

Fiscal convergence and discipline in monetary unions: Are pilgrims to EMU better disciplined than EU15?

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Abstract

We examine the progress of the recent ten European Union (EU) members with respect to satisfying the official Maastricht fiscal criteria, and their degree of fiscal discipline against the performance of EU15. Our study includes alternative measures of fiscal convergence and employs vastly flexible tests of convergence, allowing for structural breaks. The findings indicate poor progress on convergence in general, and more importantly, we find that the new members are relatively more disciplined than the core and periphery EU members. The results suggest that monetary unions may not provide strong fiscal discipline. We conclude with some suggestions for the pilgrims to improve their fiscal discipline to satisfy the Maastricht criteria.

Keywords: convergence, European Union, integration, fiscal discipline, ERM 2, Eurozone.
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1. Introduction

This paper analyzes the fiscal convergence of the pilgrims to the European Union (EU) with respect to the official Maastricht criteria as well as comparable performance in the Eurozone by using alternative measures of fiscal convergence and employing vastly flexible tests of convergence, allowing for structural breaks. Since the underlying idea in fiscal rules of the EU is debt sustainability, our paper is related to recent studies on debt sustainability of developed and developing countries (e.g., Uctum, Thurston and Uctum, 2006; Uctum and Wickens, 2000; Prohl and Schneider, 2006). However, we are more interested in the question of how the EU countries are developing in terms of heterogeneity (rather than sustainability) of their fiscal performance on their path to a monetary union. Our results suggest poor progress of fiscal convergence in general. More importantly, we find that the new members are relatively more disciplined than the core and periphery EU members. Since the outcome of the estimations imply that monetary unions need not provide strong fiscal discipline, we also offer ideas for the EU newcomers on improving their fiscal discipline in order to meet the Maastricht criteria.

Our study is important for several reasons. First, fiscal convergence in EU has been receiving increasing attention since the formulation of the convergence criteria under the Maastricht treaty.¹ The two fiscal criteria limiting the deficit and debt ratios within a percentage of GDP have come under sharp scrutiny.² These conditions were set to allow qualifying countries to form the Economic and Monetary Union (EMU) in 1999. After this formation, empirical literature has turned to analyzing the new EU fiscal framework under the Stability and Growth Pact and its reforms.³ Our study provides a different perspective on the issue of fiscal discipline via an explicit comparison of the fiscal convergence during accession, membership and the Stability Growth Pact.

¹ See, for example, Glick and Hutchison (1993), Hutchison and Kletzer (1995), and Watson (1997).

² Influential studies include, among others, Buiter, Corsetti and Roubini (1993), Aglietta and Uctum (1995), Corsetti and Roubini (1995), and Holzman, Herve and Demel (1996)

³ Buti and Giudice (2002), Orban and Szapary (2004), Tanzi (2004), Eichengreen (2005), Eijffinger (2005), Feldstein (2005), and Schuknecht (2005).

Second, in May 2004, ten new members (pilgrims) joined the EU.⁴ All of these countries must join the Eurozone once they satisfy the Maastricht criteria. Although EU accession leaves new members some freedom to select how to link their national currencies to the euro, policymakers in the new member countries appear to be inclined to adopt the Euro sooner rather than later (McKinnon 1999, Buiters and Grafe 2002, and Buiters 2004). The sooner the new EU countries complete their restructuring process and become more like the core EU members in terms of a broad range of macroeconomic indicators, the more likely and faster they are to unilaterally adopt the Euro (e.g., Salvatore 2004). Understandably, several observers have raised concerns about the fiscal performance of some new members.⁵ Many of the new EU members have therefore been put under the Excessive Deficit Program (EDP) since their entry in 2004. In this respect, our study offers a way to evaluate the effectiveness of the EDP.

Third, although the analysis of the fiscal convergence of the 10 new members is understudied in comparison to the core EU15, a comparison of the fiscal performance of the new 10 members against the core EU15 is also missing in the literature.

Fourth, empirical evidence indicates a direct relationship between fiscal discipline and macroeconomic performance. In their study of discretionary fiscal policy for 91 countries, Fatás and Mihov (2003) conclude that “governments that use fiscal policy aggressively induce significant macroeconomic instability” in the form of output volatility.⁶ There is also ample evidence that fiscal convergence is systematically associated with enhanced business cycle synchronization as it eliminates idiosyncratic fiscal shocks. And finally, there is proof of reduced primary fiscal deficits (or higher surpluses) increasing the coherence of business cycles across countries (Darvas, Rose,

⁴ Eight of them were Central and Eastern European countries (hereafter the CEE8), namely the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, the Slovak Republic, and Slovenia. The other new members were Cyprus and Malta.

⁵ Berger, Kopits and Szekély (2004) point out that deteriorating fiscal performance, especially in Central European countries, may create inflationary pressures, constraining their ability to satisfy the Maastricht criteria successfully. Further arguments in the same spirit are voiced by de Grauwe and Schnabl (2004). Buiters and Sibert (2006) state that “it is frequently believed that a country’s actual or threatened insolvency might jeopardize the entire Eurozone financial system or destabilize common currency by forcing the European Central Bank into a bail out” (p.8).

⁶ In a similar spirit, Fatás and Mihov (2004) state that “fiscal policy is a significant source of business cycle volatility among the U.S. states, and, as a result, constraints on politicians lead to less volatile economic fluctuations.”

and Szapáry 2005). Since both the Maastricht convergence criteria and the Stability and Growth Act require both fiscal convergence and reduced deficits before entry to EMU, they indirectly move EU closer to an optimum currency area in the sense of Mundell (1961). Thus, an increase in business cycle coherence due to fiscal convergence makes countries within the region better candidates for a currency union (Darvas et al. 2005). As Buitier (2004) argues, achieving fiscal sustainability is not only a necessary but also a sufficient condition for the new EU members to achieve full EMU membership.

