LEARNING FROM THE PAST: FISCAL ADJUSTMENTS ON THE RUN-UP TO THE EURO AREA*

*Maria Manuel Campos***

ABSTRACT

This paper examines the fiscal adjustments that took place on the run-up to the euro area. OECD data are used to identify and characterize episodes of fiscal consolidation in a broad set of countries and within the 1980-2008 time-frame, but focusing, in particular, on those corresponding to the founding Member-states of the euro area and to the 1993-1997 period. Results suggest that, on the period prior to the inception of the euro area, cyclical and interest rate conditions made it easier to comply with the Maastricht criteria without requiring strong primary expenditure cuts, particularly as regards sensitive items such as social transfers and compensation of employees. This may explain why none of the fiscal adjustments identified in 1993-1997 in countries that would become members of the euro area was successful in persistently reducing public debt ratios.

1. Introduction

In the last years, fiscal deficits have been increasing across euro area countries partially as a result of the financial and economic crisis. Public debt-to-GDP ratios are also high (and rising) in several Member-states, not only due to the recent deterioration of public finances, but also as a result of high stocks of debt, contingent liabilities related to financial rescue operations and implicit liabilities associated with population ageing. Consequentially, in order to comply with the commitments imposed by the Stability and Growth Pact (SGP), the vast majority of Member-states is currently engaged in processes of fiscal adjustment. In fact, according to the European Commission's 2011 Spring Economic Forecasts, the general government deficit-to-GDP ratio is expected to decrease between 2010 and 2012 in most Member-states.

This across-the-board need to engage in fiscal consolidation is not a novelty among euro area countries. In fact, along the 1990s, the countries that were on their way to participate on the third stage of the European Monetary Union (EMU) had to bring down their public debt and deficit ratios in order to fulfill the convergence criteria set down by the Maastricht Treaty. To frame the consolidation efforts currently in progress it is crucial to understand the developments underpinning the adjustments that took place on the run-up to the euro area and which lessons can be drawn from them.

In this paper we identify and characterize episodes of fiscal adjustment across a broad set of OECD countries in the 1980-2008 period, but focusing more thoroughly on the eleven founding members of the euro area (and Greece) in the time frame bounded by the signing of the Maastricht Treaty and the assessment of the criteria for adopting the single currency (1993-1997). By performing an exercise similar

to those in, for instance, Alesina and Perotti (1995), Alesina *et al.* (1998) and Alesina and Ardagna (2009), we identify several stylized facts generally presented in the literature on fiscal adjustments. Additionally, we show that the episodes that took place on the run-up to the euro area were mostly made on the revenue side, did not require particularly strong consolidation efforts and did not have persistent effects in reducing public debt and deficit ratios, with consolidation stalling after the assessment of the criteria. These results reinforce the general idea that successful fiscal adjustments require assertive and strong commitments and, in particular, should primarily rely on the expenditure side.

The article is organized as follows. Section 2 provides a brief description of the path that led to the adoption of the euro, emphasising the importance of fiscal adjustments in the context of the EMU and the SGP. Sections 3 and 4 pinpoint and characterize episodes of fiscal adjustment and the determinants of their (un)success, focusing more thoroughly on those referring to countries that in 1993-1997 were engaged in the fulfilment of the Maastricht convergence criteria. Finally, Section 5 concludes.

2. The path to the euro area - an overview[1]

The idea of creating an economic and monetary union among European Economic Community (EEC) members had been on the table since the late 1960s. However, only in 1989 the three stages that would culminate in the adoption of a single currency were formally set down in the Delors Report.

During the first stage, which started in July 1990, capital movements were liberalized within the EEC and the Maastricht Treaty, in force since 1993, established the criteria for joining the euro area. The main objective of the criteria was to ensure convergence between Member-states during stage two of the EMU and macroeconomic stability and currency credibility in the third stage. In particular, the countries aiming to participate in the euro area had to feature sound fiscal positions, stable exchange rates, low interest rates and price stability. Regarding, more specifically the criterion on sound fiscal positions, the Treaty states that, in order to ensure the sustainability of its public finances, in each Member-state the ratio of general government deficit to GDP should not be higher than 3 per cent. Additionally, the ratio of gross general government debt to GDP should not exceed 60 per cent. These requirements are expected to safeguard against the risk of a country becoming unable to service debt relying on its own tax revenue, thereby preventing the emergence of unsustainable fiscal positions (EMI (1995)).

In the second stage of the EMU (that began in January 1994) the SGP was adopted with the objective of monitoring budgetary developments and ensuring the fulfilment of the Maastricht fiscal criteria, not only at euro area's inception, but also on a sustained basis. In particular, the SGP consists of a more detailed set of rules that aim at enhancing the coordination of fiscal policies in the EMU. The Pact has both a preventive and a corrective dimension.

The preventive arm of the Pact is a surveillance mechanism that is supposed to avoid the violation of the fiscal criteria, mostly reflected on the existence of excessive deficits, i.e., deficit ratios to GDP above the 3 per cent reference value. Within this scope, Member-states should submit annual Stability or Conver-gence Programmes (respectively if they have already adopted the euro or not). According to the more recent version of the SGP, the Programmes should include a medium-term budgetary objective (MTO) and the adjustments required for fulfilling that goal. Based on recommendations from the European Commission, the ECOFIN Council assesses whether each country's MTO grants room of manoeuvre to avoid an excessive deficit, while ensuring the convergence of the debt ratio to prudent levels. The Council also supervises the implementation of the Programmes and, if required, proposes additional corrective measures. In spite of these preventive mechanisms, deficits may rise above the 3 per cent of GDP threshold, in which case Excessive Deficit Procedures (EDP), governed by the corrective arm of the

---

1 This section is mostly based on Obstfeld (1997), Cabral (2001) and Eichengreen and Wyplosz (1998).

Pact, are implemented.[2] Member-states under EDP should take effective action in order to correct the excessive deficit within the deadline set by the Council and non-compliance with its recommendations may prompt the imposition of sanctions.

