

FISCAL DEFICITS IN MONETARY UNIONS: A COMPARISON OF EMU AND UNITED STATES

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Monetary unions deprive individual member states of monetary and exchange rate policies as independent tools for stabilization. The level of seigniorage is also collectively determined by a common central bank and shared among the member states.¹ The latter is expected to put a limit on the extent of deficit monetization by member states. Moreover, in order to discourage deficit monetization by any member states it is stipulated that, for the success of a monetary union, member states strictly adhere to fiscal discipline; that is, the levels of deficits and debts must not exceed sustainability [Delors Report, 1989]. Thus, a monetary union imposes monetary policy constraints and demands collective fiscal disciplines. In the case of the Economic and Monetary Union (EMU) in Europe, this has been adopted explicitly. (On the fiscal discipline aspect, see, for example, Arestis, McCauley and Sawyer [2001]; on the historical emergence of the EMU, and also on the political will for a monetary union, see, for example, Arestis, Brown, and Sawyer [2001].)

There is a difference of opinion whether in practice monetary unions increase fiscal discipline amongst their member states. One line of argument suggests that monetary unions may not foster fiscal discipline because of the moral hazard problem. A member state of a union may be inclined to run a large fiscal deficit by issuing new debts on the premise that other member states would bail her out in the event of her financial insolvency. This follows from the fact that the credibility of the entire union would be at stake if one of its members were allowed to default or go bankrupt. This does not imply that any one member defaulting on her debt would bring collapse to the EMU. The point is that such default would be embarrassing to all concerned, and, more importantly, damage the credibility of the union. This argument would be even more pertinent currently in view of the strenuous efforts by the EMU to gain and maintain credibility. Likewise, a monetary union could be an incentive for some member countries to run large deficits as it makes money holders in all member countries

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pay for such deficits (by way of increased inflation tax). Sibert [1994] and Chari and Kehoe [1997] elaborate on the issue of monetary union and the incentives it provides to member states to run large debts. Thus, the solidarity of alliance and the joint seigniorage may work against fiscal discipline in a monetary union. However, those who believe monetary union fosters fiscal discipline argue that members of a monetary union tend to have much less power of deficit monetization than a sovereign nation because of the pledge of collective responsibility. Further, monetary union does not operate in vacuum; mechanisms are put in place to ensure that union-wide agreed policies are adhered to by every member state. Thus, the mechanism of union-wide checks and the pledge of collective accountability significantly thwart the motive and reduce the incentive to act alone in a Machiavellian way. In fact it has been a common argument among the proponents of EMU that exchange-rate discipline provides a credible disinflationary policy [Agell et al., 1996].

The arrangements for the EMU entail formal fiscal restraints on individual countries and a great deal of emphasis appears to be placed on coordination of fiscal policies among the member states. The project of greater fiscal coordination involves steps to streamline and harmonize tax rates and state benefits across the EMU countries. However, no specific EMU agenda has been agreed on these issues. A French attempt to bring up a similar proposal in the recently concluded Nice summit of the EMU did not materialize because other member states (the UK in particular) regarded this as going too far toward creating a Federal Europe. In terms of fiscal restraints, though, the picture is very different. The EMU calls for formal fiscal restraints on individual countries. The Maastricht Treaty of the European Union (EU), following Delors' Report, has laid down a specific level of fiscal deficit that a member country can incur. The treaty stipulates a maximum level of permissible budget deficit as 3 percent of GDP. The conditions and details governing the EMU fiscal restraints are contained in the Stability and Growth Pact [Arestis, McCauley, and Sawyer, 2001; Arestis, Brown, and Sawyer 2001].² The Stability and Growth Pact accompanied the introduction of a single currency in the European Union as part of the third stage of economic and monetary union. It governs the economic policies of the member countries that have joined the single currency.

The following quote from the Stability and Growth Pact indicates the importance of fiscal convergence in euro area countries: "The European Council underlines the importance of safeguarding sound government finances as a means of strengthening the conditions for price stability and for strong sustainable growth conducive to employment creation. It is also necessary to ensure that national budgetary policies support stability oriented monetary policies. Adherence to the objective of sound budgetary positions close to balance or in surplus will allow all Member States to deal with normal cyclical fluctuations while keeping the government deficit within the reference value of 3 percent of GDP" [*Resolution of the European Council on the Stability and Growth Pact*, Amsterdam, 17 June 1997]. The main feature of the Stability and Growth Pact is a requirement that the national budget deficit does not exceed 3 percent of GDP. Failure to meet that requirement could lead to a series of fines depending on the degree to which the deficit exceeds 3 percent. Since the Maastricht Treaty, it has become commonplace among commentators and analysts to use budget deficit/GDP ratio as a yardstick of fiscal convergence across the members of the EMU

and for those who are aspiring to join the single currency. However, the rationale behind such a fiscal rule is not without criticism. For example, Buiters et al. [1993] are critical of the arbitrary nature of such a criterion (rule) and question its ability to address asymmetric shocks hitting the member countries. Moreover, Bredenkamp and Deppler [1990] and De Grauwe [1992] argue that there is no need for fiscal convergence among the member states in a monetary union. Arestis, McCauley, and Sawyer [2001] are also critical of the Stability and Growth Pact in that among other theoretical weaknesses it is unnecessarily deflationary, and argue for different fiscal arrangements so that fiscal policy could be given a prominent role at the pan-EMU level (not merely at the national level as currently envisaged).