Fifth, our empirical results have broader policy implications regarding the benefits and costs of joining a monetary union, and relate the literature on the link between fiscal discipline and the choice of an exchange rate regime.⁷ In a similar spirit, our paper investigates whether monetary unions like EMU provide fiscal discipline for both the new and core members. Some observers have argued that the two key features of EU, centralized monetary policy and decentralized fiscal policy, may encourage member countries to pay closer attention to inflation and hence to monetary convergence than fiscal convergence (Feldstein, 2005).⁸ It is shown in theory that efforts of building a fiscal framework to limit the fiscal autonomy of the Union's member states, such as the Stability and Growth Pact, may be fruitless under certain circumstances. For example, Restoy (1996), comparing market-based mechanisms for fiscal and financial discipline under a monetary union versus a fixed exchange rate regime, shows that, when member governments are heavily indebted, monetary unions are weaker than fixed exchange rate regimes.

The rest of the paper is organized as follows. In the next section, we briefly summarize the existing theoretical and empirical studies. In sections 3 and 4, we describe our methodology and data. Empirical results are reported in Section 5. The last section concludes.

⁷ See Giavazzi and Pagano (1988) and Tornell and Velasco (1995, 1998, and 2002) and the references cited within.

⁸ For evidence on monetary convergence within EMU, see Kočenda (2001), Kutan and Yigit (2004, 2005), and Brada et al. (2005). These studies report empirical evidence of considerable nominal and monetary convergence, supporting the theoretical argument above. It is also consistent with the finding in Uctum (1999) that individual member countries in the European monetary system conduct cooperative and symmetric monetary policy.

2. Related Theoretical and Empirical Studies

2.1 Theoretical Work

Theoretical studies on fiscal convergence are lacking and we believe that this is a promising research avenue. The only papers we are aware of that develops a theory on fiscal convergence are Skidmore et al. (2004) and Onorante (2004). Skidmore et al. (2004) develop a theory of government spending convergence based on Barro's (1990) dynamic model of endogenous growth with government spending. Their convergence model indicates that nations with lower levels of government spending experience rapid government growth while those with higher initial levels of government spending experience lower spending growth rates; hence government spending tends to converge over time. The empirical test of the convergence theory requires that the ratio of government spending to lagged GDP per capita is not systematically related to government spending per capita. Their cross-country evidence, including the OECD countries, suggests that per capita government spending is converging. However, their model is indirectly applicable to our case because the Maastricht criteria require convergence in fiscal deficit, not in budget spending. Nonetheless, their theoretical model provides insights for testing fiscal convergence empirically.

Based on a simple game theoretical framework where agents agree on the long-term goals, Onorante (2004) shows that fiscal constraints lead to implicit coordination characterized by lower deficits, low interest rates and controlled inflation. Further, fiscal activism is always increased by the entry into the monetary union in which the capacity of a central bank to keep inflation close to targets is much smaller than in the one-country case. Finally, a strategy of convergence in public finances prior to entry in a monetary union may be preferable both for acceding country and the stability of the existing monetary union. To sum up, the model provides an argument for the benefits of fiscal convergence with respect to integration and existence of a monetary union, helping us to extend the conclusions we can derive from our empirical findings

2.2 Empirical Studies

Like the theoretical analyses, there are scant studies on fiscal convergence in EU countries. Sanz and Velázquez (2003) test whether the convergence of the composition

of government expenditures is greater for EU member states than in the non-EU countries of the OECD. Using data from 1970 to 1997, they find that EU member states are converging towards a different steady state composition of government expenditures and their convergence is faster than the non-EU countries of the OECD. However, they report that the margin for future convergence seems to be limited because the functional distribution of government expenditures appears to be close to that in the steady state. Finding different steady states for each country suggests that each country has its own individual functional distribution of public expenditure in the long run, driven by preferences and historical and institutional factors of countries. This indicates that future fiscal convergence may be limited.

Arestis, Khan, and Luintel (2002) voice that the notion that a sustainable fiscal arrangement is a must for a viable monetary union. They analyze the deficit convergence in the Euro area and compare and contrast the Eurozone deficit with the US federal deficit. They find (i) evidence of fiscal convergence in most of the countries; (ii) achievement of 3% criteria by all Euro-countries immediately before the launch of the Euro; (iii) similar magnitudes and variability of deficit in EU and US, and (iv) smaller fiscal shocks for the Euro-area than the US.

2.3 Our Contribution

Given limited studies on fiscal convergence, in particular, for the new-EU states, and its importance for EU policymakers, we provide a comprehensive empirical study on fiscal convergence of the new EU members. We also compare the performance of the new 10 members against that of EU15. We relate the fiscal convergence progress to structure of public finances in these countries, its management and specific risks that policymakers must overcome in the process of joining the Eurozone. We also employ *beta*- and *sigma*-convergence tests, and allow for structural breaks. Towards this end, we use a test developed by Vogelsang (1998) which is particularly suitable for analyzing absolute convergence.⁹ In this approach we are confronted with the existing empirical evidence

⁹ Until recently, the cross-sectional tests used in analyzing absolute convergence were criticized for over-rejection of the null hypothesis of no convergence (Bernard and Durlauf, 1996), shifting the emphasis to conditional and stochastic convergence. However, the need to meet the EU criteria for full EMU membership has regenerated interest in absolute convergence.

on structural breaks in many economic indicators during the transition and pre-accession process in the CEE countries.¹⁰ Since such structural breaks in economic series may distort the findings we employ the modified version of the Vogelsang test that allows for structural breaks (see Methodology section for details). Since this method not only allows for structural breaks but is also flexible enough to allow researchers to derive convergence estimates reliably, we believe that it yields more reliable inferences about convergence than those found in earlier studies.

One of the ways to test for the fiscal convergence of the new members towards the EU is to compare their distance from convergence criteria as set in the Maastricht Treaty: (1) fiscal deficit up to 3% of GDP and (2) national debt up to 60% of GDP. In this respect we do not dispute or discuss arbitrary choice of the two ratio-values.¹¹ Instead, we complement the previous criteria with an alternative way of measuring the fiscal convergence in the EU newcomers with respect to the two synthetic benchmarks: (1) the EU core represented by Austria, Belgium, France, Germany and the Netherlands, and (2) the EU periphery represented by Greece, Portugal, and Spain. This alternative is in the spirit of the Stability and Growth Act since we test whether any of the new EU members have been performing like the old EU countries (EU15) by comparing their debt and deficit performance against those of the EU core and periphery. This tells us whether the new EU members are as fiscally disciplined as the EU15 countries.¹² Hence, our empirical results have important implications for the disciplining effects of market-based mechanisms in monetary unions as discussed in the theoretical literature (e.g., Restoy, 1996). It also extends the empirical literature on link between fiscal discipline and the choice of an exchange rate regime (Tornell and Velasco, 1995, 1998, and 2002).

