Contributions to Macroeconomics

Volume 5, *Issue* 1 2005 *Article* 11

Exchange Rates and Fiscal Adjustments: Evidence from the OECD and Implications for the EMU

Luisa Lambertini* José A. Tavares†

*Boston College and University of California, Los Angeles, luisa@econ.ucla.edu

†Universidade Nova de Lisboa, jtavares@fe.unl.pt

Exchange Rates and Fiscal Adjustments: Evidence from the OECD and Implications for the EMU*

Luisa Lambertini and José A. Tavares

Abstract

This paper investigates whether monetary and exchange rate policies are important for the success of major fiscal adjustments. We assess their role controlling for other determinants of success identified in the literature, including the size and composition of the deficit cut, the level of public debt and the rate of economic growth. We find that successful adjustments are preceded by exchange rate depreciations. Empirically, a depreciation of the nominal effective exchange of one standard deviation of the sample mean in the two years before an adjustment increases the probability of success by 2 percentage points. The size and composition of the deficit cut are also important determinants of success: an increase of one standard deviation of the sample mean raises the probability of success by 3 and 4 percentage points, respectively. One implication of our results is that it may be more difficult to attain persistent fiscal adjustments within the Economic and Monetary Union of Europe, since the adoption of a single currency rules out the use of exchange rate policy among member countries.

KEYWORDS: Exchange Rates, Monetary Policy, Fiscal Adjustments, Economic and Monetary Union

---

*We have benefited from the comments of two anonymous referees, Jordi Gali, Arnold Harberger, Lee Ohanian, Alfredo Marvao Pereira, Aaron Tornell, Carlos Vegh and participants at the UCLA seminar in International and Development Economics and the 6th SPIE Conference 2001. Phillip Lane has kindly provided some of the data used in this paper. Jose' Tavares thanks NOVA FORUM and the Fundacao para a Ciencia e Tecnologia through POCTI/FEDER for financial support. The usual disclaimer applies.

1 Introduction

In several OECD countries public finances deteriorated rapidly after the oil shocks of 1973 and 1982. Under the pressure of budget deficits on the order of 8 percent of GDP and ballooning public debts, a number of countries undertook large fiscal adjustments. Interestingly, economic expansions rather than recessions accompanied fiscal consolidations in Denmark and Ireland, while the large fiscal expansion in Sweden in the early nineties was followed by a severe recession. At the same time, the fiscal adjustments in Denmark and Ireland proved to have long-lasting effects on public finances: Ireland brought its public debt from 80 percent of GDP in the early eighties to 40 percent of GDP in 2000; Danish public debt went from 50 to 30 percent of GDP over the same time period.

These phenomena renewed economists' interest in the macroeconomic effects of fiscal adjustments and raised a brand new question: What makes a fiscal adjustment successful in the sense of having a lasting effect on public finances? Traditional Keynesian theory of fiscal policy finds itself at odds with expansionary fiscal consolidations. Modern theories based on representative agent models may be consistent with expansionary fiscal adjustments, but they have little to say about what makes a fiscal adjustment successful.

The literature on successful fiscal adjustments points to a number of determinants of success. Giavazzi and Pagano (1990, 1996) argue that the *size* of the fiscal adjustment, namely the reduction in the deficit-to-GDP ratio, is important in raising the probability of success. Alesina and Perotti (1995), Alesina and Ardagna (1998) and Alesina et al. (1998) suggest that the *composition* of the fiscal adjustment, namely how much of the deficit reduction stems from spending cuts rather than tax increases, is fundamental for success. Perotti (1999) and Giavazzi et al. (2000) identify the level of public debt at the time of the adjustment as a determinant of success, with higher public debt being more likely to make a fiscal adjustment successful.

The role of monetary and exchange rate policies during episodes of fiscal adjustments has not received similar attention. Most episodes of successful fiscal adjustments, however, have been preceded by large exchange rate depreciations or devaluations. Earlier articles recognize that devaluations may be important in making a fiscal consolidation successful - see Giavazzi and Pagano (1990) and Alesina and Perotti (1997) - but the role of exchange rate and monetary policies has never been explicitly investigated before.[1]

[1] After completing this paper, we came across Hjelm (2000), who studies the issue of exchange rate devaluations before fiscal adjustments and obtains results consistent with our findings. While this author studies the response in terms of output growth, our focus is on

The goal of this paper is to assess the empirical role of monetary and exchange rate policies on the success of fiscal adjustments. It adds to the literature on fiscal adjustments in two ways. First, it characterizes the behavior of monetary and exchange rate policy before, during and after fiscal adjustments using formal statistical analysis. By examining successful and unsuccessful adjustments, we highlight the possible contribution of these policies for success. Second, the paper tests an empirical model that explains the persistence of fiscal adjustments by a combination of monetary and exchange rate policy and all other factors that have been previously studied in the literature.

Our results can be summarized as follows. Exchange rate depreciations in the two years before a fiscal adjustment is initiated significantly increase the probability it will be successful. In a joint regression, a one standard-deviation increase in rate of depreciation of the nominal effective exchange rate in the two years before a fiscal adjustment increases the probability of success by 2 percentage points. The size and composition of the deficit cut, namely the spending-tax revenues composition of the fiscal adjustment, are also significant: a one standard-deviation increase raises the probability of success by 4 and 3 percentage points, respectively. Monetary policy, on the other hand, is found to have an insignificant role in facilitating persistence in fiscal consolidations.

These results have important implications for the feasibility of fiscal consolidations in the Economic and Monetary Union of Europe (EMU). Since the ability to devalue the exchange rate helps in bringing a fiscal adjustment to a successful end, fiscal adjustments in the EMU are less likely to be successful. This is due to the adoption of a common European currency, denying any EMU member state the possibility of devaluing its own currency against that of its most important trading partners (the other EMU members) or even against the U.S. Dollar or the Japanese Yen.

The paper is organized as follows. Section 2 briefly reviews the literature on fiscal adjustments. Section 3 discusses the theoretical mechanisms by which a depreciation of the exchange rate makes a fiscal adjustment successful. Section 4 characterizes successful and unsuccessful fiscal adjustments and tests a model that encompasses all the determinants of success suggested by the literature, including monetary policy and exchange rate policies. Section 5 discusses the implications of our results for the EMU and concludes.

---

the persistence of the adjustment.

2 Previous Work

A fiscal adjustment is a sizable improvement in the government primary surplus relative to GDP. It can result from a reduction in government outlays, an increase in tax revenues or both. Keynesian models predict that a deficit-financed increase in government spending is expansionary for output, notwithstanding some crowding out of private investment due to higher interest rates. Government spending stimulates demand and raises production in an economy with some unemployment. On the other hand, an increase in taxes with unchanged public spending reduces disposable income, thereby lowering private consumption and interest rates. Investment may increase, but the overall effect on output is typically negative in such models.

Models with infinitely lived agents have different predictions for the effects of fiscal policy. A reduction in government outlays raises permanent income because current and/or future taxes are lower, thereby raising private consumption. Changes in taxes that are not accompanied by changes in current or future public spending have no effects on private consumption or investment: aggregate saving remains unchanged, as changes in public saving lead to compensating changes in private saving. This is the well known Ricardian Equivalence result, as in Barro (1974). Ricardian Equivalence, however, holds only in a world where taxes are nondistortionary, individuals are not credit constrained and there is no uncertainty about future government policies. If current changes in taxes signal future changes in public spending, as suggested by Feldstein (1982), the temporal pattern of taxes has real effects on the economy.

