EUROPEAN FISCAL DISCIPLINE BEFORE AND AFTER EMU PERMANENT WEIGHT LOSS OR CRASH DIET?

by

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Permanent Weight Loss or Crash Diet?

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Abstract: This paper studies the evolution of European fiscal policies and the attempts at budgetary consolidation through three periods: the pre-Maastricht phase (to 1991); the run up to monetary union (1992-97), and finally the stability pact phase (1998 onwards). Using three separate indicators – the probability of undertaking a consolidation, the degree to which it is sustained, and the probability of exceeding a specified deficit limit – we search for structural breaks which could signify a change in the average level of fiscal discipline in these periods. We find increased discipline only up to 1997. Thereafter discipline erodes to the extent that, by 2005, there is less discipline than before the Maastricht process started. We conclude the new fiscal discipline was temporary; a product of the sanction of being denied entry to the Euro, and that EMU itself has had no impact on discipline (in the absence of that sanction). Our methodological innovation is to show the importance of the *dynamics* of fiscal behaviour: step dummies for changes in the average level of discipline, and trend dummies to capture any decline/increase relative to that average. A single structural break test will miss these dynamic effects, and may generate the erroneous conclusion that fiscal discipline had tightened since the start of phase two of EMU.

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1. Introduction

Concerns over the effect of fiscal policy on the stability of the Euro have played a significant role in shaping the institutional architecture of EMU. At the heart of these concerns lies the view that, when fiscal policy is devolved to national governments and monetary policy is decided supranationally, fiscal policy would generally be looser than in the absence of a monetary union. The concern more specifically is that the costs of a looser fiscal policy by an individual government – in the form of higher interest rates and the political pressure for a looser monetary policy – would be borne, not by the individual governments, but by the currency union as a whole, and would therefore create a "tragedy of the commons".[1]

For this reason governments wishing to participate in EMU have been subject to supranational constraints on fiscal policy. The Maastricht Treaty stipulated that government deficits may not exceed 3% of GDP, and that the ratio of debt to GDP should either be less than 60%, or approaching this level at a satisfactory pace.

However, now that EMU has started, we can identify two distinct phases of European monetary integration - prior to monetary union itself, and after the monetary union. These two phases contain two quite different sets of constraints on fiscal policy. In the pre-EMU phase, fiscal policy was disciplined by the threat of exclusion from EMU. In fact, during the 1991-1997 period, there were no formal limits on the deficit or debt ratios in any particular year, nor were there any fines or other enforcement mechanisms for countries deemed to be running unsustainable fiscal policies. Rather, discipline was exerted by the threat of being excluded from the single currency when, in 1997, an assessment was made on each country's compliance with the Maastricht convergence criteria. Complying with these criteria required a substantial fiscal consolidation in many countries, with fiscal policy being largely subordinated to the goal of the joining EMU.

By contrast, from 1998 onwards, once countries were accepted into the Euro, the threat of exclusion was neither credible nor viable. Instead, the 3% deficit limit was

to be enforced through the Excessive Deficit Procedure (EDP) which was codified into the Amsterdam Treaty in 1997 as the Stability and Growth Pact (SGP). Essentially, the Stability Pact consisted of two components: a monitoring process carried out by the European Commission, and the possibility of fines being levied on countries whose deficits exceeded the reference value. Fines would be levied by a vote of finance ministers, with the transgressing nation excluded from the voting.

In this paper, we develop an account of fiscal policy which highlights two specific features. First, we quantify – in numerical values – exactly what has happened to Eurozone fiscal policies over the period 1991-2002. We focus on their responsiveness to output gaps, and on their inertia and overall discipline. Second, we test for any differences in behaviour between the two epochs. This enables us to see whether the fiscal benefits of EMU were "front-loaded", i.e. occurred primarily in the pre-EMU epoch; or whether fiscal policy has been consistent over the whole period in the sense that some distinct pattern of discipline emerged.

Our methodology uses three key indicators of fiscal policy. First, we use hazard rate analysis to examine the effects of the EMU process on the success of fiscal consolidations. Second, we use probit analysis to consider the probability of violating the 3% deficit limit over the period 1991-2002. Third, we estimate fiscal policy "reaction functions" which capture fiscal policy as a response to certain key variables such as the output gap, and the debt ratio. We capture change of regime effects using a series of time specific dummy variables and trends. Having stripped out the influence of "economic" variables, we interpret the explanatory power of time specific terms as an indicator of the discipline in place at that particular time.

Throughout the paper, we test for time specific effects with a particular emphasis on discovering the exact timing of changes in fiscal behaviour. To that end, we vary the cut-off point for different epochs to pinpoint the exact timing of those changes. And to do that, we use a combination of step and trend dummies and allow the data to select the representation which gives the best fit.

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[1] For a full explanation of this rationale for the Stability Pact, see Beetsma (2001)

2. Fiscal Consolidations in Europe Post-Maastricht

In this section, we analyse the fiscal consolidation efforts of EU member states post-Maastricht. We place particular emphasis on comparing the pre-EMU epoch, during which countries were trying to meet the Maastricht criteria and gain entry to EMU, compared to the post-1997 experience when they were already in the euro. We are interested in two issues relative to the pre-Maastricht era:

- The probability of commencing a consolidation.
- The factors affecting the longevity of a consolidation.

For the purposes of analysis, we use the following definition of *fiscal consolidation* taken from von Hagen et al. (2002). A fiscal consolidation is defined as an episode in which the cyclically adjusted budget deficit decreases (or surplus increases) by at least 1.25% of cyclically adjusted GDP in two consecutive years, or if the change exceeds 1.5% in one year, and was at least positive in both the preceding and following years. A consolidation episode is said to be *ongoing* for as long as the budget balance stands at no less than 75% of the balance in the first year of the consolidation episode. Cyclical adjustments are made on the basis of a linear-quadratic trend for each country. A consolidation is therefore a contraction in a deficit position; a fiscal adjustment is a change that could go either way.

Clearly such a definition is to some extent arbitrary. It does, however, have the advantage of focusing attention on periods in which governments made strong and deliberate efforts to consolidate their deficits.[2] And, in what follows, we use data to cover the consolidation period 1960–2002 for the 15 countries that were members of the EU at the launch of the single currency.

Fiscal consolidations are a useful variable to analyse, since the run-up to EMU required substantial consolidations on the part of many nations. Equally, it was clear that even after meeting the headline Maastricht Criteria, many countries required

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[2] See Alesina and Perotti (1995, 1997a) for a demonstration of the robustness of these results with respect to alternative definitions of 'consolidation'. Reasonable changes do not change the qualitative results (see also Von Hagen et al., 2001, 2002), and the results reported in this paper are no exception.

further consolidations to achieve the medium term goal of a balanced budget over the cycle required by the SGP.