¹⁰ See Dibooglu and Kutan (2001), Fidrmuc and Tichit (2004), and Kočenda (2005), among others. Further, it has to be recognized that the transition alone represented a massive structural shift by definition.

¹¹ Buitier and Grafe (2004) find the existing criteria to be seriously flawed and propose an alternative rule, the Permanent Balance Rule, based on a strong form of tax smoothing.

¹² Fiscal prudence is the key issue since governments are conducive to deficits even at the time of the Growth and Stability Pact. This behavior is in accord with classical arguments by Kydland and Prescott (1977) or Buchanan and Wagner (1977)

3. Methodology

The analysis of convergence has been an active as well as a challenging field of interest since the late 1980s.¹³ Numerous methods have been used to analyze different measures of convergence, namely absolute or conditional β -convergence, sigma convergence, and stochastic convergence. While the former two types analyzed the issue of catching up, the latter and more recent focused on the synchronization of shocks and cross-sectional units moving together in time. The enlargement of the EU has refocused interest in the issue of the “catching up” of the new entrants to the core EU members. Cross-sectional tests mostly used to analyze β -convergence were criticized on the grounds of over-rejecting the null hypothesis of no convergence (Quah 1996, Bernard and Durlauf 1996). These criticisms pushed researchers to apply time series (or panel data) methodologies to introduce a second dimension to β -convergence.

A new test introduced by Vogelsang (1998, 1999) deals with the β -convergence issue by relying on time-series methodology. Following this literature, we consider a simple model of convergence towards a benchmark as

$$y_t = \mu + \delta t + u_t \quad (1)$$

where y_t is the difference of the natural logarithm of a variable minus a benchmark, in our case for example, the budgeted deficit-to-GDP ratio of country i minus the Maastricht (or other) benchmark at time t would be the y_t variable, while μ is an intercept to capture the initial level of the deviation, t is a deterministic time trend, and u_t is the residual term. In such a set-up, β -convergence requires that for countries where μ is initially significantly negative, so the country is lagging behind, the trend coefficient δ should have the opposite sign (positive) and be statistically significant. Carlino and Mills (1993) developed this test with a very restricted form of serial correlation for the residual term, namely AR(2). Vogelsang (1998) extended the analysis of this specification to u_t with an unknown form of serial correlation by allowing a span of stationary and non-stationary serial correlation specifications for the error term ranging from integration of order zero, $I(0)$, to of order one, $I(1)$. Since the possibility of no

¹³ For recent discussions, see Taylor (1999) and de la Fuente (2002).

convergence implies nonstationarity of the error terms, one can draw a false inference on the trend coefficient when the errors are assumed to be stationary AR(2).¹⁴ Vogelsang's (1998) methodology, in the spirit of Equation 1, considers the following Partial Sums with J correction (PSW) test statistic that helps to alleviate the above problems.¹⁵ It is defined as:

$$PSW_T = T^{-1} (R\hat{\beta} - r)' \left[R(X'X)^{-1} R' \right]^{-1} (R\hat{\beta} - r) / \left(100T^{-1} s_z^2 \exp(bJ_T(m)) \right) \quad (2)$$

where X and β consist of $[1 \ t]$ and $[\mu \ \delta]$ respectively, s_z^2 is the standard deviation of the partial cumulated sum of y_t and J_T is the Park and Choi (1988) unit root test statistic obtained from the following regression

$$y_t = X_t \beta + \sum_{i=2}^m c_i t^i + u_t \quad (3)$$

$$J_T(m) = (RSS_y - RSS_J) / RSS_J$$

In other words, J_T is the Wald statistic that tests the joint hypothesis of $c_2 = c_3 = \dots = c_m = 0$. In Monte Carlo simulations, Vogelsang (1998) finds the values of b and m for which the above tests would be comparable and valid for every type of serial correlation form, including unit roots.

Despite the great flexibility of these tests in deriving the mean and trend coefficient estimates in time series with varying stationarity properties, one needs to be careful in using this methodology in the analysis of post-transition economies. The reason stems from the volatile nature of these economies and the presence of structural shifts that are documented in the empirical literature. The problem of structural breaks during the transition process is given serious empirical consideration in Fidrmuc and Tichit (2004) who provide evidence of significant breaks for macroeconomic data. They argue that empirical analyses of transition economies must account for the possibility of structural changes, otherwise inferences are misleading. However, only a few papers

¹⁴ When u_t is $I(1)$, the estimate of β obtained from the above regression is not related to the true trend, and information on β must be obtained from the estimate of the intercept in the autoregressive representation of y_t .

¹⁵ See Vogelsang (1998) for further test statistics and a deeper elaboration of the tests.

consider the structural breaks on transition issues (see, for example, Dibooglu and Kutun 2001, and Kočenda 2005).

We obtain robust results by using Vogelsang's (1999) methodology that, allows for structural breaks in the modification of the statistics by including the possibility of shifts in the trend function. The test has been designed in two versions: one with predetermined breaks and the other with endogenous break selection. We favor the latter one. First, we estimate the break date using the optimal tests of Andrews and Ploberger (1994). Then, using the estimated break date, normalized critical values are obtained using the following altered version of Equation (1)

$$y_t = \mu_1 DU_{1t} + \mu_2 DU_{2t} + \delta_1 DT_{1t} + \delta_2 DT_{2t} + u_t \quad (4)$$

where $DU_{1t} = 1$ if $t \leq T_b$ (the break date) and zero otherwise, $DU_{2t} = 1$ if $t > T_b$ and zero otherwise, $DT_{1t} = t$ if $t \leq T_b$ and zero otherwise, and finally $DT_{2t} = t - T_b$ if $t > T_b$ and zero otherwise. An application by Tomljanovich and Vogelsang (2002),¹⁶ also focusing on convergence issues, provide an interesting exploitation of this methodology on the US regional data.