In overlapping-generation models of finitely lived individuals, the timing of taxation is important to determine the real effects of fiscal policy even when taxes are nondistortionary. Cuts in public spending raise private consumption only if matched by cuts in taxes; changes in current taxes affect private consumption, whether accompanied or not by changes in public spending.

A different class of models proposes that the effects of fiscal policy on output and private consumption are nonlinear and depend on the circumstances of adjustment. Blanchard (1990) presents a model where the level of public debt matters. An increase in net taxes lowers private consumption if public debt is low, but may raise private consumption if public debt is high. This happens because higher current taxes delay the date of the adjustment, postponing its deadweight cost to future generations. As a result, the lifetime income of existing households and their consumption increase.

Sutherland (1997) proposes a similar mechanism. If an adjustment is expected when public debt reaches a certain threshold, an increase in taxes when

the economy is closer to the threshold delays the adjustment and may increase the lifetime wealth of finite-horizon households.

In Perotti (1999), some households are liquidity constrained. Higher budget surpluses stemming from higher taxes reduce the consumption of liquidity-constrained households; at the same time, higher budget surpluses stemming from lower public spending increase the consumption of unconstrained households. Which effect dominates depends on the tax/spending composition of the fiscal adjustment and on the level of public debt; when the debt-to-GDP ratio is high, the positive effect on consumption dominates.

Other authors have pointed to the possibility of nonlinear effects of public spending cuts. Feldstein (1982) and Drazen (1990) argue that small cuts in public spending have Keynesian effects, while large cuts signal a change in regime and thus lead to increases in private consumption. Bertola and Drazen (1993) propose a model where the relationship between private and public consumption is nonlinear because agents expect a fiscal stabilization once public spending reaches a predetermined threshold. An increase in public consumption when it is close to the threshold makes the stabilization more likely and, as a result, it may increase private consumption.

Giavazzi and Pagano (1990, 1996) started an exciting literature that aims to test empirically the effects of fiscal stabilization. They analyze the Danish stabilization of 1983-86 and the Irish stabilization of 1987-89 to conclude that these fiscal adjustments did in fact lead to an upward revision of estimates of permanent income and an increase in private consumption. Giavazzi et al. (2000) find that non-Keynesian responses of national saving to fiscal policy are associated to large and persistent fiscal impulses, especially during fiscal contractions. As for other determinants of non-Keynesian response, they show that a high or rapidly growing debt-to-GDP ratio as well as the composition of the fiscal adjustment fails to predict a non-Keynesian response to fiscal adjustments.

Alesina and Perotti (1995), Alesina et al. (1998) and Alesina and Ardagna (1998) classify fiscal adjustments on the basis of their ex-post performance: adjustments are successful if, three years after their implementation, the debt-to-GDP ratio has fallen at least 5 percentage points. They find that composition matters: cutting spending rather than raising taxes leads to more persistent improvements of public finances and is usually accompanied by an increase in GDP.[2]

[2]Tavares (2004) presents evidence that it is the interaction of the ideological bent of the cabinet and the composition of the fiscal adjustment that matters: Spending cuts by left-wing cabinets and tax increases by right-wing cabinets have the most impact on persistence.

3 Theoretical Mechanism

The literature on fiscal adjustments was first motivated by the study of specific fiscal episodes in small open economies such as Ireland, Denmark and Sweden. Giavazzi and Pagano (1990) find those fiscal retrenchments to be expansionary and Alesina and Perotti (1995) point to them as successful in the sense of having a long-lasting effect on public finances. Interestingly, those adjustments were preceded by large devaluations of the exchange rate against the nominal anchor, which at that time was the German DM, as remarked by Giavazzi and Pagano (1990).

Ireland's successful consolidations in 1983-84 and 1987-89 were preceded by 16 and 15 percentage points devaluations of the Punt that generated large gains in competitiveness - see Figure 1. The unsuccessful 1996 adjustment, however, was preceded only by a 3 percentage-point devaluation of the Punt relative to the German DM that, coupled with a positive inflation differential relative to Germany, generated a 4 percentage-point appreciation of the Irish real effective exchange rate and a fall in its competitiveness. Sweden's successful adjustments in 1983-87 and 1994-96 were preceded by 38 and 25 percentage points devaluations, respectively, of the Swedish Krona relative to the German DM that led to large gains in competitiveness - see Figure 2.

Why may depreciations facilitate the persistence of fiscal consolidations? We suggest a number of different mechanisms at work. The first is that nominal exchange rate depreciations (or devaluations), especially when combined with fiscal adjustments, lead to competitiveness gains that generate export-lead economic expansions. Consider first the case of a country that has adopted a fixed exchange rate regime. If prices do not adjust instantaneously, exchange rate devaluation leads to real exchange rate depreciation in the short run. More precisely, the devaluation makes domestic goods cheaper relative to the foreign goods, shifting demand away from foreign to domestic goods. This increase in aggregate demand for domestic goods raises output and consumption and improves the trade balance - see for example Obstfeld and Rogoff (1996, Chapter 10). The same forces are at work under a flexible exchange rate regime. A monetary expansion makes the nominal exchange rate depreciate in the short run, possibly even more than in the long run, while prices adjust more slowly. As a result, domestic goods become cheaper than foreign goods in the short run, output and consumption increase and the trade balance improves. Therefore, the economic model we have in mind is one where a nominal exchange rate devaluation (or depreciation) has short run expansionary effects on output and consumption.

If the nominal exchange rate devaluation is accompanied by a credible

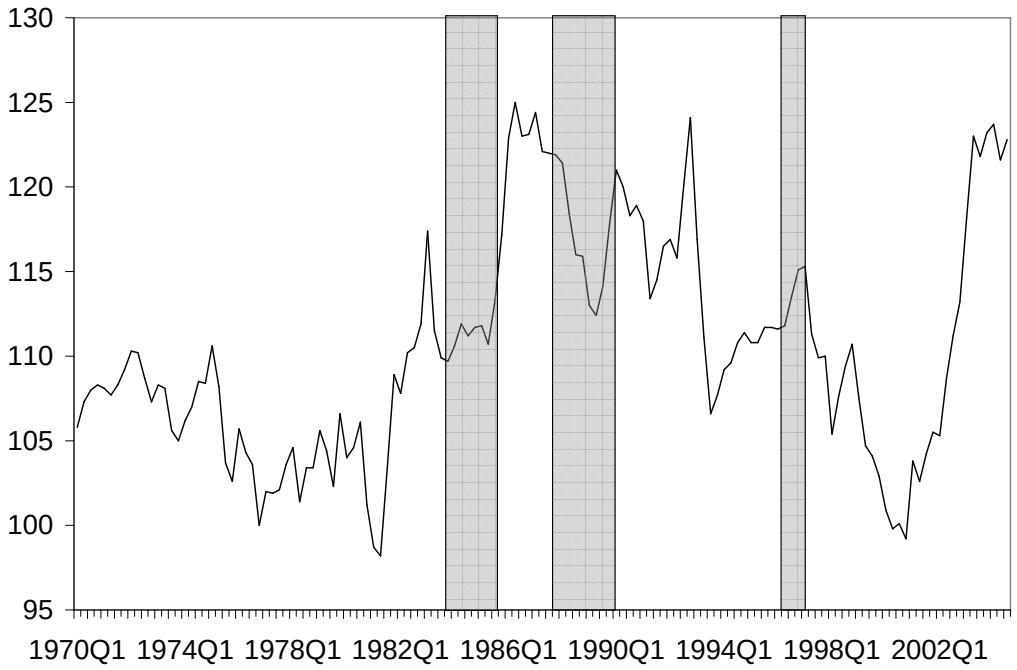

Figure 1: Irish Real Effective Exchange Rate (quarterly)