The purpose of this paper is to examine the level and trend of EMU fiscal deficits and provide a perspective on the level and dispersion of the deficit ratio within a monetary union by drawing from the experience of the United States. Our choice of the United States as a benchmark of a successful fiscal union needs some justification. We treat the United States as a successful fiscal union in the sense of being able to cope with adverse economic shocks. We do not pretend to suggest that the United States is a successful story in establishing a sustainable long-term path for public debt. It is well known that during the 1980s and early 1990s doubts were raised on the sustainability of U.S. fiscal policy stance [Quintos, 1995; Arestis, Cipollini, and Fattouh, 2001]. However, it is also equally true that such concerns are hardly evident now, especially in the aftermath of the Clinton era of budget surpluses. Nevertheless, the United States, as a successful monetary and fiscal union in the world, provides a framework for comparison.

We focus on two main issues. The first is whether, following the treaty of Maastricht, deficit convergence has occurred in the EMU countries. Despite theoretical debate surrounding it, this is important because at the political level deficit convergence is regarded as one of the essential criteria for joining the single currency. We define deficit convergence in two simple ways: (1) a gradual periodic reduction in the level of deficit ratio towards the set Maastricht target of 3 percent of GDP, and (2) an EMU wide reduction in the dispersion of deficit/GDP ratio assuming that convergence implies less dispersion. Thus, according to our definition, deficit convergence implies that countries with a high deficit ratio (say 6 percent or above of GDP) in the seventies and/or early eighties should show evidence of significant reductions in the levels of their deficit by late eighties and throughout the nineties. We do not suggest that convergence implies achievement of the Maastricht target; instead we expect significant (statistical) evidence of gradually moving toward it. We also hypothesize that an increased level of convergence implies a reduced level of dispersion.

Second, we compare and contrast the level and dispersion of euro area fiscal deficit/GDP ratio with those of the U.S. federal deficit. The United States is an existing monetary and fiscal union that has operated successfully for over two centuries. However, since most of the U.S. states by law cannot incur budget deficit, much of the stabilization role in the face of economic shocks falls on the federal expenditure.³ Hence, a comparison between euro area's aggregate deficit with that of the federal United States would provide insights on the likely magnitude and variability of deficit ratio in a monetary union.

THE DATA

Our data set consists of annual observations on government budget deficit and GDP, both measured in nominal terms. Budget deficit is calculated as government expenditure minus government revenue. We use two measures of fiscal deficit for the EMU countries. The first measure is the total deficit inclusive of net-interest payments and taken from the International Monetary Fund (IMF) publication *International Financial Statistics* (IFS), line 80 from 1970 to 1992 and then line 80G from 1993 to 1999. Line 80G is consistent with the Maastricht definition of fiscal deficit and is available only from 1993. The second measure we use is *primary* deficit, which excludes net-interest payments. Data on *primary* deficit are collected from International Financial Statistics and Government Financial Statistics CD-ROM (International Monetary Fund).⁴ Data on the U.S. federal deficit and GDP are also extracted from IMF CD-ROM.

We analyze data for the 11 euro area countries—Austria, Belgium, Finland, France, Germany, Ireland, Italy, Luxembourg, the Netherlands, Portugal, and Spain.⁵ The sample period is 1970-1999 for both the EMU countries and the U.S. federal government. At the time of writing no consistent data after 1999 were available for the EMU. We distinguish three sub-samples for the EMU countries in our analysis: the pre-ERM period (1970-1978), the ERM period (1979-1992), and pre-EMU period (1993-1999). Thus, the total sample of 30 years is divided into 9 years of pre-ERM; 14 years of ERM; and 7 years of pre-EMU. Von Hagan and Neumann [1994] define 1979-82, 1983-86 and 1987-89 as the early, intermediate and the late EMS periods. We treat the whole period after 1979 and up to and including 1992 as the ERM period. The Maastricht treaty was signed in 1992. There are good reasons for doing this. First, von Hagan and Neumann analyze the real exchange rate variability between German Landers and EU countries, and their sub-periods are sensible in that the European Snake was established as early as 1972.⁶ In contrast, there was no clear-cut policy agreement regarding the magnitude of fiscal deficits until the promulgation of Maastricht criteria. Second, Hagan and Neumann analyze monthly and quarterly data whereas we only have annual data. Thus the low frequency of data limits the scope of further segregation of sample period.

EMPIRICAL ANALYSIS

The mean and standard deviation of deficit ratios (inclusive of net-interest payments) of 11 EMU countries are reported in Table 1. Four EMU members (Finland, Germany, Luxembourg and the Netherlands) have on average always maintained a deficit ratio of less than 3 percent of their respective GDPs; hence the issue of deficit convergence does not apply to these countries. The remaining seven countries show different deficit ratio magnitudes across different periods. Hence, our analysis of convergence is primarily applicable to this group of countries.