2.1 Initial conditions and the probability of commencing fiscal consolidations

In this section, we characterize the conditions under which fiscal consolidations are likely to be started. To do this, we construct a dummy variable, which takes the value one in the period that a consolidation is started and zero in a period in which a consolidation is not started. Periods in which a previously begun consolidation is ongoing are excluded from the sample on the grounds that they are difficult to classify into one group or the other.[3]

We then conduct a probit analysis to assess the likelihood that a country (currently not consolidating) will commence a consolidation. Possible explanatory variables to be included in these regressions are the cyclically adjusted budget deficit; the debt ratio; the domestic output gap; the real interest rate; and the EU-wide output gap. In addition, dummy variables are included to capture specific behaviour in the run-up to EMU, and in the period following the launch of the single currency. The Maastricht dummy therefore corresponds to the period 1991–7, prior to the final decision about membership being taken. The SGP dummy corresponds to the period from 1998 onwards when states were assured of EMU membership, but were subject to the Stability and Growth Pact.

We commence by considering the post-Maastricht era with the whole of the sample, and capturing the effects of EMU with dummy variables. Specifically, we estimate the following probit equation:

$$P(Starting\ a\ consolidation) = \phi(x_t{}'\beta) \tag{1}$$

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[3] Including them as periods in which a consolidation does not commence will bias the results against finding an effect for explanatory variables. However, including them as periods in which a consolidation commences will conflate the issues of starting a consolidation with its longevity. Section 2.2 below deals with that issue.

where x_t corresponds to the vector of explanatory variables, β represents the coeff-icients on these variables and φ signifies the normal distribution. This approach enables us to come up with a single figure between 0 and 1 to express the probability of commencing a consolidation given the initial conditions at time *t*.

<u>**Box 1:**</u> <u>The explanatory variables are:</u>

Debt ratio = public-sector debt/GDP (%)

Cyc Adj Deficit = cyclically adjusted deficit to GDP ratio (%), where the adjustment is made using a quadratic trend fitted to national output

Dom Output Gap = domestic GDP-trend GDP, using the same trend estimates

EU Output Gap = sum of national output gaps

FSEU = aggregate fiscal stance in the EU (weighted aggregate of national deficit ratios)

SGP dummy =1 for the Stability and Growth Pact era (1998 onwards); zero otherwise.

Maastricht dummy =1 for the post-Maastricht Treaty period (1992 onwards); zero otherwise.

Real interest rate = nominal rate less inflation rate

In each case, we estimate three separate regressions using lags, levels and first differences of the explanatory variables. The levels regressions are intended to show the basic impact of a variable on the probability of a consolidation. The lagged regressions take into account the fact that policy responses to a given situation may be delayed because of information or implementation problems, or for political reasons. We also consider first differences because the rate of change may be more important than the level of a variable. For instance, the rate of economic growth may play a role in determining the budgetary position of a government, through its effects on automatic stabilizers. Similarly, economic theory suggests that the rate of change in debt and cyclically adjusted budget ratios may be of greater importance in determining whether a country's long-run fiscal position is viewed as solvent or not.

Table 1(a): Initial conditions for commencing a consolidation, 1960–2002

Variable	Levels		Lags		1st Difference	
Debt Ratio	0.003	(1.57)	0.002	(0.45)	**-0.042**	**(-2.16)****
Cyc Adj Deficit	**0.066**	**(3.16)****	**-0.124**	**(-4.69)*****	Not included	
Dom. Output Gap	0.037	(1.08)	**0.097**	**(1.98)****	**-0.121**	**(-2.64)*****
EU Output Gap	-0.029	(-0.40)	-0.147	(-1.13)	-0.004	(0.963)
FSEU	**-0.040**	**(-3.62)*****	0.004	(0.30)	**0.027**	**(3.08)*****
SGP	**-0.533**	**(2.15)****	-0.705	(-0.40)	**-0.502**	**(-2.25)****
Maastricht	0.082	(0.184)	**0.477**	**(3.04)*****	0.203	(1.36)
Real Interest Rate	-0.031	(-1.52)	0.0312	(1.32)	-0.003	(-0.07)
Pseudo R^2	**0.09**		**0.10**		**0.07**	

Table 1(b): Initial conditions for commencing a consolidation, 1992–2002

Variable	Levels		Lags		1st Difference	
Debt Ratio	**-0.007**	**(-2.55)****	0.007	(1.42)	**-0.069**	**(-1.96**)**
Cyc Adj Deficit	**0.141**	**(3.99)*****	**-0.139**	**(-2.20)****	Not included	
Dom. Output Gap	0.128	(1.98)	0.068	(1.24)	-0.074	(-0.59)
EU Output Gap	0.895	(-0.43)	-0.171	(-0.77)	-0.072	(-0.35)
FSEU	0.451	(1.03)	-0.060	(-1.40)	**0.048**	**(1.89)***
SGP	-0.695	(-1.07)	**-0.854**	**(-2.25)****	**-0.682**	**(-2.24)****
Real Interest Rate	0.049	(0.51)	-0.036	(-0.74)	0.035	(0.69)
Pseudo R^2	**0.1604**		**0.1392**		**0.1501**	

Table 1(c): EMU participants versus non-participants, 1992–2002

Variable	Levels		Lags		1st Difference	
	INS	OUTS	INS	OUTS	INS	OUTS
Debt Ratio	**-0.007****	-0.029	**0.015****	0.029	**-0.617****	-0.151
Cyc Adj Deficit	0.142	0.106	**-0.305****	**-0.290*****	Not included	
Dom. Output Gap	0.112	0.627	-0.003	**0.527*****	-0.986	**0.411*****
EU Output Gap	-0.112	-0.251	0.043	-0.742	-0.122	-0.397
FSEU	0.034	0.151	-0.027	-0.185	0.045	**0.106*****
SGP	-0.805	-0.827	**-0.918****	-0.429	**-0.643****	-0.398
Real Interest Rate	0.021	0.246	-0.098	0.046	-0.179	**0.252*****
Pseudo R^2	**0.1486**	**0.3170**	**0.2043**	**0.2454**	**0.1629**	**0.2515**

A full treatment of the role of various factors here, economic and political, can be found in Hughes Hallett et al (2004). But it is clear from these tables that the size of the deficit relative to its position in the cycle, the output gap, the fiscal position in neighbouring countries, and the threat of exclusion when it came to EMU, were the main factors driving fiscal consolidations in the past. However, when EMU approached, and finally arrived, only the debt or structural deficit positions seem to have mattered (along with the threat of exclusion). On the political side, the literature suggests that imminent elections, a larger country size and coalition governments are associated with consolidation fatigue. However in what follows, we focus on the overall predictive power of the model, and the values of the time-specific coefficients. With regard to functional form, we experimented with trend dummies, but found none to be significant.

Tables 2 to 4 report the regression coefficients on time dummies which are varied systematically to allow us to pick out the year in which a regime change took place, and also the associated log likelihood in each of the regressions. Figure 1 shows these log likelihoods as a function of the successive "focal years" chosen to represent the Maastricht effect.