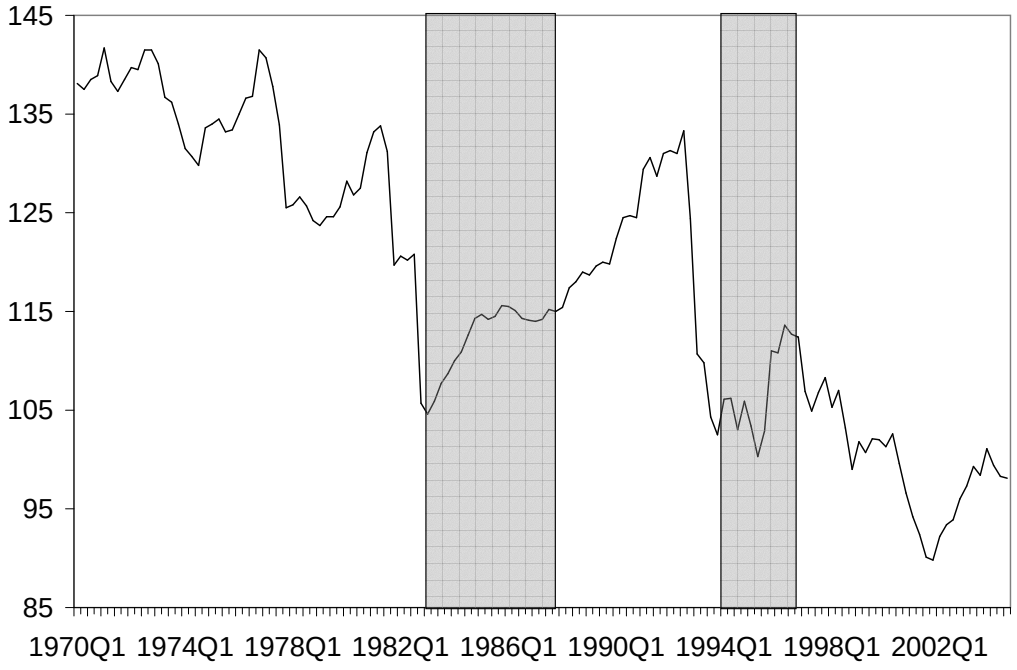

Figure 2: Swedish Real Effective Exchange Rate (quarterly)

Note: shaded areas are periods of fiscal adjustment. A decrease in the real effective exchange rate corresponds to a depreciation, i.e. an increase in competitiveness.

switch in policy consistent with lower long-run inflation, the expansionary effect is amplified as domestic prices will adjust by less. A severe fiscal contraction leads to lower expected long-run inflation because it reduces the danger of future monetization of public debt. This was the case for Ireland and Denmark in the 1980s, where large fiscal consolidations enhanced the long-run credibility of their pegs to a low-inflation currency, the German DM. The amplification of the expansionary effect stemming from lower long-run inflation may explain why depreciations are expansionary in our sample of successful fiscal adjustments while the overall evidence that devaluations and depreciations are expansionary is mixed – see for example Edwards (1986) and Agenor and Montiel (1999).

An economic expansion affects the likelihood of success of a fiscal consolidation in a number of ways. First, the automatic stabilizers tend to raise government surplus as GDP grows faster. Second, an expansionary fiscal adjustment is more likely to be continued for political-economy reasons as the government is likely to be reelected and the fiscal program not to be reversed.

The theoretical mechanism above indicates that exchange rate rather than money supply is important for successful fiscal stabilizations. The money supply rises during an expansionary fiscal stabilization in response to an increase in the demand of real balances, but it also rises after failed inflation stabilization. Our theoretical mechanism also suggests that the empirical analysis should focus on the real effective exchange rate, which better captures competitiveness gains than the nominal exchange rate.

The mechanism highlighted above is consistent with the data. Successful adjustments are preceded by depreciations, as shown in Section 4. A simple statistical analysis of the fiscal episodes in our sample[3] indicates that real GDP growth and investment as percent of GDP accelerate and the current account improves during a successful adjustment.

If countries have foreign-denominated external debt, servicing the debt becomes more onerous after devaluation. This may be the second mechanism at work, as higher interest payments on the existing stock of debt force countries to run primary surpluses, as they would otherwise be unable to repay their external debt and face the consequences of default. The fiscal episodes in our samples are characterized by low foreign-denominated levels of external debt. Over the period 1980 to 2002, foreign-denominated public external debt was on average 5.5 percent of GDP in our OECD sample, while public debt was

[3]A panel regression with fixed effects of several macroeconomic variables of interest on their own lagged value and dummies for the two years before, during and the two years after successful and non-successful adjustments. The results of this regression are available from the authors.

on average 63 percent of GDP. Hence, a mere 8 percent of government debt was issued in foreign currency. Even small open economies such as Ireland, Denmark and Sweden had relatively little foreign-denominated government debt during their episodes of fiscal adjustments, respectively 10, 13 and 13 percent of GDP. So while the denomination of external debt may contribute to the success of a fiscal adjustment successful, we believe that in practice this channel does not play an important role in our OECD sample.

4 Empirics

This section assesses the role of changes in exchange rate and the money supply on the persistence of fiscal adjustments. We analyze the impact of monetary and exchange rate policies taking into account the determinants of successful adjustments previously studied in the literature. We use data on fiscal, monetary and output indicators for 20 OECD economies between the years 1970 and 1999.[4] Fiscal and output data are from the OECD Economic Outlook; a shorter sample of these data has been widely used in the empirical literature on fiscal adjustments. As to the data on the money supply, we have obtained them from the International Monetary Fund's International Financial Statistics. In Appendix A we provide a description of the data series, including units and sources.

A period of fiscal adjustment is a year for which the primary deficit is cut by at least 1.5 percent of GDP, a rather stringent definition as has been pointed out in the literature.[5] To assess this threshold, and as an illustration, we have verified that the sustained output expansion in the 1990s in the United States, which has led to a marked decrease in the budget deficit, does not display a single year that qualifies as an "adjustment year" according to our criterion. We then subdivide adjustment years into successful and unsuc-

[4]The countries are Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Japan, Ireland, Italy, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, United Kingdom and the United States.

[5]We use 1.5 percent of GDP as the threshold to define a fiscal adjustment year for several reasons. First, this is the benchmark in most empirical papers in this research area and one of the objectives of our paper is to provide new results on the role of monetary and exchange rate policy that are directly comparable to those in the existing literature. Second, the 1.5 percentage-point threshold captures the most important episodes of adjustment originating from truly discretionary changes in fiscal policy. A 1 percent-of-GDP threshold would likely pick up cyclically-driven fiscal improvement while a 2 percent-of-GDP threshold is too demanding and drastically reduces the number of adjustment episodes. However, we verified that the use of both the 1 and 2 percent-of-GDP thresholds delivers qualitatively similar results.

cessful, where a fiscal adjustment is successful when the average change in the primary deficit-to-GDP ratio is less or equal to zero in the three (or, alternatively, two) years following the year the deficit was cut. All other cases are classified as unsuccessful adjustments.[6] Appendix B defines our variables and how they are calculated.