Results in Table 1 show that during the pre-ERM period (1970-78), on average, Finland and Luxembourg were running budget surpluses, and the rest were in deficit. Ireland had the highest deficit ratio (9.1 percent) and Germany had the lowest (0.5 percent). In fact only four countries (Belgium, Ireland, Italy and Portugal) had

budget deficits above 3 percent of GDP. Portugal shows the highest dispersion measured by the standard deviation of deficit ratio and the Netherlands the lowest. The highest mean deficit ratio coupled with a relatively high standard deviation suggests that Ireland, during this period, consistently ran high and volatile deficit levels. On the other hand, Finland and Luxembourg, which were in surplus, exhibit a low standard deviation suggesting that they were consistently running either a budget surplus or more or less a balanced budget.

Turning our attention to the ERM period, only Luxembourg maintained a budget surplus on average; the rest were in deficit. A closer look at Table 1 also shows that with the exception of Ireland and Luxembourg, all EMU countries experienced increases (reductions) in their mean levels of fiscal deficit (surplus) during this period compared to the pre-ERM period. Italy, with 11.60 percent of her GDP, had the highest level of deficit during this period.

To assess whether the ERM (1979-1992) period had any effect toward reducing the deficit ratio of EMU member countries, we computed two tests. The first tests the null hypothesis that the mean deficit ratio of the 1979-1992 period is equal or less than that of the 1970-1978 period against the alternative that the mean deficit ratio in the 1979-1992 period is bigger. Formally these hypotheses can be postulated as: $H_0: \mu_2 \leq \mu_1$ and $H_1: \mu_2 > \mu_1$; where μ_1 and μ_2 represent population means of deficit during the 1970-1978 and 1979-1992 sub-samples, respectively. The one-sided null hypothesis reflects our *a priori* expectation of a lower mean level of deficit during the ERM period compared to that of the pre-ERM. The test statistic is calculated as follows:

$$(1) \quad t = [(\bar{x}_2 - \bar{x}_1) / \hat{\sigma}] [(n_1 n_2) / (n_1 + n_2)]^{0.5}$$

where

$$(2) \quad \hat{\sigma} = \left[(n_1 s_1^2 + n_2 s_2^2) / (n_1 + n_2 - 2) \right]^{0.5}$$

and n_1 and n_2 are two sub-samples, s_1 and s_2 are their standard deviations respectively, and $\hat{\sigma}$ is the common standard error. The test statistic is t -distributed with $(n_1 + n_2 - 2)$ degrees of freedom. Since the alternative is one-sided, the rejection region lies on the right tail of the distribution. A significantly large and positive value of empirical t -ratio would reject the null hypothesis in favor of the alternative, implying that the mean deficit ratio has increased during the ERM period compared to the pre-ERM. On the other hand, a significantly negative t -ratio would imply that the deficit ratio has declined during the ERM period.

Empirical t -ratios are reported in Panel A of Table 1. The results show that nine countries (Austria, Belgium, Finland, France, Germany, Italy, the Netherlands, Portugal, and Spain) reject the null hypothesis in favor of the alternative. This implies that during the ERM (1979-1992) period, these nine countries had deficit levels that were significantly higher than their pre-EMU (1970-1978) levels. Of these, five countries had a rise in deficit ratios that are significant at 1 percent, two countries each at

TABLE 1
Period Average (Total) Fiscal Deficit Ratio: Euro-11

Period	Austria	Belgium	Finland	France	Germany	Ireland	Italy	Luxembourg	the Netherlands	Portugal	Spain
1970-78											
Mean	0.0224	0.0417	-0.0010	0.0050	0.0081	0.0908	0.0877	-0.0066	0.0089	0.0526	0.0163
Std. Dev.	0.0185	0.0177	0.0167	0.0111	0.0188	0.0315	0.0276	0.0253	0.0038	0.0440	0.0072
1979-92											
Mean	0.0446	0.0882	0.0235	0.0229	0.0165	0.0870	0.1160	-0.0155	0.0157	0.0855	0.0435
Std. Dev.	0.0089	0.0266	0.0402	0.0106	0.0062	0.0558	0.0159	0.0459	0.0086	0.0346	0.0265
1993-99											
Mean	0.0350	0.0337	0.0287	0.0403	0.0254	0.0027	0.0584	-0.0260	0.0219	0.0404	0.0461
Std. Dev.	0.0137	0.0225	0.0388	0.0157	0.0084	0.0191	0.0328	0.0070	0.0146	0.0187	0.0235
						Panel A:					
t-ratio	3.684 ^a	4.419 ^a	1.653 ^c	3.716 ^a	1.463 ^c	-0.176	2.983 ^a	-0.507	2.156 ^b	1.908 ^b	2.886 ^a
F-statistics	4.336 ^b	0.442	0.173	1.0949	9.1811 ^a	0.319	3.019 ^c	0.305	0.201	1.613	0.074
						Panel B:					
t-ratio	-1.839 ^b	-4.424 ^a	0.269	2.851 ^a	2.620	-3.692 ^a	-5.159 ^a	-0.574	1.158	-3.060 ^a	0.210
F-statistics	0.423	1.396	1.106	0.453	0.5405	8.520 ^a	0.2345	43.579 ^a	0.3429	3.440 ^c	1.2627

In panel A, t -ratios test the hypotheses: $H_0: \mu_2 \leq \mu_1$ and $H_1: \mu_2 > \mu_1$, where μ_1 and μ_2 represent population means of deficit during 1970-1978 and 1979-1992 periods; the F statistics test the null of equality of variances (i.e. $H_0: \sigma_1^2 = \sigma_2^2$) against the alternative: $H_1: \sigma_1^2 > \sigma_2^2$ for the same periods. Panel B reports tests between 1979-1992 and 1993-1999 sub-samples. The critical t -values are 2.83, 1.721 and 1.323 for the 1 percent, 5 percent and 10 percent levels. For Panel A the critical F statistics are 4.30, 2.70 and 2.20, at the 1 percent, 5 percent and 10 percent levels; for Panel B the respective critical values are: 2.90, 4.00 and 7.72. Superscripts a, b and c denote significance at the 1 percent, 5 percent and 10 percent levels, respectively.