Table 2: Probability of Starting a Consolidation- Levels

| Focal Year	Post-92 Dummy	Focal Dummy	Log Likelihood	Pseudo R-squared
1994	0.217	-0.539**	-146.526	0.0889
1995	0.151	-0.534*	-146.293	0.0903
1996	0.138	-0.588**	-145.853	0.0930
1997	0.187	-0.811***	-144.432	0.1019
1998	0.082	-0.615**	-145.800	0.0934
1999	0.025	-0.537*	-146.239	0.0907
2000	-0.110	-0.205	-147.435	0.0832

Table 3: Probability of Starting a Consolidation- First Differences

Focal Year	Post 92 Dummy	Focal Dummy	Log Likelihood	Pseudo R-squared
1994	-0.006	-0.937	-147.427	0.0587
1995	0.121	-0.309	-147.003	0.0614
1996	0.168	0.461*	-146.314	0.0658
1997	0.294***	-0.846***	-143.822	0.0817
1998	0.235*	-0.744***	-144.548	0.0770
1999	0.203*	-0.750***	-144.453	0.0777
2000	0.084	-0.501**	-146.129	0.670

Table 4: Probability of Starting a Consolidation- Lags

Focal Year	Maastricht	Focal Dummy	Log Likelihood	Pseudo R-squared
1994	0.458**	-0.285	-141.441	0.0969
1995	0.294	-0.077	-141.690	0.0953
1996	0.282*	-0.069	-141.693	0.0953
1997	0.549***	-0.672***	-139.425	0.1098
1998	0.477***	-0.548**	-140.194	0.1048
1999	0.439***	-0.511**	-140.417	0.1034
2000	0.319**	-0.222	-141.478	0.0967

Figure 1: Log likelihood versus focal year (consolidation model).
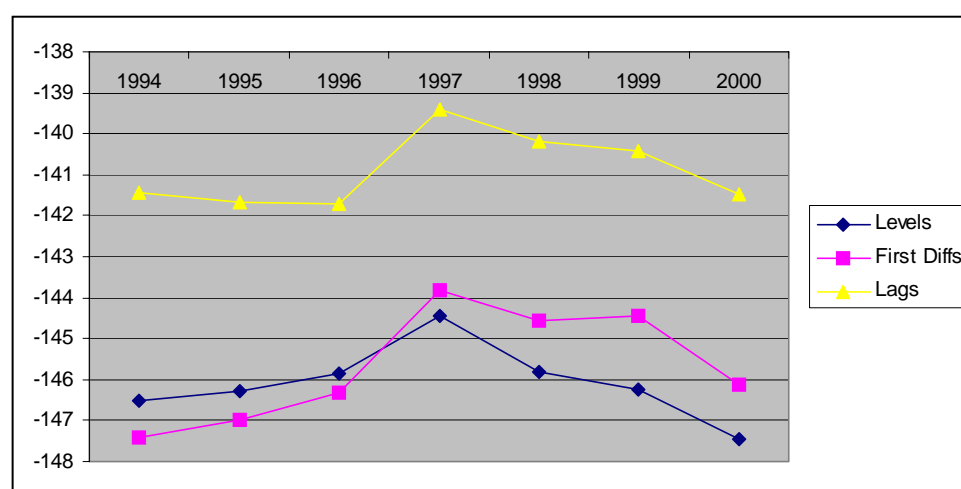
The three regressions in tables 1 to 4 tell a very consistent story. In each case, there was a significant "Maastricht Effect"- namely that countries were more likely to start a consolidation after 1991 than before. However, the significant negative value of the focal dummy indicates that there was a countervailing tendency which kicked in later on. If EMU itself had produced significant discipline effects, then we would expect

this focal dummy to be insignificant. But it is not.[4] In fact, comparing the size of the two dummy variables we can say that the subsequent slippage was actually slightly larger than the initial Maastricht consolidation effect. This suggests that the Maastricht effect was entirely reversed after a period of time; and that by 2002 countries were (*ceteris paribus*) slightly less likely to commence a consolidation than they were in the period 1960-2002.

By varying the time period of the focal dummy we can investigate exactly when this effect starts.[5] In each case, the peak for the log likelihood function is in the year 1997, locating the structural break at that point. This corresponds exactly to the year in which entry decisions were made. In other words, from 1998 onwards, the Maastricht effect had already begun to vanish. This makes perfect sense in the context of the political economy of the situation: once the sanction of not being permitted entry into the Eurozone was removed, countries relaxed their fiscal policies and scaled back on their efforts at consolidation and discipline. That in turn suggests they would probably have made little effort to comply with the Stability Pact when it came to the point. With the benefit of hindsight, this is perhaps an obvious point. But it is interesting to see that it was already so clear in the data by 1998. And even more significantly that, on the basis of these estimated parameters, four years of atrophy meant that by 2002 the "Maastricht Effect" had been completely undone. This means that the SGP was a lame duck even before its official suspension.

It is important to note that we control for economic variables, including debt and deficit levels, so our results do not simply reflect that by 1997 there was no need for further consolidation. That is made clear by the results in Tables 1(a)-(c).

2.2 The Duration of Fiscal Consolidations

The analysis of the previous section concentrated entirely on the issue of starting a consolidation, but made no attempt to explain the factors affecting how long it might

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[4] It is worth re-iterating that a variety of other, more complex specifications of the timing effects were tried, but this simple setup was found to be the best. We can therefore be confident that our results do not simply reflect model misspecification.

be sustained. This neglects an important aspect of fiscal discipline: a consolidation, once started, needs to be sustained.

In this section, we consider the factors that affect the probability of an on-going consolidation ending. The methodology used is a hazard rate analysis. As before, we say that a consolidation episode ends when the cyclically adjusted budget balance stands at less than 75% of its figure in the first year of the consolidation episode. A dummy variable is then constructed, which takes the value of one when a consolidation is ongoing and zero in the period in which it ends. All periods coming after the end of one consolidation, but before the beginning of the next, are excluded. Then, given that a consolidation has started, there is a certain probability that the consolidation will be sustained, and a certain probability that this period will be the last. The ratio of these is known as the *hazard ratio*. A low figure implies that the consolidation is very likely to continue into the next period, whereas a higher figure implies the consolidation is likely to end.

We assume that the conditional hazard rate follows a *Weibull* distribution which is particularly convenient in our context as it allows us to include the effect of time. For a consolidation which began in period *t-1*, the hazard rate is given by a standard Weibull hazard rate model

$$\lambda(t|z) = \rho t^{\rho-1}\exp(z_t'\beta) \qquad\qquad (2)$$

where z_t is a vector of explanatory variables at time t and β represents the coefficients on these variables. The value of ρ captures the effect of time on consolidation hazard ratio. A value of $\rho > 1$ implies that the probability of failure increases as the consolidation goes on; a value of $\rho = 1$ means that time has no effect.