To derive inference on fiscal convergence we test the significance of and the opposite signs in the pair of coefficients μ_1, δ_1 and μ_2, δ_2 . The null hypothesis is that trend coefficients are equal to zero, which in our framework translates to no trend in developments of budget deficit or debt. An alternative hypothesis of trend coefficients being statistically different from zero indicates existence of positive or negative trends in developments of both measures, depending on the sign. In particular, finding of (statistically significant) mean and trend coefficients with opposite signs indicates how countries with different starting positions approach the benchmark. As an example consider the dependent variable being the budget deficit (surplus) to GDP ratio in country i minus the 3% deficit benchmark. Then a positive intercept indicates a surplus or a deficit ratio below 3% since the negative 3% benchmark subtracted from a less negative deficit ratio yields positive value. Accordingly, a positive trend coefficient indicates improving comparative fiscal stance. The reverse follows for the opposite

¹⁶ We are grateful to the authors for providing us with the Gauss routine used in this paper.

combination of signs. We supplement these results by tests of σ -convergence¹⁷ since confirmation of absolute convergence requires both β - and σ -convergence.

Granted that the Vogelsang (1999) methodology allows for only a single break, and it is desirable to use methodologies allowing for more breaks like Bai and Perron (BP henceforth, 1998), the data availability and the performance of BP under $I(1)$ errors prevent us from pursuing alternative methodologies. Uctum et al. (2006) analyze the mean reversion of the debt of developed and developing countries to examine sustainability by using a combination of the BP and Zivot and Andrews (1992) tests. These tests revolve around the same idea by testing for the mean reverting trends and temporary fluctuations around them (stationarity) in the existence of breaks. We prefer the Vogelsang methodology since it gives more accurate inference on the trend functions (and breaks in them) regardless of the (non)stationarity of the data series.¹⁸ This way, one does not have to test for the stationarity of the series around the trend values to evaluate convergence to benchmarks (or debt sustainability in the case of Uctum et al., 2006).

4. Data and Sample Period

We analyze fiscal convergence of the new EU members, using the official Maastricht criteria of the deficit-to-GDP and debt-to-GDP ratios to assess their performance in satisfying the fiscal subset of the Maastricht Treaty convergence criteria. We further examine fiscal convergence of these countries with respect to two naturally produced benchmarks. These are deficit and debt ratios achieved in the core of the EU, represented by the average values in Austria, Belgium, France, Germany and the Netherlands, and the EU periphery, represented by average values from Greece, Portugal and Spain. An analysis of the debt ratios is also consistent with testing the theoretical implications of the disciplining effects of monetary unions (e.g., Restoy, 1996).

¹⁷ Sigma-convergence occurs when the cross-sectional standard deviation of a variable for a group of economies decrease in time.

¹⁸ The determination of the structural break date in Uctum et al (2006) and our paper is quite similar.

We use quarterly data from 1995:1 through 2005:4 for variables under research. This time span was chosen because: (1) official EU membership applications started in 1995, (2) EuroStat began using the harmonized time series on macroeconomic variables at that time, (3) consistent data are available for all countries through end of 2005, and (4) the post-1995 period excludes the major transition-related shocks observed in the early 1990s. Table 1 documents the major milestones in the pre-accession process: the date when an application to join the EU was submitted and the beginning and end of the admission negotiations. The data are obtained primarily from the EuroStat database and checked for consistency against the International Financial Statistics of the IMF. In case of missing or incomplete observations, data are gathered from the individual central banks and finance ministries.¹⁹ We also annualize the quarterly debt and deficit data by summing the four quarters and then using this sum to obtain the deficit-to-GDP and debt-to-GDP ratios. We should reiterate at this point that the serial correlation generated by the methodology used for de-seasonalizing the data is of little concern here since the Vogelsang test is able to handle broad forms of serial correlation.

5. Empirical Findings

We analyze the performance of the new EU members in satisfying the convergence criterion of the Maastricht Treaty, namely the fiscal deficit ratio below 3% and debt ratio below 60%. For this purpose, we examine the deficit-to-GDP and debt-to-GDP ratios of the new ten members in comparison to the two Maastricht benchmarks, the core of the EU, represented by the average values in Austria, Belgium, France, Germany and the Netherlands, and the EU periphery represented by average values from Greece, Portugal and Spain.

The Vogelsang test results are displayed in Tables 2 through 5. They display the results for *PSW* (Partial Sums with *J* correction) tests, given by the specification in Equation 2. The last column in each table contains the estimated break date using the

¹⁹ In some cases, quadratic interpolation of annual data was necessary to fill some missing data points because the empirical methodology we use relies on uninterrupted data. Quadratic interpolation of annual data was used for debt in the case of Austria, Estonia, France, Germany, and the Netherlands, and for the Portuguese deficit and second half of the Greek deficit.

maximum $T^{-1}W_T$ statistic of Andrews and Ploberger (1994). Following the theoretical grounds of the methodology employed, we apply a 10% trimming from each end of the sample since the break dates close to the endpoints are unreliable and should mostly be disregarded. We display the test statistics below the coefficient estimates and the asymptotic critical values for the endogenous break option of the *PSW* tests at the bottom rows of each table, respectively.

When interpreting results, the readers should note that positive trend coefficients represent *improvements* of position in comparison to the Union. For instance, a positive trend coefficient shows new members' fiscal position is improving further, away from the 3% deficit benchmark. In short, a positive trend coefficient is always good. We supplement this brief explanation at the bottom of each table by indicating the dependent variable and providing a brief guideline to interpret the results easily.

The dependent variables in the analyses are the ratio of the budget deficit (surplus) to GDP and total debt to GDP in a new member country minus the benchmarks, 3% for deficit and 60% for total debt. Since all deficits (debt) are indicated by a negative number (e.g., minus 2% stands for two percent deficit), all mean values that are positive indicate surplus or deficit (debt) ratios below (less negative) 3% (60%), values that are zero indicate deficit (debt) of exactly 3% (60%), and values that are negative indicate deficit (debt) ratios greater than 3% (60%). Accordingly, negative trend coefficients depict deficit (debt) increases (or declining budget surpluses) with respect to the benchmark, and positive coefficients suggest just the opposite.