5 percent and 10 percent. Ireland and Luxembourg also recorded changes but are statistically insignificant.

To evaluate the dispersion of deficit ratios we have calculated the standard F statistics that tests the equality of variance across two sub-samples. The null hypothesis is the equality of variances ($H_0: \sigma_1^2 = \sigma_2^2$) against the alternative that the variance in the first period is higher ($H_1: \sigma_1^2 > \sigma_2^2$). Again our *a priori* expectation is that during the ERM period the dispersion of fiscal deficit may have been reduced. The test statistic is:

$$(3) \quad V = \left(\frac{\sigma_1^2}{\sigma_2^2} \right) / \left(\frac{\sigma_2^2}{\sigma_1^2} \right) \approx F_{1-\alpha}(n_1 - 1, n_2 - 1)$$

The test statistic, V , is $F_{1-\alpha}(n_1 - 1, n_2 - 1)$ distributed. Empirical F-statistics are reported in panel A of Table 1. Results show that dispersion in Austria and Germany has gone down significantly at 5 percent or better; Italy shows a significant reduction in dispersion at 10 percent only. For the remaining countries there is no evidence of significant changes in the dispersion of deficit ratio either way.

Thus, deficit ratios of most EMU countries, on average, went up whereas their dispersion remained unchanged during the ERM period. This finding goes against the view that a fixed exchange-rate arrangement may engender fiscal discipline and disinflationary policies [De Grauwe, 1992; Giavazzi and Pagano, 1988; Weber, 1991]. It is also interesting to note that during the ERM period six EU countries, on average, had a level of budget deficit, which was well above 3 percent of their GDPs. The increase in European budget deficits evident in Graphs 1 and 2 for the period 1974-1982 may afford another interpretation. This is that the two oil shocks may have resulted in what has been termed the displacement hypothesis [Peacock and Wiseman, 1979]. According to this hypothesis, emergency situations like the two oil shocks create conditions that temporarily displace the level and the growth pattern of public expenditure by changing the public conceptions regarding the proper size of government spending. The implied increase in public expenditure is then followed by tax increases, originally justified by the presence of the emergency situation. By the time the emergency is over, the public has developed a higher degree of tolerance regarding tax levels. Therefore, tax increases acquire a permanent character, which gives rise to a permanent higher level of public expenditure. This may very well be another explanation for the failure of budget deficits to converge to their pre-oil shock mean value during the 1980s.

What is the scenario during the pre-EMU? This is interesting because following the Maastricht treaty prospective EMU countries now have a clearly defined deficit convergence criterion to meet. Table 1 shows that six EMU countries (Austria, Belgium, France, Italy, Portugal and Spain) had deficit ratios well in excess of 3 percent of GDP on average over the period 1993-1999. During this period the highest deficit ratio is recorded for Italy (5.8 percent). On the basis of the t -test we can group the countries into three categories: (1) converging, (2) diverging, and (3) maintaining *status quo* (showing no change). Five countries (Austria, Belgium, Ireland, Italy and Portugal) can be classified as converging in that their mean deficit ratios fell significantly during 1993-1999 compared to the 1979-1992 period. In this group, only Ire-

land managed to reduce her deficit ratio below 3 percent of GDP. France falls in the second category in that she shows significant rise in her deficit ratio. Although Denmark also shows a significant rise in her deficit ratio, she maintains, nonetheless, a deficit ratio below 3 percent. The remaining four countries (Finland, Luxembourg, the Netherlands and Spain) show no significant changes in their deficit ratios and hence fall in the third category. In this group only Spain has a deficit ratio in excess of 3 percent of GDP.

The overall picture is as follows: (1) five countries (Finland, Germany, Ireland, Luxembourg, the Netherlands) show, on average, a deficit ratio of less than 3 percent; (2) of the six countries that have a deficit ratio in excess of 3 percent, Austria, Belgium, Italy and Portugal show significant convergence; (3) France shows divergence at the mean level of deficit, and (4) Spain shows no change, i.e. no convergence. Although, on average, more than 50 percent of EMU countries had a deficit ratio in excess of 3 percent, nevertheless there is evidence of deficit convergence across most of the EMU countries. Only two countries (France and Spain) show non-convergence.

Tests of equality of variances show a significant fall in the dispersion of Ireland, Luxembourg and Portugal; a significant rise for Italy; and no significant difference for the remaining seven countries. Thus only a limited number of countries (three) show a decline in the dispersion of fiscal deficit ratio.