In this test we use data over the full sample, with four parameters which capture the political factors surrounding the launch of the single currency. First, we have a trend dummy in the run-up to EMU running from 1992 to 1997; then we have a trend dummy after EMU, from 1998 onwards. There are also two step dummies: one to

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[5] These results suggest that changing the focal year makes only a small difference to the log likelihood. However, we would expect this to be the case, since shifting the focal year gives us only a slightly different model each time.

capture the average effect on fiscal behaviour in the period between Maastricht and the decisions about participation (ie =1 for 1992-97, zero otherwise); and the other to capture the average fiscal behaviour effect after 1997. As before we pick a focal year, and set a dummy to be 1 in that and subsequent years (and zero elsewhere). Then we vary the chosen year through the sample, from 1993 to 2000. In addition, we also include trend dummies to show how that behaviour has deviated from the average in each period. The results are in Tables 5 and 6(a) to (c).

Table 5. Accompanying factors and consolidation hazard

Variable	Levels		Lags		1st Difference	
Constant	-3.104	**(-9.23)*****	**-3.077**	**(-9.45)*****	**-3.359**	**(-12.77)*****
Debt Ratio	-0.002	(-0.49)	-0.003	(-0.72)	0.039	(1.63)
Dom. Output Gap	0.055	(1.00)	-0.022	(-0.45)	**-0.173**	**(1.88)***
EU Output Gap	-0.079	(-0.73)	-0.094	(0.80)	-0.162	(-1.31)
FSEU	-0.022	(-1.55)	0.002	(0.23)	-0.015	(-1.41)
Real Interest Rate	-0.051	(-1.32)	-0.049	(-1.43)	-0.005	(-0.11)
Maas	0.641	(-1.32)	0.468	(0.65)	0.112	(0.14)
Pre-EMU trend	-0.192	(-1.01)	-0.166	(-0.91)	-0.133	(-0.65)
SGP	**-1.596**	**(-2.49)****	**-1.502**	**(-2.23)****	**-1.53**	**(-2.54)****
Post-EMU trend	**0.441**	**(2.79)*****	**0.449**	**(2.51)****	**0.499**	**(3.16)*****
ρ	**2.49**	**(11.27)*****	**2.48**	**(12.75**)**	**2.41**	**(11.63)*****
Chi-Square	20.87**		16.54*		26.99***	

Notes:

(1) Numbers in parentheses are t ratios.

(2) ***, **, * indicate that the coefficient is significantly different from zero at the 1%, 5% and 10% significance levels respectively.

(3) The dependent variable is the probability that the current period is the last in this consolidation.

The rationale behind this set-up is that we first need to model how incentives have changed over time. Second, this specification nests a variety of simpler behavioural hypotheses, which means that the diagnostic tests can be applied to check whether this structure is appropriate[6].

Table 6(a) - Levels

Focal year	1992 dummy	Pre-trend	Focal dummy	Post-trend	Rho	Log Lik
1993	-0.115	dropped	0.029	-0.32	2.42	-46.93
1994	-0.669	0.557	0.278	0.021	2.42	-46.37
	0.225	-0.028	-0.914	0.094	2.42	-46.10
1996	0.290	-0.062	-1.483	0.249	2.43	-44.97
1997	0.253	-0.041	-1.724	0.405*	2.47	-43.41
1998	0.641	-0.192	-1.795 **	0.441**	2.49	-43.83
1999	-0.272	-0.476	-0.476	0.470***	2.46	-45.38
2000	-0.291	-0.009	-0.019	0.552**	2.45	-45.59

Table 6(b) - Lags

Focal year	1992 dummy	Pre-trend	Focal dummy	Post-trend	Rho	Log Lik
1993	-0.084	-0.518	Dropped	-0.022	2.41	-45.42
1994	-1.31	0.767	0.994	0.02	2.42	-45.22
1995	-0.56	0.281	-0.061	0.094	2.42	-44.79
1996	-0.198	0.103	-0.943	0.255	2.43	-43.62
1997	0.046	0.004	-1.462	0.421**	2.47	-42.49
1998	0.468	-0.167	-1.521*	0.448**	2.49	-43.11
1999	-0.265	-0.004	-0.387	0.464**	2.46	-44.13
2000	-0.227	-0.005	-0.156	0.680***	2.45	-43.95

Table 6(c) - First Differences

Focal year	1992 dummy	Pre-trend	Focal dummy	Post-trend	Rho	Log Likl
1993	-0.695	dropped	0.096	0.096	2.42	-44.68
1994	-0.71	0.158	-0.013	0.117	2.40	-44.57
1995	-0.677	0.149	-0.244	0.186*	2.38	-44.05
1996	-0.47	0.068	-0.798	0.321**	2.39	-43.01
1997	-0.369	0.057	-1.09	0.479***	2.42	-41.58
1998	0.113	-0.133	-1.146	0.499***	2.41	-42.19
1999	-0.043	-0.036	-0.239	0.539***	2.46	-42.01
2000	-0.02	-0.036	-0.141	0.626**	2.47	-42.00

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[6] This is the business of section 4 below

Figure 2: Log likelihood vs. focal years (the duration model)
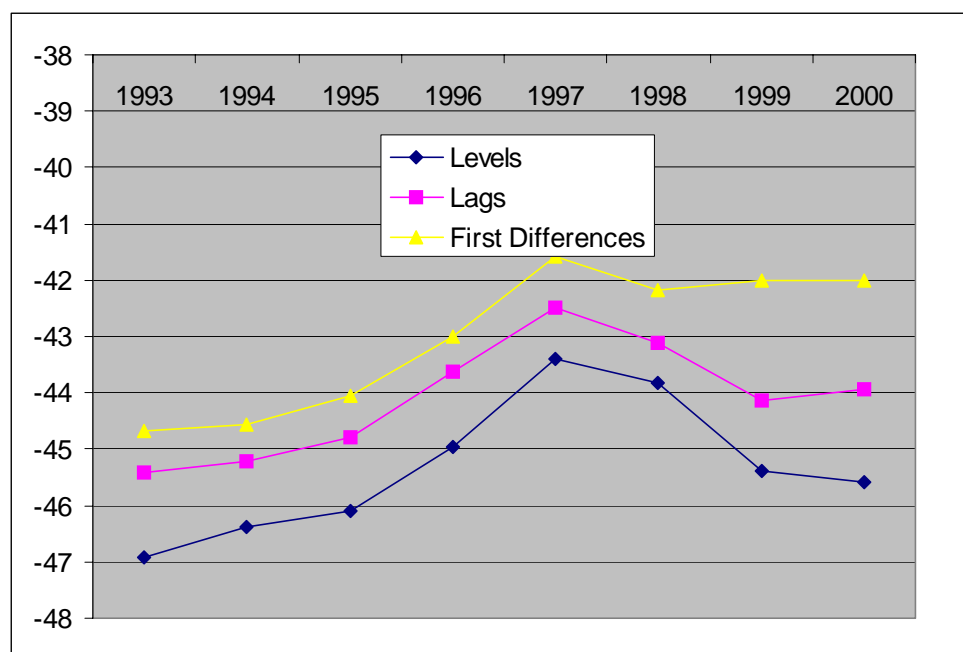
Once again these regressions locate the change in behaviour around 1997. This change corresponds to a weakening in discipline (a rise in the hazard ratio) *after* 1997 for all 3 specifications. Moreover, using 1998 as a focal year, we can see that there was an improvement in discipline corresponding up to and at the launch of EMU; but that this improvement then progressively weakened over time. However, this specification with 1998 as the focal year produces a somewhat lower log likelihood value than using 1997 as the focal year. It therefore seems fair to locate the peak of the *sustained* fiscal discipline as somewhere between 1997 and 1998, after which it declined – sharply in 1999 and more gradually after that. The other parameters in this regression (those in table 5) are not affected by these variations in the focal year.