We complement our beta convergence results from above with the σ -convergence tests to be able to comment on absolute convergence or “catching up”. We illustrate the σ -convergence levels graphically. One should note that since the sigma (standard deviation in our case) is calculated cross-sectionally, the choice of benchmark does not alter the results.

5.1 Deficit Convergence

Table 2a examines whether the mean and trend coefficients of Equation (4) *i* are statistically different from zero, implying that there is a positive or negative trend in

budget deficits and, *ii*) have opposite signs, indicating that countries with higher (or more negative) deficit approach the benchmark or each other. Initially one notice that the coefficients are quite often not significant, which means that these countries are not showing a significant change in their deficit in one particular direction. Although the lack of statistical significance in the deficit analysis precludes an unambiguous judgment (see also Figure 1), the following pattern emerges for the Maastricht benchmark: most of the countries start with surplus or low deficit ratios and some of them reduce the surplus during the pre-break period; in fact only three countries with statistically significant surplus coefficients proceeded with a reduction in surplus while four of them experienced deepening in their deficit. In the post-break period, the statistically insignificant coefficients preclude a qualified judgment, but countries like Estonia, Latvia, Malta and Slovak Republic show more fiscal discipline than the others that maintain the status quo. A strict pattern does not emerge as a result of the estimations, but one notices that countries with large deficits tend to act more prudently (except the Czech Republic) than the others. In any event, the results suggest that the deficit-to-GDP ratio condition seems to be a challenging criterion to meet.

The deficit-to-GDP ratio with respect to the benchmark of the core shows in essence a clearer picture than that of the 3% benchmark (Table 2b). The large negative post-break mean values (μ_2) indicate less fiscal prudence than the EU core countries. Observing that most of these countries start out with much better fiscal positions compared to the core implies that their attention was focused elsewhere. Despite this fact, only a few of the new members try to improve their fiscal position in the post-break period. This finding is confirmed when we compare the new members with the periphery (Table 2c). The drastic difference in fiscal position between the new members and the periphery at the beginning of the sample period had not only been closed in all countries, but it reverses direction in some countries like the Slovak Republic later on. In short, the difference between the new members and the core and periphery regressions point towards more fiscal discipline in the ten new members than EU15.

Inspecting Figure 2a for sigma convergence, one notices that the older EU members are quite in conjunction with one another while the new 10 members show a

very slow decline in their cross-sectional standard deviation. Accounting for the average mean deficit of each group (Figure 2b) confirms this finding with the deficit condition of the new members exhibiting an inferior trend when compared to the older members. The periphery countries seem to be the best performers with their constant decline in the mean and standard deviation of the deficit ratio while the core countries seem to lose focus after 2001. Mean ratio of the newcomers shows no improvement (or decline) with a flat trend during the period under research. The old members seem to be converging to a higher than desired equilibrium. From this perspective, convergence of the newcomers in terms of deficit-to-GDP ratio towards either the core or the periphery looks like a dubious enterprise, casting doubts on the stability of the Eurozone.

5.2 Debt Convergence

Convergence of the general government debt-to-GDP ratio towards the Maastricht benchmark of 60% is displayed in Table 3a and Figure 3. Further, Tables 3b and 3c show the test results in comparison with the core and the periphery (in a similar fashion as with the budget deficit). The dependent variable in Table 3a is the consolidated debt-to-GDP ratio in a new member country minus the 60% benchmark. A positive number indicates a debt ratio below 60% since the negative 60% benchmark subtracted from a less negative debt ratio yields positive values; thus, for example, a mean value of 40 means a 20% debt-to-GDP ratio. All countries, except Hungary, start with a debt-to-GDP ratio lower than the Maastricht benchmark of 60% since the mean coefficients are all positive. The few positive trend coefficients observed in the pre-break period either reverse direction or lose significance in the post-break period, suggesting that the new member countries are increasing their debt-to-GDP ratio. Countries like Malta and the Czech Republic stand out with the large deterioration of their indebtedness towards the benchmark.

A similar tendency and a clearer picture are observed when the 60% benchmark is replaced by the actual debt-to-GDP ratio in the core and the periphery. Again the big debt position difference at the beginning of the sample period narrows down the second half due to the fiscal indiscipline of the new members. Only Hungary stands out in both Table 3b and 3c as the consistently prudent country among the new members. The other

more disciplined countries Estonia and Poland seem to adopt fiscal discipline either in post- and pre-2000, respectively, not displaying as consistent picture as Hungary. A quick glance at Figure 3 shows that the slight decline in the core's debt situation, while the high debt of the periphery keeps the new members within comparatively acceptable debt positions. However, we can hardly call it a success story because their indebtedness increases in general and its dynamics are discomfoting. Supporting the theoretical arguments presented in Restoy (1996), these results suggest that market-based mechanisms for fiscal and financial discipline are relatively weak in the EMU as indicated by significant and growing debt ratios.

The sigma convergence results in Figure 4a also support Restoy's theoretical argument, as we observe that the new 10 members have outperformed the EU15 members, especially before 2001. Afterwards, their fiscal discipline loses some of its momentum as the variation of the debt positions of the new ten members evolve at par with the core after 2003. Fiscal discipline of the periphery starts to improve after 1996 but loses its original dynamics in 1998, further worsening in the recent period. The average debt ratios in Figure 4b confirm this finding since the periphery as well as the core show worse debt positions than the newcomers. On other hand, its dynamics points at slowly diminishing debt position over the time. The results of the sigma convergence thus support better performance of the new members compared to the older ones but this finding is confronted with the worsening dynamics of their debt position.