In 1994, on the basis of the data then available, all EU Member-states featured excessive deficits, with the exception of Ireland and Luxembourg. Taking advantage of the 1990s' favourable economic context, most Member-states engaged in deficit correction efforts and in 1998 Greece was the only country with a deficit above the 3 per cent of GDP threshold. However, debt ratios remained above the 60 per cent of GDP reference value in the majority of countries and only France, Finland, Luxembourg and the United Kingdom featured lower figures. In the other Member-states the debt ratio was declining and approaching the reference value, hence the European Commission decided on the fulfillment of the criterion on government budgetary positions by every country except Greece (European Commission (1998)). Additionally, the 1998 European Monetary Institute Convergence Report stated that, on the basis of 1997 data, all Member-states except Greece and Sweden fulfilled the criteria on price stability and exchange and interest rates. Therefore, on the basis of the figures presented in Table 1[3], the Commission recommended the adoption of the single currency by Belgium, Germany, Spain, France, Ireland, Italy, Luxembourg, the Netherlands, Austria, Portugal and Finland from January 1999 onwards. Greece qualified later and entered the third stage of EMU shortly after, in January 2001 (followed by Slovenia in 2007, Cyprus and Malta in 2008, Slovakia in 2009, and Estonia in 2011).

After 1997, fiscal consolidation stalled (or reversed) in several Member-states, but this was somewhat disregarded because nominal fiscal balances were improving. As this development was driven by favourable cyclical conditions, when growth rates diminished, circa 2002, fiscal balances began to deteriorate and the 3 per cent limit was exceeded in many Member-states, jeopardizing the credibility of the SGP and urging its revision (Fatas and Mihov (2009)). In 2005 a number of changes were introduced in the Pact, including the clarification of the definition of the MTO and the catching-up process necessary to reach it. The MTO is defined in terms of the cyclically adjusted balance, net of temporary measures, as a percentage of GDP. Its value takes into account the debt ratio and potential output growth, and thus can be differentiated among Member-states. Implicit liabilities shall also be relevant to determine MTOs, once the criteria and modalities are established by the European Council.

---

2 Note that the currently in force revised SGP, in addition to introducing the concept of MTO, has also broaden the scope of "exceptional circumstances" and "other relevant factors" under which the 3 per cent of GDP limit can be transcended without triggering an excessive deficit procedure.

3 Table 1 presents the exact data on the basis of the Commission's recommendation and figures are according to the ESA-79 national accounts system. This methodology was replaced by a new one, ESA-95, which is in force since 2000. Figures were accordingly revised and therefore data in Table 1 does not coincide with the values presented in the following tables. It is worth highlighting that, based on the current data, France, Spain and Portugal would not have qualified for adopting the euro in 1998 and the Greek fiscal developments would have been insufficient for joining the single currency in 2001 (see Table 2).

Table 1

DATA ON THE BASIS OF THE ASSESSMENT OF THE STABILITY AND GROWTH PACT CRITERIA						
			Government budgetary position			
	Inflation	**Deficit (% of GDP)**	**Public debt (% of GDP)**			**Long-term interest rates**
				Change from previous year		
	Jan-98	**1997**	**1997**	**1997**	**1996**	**1995**	**Jan-98**
Reference Value	**2.7**	**3**	**60**	**-**			**7.8**
EU (15 countries)	1.6	2.4	72.1	-0.9	2	3	6.1
Belgium	1.4	2.1	122.2	-4.7	-4.3	-2.2	5.7
Germany	1.4	2.7	61.3	0.8	2.4	7.8	5.5
Ireland	1.2	-0.9	66.3	-6.4	-9.6	-6.8	6.2
Greece	5.2	4	108.7	-2.9	1.5	0.7	9.8
Spain	1.8	2.6	68.8	-1.3	4.6	2.9	6.3
France	1.2	3	58	2.4	2.9	4.2	5.5
Italy	1.8	2.7	121.6	-2.4	-0.2	-0.7	6.7
Luxembourg	1.4	-1.7	6.7	0.1	0.7	0.2	5.6
Netherlands	1.8	1.4	72.1	-5	-1.9	1.2	5.5
Austria	1.1	2.5	66.1	-3.4	0.3	3.8	5.6
Portugal	1.8	2.5	62	-3	-0.9	2.1	6.2
Finland	1.3	0.9	55.8	-1.8	-0.4	-1.5	5.9

Source: European Commission (1998).

Note: The figures are according to the ESA-79 methodology.

3. Identifying fiscal adjustments in the euro area

The limits imposed by the Maastricht Treaty, as requirements for entering the single currency area, played a highly relevant role in the candidates' fiscal policy in the years preceding the inception of the euro area. In particular, the criterion on the government budgetary position triggered important consolidations along the 1990s in the Member-states aiming to participate in the third stage of the EMU (Table 2). Indeed, within the 1993-1997 time span, Germany was the only country featuring a balance deterioration (although it remained above the -3 per cent of GDP balance threshold by the end of 1997), while the biggest improvements took place in Italy and Belgium. Table 2 points out that, after the introduction of the euro, deficits increased in several Member-states. This outcome, although partially explained by the deterioration of the macroeconomic scenario, raises the question of why were some consolidation efforts more effective and persistent than others. In this section, we undertake an exercise similar to those in, for instance Alesina and Perotti (1995), Alesina *et al*. (1998) and Alesina and Ardagna (2009), with the purpose of identifying in the euro area Member-states the empirical regularities usually found in the literature on fiscal adjustments.

In order to analyse the size and composition of the fiscal adjustments, we begin by measuring the fiscal stance in terms of "discretionary changes in the budgetary position of the government". As previously mentioned, budgetary developments are influenced by business cycle fluctuations and interest rate conditions. We are not interested in developments resulting from automatic responses to economic growth or changes in interest-related expenditure, which is ultimately related to a stock of public debt built-up along several years. Hence, with the purpose of identifying the changes in the budgetary position that derive from government's discretionary policy choices or structural trends, we use the annual change in the cyclically-adjusted primary deficit, as a percentage of potential GDP, as a measure of the