3. Fiscal policy and the 3% limit on budget deficits

The analysis so far has focussed on the specific issue of fiscal consolidations, rather than on budget balances *per se*. It could be argued that the reduced incidence and longevity of fiscal consolidations reflects the change in the fiscal benchmark, from hard targets under the Maastricht treaty to soft targets under the Stability Pact. That

would be consistent with countries either attempting to meet the debt criteria prior to EMU, but only a deficit rule under the SGP; *or* with them aiming to exploit the adjustment period under the SGP, when breaching the deficit criterion in the Maastricht treaty era would have meant sudden death. In that case one could argue the results of the previous section simply reflect countries reacting to different targets, rather than a weakening of discipline.

In this section, we examine this question directly by considering performance relative to the 3% reference value for deficit ratios. This provides a good yardstick for comparison because, throughout the process of EMU, countries have been obliged to meet this target either as a convergence criterion for membership of the single currency, or as the criterion needed to satisfy the SGP.

To examine what has happened, we construct a dummy variable equal to one if the primary budget deficit of a country exceeds 3% of GDP, and zero otherwise. We then conduct a probit regression to find the probability of a country violating the 3% limit in any given year. As before, we use shift and trend dummies to capture the effects of regime changes and changing behaviour. The results, based on the full sample, appear in Table 7.

3.1 Fiscal discipline in a historical context

Table 7: Factors affecting 3% budget violation, 1960–2002

Variable	Levels		Lags		1st Difference	
Debt Ratio	**0.065**	**(5.43)*** **	**0.034**	**(6.46)*** **	**0.176**	**(5.31)*** **
CA. Bud Bal	**-0.870**	**(-6.13)*** **	**-0.527**	**(-7.32)*** **	0.0231	(0.49)
Dom. Output Gap	**-0.394**	**(-4.02)*** **	**-0.227**	**(-3.65)*** **	**0.080**	**(1.87)***
EU Output Gap	0.110	(0.67)	-0.018	(-0.13)	0.054	(0.84)
FSEU	**0.040**	**(3.42)*** **	-0.009	(-0.64)	**0.009**	**(1.72)***
Real Interest Rate	0.047	(0.97)	-0.009	(-0.24)	-0.004	(-0.16)
Maastricht	-0.064	(0.16)	**1.126**	**(2.64)*** **	0.439	(0.99)
Pre-EMU Trend	-0.793	(-1.00)	**-0.292**	**(-2.97)*** **	0.016	(0.843)
SGP	**-3.25**	**(-6.04)*** **	**-3.130**	**(-5.09)*** **	**-2.78**	**(-3.85)*** **
Post-EMU Trend	**0.385**	**(3.19)*** **	**0.448**	**(3.40)*** **	**0.419**	**(-3.00)*** **
Pseudo R^2	**0.7126**		**0.5931**		**0.3039**	

We observe that a high debt ratio increases the probability of violating the 3% limit in all three regressions. Conversely, a larger (cyclically adjusted) budget surplus reduces the probability of a violation, as does a positive domestic output gap. But a (cyclically adjusted) deficit increases it. Where both the deficit and output gap effects are significant, we find that a 1% improvement in the cyclically adjusted budget balance has roughly twice the effect of an increase of 1% in the domestic output gap. Monetary policy, as proxied by the real interest rate, appears to be an insignificant factor in each regression.

More important, the analysis of time specific factors tells a familiar story in each regression. Initially the Stability Pact appears to have reduced the probability of violating the 3% limit on deficits. But the post-1998 time trend suggests that, in each subsequent year (beyond 1998), there was an increasing tendency to violate that limit. Thus, as in Table 5, these results suggest that countries made a concerted effort to get under the 3% hurdle in order to be accepted into the single currency, but since then fiscal discipline has gradually weakened.

3.2 Fiscal discipline since 1991

To get a clearer picture of why fiscal discipline weakened in the period following the signing of the Maastricht Treaty, we turn to the specific factors which might affect a country's chances of violating the 3% deficit limit. We run the same regressions as before but restrict the sample to the post-1991 period and to EMU participants only. These results back up the account detailed in the discussion of Table 7. For both sample periods, the debt ratio increases the probability of violation; and a high cyclically adjusted budget deficit or a positive output gap reduces the probability of a

Table 8: Factors affecting 3% budget violation, EMU participants, 1991–2002

Variable	Levels		Lags		1st Difference	
Debt Ratio	0.126	(4.42)***	0.022	(2.32)**	0.359	(2.94)***
CA. Bud Bal	-2.249	(-5.26)***	-0.583	(-4.44)***	-0.366	(-3.03)***
Dom. Output Gap	-1.061	(-4.59)***	-0.199	(-1.84)*	-0.201	(-1.66)*
EU Output Gap	0.635	(1.72)*	-0.214	(-0.85)	0.802	(1.65)*
FSEU	0.093	(2.30)**	-0.072	(-2.85)***	0.072	(4.22)***
Real Interest Rate	0.187	(1.47)	0.206	(3.08)***	0.287	(1.92)*
Pre-EMU Trend	0.002	(0.01)	0.154	(0.74)	0.163	(1.20)
SGP	-3.589	(-3.15)**	-3.023	(-2.95)***	-6.286	(-3.18)***
Post-EMU Trend	0.350	(1.31)	0.586	(3.68)***	1.212	(4.31)***
Pseudo R²	0.8242		0.5851		0.6606	

Notes:

(1) Numbers reported are regression coefficients; numbers in parentheses are t-ratios

(2) ***, **, * indicate that the coefficient is significantly different from zero at the 1%, 5% and 10% significance levels respectively.

violation. We also find that in the latter period, the size of these coefficients has changed, with each taking a higher value. In particular, a tighter monetary policy now appears to have a positive effect on violation. So once inside EMU, tight monetary policies could trigger excessive deficits – though it is not clear from these results whether this happens because tighter money induces a recession, or because tighter money triggers a fiscal response to ward off that recession. Whichever it is, the point is that these interactions with monetary policy *increase* in the post-Maastricht era (compare Table 7) and provide significant a source of potential violations of the SGP.