5.3 Implications of Findings and Recommendations for Fiscal Discipline

Our results indicate that the ongoing reform of the public finance systems in the whole EU25 is an agenda that is not to be underestimated. In the new EU members it is even more important since a neglect of public finance reforms and lack of fiscal discipline could lead to serious consequences for these countries, well beyond the satisfaction of the Maastricht criteria and the consideration of entry into the Eurozone. Our results have important implications regarding the ongoing reforms of the fiscal framework of the EU. One implication is for the authorities in the new EU and old core members to better

coordinate fiscal and monetary policies to improve fiscal discipline.²⁰ Such a claim is consistent with Gleich (2003) who shows that countries having institutional structures that are more conducive to strengthening coordination and cooperation in budget decision-making have been associated with lower budget deficits and reduced debt levels.

To further see the importance of institutional design on fiscal policy outcomes, Table 4 reports the institutional indices of the budget process in the CEE8 plus Bulgaria and Romania, the latter two being candidate countries.²¹ The indices are based on the sum of the scores on budget preparation, legislation (authority) and implementation, each ranging between zero and four points, with the cumulative index ranging from zero to 12. Higher index scores indicate higher fiscal discipline. The indices are available for 1997-2001. The results in Table 4 show that two of the Baltic countries, Estonia and Latvia, have the highest scores, indicating better fiscal performance than the rest of the countries. This is consistent with our empirical results that both Estonia and Latvia show sufficient fiscal discipline, indicating they are ready to enter the ERM 2. Our results support the notion that countries with weak budget institutions tend to have a lower level of fiscal discipline.

Table 5 reports the sub-indices (in 2001) of the cumulative budget institutional index reported in Table 4. The sub-indices for budget preparation, legislation and implementation range from zero to four and higher scores indicate a higher level of fiscal discipline. Although all countries tend to do better in term of the implementation side, empirical evidence suggests that this is not as important as the preparation and authority (legislation) stages of the budget in order to lower budget deficit and fiscal debt (Gleich 2003). Unfortunately, the scores for preparation and legislation are poor across all the countries. The results suggest that the new EU member states have poor budget preparation and legislation scores (reaching a maximum score of 3 and 2.69, respectively), indicating significant room for further improvement (up to a score of 4).

²⁰ For a review of the literature on the interaction of monetary and fiscal policies in a monetary union, see Dixit (2001) and Dixit and Lambertin (2001). For supporting empirical evidence, see Darnaut and Kutos (2005).

²¹ The indices (Table 4) and sub-indices of the cumulative budget institutional index (Table 5) are reported in detail in Gleich (2003).

Hence, further and more serious reforms in the areas of budget preparation and legislation are necessary to improve fiscal discipline.

Our results indicate that both Estonia and Latvia show sufficient fiscal discipline, indicating these countries are ready to enter the ERM 2.

A second policy recommendation of our results is that policymakers need to design policies to improve fiscal consolidation.²² To shed further light on this issue, Table 6 reports the current federal expenditures and revenues for 2000 and 2004 to see the developments in the budget. In terms of expenditures (Table 6a), all countries have been able to lower their subsidies and interest payments; however, they face significant outlays in social benefits, including in-kind transfers. Together, these social benefits expenditures reach close to 30% of GDP for some countries (Slovenia, etc.), with the least expenditure to GDP ratio being 20% or so (Cyprus, Estonia, Latvia). Our results suggest that a reduction in social benefit expenditures would be desirable for improving fiscal performance in the future. However, this is a politically sensitive area and progress may be difficult to achieve quickly. Other areas of expenditures that could be cut down is collective consumption and employee compensation expenditures, each eating up close to or more than 10% of GDP. However, we observe that most of the countries increased their spending in these areas in 2004 relative to 2000. In sum, the new member states need to make significant cuts in the areas of social benefits, collective consumption and employee compensation to improve fiscal performance. Of course, the other option is to raise taxes. However, the results in Table 6b suggest that most countries have been lowering both direct and indirect taxes in 2004 relative to 2000. This is widely suggested in the literature and although such trends are sensitive to the economic cycles experienced by the countries, lowering taxes is consistent with the recommendations of many observers (e.g., von Hagen et al. 2002).

A third policy implication that follows from our results is that EU policymakers may consider adopting fiscal policy rules, rather than a counter-cyclical fiscal policy.²³ Some countries, such as Poland and the Netherlands, have already introduced fiscal

²² Daviddi and Ilzkovitz (1997) provide a discussion of this and other related issues.

²³ For an important early treatment of this issue, see Kydland and Prescott (1977).

rules into the laws and constitutions (Tanzi 2005). Of course, the fact that the member states have different fiscal positions certainly creates implementation problems, at least initially. Tanzi (2005) suggests that “flexibility is required as to the time needed to conform to the rule, but the rule should not be relaxed to the point of making sinning more acceptable for everyone” (p. 63).

6. Conclusions

Our study provides a comprehensive look at the fiscal convergence performance and prospects of the new members with respect to EU15. It includes alternative measures of fiscal convergence, employs tests of convergence that allow for structural breaks and hence improved inferences, and ties the empirical results on the literature regarding the link between fiscal discipline and the choice of an exchange rate.

We observe an extent of heterogeneity in the fiscal convergence, a lack of fiscal discipline in general, and that the pilgrims are relatively more disciplined than the EU15. These findings raise concerns about the ability of monetary unions to provide credible signals for fiscal discipline for its new and old members. Our results support the argument that “the European institutional structure with a centralized monetary policy but decentralized fiscal policies creates a very strong bias toward large chronic fiscal deficits and rising ratios of debt to GDP.” (Feldstein, 2005, p. 422). In addition, it is in line with theory that monetary unions are not powerful when member countries carry significant amount of debt outstanding (i.e., Restoy, 1996).

In short, it appears that the EU member countries have not yet become a union in the fiscal aspect and neglected the necessary measures of fiscal prudence in their attempt of balancing the E(M)U criteria with their national interests. Hence, along with new fiscal reforms, establishing fiscal discipline is essential towards achieving a credible and strong fiscal union. Otherwise, current fiscal practices may destabilize economic activity in the entire EU25 countries, and delay the entry of the new EU member states to the ERM 2 and hence their adoption of the Euro.