Table 2

GENERAL GOVERNMENT FISCAL BALANCE	AS A PERCENTAGE OF GDP																
	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Belgium	-8.2	-7.5	-5.2	-4.5	-4.0	-2.3	-1.0	-0.7	-0.1	0.4	-0.2	-0.2	-0.4	-2.8	0.2	-0.2	-1.2
Germany	-2.5	-3.0	-2.3	-9.7	-3.3	-2.6	-2.2	-1.5	1.3	-2.8	-3.6	-4.0	-3.8	-3.3	-1.6	0.2	0.0
Ireland	-2.9	-2.7	-2.0	-2.0	-0.1	1.4	2.3	2.6	4.8	0.9	-0.3	0.4	1.4	1.7	3.0	0.2	-7.2
Greece	-10.9	-11.9	-8.3	-9.1	-6.6	-5.9	-3.8	-3.1	-3.7	-4.4	-4.8	-5.7	-7.4	-5.3	-3.2	-4.0	-7.8
Spain	-4.0	-7.3	-6.8	-6.5	-4.9	-3.4	-3.2	-1.4	-1.0	-0.7	-0.5	-0.2	-0.4	1.0	2.0	1.9	-4.1
France	-4.5	-6.4	-5.5	-5.5	-4.0	-3.3	-2.6	-1.8	-1.5	-1.6	-3.2	-4.1	-3.6	-3.0	-2.3	-2.7	-3.4
Italy	-10.4	-10.1	-9.1	-7.4	-7.0	-2.7	-3.1	-1.8	-0.9	-3.1	-3.0	-3.5	-3.6	-4.4	-3.3	-1.5	-2.7
Luxembourg	-0.2	1.5	2.5	2.4	1.2	3.7	3.4	3.4	6.0	6.1	2.1	0.5	-1.1	0.0	1.3	3.7	2.5
Netherlands	-4.2	-2.8	-3.5	-9.2	-1.9	-1.2	-0.9	0.4	2.0	-0.3	-2.1	-3.2	-1.8	-0.3	0.5	0.2	0.7
Austria	-2.0	-4.4	-4.9	-5.9	-4.1	-2.0	-2.5	-2.4	-1.9	-0.2	-0.9	-1.6	-4.5	-1.7	-1.7	-0.7	-0.5
Portugal	-4.2	-7.5	-7.2	-5.0	-4.5	-3.5	-3.4	-2.8	-3.0	-4.3	-2.9	-3.0	-3.4	-6.1	-3.9	-2.7	-2.8
Finland	-5.4	-8.3	-6.7	-6.2	-3.5	-1.3	1.6	1.6	6.9	5.0	4.1	2.4	2.2	2.6	3.9	5.2	4.4

Source: OECD.

Note: The table presents the net lending (+) or net borrowing (-) of general government based on the ESA-95 methodology, including one-off proceeds relative to the allocation of mobile phone licences.

fiscal stance.[4] We computed this indicator for a sample of 19 countries (including the eleven euro area founding Member-states, Canada, Denmark, the United Kingdom, Greece, Japan, Norway, Sweden and the United States of America), from 1980 to 2008. As data is unavailable for some country-year pairs, our sample comprises a total of 493 observations.

Alesina and Perotti (1995) proposes the following classification of the fiscal stance in terms of the magnitude of the annual change in the cyclically-adjusted primary balance as a percentage of GDP: years of neutral fiscal policy are those in which such variable stands between -0.5 and 0.5 p.p.; fiscal policy is considered to be loose for values between -0.5 and -1.5 p.p.; very loose for figures equal or below -1.5 p.p.; tight if it is between 0.5 and 1.5 p.p. and very tight for values equal or above 1.5 p.p. As most studies on this subject, we use the Alesina and Perotti (1995) classification of the fiscal stance and consider years of fiscal adjustment those in which the change in the cyclically adjusted primary balance is above 1.5 p.p. of GDP, in order to identify "large" changes in the fiscal stance and rule out minor adjustments. Note that this definition only allows the identification of yearly adjustments, which means that, when the measure of fiscal stance declines for consecutive years we consider several annual adjustments instead of a single, multi-year episode. Other studies, such as Barrios *et al*. (2010), follow slightly different approaches and consider adjustment episodes that last longer than one year. Adopting a multi-year definition would lead to the identification of a different number of episodes, but the underlying developments regarding the cyclically-adjusted primary deficit would be essentially the same.

Overall, we identified 60 episodes of fiscal adjustment, distributed as depicted in Table 3. This table shows, in the one hand, that the majority (39 out of 60) of the episodes of fiscal adjustment refers to euro area founding countries,[5] with the other nations featuring, on average, a looser fiscal stance. On the other

---

4   More precisely, we use OECD figures referring to the underlying primary balance, available on the Economic Outlook database. In addition to being corrected for the effects of the business cycle, the figures are also net of the impact of temporary measures (including those related to the selling of mobile phone licences). Throughout this paper, whenever cyclically-adjusted variables are mentioned, assume that they are also corrected for the impact of temporary measures (for more details regarding the methodology employed by the OECD for computing these variables, see Joumard, I. *et al*. (2008), "Accounting for one-off operations when assessing underlying fiscal positions", Working Paper 642, OECD.). Note, however, that it is impossible to completely isolate the policy induced effects. In fact, cyclical adjustment methodologies are unable to fully eliminate the effects of the business cycle and the identification of temporary operations demands a substantial amount of information. Moreover, a certain degree of endogeneity remains present, as governments' decisions are obviously influenced by the macroeconomic context.

5   Through this paper, whenever founding members of the euro area are mentioned, consider the eleven countries that adopted the euro in 1999 and Greece.

Table 3

EPISODES OF FISCAL ADJUSTMENT					
Austria	1984 ; [1]	1996 ; [1]	1997 ; [0]	2001 [0]	
Belgium	1982 ; [5]	1983 ; [4]	1984 ; [3]	1993 [1]	
Canada	1981 ; [0]	1986 ; [2]	1995 ; [2]	1996 ; [1]	1997 [0]
Germany	- -				
Denmark	1983 ; [3]	1984 ; [2]	1985 ; [1]	1986; [0]	2005 [0]
Spain	1992 [5]				
Finland	1981 ; [0]	1984 ; [0]	1988 ; [0]	1994 ; [6]	1998 ; [2]
France	- -				
United Kingdom	1981 ; [1]	1997 ; [3]	1998 [2]		
Greece	1982 ; [1]	1986 ; [2]	1990 ; [4]	1994 ; [0]	1996; [0]
Ireland	1983 ; [1]	1984 ; [0]	1987 ; [2]	1988 [1]	
Italy	1982 ; [2]	1993 ; [0]	1995 [2]		
Japan	1984 [1]				
Luxembourg	1993 ; [4]	1994 ; [3]	1997 [0]		
Netherlands	1983 ; [0]	1991 ; [0]	1993 [0]		
Norway	2000; [0]	2004 [2]	2006 [1]		
Portugal	1982 ; [2]	1983 ; [1]	1992 ; [0]	1995; [0]	2006 [1]
Sweden	1983 ; [1]	1987 ; [0]	1996 ; [4]	1997 [3]	
United States	- -				