We therefore see the same effect emerging from the Stability Pact as we did for the Maastricht effect in Table 5 – namely that the initial effect (of reducing probability of violating 3% limit) is offset by a time trend running in the opposite direction. Comparing coefficient sizes, our analysis again suggests that within five years – that is from 2005 onwards – the disciplinary benefits of the SGP will have worn off entirely.

4. The Evolution of Discipline over Time

It remains to check that we are correct in our assumption that there is some form of change in fiscal discipline <u>within</u> each regime – be it a steady weakening or a gradual strengthening – as well as a shift in discipline <u>between</u> regimes as the Maastricht treaty and entry into the Euro took hold. We have of course modelled the latter (changes between regimes) using shift dummies to mark the change in the level of discipline at the beginning of each regime; and the former (changes within regimes) with trend dummies to track any gradual weakening or strengthening of discipline within each regime.[7] We label changes in the average level of discipline between regimes (a structural shift) as the "Maastricht effect"; and changes in discipline within each regime (a trend) as a "squeezing in under the door effect".

It is important to make this distinction because others have claimed that the changes in discipline can be captured by including a single shift dummy in the behaviour of the fiscal authorities.[8] That specification might be seriously misleading because it could show an increase in discipline at one quite specific moment, but not capture the gradual erosion of fiscal discipline thereafter. That would lead us to claim, wrongly as it turns out, that discipline had increased in general – when in fact it had increased only at a specific time, and had then weakened to leave even less discipline than before the regime change. In short, we need the combination of shift and trend dummies within each regime to capture dynamic adjustments to the level of discipline.[9] That will allow us to distinguish temporary increases in discipline as policy makers reacted to the possibility that they might be excluded from Eurozone membership, from general increases in fiscal discipline which are an intrinsic and desirable part of the EMU regime. In our results, we find the former, "squeezing in under the door" or consolidation fatigue effect is significant; whereas the latter,

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[7] We have also used a slope dummy in one case to track a specific change in behaviour by the fiscal authorities. But this has more to do with the goals the authorities set for themselves, and how they went about trying to achieve them, than it does about the discipline they may have exercised on the use of fiscal policies in the process of trying to achieve these goals. Changes in behaviour in this sense need to be examined separately. That is the business of Section 5 below.

[8] See Turini & in 't Veld (2004), Berger et al (2004) and Lewis (2005) for example.

[9] Our use of linear trends here might be a restriction that should be relaxed in subsequent work since it does not allow for accelerating or time varying relations of discipline. But the first point to establish is whether there is a change in discipline over time within each regime as well as between regimes.

"Maastricht discipline" effect is never significant and never shows any tendency to strengthen under EMU.

In order to demonstrate the temporary nature of the increase in discipline, we reran the regressions in Table 7 but with only one shift dummy (varying year by year) and no trend dummies. The results appear in table 9. Once again the likelihood function is maximised with the shift dummy set at 1997; and likelihood ratio tests for four parameter restrictions show the losses between these results and the specification in table 7 are significant at 5% for all years but 1997-8 (and for all years but 1997 at the 1% level). So once again, fiscal discipline has taken hold in 1997-8 – but not before, and not later. The important difference in this case is that the null is the original specification in tables 7 or 8 (including trend dummies), not the 1997 regressions in tables 3 and 4. That implies the trend dummies became a crucial part of the story after 1997/8. Moreover, including a single shift dummy at any point, but most obviously in 1987/8, will suggest (wrongly again) that fiscal discipline has improved with the single currency – instead of first improving, and then declining.

Table 9

Year	Levels		Lags		First Differences	
	Step Dummy	**Log-Lik**	**Step Dummy**	**Log-Lik**	**Step Dummy**	**Log-Lik**
1993	**-1.117** *0.000*	**-86.19**	**-0.667** *0.001*	**-124.36**	**-0.194** *0.458*	**-205.28**
1994	**-1.000** *0.000*	**-87.40**	**-0.917** *0.000*	**-120.94**	**-0.182** *0.473*	**-205.41**
1995	**-1.018** *0.000*	**-87.09**	**-0.974** *0.000*	**-119.57**	**-0.378** *0.105*	**-203.61**
1996	**-1.245** *0.000*	**-84.21**	**-1.233** *0.000*	**-114.77**	**-0.691** *0.005*	**-199.15**
1997	**-1.582** *0.000*	**-80.23**	**-1.600** *0.000*	**-109.63**	**-1.115** *0.000*	**-192.26**
1998	**-1.802** *0.000*	**-80.62**	**-1.629** *0.000*	**-112.69**	**-1.404** *0.000*	**-189.00**
1999	**-1.436** *0.000*	**-87.10**	**-1.386** *0.000*	**-119.13**	**-1.252** *0.001*	**-193.81**
2000	**-1.18** *0.001*	**-90.37**	**-1.089** *0.001*	**-124.16**	**-1.036** *0.013*	**-198.98**

However, table 9 also shows that something else has been happening – that the coefficient of the shift dummy in these additional regressions starts to change in the later 1990s. As we move the date of regime change to later periods, that coefficient gets progressively smaller – meaning that the degree of extra discipline gets progressively weaker and will eventually vanish. Consequently any estimates that separate the 1990s into two *constant* regimes will suggest that discipline has improved; whereas it has actually improved and then weakened again – perhaps to the

point where it is now weaker than before the single currency began. Hence the need to use a trend dummy to capture the dynamic effects, alongside a shift dummy to catch the level effects. It appears in this case that the "squeezing in under the door" effect (of temporary, opportunistic discipline) has dominated the "Maastricht effect" of lasting discipline.

5. Has EMU Changed Fiscal Behaviour as Well as the Degree of Fiscal Discipline?

One objection to the foregoing analysis could be that the results rely on probit and hazard rate analysis which essentially divides behaviour up into just two states. For example, two deficit ratios of 4% and 10% will both breach the SGP, but they represent two quite different levels of fiscal discipline. Accordingly, the last step in our analysis will be to examine the size of the deficit ratios directly. Specifically, we ask if the change in monetary regime has brought about any changes in the list of targets that governments routinely address with fiscal policy; or any changes to the *relative* importance between those targets and other targets. Or have the changes simply been in the level of discipline they exercise over fiscal policy, in pursuit of the same targets and the same priorities as before?

There are two questions here. A general increase in fiscal discipline would imply a change in behaviour in the sense that deficits would typically be smaller, and perhaps surpluses larger, in any given set of circumstances. However, it is changes in behaviour with regard to the targets, rather than changes in the level of discipline (i.e. in the use of the instruments, given those targets), which we concerns us here. Has fiscal policy changed in terms of its targets with the arrival of EMU; or is it simply a change in the vigour or discipline with which those policies are exercised?