We allow for overlapping episodes and treat each and every year of change in the primary deficit-to-GDP ratio less than or equal to -1.5 percent as an adjustment. The years before and after any year of adjustment are considered as such, irrespective of whether they are also classified as periods of fiscal adjustment. In this way we are not required to choose which episodes to include and which to leave out. In our sample there are 99 fiscal adjustments, of which 50 are successful according to our two-year definition and 47 are successful according to our three-year definition.

Since our theoretical mechanism suggests that competitiveness affects the likelihood of success of a fiscal adjustment, we use effective exchange rates in our estimations. The nominal effective exchange rate measures competitiveness but does not account directly for the dynamics of prices. If prices adjust quickly, as is the case in high-inflation countries, the nominal effective exchange rate may be an inappropriate measure of competitiveness. This is not a problem in our sample that consists of OECD countries with low inflation. The real effective exchange rate adjusts for inflation and therefore measures competitiveness more appropriately than the nominal effective exchange rate. However, it already captures the role of monetary policy and inflation. This is problematic when we want to run a horse race between monetary and exchange rate policies. To deal with these problems, we present the results using both the nominal and the real effective exchange rate.

Next we provide empirical estimates of the impact of exchange rate changes as well as other macroeconomic indicators on the persistence of fiscal adjustments. We are able to quantify the relative importance of each variable as a determinant of success. We use a panel Probit specification for the sample of adjustments. The dependent variable to be explained is a dummy variable that takes the value 1 in case of success and 0 otherwise.[7]

Table 1 presents summary statistics on changes in monetary and exchange rate policy variables around the date of adjustment. We present estimates from random-effects panel data regressions of each variable on its lagged value and on dummy indicators for the two years before, during and the two years after

[6]This definition of success is also widely used in the empirical literature on adjustments and its aim is to capture the persistence of the adjustment. It focuses on adjustments that are not quickly reversed and bring a persistent improvement to public finances.

[7]See Appendix B for a precise three- and two-year definition of success.

fiscal adjustments. The -2.64 significant coefficient on the nominal effective exchange rate tells us that there is a significant depreciation before successful adjustments. In the third column we uncover evidence that the real effective exchange rate depreciates on average by 3.86 percent before a successful fiscal adjustment and this depreciation is statistically significant. As to monetary policy, the significant coefficient of 2.69 is evidence that the money supply increases in the two years before unsuccessful adjustments. A different issue is whether these changes in effective exchange rates and money supply actually contribute to success in fiscal adjustments. This is assessed later in Tables 2 and 3, which suggest that only changes in the exchange rate contribute significantly to persistence of fiscal adjustments.

The results show that before and during successful adjustments there are depreciations of the exchange rate (or devaluations, for the case of fixed exchange rate regimes). This result emerges with both the nominal and real effective exchange rate. Quantitatively, the coefficients suggest that the average nominal depreciation is 2.69 percentage points while the average real depreciation is 3.86 percentage points before a successful adjustment. In contrast, there is not a similar regularity as to changes in monetary policy before successful adjustments. If anything, an increase in the money supply before an adjustment is associated with a smaller likelihood of success.

As we pointed out earlier, previous works have identified different characteristics of fiscal adjustments that may be associated with high persistence: the *size* of the adjustment, as in Giavazzi and Pagano (1990; 1996); the *composition* of the fiscal adjustment, as in Alesina and Perotti (1995), Alesina et al. (1998) and Alesina and Ardagna (1998); "good" and "*bad*" times, i.e. a high debt-to-GDP ratio or low economic growth, as in Perotti (1999) and Giavazzi et al. (2000). We use the literature to guide our specification and test for the role of exchange rates and monetary policy in determining success. Our benchmark specification is thus:

$$\begin{aligned}\text{Success}(t) \;=\; & \Phi(\beta_1 * \text{Level of Public Debt}(t-1) \\ & +\beta_2 * \text{Real GDP growth}(t-1) \\ & +\beta_3 * \text{Change in Public Deficit}(t) \\ & +\beta_4 * \text{Change in Government Consumption}(t) \\ & +\beta_5 * \text{Change in M1 Money Supply}(t-1, t-2) \\ & +\beta_6 * \text{Change in the Exchange Rate}(t-1, t-2))\end{aligned}$$

where (t) refers to the time period, $(t-1)$ to the lagged value and $(t-1, t-2)$ to the average lagged value in periods $t-1$ and $t-2$. Our variables of interest

Timing	**Effective Exchange Rate**		**Money**
	Nominal	**Real**	**Supply**
Before Successful	-2.64**	-3.86**	-1.70
Adjustments	(-3.22)	(-2.39)	(-0.95)
During Successful	-1.99**	-0.62	-0.58
Adjustments	(-2.41)	(-0.35)	(-0.31)
After Successful	2.06**	1.45	-0.01
Adjustments	(2.59)	(1.05)	(-0.01)
Before Unsuccessful	-0.54	-0.74	2.69*
Adjustments	(-0.77)	(-0.46)	(1.74)
During Unsuccessful	-0.25	0.63	-1.22
Adjustments	(-0.32)	(0.36)	(-0.72)
After Unsuccessful	-1.16*	-0.26	0.73
Adjustments	(-1.68)	(-0.15)	(0.48)
R^2 Overall	0.04	0.05	0.01
No. of Observations	752	384	680

Note: This table presents random-effects panel data estimates of the average sample behavior of the effective exchange rate and of the money supply in the two years before, during and the two years after successful and unsuccessful adjustments. The $t-statistic$ is presented in parenthesis below the coefficient. A positive change in the exchange rate denotes an appreciation. * and ** indicate a significant coefficient atthe 10 and the 5 percent confidence level, respectively.

Table 1: Exchange Rate, Money Supply and Fiscal Adjustments: Random Effects

are the changes in the exchange rate and in M1 in the years preceding the adjustment. The control variables are:[8]

- Level of Public Debt $(t-1)$, i.e. Government Net Financial Liabilities as percent of GDP in the year preceding the adjustment;
- Real GDP growth $(t-1)$, i.e. the rate of growth in real GDP the year before the adjustment;[9]
- Change in Public Deficit (t), i.e. the contemporaneous change in the public deficit, corrected for the cycle;
- Change in Government Consumption (t), i.e. the contemporaneous change in government consumption.

Table 2 and Table 3 use the whole sample of adjustments to identify the strongest predictors of success in fiscal adjustment for different definitions of success. Table 2 reports the results for the nominal effective exchange rate; Table 3 reports the results for the real effective exchange rate.[10] Columns (1) through (4) add, in turn, each of the determinants of successful adjustment as suggested by the literature to the lagged change in the money supply and in the effective exchange rate. The coefficient of the lagged change in the exchange rate is always significant and negative, suggesting that a devaluation/depreciation in the effective exchange rate in the two years before the adjustment raises the probability of success. In contrast, the money supply does not affect the likelihood of success. As to the control variables, only the size and the composition of the adjustment matter for the persistence of the adjustment. Thus, more severe cuts concentrated on decreases in government consumption rather than increases in tax revenues favor success. These results are robust to using the three- or the two-year definition of success.

The regression including all control variables in Table 2 suggests that a one standard-deviation increase of the change in the nominal effective exchange

[8]The control variables are described in Appendix A.

[9]The inclusion of real GDP growth also corrects for the phase of the business cycle at the time of the fiscal adjustment. Nevertheless, our results do not change when this variable is omitted.

[10]In Tables 2 to 5 we estimate a maximum-likelihood Probit specification and use the *dprobit* instruction which, rather than coefficients, reports the change in the probability for an infinitesimal change in the independent variable (or, if the control variable is a dummy variable, a change from 0 to 1 in this variable). The change in the probability for an infinitesimal change in the control variable is evaluated taking the other control variables at the sample mean.