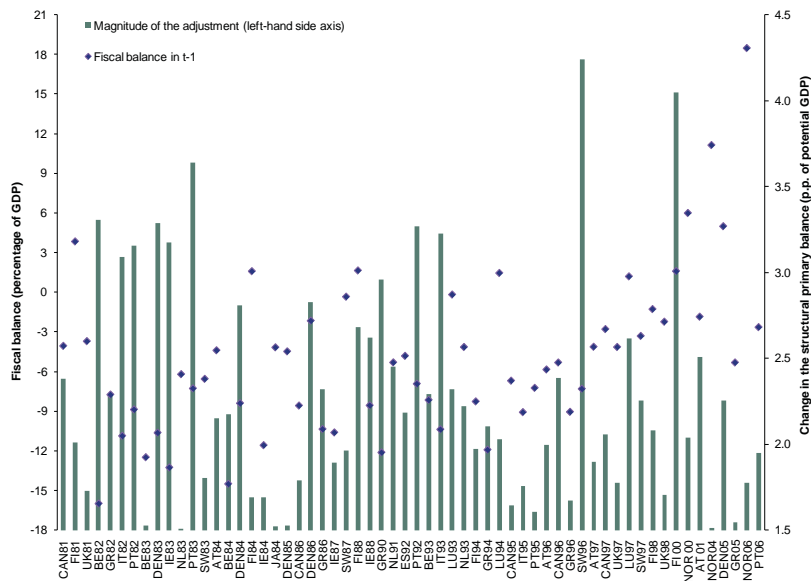**Source:** Author's calculations.

Note: The table lists all the episodes identified in the sample. Figures in brackets are the number of consecutive years during which, after the initial adjustment, the cyclically-adjusted primary balance continued to improve.

hand Table 3 also shows that episodes of fiscal adjustment are mostly concentrated in two periods, 1980-1984 and 1993-1997. Between 1985 and 1992 episodes of fiscal adjustment are less frequent in our sample, and the interruption of this period of generally looser fiscal policy coincides with the signature of the Maastricht Treaty. Moreover, our results also show that the majority of the adjustment episodes identified in 1993-1997 refer to developments regarding the euro area founding countries and that after 1997 (when the assessment underlying the decision to participate in the third stage of the EMU was made), the number of countries featuring loose fiscal stance has generally increased.

Chart 1 shows that, on average, there is no obvious relationship between the magnitude of the adjustments and the actual general government balance in the year preceding the episodes. In fact, on the one hand, several episodes correspond to situations in which countries recorded striking general government deficits in the previous year. On the other hand, the figure shows that some of the largest adjustments took place in countries with relatively comfortable fiscal positions, featuring small deficits or, in some cases, surpluses. It is also interesting to notice that in the period between the signing of the Maastricht

Chart 1

Source: Author's calculations based on data from the OECD.

Treaty and the assessment of the budgetary criteria, 10 out of 13 adjustment episodes identified in euro area countries correspond to situations in which the general government balance was below the -3 per cent of GDP threshold. This is consistent with the idea that, in these cases, deficit reduction efforts may have been triggered by the need to fulfill the prerequisites for adopting the euro.

Summary statistics in Table 4 show that in the whole sample the measure of fiscal stance is slightly negative (-0.08 p.p. of GDP), while in adjustment years the average primary deficit decline stands at 2.28 p.p. of GDP (and is explained, on average, by a 0.98 p.p. drop in primary expenditure and a 1.30 p.p. revenue increase). As pointed out in Table 4, figures computed only for euro area founding countries along the entire time span are not dramatically different from those referring to the whole sample, but within that sub-sample there is an interesting feature. In fact, although the episodes identified between 1993 and 1997 are, on average, less marked than those identified before 1993, they are achieved through sharper cuts in total expenditure. However, the figures for primary expenditure retrenchment are similar. Given that primary expenditure is the part of governments' spending that actually depends on its discretionary decisions, this finding suggests that the 1990's budgetary improvements have benefited from the decline in interest rates that took place in this period (on average, the change in interest payments in euro area founding countries in 1993-1997 is considerably smaller than the observed outside this interval) and did not result from particularly strong efforts in terms of expenditure retrenchment.

To answer the question of whether the tightening of fiscal policy observed on the run-up to the third stage of the EMU was triggered by the need to comply with the Maastricht budgetary criteria, we analysed the determinants of the probability to engage in fiscal consolidation. Results in Table 5 show that the estimated probability of engaging in fiscal adjustment is enhanced in the case of observations referring to the 1993-1997 period, but being a euro area country, *per se*, does not have a statistically significant impact (see the results obtained using specifications 1 and 2). Moreover, results based on specification 3 suggest that, even though observations referring to euro area Member-states and to the 1993-1997 period are estimated to have a higher probability to record fiscal adjustments (as shown by the positive sign of the marginal effect of the interaction between these variables), the impact of combining these two attributes is not statistically significant. Finally, in spite of the fact that variables

Table 4

AVERAGE CHANGE IN CYCLICALLY-ADJUSTED FISCAL VARIABLES	P.P. OF POTENTIAL GDP				
	Number of observations	Change in the structural primary deficit	Change in the structural total expenditure	Change in the structural primary expenditure	Change in the structural total revenue
Entire sample	493	-0.08	0.03	0.05	0.13
		(1.32)	(1.1)	(1.02)	(1.03)
of which euro area countries	314	-0.10	0.07	0.07	0.16
		(1.36)	(1.2)	(1.11)	(1.08)
Episodes of fiscal adjustment	60	-2.28	-0.80	-0.98	1.30
		(0.65)	(0.98)	(0.78)	(0.86)
of which euro area countries	39	-2.35	-0.80	-0.99	1.36
		(0.63)	(1.03)	(0.79)	(0.93)
before 1993	21	-2.47	-0.61	-0.90	1.57
		(0.64)	(0.98)	(0.83)	(0.89)
in 1993-1997	13	-2.13	-0.72	-0.89	1.24
		(0.43)	(0.98)	(0.66)	(0.9)
after 1997	5	-2.43	-1.84	-1.66	0.77
		(0.97)	(0.89)	(0.77)	(1.04)

Source: Author's calculations based on data from the OECD.
Note: Standard-deviations in parentheses.