Table 2 contains results on *primary* deficits. Unless net interest payment is a credit item in the government account, we expect the level of *primary* deficit to be lower than the level of total deficit. This fact is backed up by the mean level of deficits reported in Table 2 for the pre-ERM and ERM periods; the only exception is the Netherlands in the 1979-92 period. Interestingly, however, during the pre-EMU period this scenario changes; the primary deficit exceeds the total deficit for all EMU countries except Spain. This change indicates that the accounting practices must have changed during this period. The *t*-tests show qualitatively similar results to those found in Table 1 between the pre-ERM and ERM periods; nine EMU countries record significant rise in their mean deficit ratios. However, for the period of 1993-99 primary deficits show few cases of deficit convergence. In contrast to Table 1 Italy and Portugal show no convergence and there has been a significant rise in the deficit of Finland. Thus, the evidence of convergence is weakened when *primary* deficit is used instead.

Tests of hypotheses about mean deficit ratios and their dispersion across subsamples provide an overall picture and attach some probabilistic measure of confidence in their direction of change. However, if members of the EMU achieve the 3 percent target just before the launch of the euro, then that may be diluted and may not be apparent in a period average analysis as above. To allow for this possibility we plot the deficit ratios against time in Figure 1 and examine their movements. A visual approach such as this could be quite insightful.

Plots of deficit ratios reveal that Germany and the Netherlands always had a deficit ratio of less than 3 percent of GDP except on two occasions: in 1975 and 1995-96. These marginal rises in deficit levels quickly reverted to below 3 percent. Finland also maintained a deficit ratio of less than 3 percent during 1970-90; however her deficit ratio started to rise in 1991 and shot up as high as 14 percent in 1993; thereafter it gradually reverted to below 3 percent by 1995. Likewise, except for the blip of

1990-92, Luxembourg also consistently maintained a low deficit ratio. Another country with a low deficit ratio is France, which has maintained a deficit ratio of less than or very close to 3 percent of GDP except in the mid-nineties. Plots of the deficits for Belgium, Ireland, Italy, Portugal, and Spain show prolonged periods of high deficit as well as high volatility. Two points emerge from these plots: (1) the deficits of all EMU countries, which were high throughout the 1970s and 1980s gradually declined in the 1990s⁷ and (2) all EMU countries appear to have achieved the Maastricht criteria by 1997. Using period average data, we statistically demonstrated above that although deficits were converging in most EMU countries, the 3 percent criteria had not been achieved. However, plots show that all EMU countries had achieved the 3 percent deficit criteria before the launch of the euro, a pattern that is evident in the plots of primary deficits as well in Figure 2.⁸

To examine if EMU countries were experiencing convergence in their fiscal stance we compute intra-EMU deficit variability. This measure is computed as follows. Let ω_i ($i=1, \dots, k$) be the difference between the i^{th} EMU country and its j^{th} fellow member ($j=1, \dots, k-1$), where k is the total number of member states. The following mean standard deviations of ω_i , ψ_i , measures the intra-EMU deficit dispersion:

$$(4) \quad \psi_i = \left[\frac{k-1}{\sum_{j=1}^{k-1} \text{var} \omega_{ij,t}} \right]^{1/2} / (N-1)$$

where N is the sample size. Thus, ψ_i is a measure of EMU-wide dispersion for the i^{th} EMU country. We expect this measure of intra-EMU variability to decline over time if deficits are converging across EMU countries. The results are reported in Table 3 and show that the intra-EMU dispersion of fiscal deficit has remained fairly stable during the last 28 years. This indicates that there is very little or no convergence in deficit variability across the constituent members of Euro-11 following the ERM and the Maastricht Treaty.

Most U.S. states are committed to running a balanced budget at the state level. Hence, federal expenditures act as stabilizers when these states face adverse economic shocks. Thus, the magnitude and the variability of the U.S. federal deficit can be used as a yardstick to judge whether the level and variability of the Euro-11 deficit was far apart from that of a monetary union (the United States). To accomplish this we calculate a GDP-weighted fiscal deficit ratio for the Euro-11 countries (in U.S. dollar terms)⁹ and compare and contrast it with the U.S. federal deficit. Results, reported in Table 4 (panel A), show very similar magnitudes of the levels and the variability of deficit ratios across the Euro-11 and United States during the 1970-1992 period. However, during the 1993-1998 period the magnitude of the Euro-11 deficit is higher compared to the U.S. federal deficit. The latter can be attributed to the substantial reduction in the U.S. federal budget deficit towards the latter part of the 1990s. Thus, the overall level and variability of deficit ratios across the Euro-11 and United States suggest that they have remained remarkably similar during the last three decades or so.