	3-Year Success					2-Year Success
Lagged Debt	0.051				0.0046	-0.0074
	(1.61)				(0.31)	(-0.54)
Lagged Real GDP growth		-0.0085**			-0.0041	-0.0027
		(2.12)			(-1.31)	(-0.97)
Change in Deficit			-0.0338**		-0.0190**	-0.0206**
			(-2.96)		(-3.32)	(-3.53)
Change in Government				-8.52**	-6.5992**	-7.0915**
Consumption				(-6.71)	(-4.64)	(-5.03)
Lagged Change in the	-0.011**	-0.0092**	-0.0055**	-0.0053**	-0.0034**	-0.0022**
Exchange Rate	(-4.81)	(-5.05)	(-2.88)	(-3.94)	(-2.72)	(-1.82)
Lagged Change in M1	-0.0024	-0.0013	-0.0016	-0.0007	-0.0008	-0.0009
	(-1.32)	(-1.21)	(-1.22)	(-0.97)	(-1.17)	(-1.45)
Pseudo R^2	0.11	0.12	0.24	0.25	0.37	0.43
No. of Observations	460	580	466	530	421	421

Note: The coefficient is interpreted as the percentage change in the dependent variable (success of the fiscal adjustment) for a one percent change in the independent variable. The Lagged Change in Exchange Rate and the Lagged Change in M1 are, respectively, the change in the exchange rate (a positive value denotes an appreciation) and in M1 in the two years before the adjustment. The control variables are described in Appendix A. The $t-statistic$ is presented in parenthesis below the coefficient. * and ** indicate a significant coefficient at the 10 and the 5 percent confidence level, respectively.

Table 2: Exchange Rates and Fiscal Adjustments: Nominal Effective Exchange Rates

	3-Year Success					2-Year Success
Lagged Debt	0.0492				0.0050	-0.0143
	(1.36)				(0.33)	(-0.90)
Lagged GDP growth		-0.0112			-0.0044	-0.0028
		(-1.58)			(-1.08)	(-0.77)
Change in Deficit			-0.0343**		-0.0261**	-0.0317**
			(-4.73)		(-4.93)	(-5.91)
Change in Government				-9.5420**	-4.0497**	-3.7794**
Consumption				(-4.35)	(-2.41)	(-2.43)
Lagged Change in the	-0.0089**	-0.0081**	-0.0038**	-0.0043**	-0.0022**	-0.0016*
Exchange Rate	(-3.40)	(-3.43)	(-3.09)	(-2.60)	(-2.36)	(-1.92)
Lagged Change in M1	-0.0004	-0.0007	-0.0002	-0.0008	-0.0005	-0.0008
	(-0.33)	(-0.66)	(-0.28)	(-0.77)	(-0.76)	(-1.41)
Pseudo R^2	0.08	0.09	0.35	0.18	0.40	0.47
No. of Observations	322	334	337	352	312	312

Note: The coefficient is interpreted as the percentage change in the dependent variable (success of the fiscal adjustment) for a one percent change in the independent variable. The Lagged Change in Exchange Rate and the Lagged Change in M1 are, respectively, the change in the exchange rate (a positive value denotes an appreciation) and in M1 in the two years before the adjustment. The control variables are described in Appendix A. The $t - statistic$ is presented in parenthesis below the coefficient. * and ** indicate a significant coefficient at the 10 and the 5 percent confidence level, respectively.

Table 3: Exchange Rates and Fiscal Adjustments: Real Effective Exchange Rates

rate raises the probability of success by 2 percentage points.[11] This effect is significant but quantitatively small. It points to the fact that exchange rate movements are a small determinant of success in practice. However, the quantitative effect of change in the exchange rate is comparable to that of the other determinants of success. A one standard-deviation increase in the size and composition of the fiscal adjustment raise the probability of success by 3 and 4 percentage points, respectively. The effects suggested by the coefficients in Table 3 are quantitatively similar.

We interpret the findings of Table 2 and Table 3 as evidence that a depreciation before the fiscal adjustment, as well as an increase in the size and composition of the fiscal consolidation, raises the probability of success. A causal interpretation of the relationship between exchange rates and the probability of success needs caveats. If the fiscal adjustment *ex-post* causes the depreciation of the exchange rate, our empirical estimates should be interpreted as documenting a correlation among the two variables. This would be the case if the government's decision to devalue/depreciate the exchange rate is caused by its decision to carry out a fiscal adjustment in the future. We do not believe this is typically case in our sample. The study of specific fiscal episodes in small open economies suggests that the decision to devalue the exchange rate was often taken by the central bank independently of the Treasury. In other cases, the devaluation and the fiscal adjustment were undertaken by different cabinets.

An important issue is whether the countries analyzed were under a fixed or a flexible exchange rate regime and how this matters. Table 4 and Table 5 interact an indicator of the exchange rate regime with changes in the exchange rate and in the money supply, respectively. The interaction variables help us identify whether it is the money supply or exchange rate changes that matter according to the policy regime. We classify each country at each point in time as a Fixer or a Nonfixer based on the IMF's Classification of Exchange Rate Arrangements and Monetary Policy Frameworks detailed in Appendix A. Countries classified by the IMF as pursuing an independent float policy are classified as Non-Fixers and all others - independently of the type of peg or band restricting exchange rate movements - are classified as Fixers.[12]

[11] This figure is obtained by multiplying the coefficient of Table 2 by the standard deviation of the nominal effective exchange rate in our sample. Table 6 in Appendix C reports the standard deviation of selected variables.

[12] The IMF's Classification of Exchange Rate Arrangements and Monetary Policy Frameworks defines an independent float as follows: "The exchange rate is market-determined, with any official foreign exchange market intervention aimed at moderating the rate of change and preventing undue fluctuations in the exchange rate, rather than at establishing

	3-Year Success		2-Year Success	
	Nominal	Real	Nominal	Real
Lagged Debt	0.00112	0.0056	-0.00355	-0.0096
	(0.72)	(0.39)	(-0.25)	(-0.79)
Lagged Real GDP growth	-0.0042	-0.0038	-0.00240	-0.0007
	(-1.28)	(-0.99)	(-0.88)	(-0.24)
Change in Deficit	-0.0202**	-0.0247**	-0.0227**	-0.0249**
	(-3.52)	(-4.76)	(-3.62)	(-5.45)
Change in Government	-6.472**	-3.74**	-6.920**	-2.62**
Consumption	(-4.53)	(-2.61)	(-4.68)	(-2.37)
Lagged Change in the	-0.0046*	-0.0018	-0.00423**	-0.0020
Exchange Rate: Fixers	(-1.74)	(-1.03)	(-2.21)	(-1.47)
Lagged Change in the	-0.0026*	-0.0019**	-0.00136	-0.0005
Exchange Rate: Non-Fixers	(-1.85)	(-2.03)	(-0.84)	(-0.73)
Lagged Change in M1:	-0.00084	-0.0011	-0.000253	-0.0018**
Fixers	(-0.98)	(-2.06)	(-0.26)	(-2.06)
Lagged Change in M1:	-0.00038	-0.0001	-0.000295	-0.0003
Non-Fixers	(-0.46)	(-0.18)	(-0.40)	(-0.60)
Pseudo R^2	0.37	0.41	0.43	0.48
No. of Observations	420	313	420	313

Note: The coefficient is interpreted as the percentage change in the dependent variable (success of the fiscal adjustment) for a one percent change in the independent variable. The Lagged Change in the Exchange Rate and the Lagged Change in M1 are, respectively, the change in the exchange rate (a positive value de-notes an appreciation) and in M1 in the two years before the adjustment. The control variables are described in Appendix A. The monetary and exchange rate variables are interacted with dummy variables forfixed and flexible exchange rate regimes. The $t - statistic$ is presented in parentheses below the coefficient. * and ** indicate a significant coefficient at the 10 and the 5 percent confidence levels, respectively.