Table 5

DETERMINANTS OF THE PROBABILITY TO ENGAGE IN A FISCAL ADJUSTMENT				
	Specification 1	Specification 2	Specification 3	Covariates description
Balance$_{(t-1)}$	-0.013*	0.004	0.004	General government balance in the previous year, % of GDP
	(0.007)	(0.006)	(0.006)	
Excessive Deficit$_{(t-1)}$	0.027	-0.071	-0.071	=1 if the general government deficit was above 3% of GDP in the previous year
	(0.046)	(0.051)	(0.051)	
Public Debt$_{(t-1)}$	-0.001*	-0.002*	-0.002*	Public debt in the previous year, % of GDP
	(0.001)	(0.001)	(0.001)	
Excessive Public Debt$_{(t-1)}$	0.042	-0.047	-0.046	=1 if the public debt was above 60% of GDP in the previous year
	(0.036)	(0.084)	(0.084)	
Favourable cyclical position	-0.005	-0.004	-0.005	=1 if the output gap increased vis-à-vis the previous year
	(0.032)	(0.031)	(0.031)	
Euro area membership	-0.015	-0.029	-0.038	=1 if the observation refers to an euro area Member-state
	(0.029)	(0.031)	(0.035)	
Period from 1993 to 1997	0.066	0.080*	0.053	=1 if the observation refers to a year between 1993 and 1997
	(0.043)	(0.045)	(0.072)	
Interaction effects[1]				
Balance$_{(t-1)}$*Excessive Deficit$_{(t-1)}$	-	-0.03	-0.03	
	-	(0.021)	(0.021)	
Pub. Debt$_{(t-1)}$*Excess.Pub.Debt$_{(t-1)}$	-	0.00	0.00	
	-	(0.001)	(0.001)	
Euro area membership*Period 1993-1997	-	-	0.03	
	-	-	(0.091)	
Observations	492.00	492.00	492.00	
Log-pseudolikelihood	-166.08	-157.72	-157.60	

Source: Author's calculations based on data from the OECD.
Notes: The table presents the estimated marginal effects of changes in the covariates on the probability to engage in a fiscal adjustment and the correspondent robust standard-errors (in parentheses). The dependent variable is a dummy that takes the value 1 for observations referring to country-year pairs for which a fiscal adjustment was identified. The marginal effects are evaluated at the mean of the covariates, except in the case of binary variables, for which they represent the discrete change from 0 to 1. Marginal effects tagged with * are significant, at least, at the 10% level. **(a)** The marginal effect of a change in two interacted variables, $x1$ and $x2$, was computed as $x = \frac{\Delta^2 F(u)}{\Delta x_1 \Delta x_2}$ or $x = \frac{\Delta \frac{\delta F(u)}{x_1}}{\Delta x_2}$ (respectively if $x1$ and $x2$ are dummy or if one of them is continuous) and the standard-errors were obtained using the Delta method. In both cases, we use the Stata *inteff* package, described in Norton *et al*. (2004).

representing indicators of the initial fiscal position (general government balance and public debt in the previous year) appear to have significant effects on the probability of undertaking fiscal adjustments, when covariates representing the interaction between those indicators and non-compliance with the criteria for accessing the third stage of the EMU are added to the equation (specifications 2 and 3), the respective estimated impact is not significant.

4. Determinants of success of fiscal adjustments: size vs composition

Alesina and Ardagna (2009) classify fiscal adjustments as successful or unsuccessful according to their ex-post performance in terms of public debt reduction. Based on the criterion proposed by these authors, we consider an episode of fiscal adjustment to be successful if, three years after its beginning, the cumulative decline in the debt to GDP ratio is sharper than 3.5 p.p. (which is the value of the 25th percentile of the distribution of the cumulative change in the debt ratio in all episodes). According to this definition, we identified 15 successful and 45 unsuccessful fiscal adjustments, of which 5 and 34, respectively, refer to euro area countries. Between 1993 and 1997, none of the 13 episodes identified within the euro area sub-sample is successful, suggesting that consolidation efforts on the run-up to the third stage of the EMU, although effective in terms of compliance with the budgetary criteria, do not seem to have had persistent effects in terms of public debt reduction.[6] In fact, we replicated the calculations presented so far but taking into account actual deficits and identified a higher number of adjustments within the 1993-1997 time span (19 instead of 13), which implies that cyclical and interest rate developments along this period had a positive impact on public finances. In particular, these developments seem to have made it easier to fulfill the requirements for joining the euro area without sizeable consolidation measures, which may explain the lack of persistence of the effects of the adjustments.

Standard-deviations presented in Table 6 provide evidence that, in successful and unsuccessful adjustments, the deficit reduction is, on average, statistically significant. Moreover, as shown in Chart 2, most adjustments in our sample are based on both expenditure retrenchment and revenue increase. In the majority of successful adjustments, cyclically-adjusted revenue improves (by 0.99 p.p., on average), but deficit reduction tends to be predominantly made on the expenditure side (primary expenditure declines, on average, by 1.34 p.p in these years). On the contrary, unsuccessful deficit reductions are revenue-based, with the contribution of cuts on the expenditure side averaging 38 per cent. Another interesting feature presented in Table 6 is the fact that successful adjustments are not necessarily those in which the cyclically-adjusted primary balance improves the most. Indeed, the average improvement in successful episodes is very similar to the one referring to the unsuccessful adjustments (2.32 and 2.27 p.p., respectively).

Our findings so far are broadly in line with those in Alesina et al. (1998), that suggests that the persistence of the effects of fiscal adjustments does not depend on the magnitude of the deficit cuts, relying, instead, on its composition. In fact, we estimated the probability of success of fiscal adjustments, using a probit specification[7], and found evidence that the only covariate that seems to be significant is the one referring to the change in the cyclically-adjusted primary expenditure. In particular, Table 7 shows that the probability of success is enhanced by sharper expenditure cuts (while greater revenue improve-

---

6 Previous empirical studies, such as Alesina and Perotti (1996b), assessed the success of fiscal adjustments according to the persistence of the decline in the primary deficit instead of focusing on the post-episode debt level. As pointed out in Barrios et al. (2010), both criteria for evaluating success entail pros and cons and this is a somewhat arbitrary choice. In order to assess the robustness of our findings, we checked if the adoption of alternative definitions would lead to significantly different results and concluded that it is not the case. For instance, defining successful adjustments as those in which, in the three years after the episode, the cyclically-adjusted deficit is, on average, at least 2 p.p. below the level recorded in the tightening year, would lead to the identification of 12 successful episodes (instead of 15), of which 2 would refer to euro area countries in the period between 1993 and 1997.