FIGURE 1
Deficit Ratios

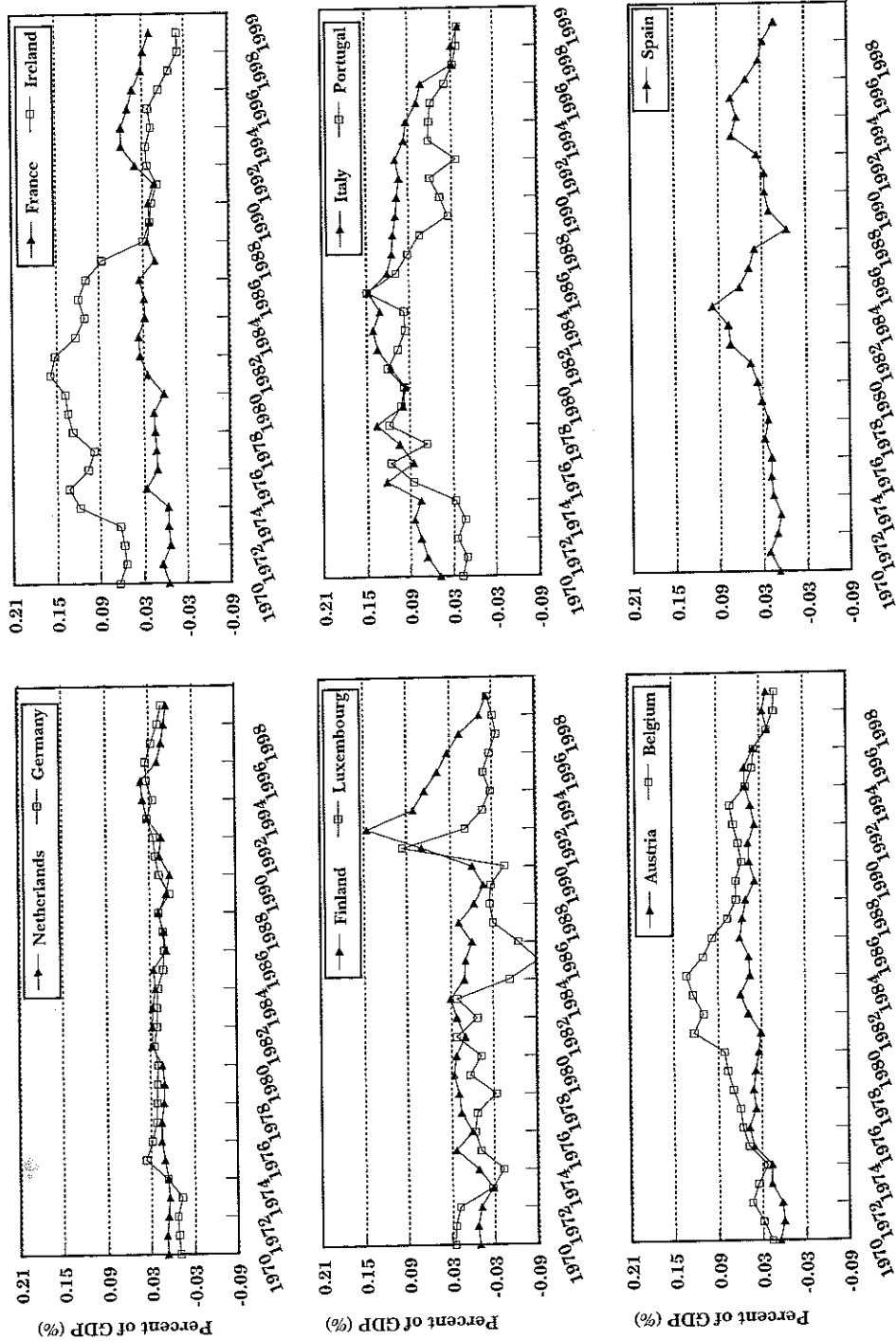


FIGURE 2
Primary Deficit Ratios

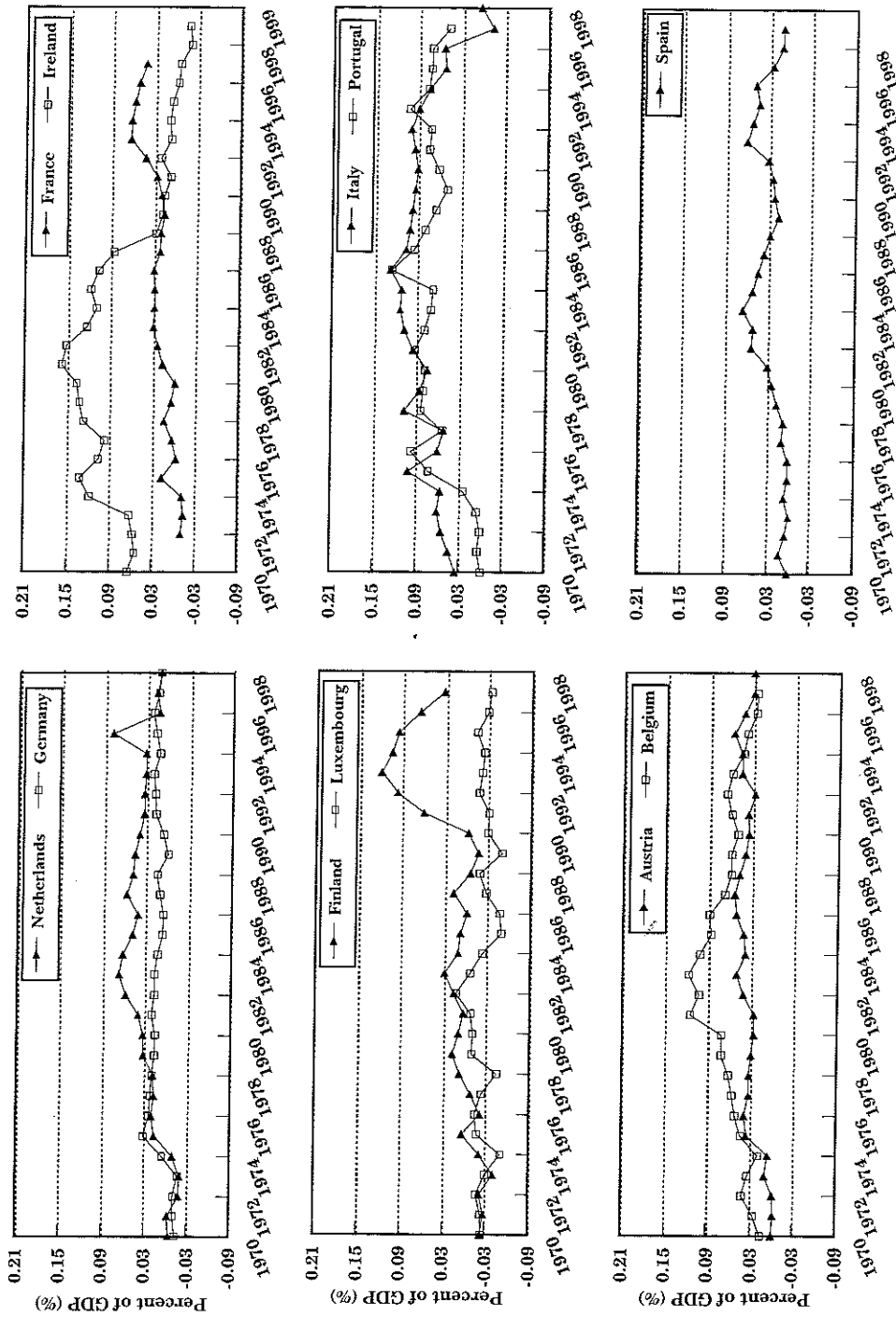


TABLE 2
Period Average Primary Deficit Ratio: Euro-11

Period	Austria	Belgium	Finland	France	Germany	Ireland	Italy	Luxembourg	Netherlands	Portugal	Spain
1970-78											
Mean	0.0171	0.0390	-0.018	-0.0008	0.0055	0.0908	0.0632	-0.0278	0.0018	0.0375	0.0045
Std. Dev.	0.0177	0.0161	0.0152	0.0126	0.0191	0.0315	0.0245	0.0122	0.0165	0.0396	0.0048
1979-92											
Mean	0.0395	0.0796	0.0168	0.0222	0.0133	0.0870	0.1001	-0.0226	0.0458	0.0785	0.0361
Std. Dev.	0.0094	0.0219	0.0294	0.0112	0.0061	0.0558	0.0130	0.0182	0.0117	0.0180	0.0153
1993-99											
Mean	0.0420	0.0389	0.0835	0.0561	0.0168	-0.0031	0.0440	-0.0244	0.0308	0.0746	0.0375
Std. Dev.	0.0106	0.0136	0.0347	0.0089	0.0042	0.0117	0.0403	0.0074	0.0249	0.0197	0.0203
Panel A:											
t-ratio	3.758 ^a	4.569 ^a	3.090 ^a	4.372 ^a	1.352 ^c	-0.176	4.502 ^a	0.716	7.159 ^a	3.212 ^a	5.743 ^a