Table 4: Exchange Rates and Fiscal Adjustments: Nominal Effective Exchange Rate and Fixers versus Non-Fixers

	3-Year Success			2-Year Success		
Lagged Debt	0.0093	0.0057	0.0056	-0.0058	-0.0138	-0.0096
	(0.60)	(0.36)	(0.39)	(-0.40)	(-0.82)	(-0.79)
Lagged Real GDP growth	-0.0054	-0.0042	-0.0038	-0.0034	-0.0009	-0.0007
	(-1.54)	(-1.00)	(-0.99)	(-1.24)	(-0.22)	(-0.24)
Change in Deficit	-0.0233**	-0.0284**	-0.0247**	-0.0242**	-0.0381**	-0.0249**
	(-4.12)	(-4.95)	(-4.76)	(-3.95)	(-6.01)	(-5.95)
Change in Government	-7.0467**	-3.9650**	-3.7403**	-7.3631**	-2.9741*	-2.6246**
Consumption	(-4.56)	(-2.47)	(-2.61)	(-4.90)	(-1.88)	(-2.37)
Lagged Change in the		-0.0024	-0.0018		-0.0040**	-0.0020
Exchange Rate: Fixers		(-1.34)	(-1.03)		(-2.13)	(-1.47)
Lagged Change in the		-0.0022**	-0.0019**		-0.0011	-0.0005
Exchange Rate: Non-Fixers		(-2.01)	(-2.03)		(-0.94)	(-0.73)
Lagged Change in M1:	-0.0008		-0.0011	-0.0002		-0.0018**
Fixers	(-0.92)		(-1.06)	(-0.20)		(-2.06)
Lagged Change in M1:	0.0001		-0.0001	-0.0001		-0.0003
Non-Fixers	(0.14)		(-0.18)	(-0.13)		(-0.60)
Pseudo R^2	0.35	0.39	0.41	0.41	0.44	0.48
No. of Observations	420	323	313	420	323	313

Note: The coefficient is interpreted as the percentage change in the dependent variable (success of the fiscal adjustment) for a one percent change in the independent variable. The Lagged Change in the Exchange Rate and the Lagged Change in M1 are, respectively, the change in the exchange rate (a positive value denotes an appreciation) and in M1 in the two years before the adjustment. The control variables are described in Appendix A. The monetary and exchange rate variables are interacted with dummy variables for fixed and flexible exchange rate regimes. The $t-statistic$ is presented in parentheses below the coefficient. * and ** indicate a significant coefficient at the 10 and the 5 percent confidence levels, respectively.

Table 5: Exchange Rates and Fiscal Adjustments: Real Effective Exchange Rate and Fixers versus Non-Fixers

Calvo and Reinhart (2000) point out that the IMF's Classification of Exchange Rate Regimes does not provide an adequate representation of what countries actually do, as many countries that claim to float their exchange rate in reality do not. Reinhart and Rogoff (2004) and Levy-Yeyati and Sturzenegger (2005) suggest alternative exchange rate regime classifications. Because our sample includes only OECD economies and because we choose to classify as Non-Fixers only those countries classified by the IMF as independently floating, i.e. the United States, Japan, Australia, Canada and, at intervals, the United Kingdom, our classification is very similar to these alternative ones.[13]

We classify as Non-Fixers countries that do not use the exchange rate as a policy variable and then test if monetary policy variables are significant in making fiscal adjustments successful in such countries. If monetary policy matters for success, this should certainly be the case among countries that independently float their exchange rates, namely the Non-Fixers. Hence, it is our deliberate choice to exclude intermediate regimes from our set definition of Non-Fixers and, therefore, to bias our results in favor of monetary policy.

The results in Table 4 and Table 5 suggest that it is changes in the effective exchange rate that favor the persistence of a fiscal adjustment. Table 4 shows the results of our test for the nominal and real effective exchange rates. When both the money supply and the nominal effective exchange rate are interacted with the exchange rate regime, only the change in the exchange rate comes out as significant and with the correct, negative sign for both Fixers and Non-Fixers under the three-year definition of success. For the two-year definition of success, the nominal effective exchange rate is significant for Fixers. The real effective exchange rate is significant and with the expected negative sign for Non-Fixers when the three-year definition of success is used. The money supply is not significant except for Fixers in the two-year definition of success, with the sign suggesting that loosening the money supply before the adjustment decreases the likelihood of success.

The results of Table 4 suggest that monetary policy does not improve the likelihood of persistence of the fiscal adjustment. Changes in the nominal effective exchange rate improve the probability of success while the results for

a level for it."

[13]Levy-Yeyati and Sturzenegger (2005) suggest a *de-facto* classification based on the actual behavior of macroeconomic variables. Their classification differs from ours only in a few years for Canada and the United Kingdom and these years are not fiscal adjustments anyway. Reinhart and Rogoff (2004) present an alternative classification that uses data on market-determined parallel exchange rates. Their classification overlaps the most with the IMF's classification of the G3 currencies and of the limited flexibility European arrangements, which are the countries in our sample.

changes in the real effective exchange rate are mixed. One explanation for the mixed performance of the real effective exchange rate is that it captures both changes in the nominal effective exchange rate and in inflation, which is closely related to changes in M1. In other words, changes in the real effective exchange rate capture both exchange rate and monetary policies. As a result, it is problematic to run a horse-race between the two policies using the real effective exchange rate. We interpret the mixed results in using the real effective exchange rate as a result of this problem.

To better understand the behavior of the real exchange rate described in Table 4, in Table 5 we add the interacted the real effective exchange rate and the interacted money supply in sequence. The third and sixth columns reproduce some of the results in Table 4. When only changes in the money supply are considered as regressors, there is no significant effect of the former on the persistence of adjustment, irrespective of the definition of success considered and the exchange rate regime. This is the most important result in Table 5. The lagged change in the real effective exchange rate comes out as significant when entered in isolation for Non-Fixers in the three-year definition and for Fixers in the two-year definition. When both the money supply and the real effective exchange rate are interacted with the exchange rate regime, the change in the real exchange rate comes out as significant in the three-year definition of success for Non-Fixers, confirming our intuition.

The magnitudes of the effects on the likelihood of success suggested by Table 4 and Table 5 are quantitatively similar to those of Table 2 and Table 3. The caveats concerning a causal interpretation of our findings still apply.

In sum, the effective exchange rate helps success when undergoing a fiscal adjustment.[14]

These results are consistent with Lane and Perotti (1998), who present empirical evidence that a fiscal adjustment is associated with an expansion of exports and the effect is "reinforced if the fiscal reform is accompanied by a flexible exchange rate [system] or a devaluation."

Our econometric tests deliver a clear message: as suggested in the empirical and theoretical literature surveyed above, the size and the composition of the fiscal adjustment are key to its persistence; depreciation of the domestic currency also facilitates the success of the fiscal adjustment irrespectively of the exchange rate regime in place; the money supply does not appear to consistently influence the persistence of the fiscal adjustment.

[14]Earlier versions of this paper presented different specifications using alternative real exchange rate variables, such as the real exchange rate versus the German DM and the U.S. Dollar. These specifications revealed a similar qualitative pattern.