To analyse that question, we set up policy reaction functions of the form

$$def = a + b.t + c.gap \tag{3}$$

where def = the primary fiscal balance as a ratio of (potential) GDP; t = a time trend; and gap = GDP − trend or potential GDP. The fiscal balance measures a primary

deficit as negative; and a surplus as positive. Notice that we are now dealing with primary balances in order to pick out changes in current behaviour, as opposed to changes in interest payments which reflect past behaviour. Given that, changes in fiscal behaviour, post Maastricht (1992 onwards) or post EMU (1998 onwards), would now be changes in the values of either a or b (a general change reflecting the way in which deficits/surpluses have been set); or a change in c reflecting the responsiveness of deficits to the traditional target of income stabilisation. Of course there may be other targets, such as debt management, the provision of public services, or a deficit target itself. We will model those by including lagged values of the debt and deficit ratios respectively (proxies for a given level of services). A change in c could then also reflect a change in priorities between stabilisation and long run sustainability.

a) Estimates of this policy reaction function for the period 1970-93 and 1994-2003 appear in tables 10(a) and 10(b) respectively. As separate samples, they have no shift or trend dummies – the differences between periods can be picked out directly. They also have no trend terms, but may include lagged debt and deficit terms as noted above. It is quite clear that the 1990s brought a significant relaxation of discipline when everything is taken together: the constant, reflecting an average of the shift and trend dummies used in previous sections, moves from -1.3 to -4.1. Thus the EU had a mild structural deficit in the 1970s and 1980s (all other factors at zero), but a significantly larger one in the 1990s. That reflects a loss of discipline, although that discipline may have temporarily increased at certain points as we argued earlier.

Table 10(a): Policy Rule 1970- 1993

Fixed Effects (within) IV regression	Number of observations $= 291$
Group variable: country	Number of groups $\quad = 15$
R-squared: within $\quad = 0.5777$	Obs per group: min $= 1$
between $= 0.8635$	ave $= 19.4$
overall $\quad = 0.7111$	max $= 23$
correlation $(u_i, X\beta) = 0.3674$	Wald test: $\chi_3^2 = 451.2$
Dependent variable: deficit ratio	Prob $> \chi_3^2 \quad = 0.00$

	Coeff.	s.e.	t-ratio	P> |t	
Dom. output gap	-0.068	0.071	0.95	0.340
Deficit ratio (-1)	0.7596	0.049	15.61	0.000
Debt ratio (-1)	0.0326	0.006	5.43	0.000
constant	-1.343	0.291	4.61	0.000

$F(14,273) = 2.01$ Prob > F = 0.017

Table 10(b): Policy Rule 1994- 2003

Fixed Effects (within) IV regression   Number of observations = 135

Group variable: country   Number of groups   = 15

R-squared: within   = 0.6978   Obs per group: min = 9

between = 0.5077   ave = 9

overall   = 0.5185   max = 9

correlation $(u_i, X\beta)$ = -0.6749   Wald test: χ^2_3 = 1138.8

Dependent variable: deficit ratio   Prob > χ^2_3 = 0.00

	Coeff.	s.e.	t-ratio	P> |t|
Dom. output gap	0.344	0.085	4.05	0.000
Deficit ratio (-1)	0.590	0.056	10.52	0.000
Debt ratio (-1)	0.081	0.017	4.67	0.000
constant	-4.08	1.183	3.45	0.00

$F(14,117) = 3.68$ Prob > F = 0.00

Second, the value of c has changed sign and become significant in the second period compared to the first. That means the primary budget has moved from being an unimportant counter-cyclical stabilisation device in the 70s and 80s – to being a pro-cyclical and significant determinant of the actual deficit in the EMU period. This represents a clear shift in behaviour with respect to the targets. Essentially the policy makers appear to have given up on output stabilisation, concentrating instead on not letting the primary deficit get too large in recessions and then compensating themselves by not attempting to save in good times. That is consistent with our evidence on changes to the probability of a deficit violation, presented in Section 4. However, whether it is also consistent with the idea that Europe's fiscal policies have

basically remained counter-cyclical, as Gali and Perotti (2003) claim, depends on what is happening elsewhere in the regression; and also on whether the sample period includes pre-1993 data or not. In our case, the post-1993 data shows the impact of past debt on the stance of fiscal policy has more than doubled, whereas the persistence from (and dependence on) past deficits has only dropped 20%. Since both are measured as proportions of potential output, and since their combined impact was larger than that of the output gap, table 10(b) must imply that fiscal policy in the EMU regime has moved to reverse this counter-cyclicality in European policies – but has not yet overcome it. That leaves our results consistent with the Gali and Perotti findings, but in a way that is diminishing over time. The changes in fiscal stance have come through the need to service an increasing debt burden and through a falling impact of the automatic stabilisers.[10] Those are not changes in behaviour as such, although the neglect of the output gap and the weakening of discipline might be thought of as changes in behaviour by omission.

b) The results so far have ignored the shift and trend dummies which we found to be important earlier. Table 11 repeats table 10(b) with those dummies included, with the break point set at 1997 as in Section 3. [No dummies were significant on pre-1993 data]. These extra dummies are all significant; and imply a significant increase in fiscal discipline leading up to, and at the moment of creating EMU. At that point, structural deficits were as low as they had been 20-30 years earlier. However this extra discipline was rapidly eroded after 1997; and would have completely vanished after nine years, leaving less discipline than before the Maastricht process. This shows the "squeezing in under the door" effect is quite clear in the policy reaction functions too. The policy target parameters, however, are essentially unchanged from table 10(b). Behaviour with respect to the targets therefore remains as before.

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[10] Taylor (2000), HMT (2003). The scaling back in the programmes of social support, which most EU governments have undertaken in order to satisfy the fiscal requirements of Euro-membership, is clear to see in the persistence coefficient from 0.76 to 0.59, and the decline in the effectiveness of the automatic stabilizer effects.

Table 11: Time Dummies inserted into the 1994-2003 Regression

Fixed Effects (within) IV regression   Number of observations = 135

Group variable: country   Number of groups   = 15

R-squared: within   = 0.7239   Obs per group: min = 9

            between = 0.6487   ave = 9

            overall   = 0.6655   max = 9

correlation $(u_i, X\beta)$ = -0.4091   Wald test: χ^2_3 = 1304.3

Dependent variable: deficit ratio   Prob > χ^2_3 = 0.00

	Coeff.	s.e.	t-ratio	P> |t|
Dom. output gap	0.279	0.087	3.20	0.001
Deficit ratio (-1)	0.607	0.062	9.81	0.000
Debt ratio (-1)	0.051	0.018	2.84	0.005
Pre97 dummy	0.374	0.206	1.81	0.070
1997 dummy	2.361	0.906	2.60	0.009
Post97 dummy	-0.286	0.082	3.46	0.001
constant	-3.663	1.409	2.60	0.009

F(14,114) = 2.86   Prob > F =0.001

c) Next we separate the pre- and post-1997 sample periods to see if there are any changes in the behavioural parameters between the Maastricht era and the Stability Pact era, as opposed to any changes in the discipline parameters. These results are reported in tables 12(a) and 12(b). The increasing fiscal discipline employed to qualify for Euro-membership is clear to see in the pre-1997 trend – but vanishes once again in the post-1997 sample. At the same time, there is an increased sensitivity to the output gap – but only in the sense of preventing large deficits and of making no attempt to save for a rainy day in good times. As before this is driven by the larger impact of past debt on the current budget. But there is now a declining level of persistence in the budget itself. Presumably this reflects the scaling back of social programmes; and the widespread use of tax reduction packages.