F-statistics	3.557 ^b	0.540	0.268	1.246	9.826 ^a	0.450	3.554 ^b	0.450	1.992	4.865 ^a	0.101
Panel B:											
t-ratio	0.535	-4.268 ^a	4.381 ^a	6.619 ^a	1.295	-4.018 ^a	-4.518 ^a	0.230	-1.792 ^b	-0.431	0.159
F-statistics	0.788	2.608	0.721	1.587	2.087	22.704 ^a	0.104	6.075 ^b	0.219	0.835	0.569

Data Sample: Ireland and Spain (1970-99); Austria, Germany, Italy, the Netherlands (1970-98); Belgium, Finland, France, Luxembourg and Portugal (1970-97). Superscripts a, b and c denote significance at 1 percent, 5 percent and 10 percent. For critical values see table 1.

TABLE 3
Intra-Euro Variability of Primary Fiscal Deficit Ratios (Standard Deviations)

Period	Austria	Belgium	Finland	France	Germany	Ireland	Italy	Luxembourg	Netherlands	Portugal	Spain	Mean
1970-78	0.0089	0.0093	0.0092	0.0076	0.0091	0.0076	0.0088	0.0071	0.0089	0.0080	0.008	0.0084
1979-92	0.0076	0.0071	0.0077	0.0073	0.0073	0.0063	0.0090	0.0077	0.0077	0.0072	0.008	0.0075
1993-97	0.0068	0.0068	0.0044	0.0072	0.0061	0.0062	0.0067	0.0062	0.0066	0.0064	0.007	0.0064

Data Sample: All(1970-97).