Our results on the exchange rate test, for the first time, the contention often made in the literature that successful fiscal adjustments tend to be preceded by exchange rate depreciations. This contention has been alluded to by several authors but previously it had never been tested explicitly. Giavazzi and Pagano (1990) mention: "several major multi-year fiscal adjustments are preceded by a devaluation of the exchange rate." Alesina and Perotti (1997) find that, though there are significant exchange rate depreciations before all type of adjustments, the average depreciation before and during successful adjustments are twice as high. These authors also find, consistent with our findings and interpretation, that there is a significant positive increase in the trade balance only during successful adjustments, suggesting a surge in exports.[15]

5 Conclusions and Implications for the EMU

The empirical literature on the determinants of successful fiscal adjustments has overlooked the role of monetary and exchange rate policies. Our paper presents new empirical estimates highlight and assess the importance of monetary and exchange rate policies.

Successful fiscal adjustments in the OECD during last three decades have typically been preceded by large nominal and real exchange rate depreciations. We believe that exchange rate depreciation improves the likelihood of success of fiscal adjustments by improving competitiveness and boosting economic activity that, in turn, improves budget surpluses and makes it more likely for the adjustment program to be continued. Exchange rate depreciations are significant in predicting success for fiscal adjustments. A one standard-deviation increase in the rate of depreciation of the nominal effective exchange rate in the two years before a fiscal adjustment increases the probability of success by 2 percentage points. The size and composition of the deficit cut, namely the spending-tax revenues composition of the fiscal adjustment, are also significant: a one standard-deviation increase raises the probability of success by 4 and 3 percentage points, respectively. In contrast, monetary policy does not play a significant role in successful adjustments.

The EMU has substantially altered the conduct of exchange rate and mon-

[15]See Table 10 in Alesina and Perotti (1997). The authors mention: "both successful and unsuccessful adjustments have been accompanied and preceded by nominal depreciations, somewhat larger in successful cases. However, significant depreciations accompanied unsuccessful adjustments as well. What is interesting is that while in successful cases the nominal depreciations had an impact on competitiveness (unit labor costs) in unsuccessful cases it did not."

etary policies by creating a common currency and the European Central Bank. The institutional setting is now characterized by centralization of monetary policy while, in the fiscal sphere, national autonomy is kept within the constraints dictated by the Pact for Stability and Growth that accompany the monetary agreement.[16] The combination of centralized monetary and decentralized, though constrained, fiscal policy raises two different questions. The first question is whether countries are more or less likely to incur budget deficits in a monetary union. On one hand, the loss of monetary autonomy may increase the use of fiscal policy to respond to asymmetric shocks. On the other hand, both factor- and product-market integration and the statutory limits dictated by the Stability Pact effectively limit fiscal autonomy. Governments are likely to be constrained by the diminished capacity to raise taxes due to increasing factor (mainly capital) mobility. In the past, governments in Europe have been able to place a substantial part of their debt with their private banks; this situation may change in the future. Moreover, lower seignorage revenues harden the fiscal budget constraint on the fiscal authority, even though such revenues are typically small in OECD economies.

The second question, and the one for which our results are relevant, is whether EMU members with excessive deficits are in a better position to correct them after adhering to the EMU. Our paper suggests they are not. Our results show that currency depreciation furthers the likelihood of successful, i.e. persistent, fiscal adjustments. Given that the EMU introduced a single currency for all its members and that EMU members trade mostly with each other, it may now be harder for individual countries to correct fiscal imbalances.

Previous evidence by other authors reinforces our case that fiscal adjustments will be harder to undertake under the EMU. Eichengreen and Wyplosz (1998) look at the major recession in OECD countries and find seven instances of countries with deficits in excess of 3 percent of GDP in the period 1955-96. By examining the growth rate of GDP and the behavior of the budget deficit, they indicate that these are "snap" recessions in that real GDP growth is negative only for the year of recession and positive in all years immediately before and after. In contrast, the budget deficit increases dramatically in the recession year and stays at values higher than 3 percent of GDP for at least 3 years thereafter. This suggests that, even though instances of exceeding the EMU deficit limits will be rare, once they occur, they are likely to require large discretionary fiscal policy measures. In this context, the abandonment of the

[16]For an overview of the history and the political and economic rationale of monetary unification in Europe see Eichengreen (1993).

exchange rate as a policy instrument is likely to have a significant impact on the persistence of the adjustment. Obstfeld (1999) points to another reason why EMU countries will find it more difficult to undertake successful adjustments: most recent adjustments within the EMU are not relying on spending cuts but rather on tax increases (sometimes temporary) which may not be sustainable. In fact, even the European Monetary Institute had expressed reservations about the persistence of the fiscal adjustments undertaken in the build-up to the monetary union. Some EMU members have high public debt-to-GDP ratios that require large interest rate payments and make the fiscal constraints dictated by the Pact for Stability and Growth binding. The recent breach of the deficit limits by France and Germany and the related tensions in the application of the EMU framework are a clear indication of such problems. Our results suggest that a successful adjustment within the EMU is likely to be more costly as countries that abandon autonomous exchange rate policies must rely entirely on the size and composition of its fiscal cuts to achieve sustainable deficit reductions.

Appendix

A Data Sources

Real GDP growth Definition: Growth rate of real GDP, computed as the difference between the value in the current year minus the value one year before, divided by the value the year before. Unit: Percentage points. Source: OECD Economic Outlook.

Nominal Effective Exchange Rate Definition: Growth rate of the nominal effective exchange rate, defined as the difference between the value in the current year minus the value one year before, divided by the value the year before. A positive value denotes an appreciation of the country's currency. Unit: Percentage points. Source: OECD Economic Outlook.

Real Effective Exchange Rate Definition: Growth rate of the real effective exchange rate, defined as the difference between the value in the current year minus the value one year before, divided by the value the year before. A positive value denotes an appreciation of the country's currency. The computation of the real effective exchange rate is based on relative consumer prices and relative nominal unit labor costs. Unit: Percentage points. Source: OECD Economic Outlook.

Lagged Change in the Exchange Rate Definition: Growth rate of the exchange rate in the year before the current one, defined as the difference between the value in the year before the current minus the value one year before, divided by the value the year before. A positive value denotes an appreciation of the country's currency. Unit: Percentage points. Source: OECD Economic Outlook.

Exchange Rate Regime Definition: A Non-Fixer country is any country classified by the International Monetary Fund under: "freely floating regime" (between 1970 and 1974), the exchange rate is not maintained in "relatively narrow bands" (between 1974 and 1978) or it is "independently floating" (after 1978). All other country-years are considered Fixers. Source: International Monetary Fund, Classification of Exchange Rate Arrangements and Monetary Policy Frameworks.

M1 Definition: Growth rate of M1 monetary aggregate computed as the difference between the value in the current year minus the value one year

before, divided by the value the year before. Unit: Percentage points. Source: IMF International Financial Statistics.

Inflation Definition: Growth rate of the Consumer Price Index computed as the difference between the value in the current year minus the value one year before, divided by the value the year before. Unit: Percentage points. Source: IMF International Financial Statistics.

Lagged Debt Level Definition: Government Net Financial Liabilities as a Share of GDP one year before the fiscal adjustment. Unit: Percentage points. Source: OECD Economic Outlook.

Change in Deficit Definition: Total change in the public deficit as a share of GDP in the year of fiscal adjustment, corrected for the cycle. A positive value indicates an increase in the public deficit. Unit: Percentage points. Source: OECD Economic Outlook.