7 See Alesina and Ardagna (1998) and Barrios et al. (2010) for similar exercises.
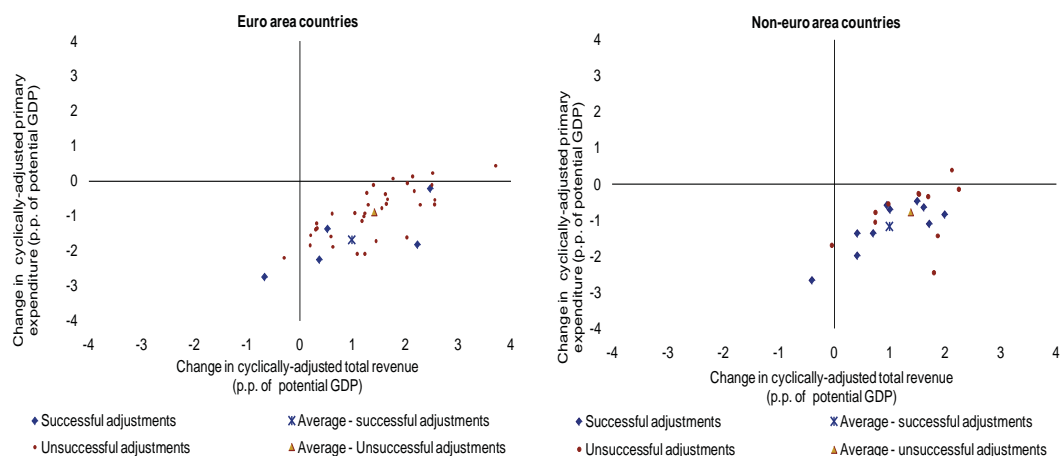
Table 6

EPISODES OF FISCAL ADJUSTMENT: AVERAGE CHANGE IN CYCLICALLY-ADJUSTED FISCAL VARIABLES |				
P.P. OF POTENTIAL GDP				
	Number of Observations	Change in structural primary deficit	Change in structural primary expenditure	Change in structural total revenue
Total				
Entire sample	493	-0.08	0.05	0.13
		(1.32)	(1.02)	(1.03)
of which euro area countries	314	-0.10	0.07	0.16
		(1.36)	(1.11)	(1.08)
Episodes of fiscal adjustment				
Entire sample	60	-2.28	-0.98	1.30
		(0.65)	(0.78)	(0.86)
of which euro area countries	39	-2.35	-0.99	1.36
		(0.63)	(0.79)	(0.93)
Successful episodes				
Entire sample	15	-2.32	-1.34	0.99
		(0.62)	(0.8)	(0.92)
of which euro area countries	5	-2.66	-1.68	0.98
		(0.84)	(0.97)	(1.33)
Unsuccessful episodes				
Entire sample	45	-2.27	-0.86	1.40
		(0.66)	(0.74)	(0.82)
of which euro area countries	34	-2.30	-0.89	1.41
		(0.6)	(0.73)	(0.87)

Source: Author's calculations based on data from the OECD.

Notes: Standard-deviations in parentheses; Figures are adjusted for the effects of the economic cycle, as well as temporary measures.

Chart 2

EPISODES OF FISCAL ADJUSTMENT: CONTRIBUTION OF THE EXPENDITURE AND REVENUE SIDES

Source: Author's calculations based on data from the OECD.

Table 7

PROBABILITY OF SUCCESS OF FISCAL ADJUSTMENTS			
	Probit Specifica-tion[a]	Heckman sample selection model[b]	Covariates description
Balance (t-1)	0.020	0.000	General government balance in the previous year, % of GDP
	(0.014)	(0.000)	
Public Debt (t-1)	0.003	0.000	Public debt in the previous year, % of GDP
	(0.003)	(0.000)	
Favourable cyclical position	0.196	0.005	=1 if the output gap increased vis-à-vis the previous year
	(0.171)	(0.008)	
Euro area membership	-0.226	-0.010	=1 if the observation refers to an euro area Member-state
	(0.138)	(0.011)	
Period from 1993 to 1997	-0.102	-0.001	=1 if the observation refers to a year between 1993 and 1997
	(0.101)	(0.005)	
Magnitude of the adjustment	-0.010	-0.002	Change in the cyclically-adjusted primary deficit, excluding one-off factors, p.p. of potential GDP
	(0.077)	(0.001)	
Change in primary expenditure	-0.200*	-0.052*	Change in the cyclically-adjusted primary expenditure, excluding one-off factors, p.p. of potential GDP
	(0.063)	(0.04)	
Number of observations	60	492	
Log-pseudolikelihood	-22.875	-174.259	

Source: Author's calculations.

Notes: The table presents the estimated marginal effect of changes in the covariates on the probability of success of fiscal adjust-ments, as well as the correspondent robust standard-errors (in parentheses).The marginal effects are evaluated at the mean of the covariates, except in the case of binary variables, for which they represent the discrete change from 0 to 1. * signals significance, at least, at the 10% level. **(a)** The dependent variable is a dummy that takes the value 1 when a fiscal adjustment is classified as success-ful. Thus this estimation is conditional on a fiscal adjustment being undertaken. **(b)** This specification is a Heckman probit two-step regression. The selection equation used in the first-step refers to the decision to undertake a fiscal adjustment and is the same as Specification 3 in Table 5. The dependent variable in the second-step equation is a dummy that equals 1 when a fiscal adjustment is classified as successful, but, as opposed to the probit specification, this estimation also takes into account observations for which fiscal consolidations were not identified. The null hypothesis of independence between the two equations is rejected (p-$value=0.00$), which justifies the usage of the Heckman method.

ments have a negative effect on the probability to succeed). Regarding the coefficient representing the magnitude of the adjustment, our results imply that sharper deficit reductions have a positive impact on the likelihood to succeed, but it is not statistically significant.

Following Barrios *et al*. (2010), in order to deal with a possible selection bias related to the fact that omitted factors that determine the decision to undertake a fiscal consolidation may be correlated with those that determine the persistence of its effects, we also estimate the probability of success using a Heckman probit selection model. The results based on this approach are broadly the same, but it is worth highlighting that, although the magnitude of the marginal effect of the change in the cyclically-adjusted primary expenditure is reduced by more than half, conclusions regarding its sign and significance still hold. Given that there is clear evidence about the importance of the composition of fiscal adjustments to explain its (un)success, in what follows we focus on the contribution of the major expenditure and revenue items for the fiscal balance improvements identified in both the successful and unsuccessful adjustments.

Table 8 depicts the composition of revenue developments in the fiscal adjustments identified in our sample. As previously mentioned, in both successful and unsuccessful fiscal balance improvements revenues tend to increase (by 0.88 p.p. and 1.43 p.p., respectively). Additionally, Table 8 shows that, in both cases, the most important share of revenue increases stems from improvements in tax receipts, especially those referring to direct taxes. Based on previous literature, we expect that, in successful adjustments, improvements in direct tax receipts are basically explained by the contribution of taxes on corporations. Such a development would not necessarily result from tax rate rises, but from a base effect related to an increase in profits that is usual during successful adjustments (as documented in Alesina and Perotti (1996a)). Additionally, in unsuccessful adjustments the contribution of taxes on households and corporations to increases in direct taxes tends to be quite similar. Regarding indirect taxes, we conclude that they increase more sharply in unsuccessful adjustments than in successful.