TABLE 4
Comparison of Euro-11 and U.S. Federal Deficit Ratios and shocks

	Panel A: Deficit Ratios			Panel B: Fiscal Shocks	
	1970-78	79-92	93-98	79-92	93-98
EU					
μ	0.024	0.045	0.040	0.004	0.005
σ	0.015	0.010	0.014	0.003	0.004
U.S.					
μ	0.021	0.038	0.015	0.007	0.007
σ	0.013	0.013	0.015	0.006	0.006

So far we have analyzed the mean and the dispersion of fiscal deficit ratios from various angles. Now, we estimate the magnitude and dispersion of deficit shocks. Following von Hagan and Neumann [1994], an auto-regressive process for each deficit ratio is estimated. The resulting non-autocorrelated residuals are used to compute the magnitude of fiscal shocks. In particular, the absolute mean of the residuals is interpreted as the magnitude of the fiscal shock and the standard deviation of the residuals as the standard deviation of the fiscal shock. A second-order lag was sufficient to obtain non-autocorrelated residuals. The results in panel B of Table 4 show that the magnitudes of fiscal shock (measured by absolute mean of residuals) for the Euro-11 are, on average, smaller than that of the United States during both intervening periods: 1979-92 and 1993-1999. Likewise, the standard deviation of fiscal shocks is also smaller. Thus, the magnitudes of the fiscal shocks and their dispersion are both smaller in the Euro-11 than in to the United States.

SUMMARY AND CONCLUSIONS

We have examined whether deficit convergence has occurred across the EMU members in the light of the Maastricht criteria. The Maastricht Treaty stipulates that Euro-member budget deficits cannot exceed 3 percent of their GDP. Since the United States is a monetary and fiscal union that has successfully operated for over two centuries, we also analyze the U.S. federal deficit and compare its magnitude and dispersion with that of the Euro-11. Finally, we also compute and compare the magnitude and dispersion of fiscal shocks.

Our findings may now be summarized. First, we find that during the first 14 years of ERM (1979-1992), most of its member countries showed significant increases in their levels of fiscal deficit. Neither is there evidence of significant reductions in the dispersion of deficits. These findings go against the theoretical models, which predict that a fixed-exchange-rate arrangement promotes fiscal discipline and disinflationary policies [Glick and Hutchison, 1993; Giavazzi and Pagano, 1988; Weber, 1991].

Second, during 1993-1999, we find evidence of deficit convergence, which we define as statistical evidence in favor of reduction in the mean deficit level. Most Euro-11 countries show significant reductions in their deficit levels during this period. It would appear that all euro-area countries achieved the 3 percent deficit target by

1998. Ireland's deficit had been less than 3 percent since 1988; Luxembourg and Germany almost always had a low deficit ratio, the Netherlands had achieved the target by 1996; Austria, Belgium, Finland, France Italy, Portugal and Spain had done so by 1997. Thus it appears that although fiscal convergence was occurring in the Euro-11 countries particularly after 1993, the major adjustment (reduction) in deficits occurred during 1997-98. Much of this can be attributed to the strong political will of the Euro-11 countries for a single currency. While a strong political will was extremely conducive to achieving the criteria, a skeptic would nevertheless raise doubts about the long-run sustainability of deficit convergence.

Indeed, commentators point to various devices that took place to meet the criteria. For example, Belgium sold some gold reserves; France included a one-off transfer of France Telecom pension fund to public-sector accounts; Germany reclassified hospital debt, which took billions of marks of debt out of the public sector (and, also, revalued gold reserves); Italy levied a repayable euro-tax; and Spain privatized a series of state-owned companies. All of this creative accounting enabled countries to achieve the all-important budget deficit criterion, and keep it below the 3 percent benchmark. (For these and other relevant accounting practices, see Arestis, Brown, and Sawyer [2001] and Dafflon and Rossi [1999].) In our analysis too we find fewer cases of convergence when the primary deficit is used, which appears to be consistent with the above skepticism.

The comparison of the EMU with United States is revealing. We find that the magnitude and the variability of the Euro-11 deficit were very similar to those of the U.S. federal equivalents during 1970-1992. However, during 1993-98 the U.S. federal deficit level was reduced due to the well-known buoyant U.S. growth. Thus, despite the much argued heterogeneity among Euro-11 countries compared to the U.S. states we do not find that the euro area had any higher level of budget deficit compared to the United States. In other words even when European countries were not part of a monetary union, their collective deficit was not larger than that of the United States. This would support the argument put forward by a number of writers, Bredekamp and Deppler [1990] and De Grauwe [1992], that fiscal convergence among the member states in a monetary union is unnecessary. Moreover, we find that the magnitude and variability of fiscal shocks in Euro-11 to be lower than that of the U.S. federal deficit. This suggests that EMU monetary authorities may very well do without any arbitrary criteria for fiscal convergence.

NOTES

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1. Agell et al. [1996] however, argue that in most OECD countries seigniorage makes up only a small fraction of total government revenue.
2. Agreement on the main components of the Stability and Growth Pact was reached at the European Council Summit in Dublin in December 1996, and it was formally adopted at the Amsterdam Summit in July 1997.

3. However, the state level budget is left to the individual states and it is not unusual to find states running deficits. We are grateful to the editor of this journal for bringing this to our attention.
4. Data series are: line 81 (Government Revenue), line 82 (Government Expenditure), line 99b (Gross Domestic Product).
5. Greece joined the EMU only recently, 1 January 2001.
6. The exchange rate arrangement that existed among European countries, prior to the launch of euro, is known as the "European Snake". For further details see von Hagen and Neumann [1994].
7. The exception is Finland whose deficit level jumps in the early 1990s and then settles gradually.
8. It has been argued that a great deal of "fudge" has taken place in achieving these targets (see the section Summary and Conclusions below).
9. In order to calculate the deficit ratio in U.S. dollars both the deficit and GDP were converted to U.S. dollars by using bilateral exchange rates.

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