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Table 1: Timing of the EU Admission Process

	Application Submitted	Admission Negotiations	
		Beginning	End
Czech Republic	January 17, 1996	March 31, 1998	December 13, 2002
Cyprus	July 3, 1990	March 31, 1998	December 13, 2002
Estonia	November 24, 1995	March 31, 1998	December 13, 2002
Hungary	March 31, 1994	March 31, 1998	December 13, 2002
Latvia	October 13, 1995	October 13, 1999	December 13, 2002
Lithuania	December 8, 1995	October 13, 1999	December 13, 2002
Malta	July 16, 1990	October 13, 1999	December 13, 2002
Poland	April 5, 1994	March 31, 1998	December 13, 2002
Slovakia	June 27, 1995	October 13, 1999	December 13, 2002
Slovenia	June 10, 1996	March 31, 1998	December 13, 2002

Source: European Commission

Table 2a: Budget Deficit Convergence to 3% of GDP

<i>Countries</i>	<i>PSW test with endogenous break selection (regression of y_t with J_T correction)</i>				<i>Break date</i>
	μ_1	δ_1	μ_2	δ_2	
<i>Cyprus</i>	3.31 [*] (1.46)	-0.49 [*] (-1.70)	-0.93 (-0.66)	-0.02 (-0.20)	1998Q3
<i>Czech Rep</i>	3.91 ^{**} (2.83)	-0.24 ^{**} (-3.42)	-4.74 [*] (-1.89)	0.57 (1.53)	2003Q1 [*]
<i>Estonia</i>	1.03 (0.63)	0.21 (1.24)	0.41 (0.34)	0.19 ^{**} (2.67)	1998Q4
<i>Hungary</i>	2.61 (1.07)	-0.41 ^{**} (-1.92)	-0.94 (-0.44)	-0.11 (-0.79)	1999Q3
<i>Latvia</i>	0.46 (0.56)	0.25 ^{**} (2.94)	-0.30 (-0.50)	0.12 ^{**} (3.21)	1998Q4 [*]
<i>Lithuania</i>	3.20 ^{**} (2.65)	-0.22 ^{**} (-2.35)	0.50 (0.42)	0.08 (0.86)	2002Q2 ^{**}
<i>Malta</i>	-8.86 ^{**} (-5.68)	0.19 ^{**} (2.35)	-7.89 ^{**} (-2.79)	0.73 [*] (1.74)	2003Q1
<i>Poland</i>	-0.07 (-0.18)	0.13 ^{**} (4.79)	-1.55 ^{**} (-2.84)	0.00 (0.06)	2001Q3 ^{**}
<i>Slovak Rep.</i>	0.03 (0.01)	-0.19 (-1.12)	-8.34 ^{**} (-4.16)	0.43 ^{**} (2.93)	2000Q1 [*]
<i>Slovenia</i>	3.02 ^{**} (7.63)	-0.07 ^{**} (-2.95)	3.45 ^{**} (5.77)	-0.06 (-0.79)	2002Q2
<i>Critical Values</i>					
5%	1.51	1.88	1.92	1.81	
10%	1.21	1.58	1.65	1.54	

Note: The dependent variable is the budget deficit (surplus) to GDP ratio in country i minus the 3% deficit benchmark (a positive number indicates a surplus or a deficit ratio below 3% since the negative 3% benchmark subtracted from a less negative deficit ratio yields positive values). Therefore, a positive trend coefficient indicates improving comparative fiscal stance. The numbers in the parentheses for the above table and those that follow below indicate the test statistic associated with the coefficient estimate and are to be compared with the critical values at the bottom of the table. ** (*) indicates 95%(90%) significance. Significance levels of breaks are determined using the critical values in Andrews and Ploberger (1994).

Table 2b: Budget Deficit Convergence to the core EU15 level

<i>Countries</i>	<i>PSW test with endogenous break selection (regression of y_i with J_T correction)</i>				<i>Break date</i>
	μ_1	δ_1	μ_2	δ_2	
<i>Cyprus</i>	3.18* (1.38)	-0.34 (-0.74)	-2.60** (-2.59)	-0.01 (-0.29)	1996Q3*
<i>Czech Rep</i>	4.64** (2.99)	-0.36** (-3.96)	-6.04** (-2.73)	0.32 (1.31)	2002Q1**
<i>Estonia</i>	1.83 (0.96)	0.09 (0.43)	-1.26 (-0.89)	0.19** (2.25)	1998Q4
<i>Hungary</i>	1.30 (0.36)	-0.04 (-0.07)	-4.33** (-2.34)	-0.01 (-0.06)	1997Q2
<i>Latvia</i>	1.58* (1.39)	0.07 (0.66)	-2.25** (-2.53)	0.14** (2.48)	1999Q1*
<i>Lithuania</i>	3.16** (1.96)	-0.21 (-1.26)	-3.10** (-2.59)	0.15** (2.05)	1998Q4**
<i>Malta</i>	-8.40** (-4.64)	0.10 (1.10)	-8.92** (-2.53)	0.71 (1.24)	2003Q2
<i>Poland</i>	0.78* (1.37)	0.00 (0.00)	-2.75** (-3.78)	-0.04 (-0.52)	2001Q3*
<i>Slovak Rep.</i>	0.74 (0.33)	-0.30* (-1.66)	-10.37** (-4.82)	0.45** (2.86)	2000Q1*
<i>Slovenia</i>	3.70** (7.02)	-0.18** (-5.92)	2.81** (3.53)	-0.17** (-1.81)	2002Q2**
<i>Crit. Value at 5%</i>	1.51	1.88	1.92	1.81	
<i>Crit. Value at 10%</i>	1.21	1.58	1.65	1.54	

Note: The dependent variable is the budget deficit (surplus) to GDP ratio in country i minus the core (or periphery) budget deficit ratio (a positive number indicates a surplus or a deficit below benchmark levels and a positive trend indicates better fiscal performance).