Table 12(a): Post Maastricht Regression (1992-97) with Time Dummies

Fixed Effects (within) IV regression   Number of observations = 90

Group variable: country   Number of groups   = 15

R-squared: within   = 0.6369   Obs per group: min = 6

         between = 0.5534   ave = 6

         overall = 0.5504   max = 6

correlation $(u_i, X\beta)$ = -0.5884   Wald test: χ_3^2 = 271.2

Dependent variable: deficit ratio   Prob > χ_3^2 = 0.00

	Coeff.	s.e.	t-ratio	P> |t|
Dom. output gap	0.398	0.099	3.99	0.000
Deficit ratio (-1)	0.373	0.081	4.61	0.000
Debt ratio (-1)	0.073	0.019	3.73	0.000
Pre98 dummy	0.388	0.081	4.80	0.000
constant	-4.81	1.221	3.94	0.000

$F(14,71) = 3.72$ Prob > F =0.000

Table 12(b): Post EMU Regression (1998-2003), Insignificant Time Dummies

Fixed Effects (within) IV regression   Number of observations = 75

Group variable: country   Number of groups   = 15

R-squared: within   = 0.4570   Obs per group: min = 5

         between = 0.1528   ave = 5

         overall = 0.1686   max = 5

correlation $(u_i, X\beta)$ = -0.7334   Wald test: χ_3^2 = 1130.7

Dependent variable: deficit ratio   Prob > χ_3^2 = 0.00

	Coeff.	s.e.	t-ratio	P> |t|
Dom. output gap	0.499	0.195	2.55	0.011
Deficit ratio (-1)	0.224	0.114	1.95	0.051
Debt ratio (-1)	0.119	0.028	4.18	0.000
constant	-5.198	2.002	2.60	0.009

$F(14,57) = 5.43$ Prob > F =0.00

d) Finally, table 13 reworks table 11, but with slope dummies (post 1997) added for each of the target variable parameters in order to match the analysis of Section 4. In terms of policy reactions, these slope dummies are all insignificant although the „squeezing in under the door" effect remains as strong as ever – with fiscal balances deteriorating faster to undo the effects of the Stability Pact within 8 years instead of 9. That confirms our earlier analysis: there has been no change in policy behaviour as such – just a general change in the level and trends of fiscal discipline, given the objectives and priorities of that time.

Table 13: Slope Dummies in the 1994-2003 Regression(compare Table 11)

Fixed Effects (within) IV regression Number of observations = 165

Group variable: country Number of groups = 15

R-squared: within = 0.7681 Obs per group: min = 11

between = 0.5492 ave = 11

overall = 0.5927 max = 11

correlation $(u_i, X\beta)$ = -0.6450 Wald test: χ^2_3 = 1235.2

Dependent variable: deficit ratio Prob > χ^2_3 = 0.00

	Coeff.	s.e.	t-ratio	P> |t |
Dom. output gap	0.339	0.126	2.70	0.007
Deficit ratio (-1)	0.515	0.074	6.95	0.000
Debt ratio (-1)	0.077	0.014	5.47	0.000
Slope dum out/gap	0.034	0.171	0.20	0.840
Slope dum def(-1)	0.003	0.007	0.42	0.675
Slope dum debt(-1)	0.153	0.104	1.47	0.141
Pre97 dummy	0.333	0.112	2.97	0.003
1997 dummy	1.607	0.667	2.41	0.016
Post97 dummy	-0.273	0.087	3.12	0.002
constant	-5.156	0.864	5.97	0.000

F(14,117) = 3.07 Prob > F =0.000

Past policies therefore seem to have been dominated by the need to qualify for the Euro. This has produced a „squeezing in under the door"effect, followed by discipline

fatigue once inside the Eurozone. Current policies, by contrast, seem to have been dominated by an increasing burden of debt, an inability to stabilise output effectively and hence a reluctance to save in good (or at least better) times.

5. Conclusions

This paper set out to analyse how the conduct of fiscal policy has been altered by the constraints and institutional structures associated with EMU. In particular, the goal was to consider whether the fiscal improvements created in the run-up to EMU have endured beyond the creation of the single currency. We conjectured two states of fiscal policy: a crash diet vs. permanent weight loss. In the former state, the gain in fiscal discipline is initially strong, but declines rapidly once the goal of EMU membership has been achieved. In the latter case, the improved fiscal behaviour would be broadly consistent across the whole sample period, indicating no weakening after EMU entry.

To adjudicate between these rival assessments we considered four separate indicators of fiscal policy- the probability of starting a consolidation, the longevity of ongoing consolidations, the probability of violating the SGP, and the behaviour captured by fiscal policy reactions. In each case our results are remarkably consistent. We do find that the run up to EMU was associated with longer lived consolidations, reduced probabilities of breaching the 3% limit, and tighter fiscal policies. However, in each case we also find that these gains were "front loaded" in the sense that they occurred up to EMU, but no further. After that, we find that there was a year on year erosion of these gains once countries were inside EMU.

Using various tests to find the optimal specification, we conclude that the structural break occurred between 1997 and 1998- corresponding to the date at which the European commission decided on fulfilment of the convergence criteria. After this date, with countries believing that they were safely inside the Euro, fiscal discipline (as measured by a variety of indicators) worsened.

Our results also offer an important lesson on the specification of models investigating fiscal performance. Specifically, if a model tries to gauge changes in fiscal behaviour using only one shift dummy, the model is likely to be misspecified. Indeed, in our case, such a misspecification would produce highly misleading inferences about the quality of fiscal discipline. Using a more general specification, which nests the simple step dummy case within a trend dummy approach, we not only reject the step-dummy specification, but also overturn its econometric result.

From a policy perspective, these results have strong implications for the enforcement mechanisms that lie behind any fiscal regime. Our analysis shows that there was a marked difference in performance before and after EMU, when two strikingly different means were used to enforce a common rule about budget deficits. It appears that the threat of exclusion from EMU was credible, and hence far more effective than the threat of possible fines imposed by other members. In other words, and this is the punch line, to enforce such a rule when there is no physical means of imposing your will, you have to withhold something which the sinner would like but doesn't have. A veiled and non-credible threat of a fine, which is to take away something the sinner already has, will not work in that environment..

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