Table 8

COMPOSITION OF FISCAL ADJUSTMENTS: AVERAGE CHANGE IN SELECTED REVENUE ITEMS	P.P. OF GDP			
	Number of observations	Change in total revenue	Change in direct taxes	Change in indirect taxes	Change in Social Security contributions
Total					
Entire sample	493	0.13	0.06	0.03	0.04
		(1.16)	(0.75)	(0.5)	(0.42)
of which euro area countries	314	0.16	0.07	0.05	0.05
		(1.16)	(0.71)	(0.5)	(0.46)
Episodes of fiscal adjustment					
Entire sample	60	1.29	0.83	0.34	0.10
		(0.96)	(0.67)	(0.55)	(0.45)
of which euro area countries	39	1.30	0.75	0.40	0.18
		(1)	(0.65)	(0.47)	(0.44)
in 1993-1997	13	1.13	0.81	0.43	0.12
		(0.68)	(0.59)	(0.34)	(0.32)
other years	26	1.38	0.72	0.39	0.22
		(1.13)	(0.69)	(0.53)	(0.49)
Successful episodes					
Entire sample	15	0.88	1.02	0.18	-0.19
		(0.84)	(0.62)	(0.5)	(0.27)
of which euro area countries	5	0.83	1.10	0.01	-0.25
		(1.24)	(0.92)	(0.64)	(0.36)
in 1993-1997	0	-	-	-	-
		-	-	-	-
other years	5	0.83	1.10	0.01	-0.25
		(1.24)	(0.92)	(0.64)	(0.36)
Unsuccessful episodes					
Entire sample	45	1.43	0.76	0.40	0.19
		(0.97)	(0.68)	(0.56)	(0.45)
of which euro area countries	34	1.36	0.70	0.46	0.25
		(0.96)	(0.61)	(0.42)	(0.41)
in 1993-1997	13	1.13	0.81	0.43	0.12
		(0.68)	(0.59)	(0.34)	(0.32)
other years	21	1.51	0.63	0.48	0.33
		(1.09)	(0.62)	(0.47)	(0.45)

Source: Author's calculations based on data from the OECD.

Note: The episodes of fiscal adjustment were identified according to the measure of fiscal stance, based on the cyclically-adjusted primary deficit net of temporary measures. The remaining variables are not adjusted. Standard-deviations in parentheses.

Table 8 also shows that, albeit not striking, there are differences between developments in the sub-sample comprising euro area countries between 1993 and 1997 and the remaining observations. In particular, our results show that revenue as a whole tends to increase less sharply in the adjustments selected in that sub-sample, but tax revenue typically features bigger enhancements. Given that Alesina and Ardagna (2009) has shown that fiscal adjustments based on tax revenue are less likely to be successful, these developments on the revenue side may explain why, out of the 13 episodes identified in euro area countries between 1993 and 1997, none has had persistent effects in terms of public debt reduction.

Regarding the developments on the expenditure side, as shown in Table 6, their contribution is more important in successful adjustments than in unsuccessful. The fact that budgetary improvements with more persistent effects are achieved through expenditure retrenchment rather than revenue increases is a feature commonly identified in the literature (see, for instance, Alesina and Ardagna (2009)). In order to analyse the composition of expenditure cuts in fiscal adjustments, we present, in Table 9, a breakdown by its major components.

Table 9 shows that, in successful adjustments, the items compensation of employees and social transfers explain together 60 per cent of the drop in primary expenditure, both declining significantly in these

years.[8] On the other hand, while public investment also typically decreases during successful adjustments, subsidies tend to remain relatively stable (even increasing in the successful episodes identified within the euro area sample). The composition of expenditure retrenchment in unsuccessful adjustments is quite different. In these cases, the bulk of the expenditure contraction relies on important cuts on public investment and compensation of employees, subsidies feature small retrenchments, while social transfers slightly increase.

The analysis of Table 9 also points to several interesting features regarding developments in the 1993-1997 period in countries that were then on the path to participate on the third stage of the EMU. In the first place, as previously mentioned, there is evidence that cuts in primary expenditure tend to be

Table 9

COMPOSITION OF FISCAL ADJUSTMENTS: AVERAGE CHANGE IN SELECTED PRIMARY EXPENDITURE ITEMS | P.P. OF GDP							
	Number of observations	Change in primary expenditure	Change in prim. expend. excluding comp. of employees	Change in compensation of employees	Change in social transfers	Change in subsidies	Change in public investment
Total							
Entire sample	493	0.06	0.10	-0.04	0.07	-0.04	-0.03
		(1.72)	(1.49)	(0.4)	(0.63)	(0.22)	(0.29)
of which euro area countries	314	0.10	0.12	-0.02	0.09	-0.04	-0.03
		(1.68)	(1.46)	(0.4)	(0.64)	(0.24)	(0.3)
Episodes of fiscal adjustment							
Entire sample	60	-1.05	-0.73	-0.32	-0.14	-0.08	-0.28
		(1.59)	(1.31)	(0.49)	(0.61)	(0.27)	(0.35)
of which euro area countries	39	-0.76	-0.52	-0.24	0.01	-0.04	-0.34
		(1.53)	(1.28)	(0.49)	(0.58)	(0.3)	(0.41)
in 1993-1997	13	-0.64	-0.41	-0.23	0.03	-0.04	-0.33
		(1.09)	(0.92)	(0.37)	(0.39)	(0.28)	(0.57)
other years	26	-0.82	-0.57	-0.24	0.01	-0.05	-0.34
		(1.73)	(1.44)	(0.55)	(0.66)	(0.32)	(0.31)
Successful episodes							
Entire sample	15	-2.07	-1.47	-0.60	-0.64	-0.02	-0.24
		(0.9)	(0.77)	(0.22)	(0.44)	(0.27)	(0.28)
of which euro area countries	5	-2.40	-1.83	-0.57	-0.96	0.15	-0.44
		(0.85)	(0.72)	(0.2)	(0.53)	(0.38)	(0.38)
in 1993-1997	0	-	-	-	-	-	-
		-	-	-	-	-	-
other years	5	-2.40	-1.83	-0.57	-0.96	0.15	-0.44
		(0.85)	(0.72)	(0.2)	(0.53)	(0.38)	(0.38)
Unsuccessful episodes							
Entire sample	45	-0.71	-0.48	-0.23	0.03	-0.10	-0.30
		(1.64)	(1.36)	(0.53)	(0.57)	(0.27)	(0.38)
of which euro area countries	34	-0.52	-0.33	-0.19	0.16	-0.07	-0.32
		(1.47)	(1.23)	(0.5)	(0.43)	(0.29)	(0.41)
in 1993-1997	13	-0.64	-0.41	-0.23	0.03	-0.04	-0.33
		(1.09)	(0.92)	(0.37)	(0.39)	(0.28)	(0.57)
other years	21	-0.44	-0.28	-0.16	0.24	-0.10	-0.31
		(1.68)	(1.41)	(0.58)	(0.44)	(0.29)	(0.29)

Source: Author's calculations.

