	+3.88
France	-3.28	-2.05	-2.09	-1.28	+0.06	+0.73	+1.08	+1.64
Ireland	+0.11	+0.30	+1.15	+0.76	+3.41	+4.28	+5.39	+6.50
Italy	-6.84	-2.48	-2.47	-1.35	-3.31	+0.72	+0.92	+1.80
Luxembourg	+3.89	+3.58	+3.36	+2.61	+8.70	+8.00	+6.20	#N/A
Netherlands	-0.85	-0.68	-0.55	+0.68	+1.17	+1.66	+2.19	+2.76
Austria	-3.67	-1.46	-2.17	-1.70	+1.03	+1.98	+1.52	+1.57
Portugal	-3.39	-2.29	-1.98	-1.77	+0.67	+0.79	+1.54	+1.81
Finland	-0.81	-1.22	+0.63	+1.87	+0.65	+1.92	+4.49	+6.82
Sweden	-2.10	-0.56	+2.93	+2.04	-0.54	+0.99	+4.07	+4.49
UK	-4.17	-2.30	+0.20	+1.35	-1.38	+0.28	+2.43	+2.77

Source: AMECO database, DG Ecfin

Secondly, the growth and stability pact does not provide guidelines for implementing a healthy composition of the fiscal policy. Perhaps that is why we find that – even though the Maastricht Treaty may have given political incentives to reduce deficits – the implementation of the Treaty did not have a significant impact on the probability of achieving a successful tight fiscal policy. It seems that the underlying idea in the Treaty and the Growth and Stability Pact is that anything will do fine, as long as the deficit converges to a balanced situation in the long run. The evidence in this paper, as in e.g. Perotti, 1996, clearly indicates that such a faith is a misplaced. There are indeed different ways to skin a cat, but composition of the fiscal policy definitely matters when it comes to fostering economic growth, and hence, reducing disparities!

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