Change in Government Consumption Definition: Change in the level of government consumption as a share of GDP in the year of the fiscal adjustment. Unit: Percentage points. Source: OECD Economic Outlook.

B Definitions

Fiscal Adjustment A period of fiscal adjustment is a year for which the primary deficit is reduced by at least 1.5 percent of GDP relative to the year before. Let $D(t)$ be the primary deficit-to-GDP ratio in year t. There is a fiscal adjustment in period t if

$$D(t) - D(t-1) \leq -0.015$$

Successful Fiscal adjustment, three years definition A fiscal adjustment is successful when the average change in the primary deficit-to-GDP ratio is less than or equal to zero in the three years following the year the deficit was cut. Let $D(t)$ be the primary deficit-to-GDP ratio in year t. The fiscal adjustment in period t is successful if

$$\frac{1}{3}\left\{[D(t+1) - D(t)] + [D(t+2) - D(t+1)] + [D(t+3) - D(t+2)]\right\} \leq 0.$$

This condition simplifies to

$$D(t+3) \leq D(t).$$

Hence, we can alternatively say that the fiscal adjustment in period t is successful if the primary deficit-to-GDP ratio in period $t+3$ is less than or equal to the the primary deficit-to-GDP ratio in period t.

Successful Fiscal adjustment, two years definition A fiscal adjustment is successful when the average change in the primary deficit-to-GDP ratio is less than or equal to zero in the two years following the year the deficit was cut. Let $D(t)$ be the primary deficit-to-GDP ratio in year t. The fiscal adjustment in period t is successful if

$$\frac{1}{2}\left\{[D(t+1)-D(t)]+[D(t+2)-D(t+1)]\right\}\leq 0,$$

which simplifies to

$$D(t+2)\leq D(t).$$

The fiscal adjustment in period t is successful if the primary deficit-to-GDP ratio in period $t+2$ is less than or equal to the the primary deficit-to-GDP ratio in period t.

C Summary Statistics

Variable	**Mean**	**Standard Deviation**
Lagged Change in the Nominal Effective Exchange Rate	-0.4377	4.7695
Lagged Change in the Real Effective Exchange Rate	0.2460	6.1648
Lagged Debt	30.3467	36.4824
Lagged Real GDP growth	3.4595	2.6680
Change in Deficit	-0.0922	1.6908
Change in Government Consumption	0.0009	0.0063
Lagged Change in the Nominal Effective Exchange Rate - Fixers	-0.0451	2.6301
Lagged Change in the Nominal Effective Exchange Rate - Non-Fixers	-0.6570	4.2941
Lagged Change in the Real Effective Exchange Rate - Fixers	-0.0472	3.7371
Lagged Change in the Real Effective Exchange Rate - Non-Fixers	0.2797	4.6974

Table 6: Mean and standard deviation of selected variables

References

Agenor, Pierre-Richard and Peter J. Montiel (1999) *Development Macroeconomics,* Second edition, Princeton: Princeton University Press.

Alesina, Alberto and Silvia Ardagna (1998) "Tales of Fiscal Adjustment," *Economic Policy: A European Forum,* 13(27), 487-517.

_____ and Roberto Perotti (1995) "Fiscal Expansions and Adjustments in OECD Countries," *Economic Policy: A European Forum,* 10(21), 205-40.

_____ and _____ (1997) "Fiscal Adjustments in OECD Countries: Composition and Macroeconomic Effects," *International Monetary Fund Staff Papers,* 44(2), 210-48.

_____; Perotti, Roberto and José Tavares (1998) "The Political Economy of Fiscal Adjustments," *Brookings Papers on Economic Activity,* 1998(1), 197-248.

Barro, Robert (1974) "Are Government Bonds Net Wealth?" *Journal of Political Economy,* 82(6), 1095-1117.

Bertola, Giuseppe and Allan Drazen (1993) "Trigger Points and Budget Cuts: Explaining the Effects of Fiscal Austerity," *American Economic Review,* 83(1), 11-26.

Blanchard, Olivier (1990) "Can Severe Fiscal Contractions Be Expansionary? Tales of Two Small European Countries: Comment," in Blanchard, Olivier and Stanley Fischer, eds. *NBER Macroeconomics Annual 1990,* Cambridge, Mass. and London: MIT Press, 111-16.

Calvo, Guillermo and Carmen Reinhart (2002) "Fear of Floating," *Quarterly Journal of Economics,* 117(2), 379-408.

Drazen, Allan (1990) "Can Severe Fiscal Contractions Be Expansionary? Tales of Two Small European Countries: Comment," in Blanchard, Olivier and Stanley Fischer, eds. *NBER Macroeconomics Annual 1990,* Cambridge, Mass. and London: MIT Press, 117-22.

Edwards, Sebastian (1986) "Are Devaluations Contractionary?" *Review of Economics and Statistics,* 68(2), 501-8.

Eichengreen, Barry (1993) "European Monetary Unification," *Journal of Economic Literature,* 31(3), 1321-57.

_____ and Charles Wyplosz (1998) "The Stability Pact: More Than a Minor Nuisance?" *Economic Policy: A European Forum,* 13(26), 65-104.

Feldstein, Martin (1982) "Government Deficits and Aggregate Demand," *Journal of Monetary Economics,* 9(1), 1-20.

Giavazzi, Francesco; Jappelli, Tullio and Marco Pagano (2000) "Searching for Non-linear Effects of Fiscal Policy: Evidence From Industrial and Developing Countries," *European Economic Review,* 44(7), 1259-89.

_____ and Marco Pagano (1990) "Can Severe Fiscal Contractions Be Expansionary? Tales of Two Small European Countries," in Blanchard, Olivier and Stanley Fischer, eds. *NBER Macroeconomics Annual 1990,* Cambridge, Mass. and London: MIT Press, 75-111.

_____ and _____ (1996) "Non-Keynesian Effects of Fiscal Policy Changes: International Evidence and Swedish Experience," *Swedish Economic Policy Review,* 3(1), 67-103.

Hjelm, Goran (2002) "Effects of Fiscal Contractions: The importance of Preceding Exchange Rate Movements," *Scandinavian Journal of Economics,* 104(3), 423-41.

Lane, Phillip and Roberto Perotti (1998) "The Trade Balance and Fiscal Policy in the OECD," *European Economic Review,* 42(3-5), 887-95.

Levy-Yeyati, Eduardo and Federico Sturzenegger (2005) "Classifying Exchange Rate Regimes: Deeds vs. Words," *European Economic Review,* 49(6), 1603-35.

Obstfeld, Maurice (1999) "EMU: Ready or Not?" National Bureau of Economic Research Working Paper 6682, Cambridge Massachusetts.

_____ and Kenneth Rogoff (1996) *Foundations of International Macroeconomics,* The MIT Press.

Perotti, Roberto (1999) "Fiscal Policy in Good Times and Bad," *Quarterly Journal of Economics,* 114(4), 1399-1436.

Reinhart, Carmen and Kenneth Rogoff (2004) "The Modern History of Exchange Rate Arrangements: A Reinterpretation," *Quarterly Journal of Economics,* 119(1), 1-48.

Sutherland, Alan (1997) "Fiscal Crises and Aggregate Demand: Can High Public Debt Reverse the Effects of Fiscal Policy?" *Journal of Public Economics*, 65(2), 147-62.

Tavares, José (2004) "Does Right or Left Matter? Cabinets, Ideology and Fiscal Adjustments," *Journal of Public Economics,* 88(12), 2447-68.