Notes: The episodes of fiscal adjustment were identified according to the measure of fiscal stance, based on the cyclically-adjusted primary deficit net of temporary factors. The remaining variables are not adjusted. Standard-deviations in parentheses.

8   It should be emphasised that, as unemployment benefits are an important share of social transfers, the evolution of this item is particularly sensitive to cyclical conditions. In order to assess whether the decrease in social transfers just described is reflecting the behaviour of automatic stabilizers, we analysed the change in the cyclical component of expenditure during adjustment episodes. We concluded that in the majority of successful episodes the change in the cyclical component was negative. This implies that the developments regarding social transfers presented in Table 9 do not seem to be primarily driven by cyclical conditions, thus do not reflect the impact of automatic stabilizers.

less marked in these episodes. Moreover, in the entire sample, most of expenditure retrenchment in adjustment years is made by cutting down expenses related to public investment and compensation of employees, but the contribution of the latter item is relatively lower in the 1993-1997 period.

Previous literature (Alesina and Perotti (1996a) or Alesina *et al*. (1998)) has shown that adjustments with less persistent effects tend to rely on cuts in public investment and leave transfers, subsidies and compensation of employees almost unchanged, whilst in successful adjustments governments typically do not refrain from cutting these outlays. Therefore, the composition of expenditure retrenchments on the run-up to the euro area depicted in Table 9 may explain why, out of the 5 successful adjustments identified in Member-states, none is within the 1993-1997 time span.

5. Concluding remarks

This article identifies and characterizes episodes of fiscal adjustment in a broad OECD sample, but focusing more thoroughly on those that took place in countries that along the 1990s were on their way to adopt the euro.

In the first place, results show that the fiscal consolidations identified in the OECD sample comply with several stylized facts generally pointed out in previous literature on this subject. In particular, it is concluded that the success of deficit correction efforts does not rely on the magnitude of the adjustments, but especially on their composition: fiscal adjustments based on expenditure cuts tend to be more successful than those relying primarily on the revenue side. Moreover, in successful adjustments the bulk of expenditure decline consists of cuts in transfers and compensation of employees, while in unsuccessful adjustments expenditure retrenchment primarily relies on cuts in public investment.

Regarding, more specifically, the founding countries of the euro area, results show that the adjustments identified in 1993-1997 were not successful in persistently reducing the deficit and public debt ratios. This is not a surprising outturn, given that these adjustments were mostly made on the revenue side rather than based on expenditure retrenchment. In fact, there is evidence that no major cuts were undertaken in primary expenditure items such as social transfers and compensation of employees. In particular, regarding cuts in the latter of these items, results show that its contribution to savings in primary expenditure is less relevant in the adjustments identified in the 1993-1997 period in euro area Member-states than in the entire OECD sample.

These results suggest that compliance with the Maastricht criteria was achieved through a reduction of interest payments and, consequently, total expenditure, without major discretionary retrenchment in primary expenditure items. Against the current background of low economic growth and upward pressure on several Member-states' financing costs, it is clear that correcting fiscal imbalances requires governments to adopt strong and assertive strategies. To ensure the persistence of the effects of the adjustments currently in progress, efforts should be mostly concentrated on expenditure retrenchment. In this context, the control of the public wage bill can play an important role, especially in the case of countries with high public employment and where there is evidence of wage premia in the public sector. A more thorough analysis of the relationship between fiscal adjustments and developments regarding the public wage bill will be addressed in future research.

References

Alesina, A. and Ardagna, S. (1998), "Tales of fiscal adjustment", *Economic Policy*.

Alesina, A. and Ardagna, S. (2009), "Large changes in fiscal policy: taxes versus spending", *Working Paper Series* 15438, NBER.

Alesina, A., Ardagna, S. and Galasso, V. (2008), "The euro and structural reforms", *Technical Report* 14479, NBER.

Alesina, A. and Perotti, R. (1995), "Fiscal expansions and fiscal adjustments in OECD countries", *Working Paper Series* 5214, NBER.

Alesina, A. and Perotti, R. (1996a), "Fiscal adjustments in OECD countries: composition and macroeconomic effects", *Working Paper Series* 5730, NBER.

Alesina, A. and Perotti, R. (1996b), "Reducing budget deficits", *Swedish Economic Policy Review* (3).

Alesina, A., Perotti, R., Tavares, J., Obstfeld, M. and Eichengreen, B. (1998), "The political economy of fiscal adjustments", *Brookings Papers on Economic Activity* 1998(1).

Barrios, S., Langedijk, S. and Pench, L. (2010), "EU fiscal consolidation after the financial crisis: Lessons from the past experiences", *Proceedings of the 12th Banca d' Italia Public Finance Workshop*.

Cabral, A. (2001), "Main aspects of the working of the stability and growth pact", in A. Brunila, M. Butu and D. Franco, eds, *The Stability and Growth Pact: the architecture of fiscal policy in EMU*, Palgrave.

Eichengreen, B. and Wyplosz, C. (1998), "The Stability Pact: more than a minor nuisance?", *Economic Policy* 26.

EMI, ed. (1995), *Progress towards convergence*, European Monetary Institute.

European Commission (1998), "Commission's recommendation concerning the third stage of economic and monetary union", *European Economy* 65.

Fatas, A. and Mihov, I. (2009), "The euro and fiscal policy", *Working Paper Series* 14722, NBER.

Norton, E., Wang, H. and Ai, C. (2004), "Computing interaction effects and standard errors in logit and probit models", *The Stata Journal* 4(2).

Obstfeld, M. (1997), "Europe's gamble", *Brookings Papers on Economic Activity* 1997(2).