Table 2c: Budget Deficit Convergence to the EU15 periphery level

<i>Countries</i>	<i>PSW test with endogenous break selection (regression of y_t with J_T correction)</i>				<i>Break date</i>
	μ_1	δ_1	μ_2	δ_2	
<i>Cyprus</i>	7.94** (2.15)	-0.64 (-0.88)	-1.10 (-0.68)	-0.07 (-0.86)	1996Q4**
<i>Czech Rep</i>	9.65** (3.05)	-0.61 (-1.43)	-2.22 (-1.19)	-0.04 (-0.46)	1997Q4**
<i>Estonia</i>	6.25** (3.27)	-0.14 (-0.68)	-0.14 (-0.10)	0.13* (1.69)	1998Q3*
<i>Hungary</i>	8.24** (3.16)	-0.83** (-3.46)	-1.87 (-0.88)	-0.14 (-1.04)	1999Q2
<i>Latvia</i>	5.96** (6.34)	-0.15 (-1.55)	-0.98 (-1.40)	0.07* (1.67)	1998Q4**
<i>Lithuania</i>	8.14** (8.42)	-0.54** (-7.31)	-0.19 (-0.19)	0.01 (0.16)	2000Q2**
<i>Malta</i>	-2.18 (-1.10)	-0.36** (-1.98)	-5.48** (-3.37)	0.04 (0.36)	1999Q2
<i>Poland</i>	4.23** (2.89)	-0.12 (-1.33)	-2.38 (-1.27)	-0.08 (-0.45)	2001Q3
<i>Slovak Rep.</i>	5.60** (2.88)	-0.59** (-4.51)	-6.52** (-2.90)	0.28 (1.44)	2001Q1**
<i>Slovenia</i>	8.19** (6.09)	-0.38** (-1.94)	1.06 (1.43)	0.00 (-0.11)	1997Q3**
<i>Crit. Value at 5%</i>	1.51	1.88	1.92	1.81	
<i>Crit. Value at 10%</i>	1.21	1.58	1.65	1.54	

Note: The dependent variable is the budget deficit (surplus) to GDP ratio in country i minus the core (or periphery) budget deficit ratio (a positive number indicates a surplus or a deficit below benchmark levels and a positive trend indicates better fiscal performance).

Table 3a: Consolidated Debt/GDP Convergence to 60% limit

<i>Countries</i>	<i>PSW test with endogenous break selection (regression of y_t with J_T correction)</i>				<i>Break date</i>
	μ_1	δ_1	μ_2	δ_2	
<i>Cyprus</i>	8.81** (3.99)	-0.46** (-2.04)	6.51** (3.99)	-0.75** (-7.61)	1998Q4
<i>Czech Rep</i>	51.50** (12.45)	-0.26 (-1.33)	25.19** (2.66)	0.27 (0.14)	2003Q4**
<i>Estonia</i>	50.32** (92.52)	0.19** (5.76)	53.89** (73.38)	0.06 (0.83)	2001Q4**
<i>Hungary</i>	-18.65** (-3.87)	1.05** (3.11)	8.53 (1.60)	-0.44 (-1.00)	2000Q4*
<i>Latvia</i>	49.12** (50.80)	0.00 (0.03)	45.83** (60.75)	0.02 (0.45)	1999Q1
<i>Lithuania</i>	36.68** (23.38)	0.01 (0.05)	26.96** (19.90)	0.58** (6.34)	1999Q3**
<i>Malta</i>	24.97** (11.23)	-1.19** (-7.65)	1.92 (0.79)	-1.05** (-5.12)	2000Q4
<i>Poland</i>	8.93** (3.43)	0.81** (3.00)	20.82** (10.81)	-0.23** (-1.95)	1998Q4**
<i>Slovak Rep.</i>	40.38** (17.98)	-0.16 (-1.02)	23.95** (9.67)	-0.15 (-0.74)	2000Q4
<i>Slovenia</i>	48.68** (54.04)	-0.77** (-9.74)	36.03** (46.32)	-0.22** (-4.26)	1999Q3**
<i>Critical Values</i>					
5%	1.51	1.88	1.92	1.81	
10%	1.21	1.58	1.65	1.54	

Note: Values are in percentages. The dependent variable is the consolidated debt to GDP ratio in country i minus the 60% benchmark (a positive number indicates a debt ratio below 60% since the negative 60% benchmark subtracted from a less negative debt ratio yields positive values). Therefore, a positive trend coefficient indicates improving comparative debt position. ** (*) indicates 95%(90%) significance. Significance levels of breaks are determined using the critical values in Andrews and Ploberger (1994).

Table 3b: Consolidated Debt/GDP Convergence to the EU15 core debt to GDP ratio

<i>Countries</i>	<i>PSW test with endogenous break selection (regression of y_i with J_T correction)</i>				<i>Break date</i>
	μ_1	δ_1	μ_2	δ_2	
<i>Cyprus</i>	4.05** (1.77)	-0.64** (-2.70)	-2.57 (-1.52)	-0.70** (-6.82)	1998Q4
<i>Czech Rep</i>	46.11** (12.45)	-0.38** (-2.17)	18.08** (2.13)	0.23 (0.13)	2003Q4**
<i>Estonia</i>	45.69** (58.02)	0.00 (0.08)	44.50** (44.10)	0.21** (2.17)	2001Q3
<i>Hungary</i>	-27.21** (-4.65)	1.38* (1.60)	-6.20** (-1.92)	0.05 (0.28)	1997Q3*
<i>Latvia</i>	44.84** (50.76)	-0.24** (-3.30)	35.41** (44.20)	0.18** (3.14)	1999Q4**
<i>Lithuania</i>	31.74** (17.77)	-0.14 (-0.89)	17.10** (11.09)	0.69** (6.62)	1999Q3**
<i>Malta</i>	20.31** (9.98)	-1.37** (-9.63)	-8.20** (-3.65)	-0.87** (-4.67)	2000Q4
<i>Poland</i>	4.36** (3.35)	0.60** (4.74)	11.29** (11.11)	-0.16** (-2.48)	1999Q1*
<i>Slovak Rep.</i>	35.72** (15.84)	-0.34** (-2.16)	13.83** (5.56)	0.02 (0.10)	2000Q4
<i>Slovenia</i>	43.92** (33.29)	-0.94** (-7.73)	26.52** (24.48)	-0.13* (-1.80)	1999Q2**
<i>Crit. Value at 5%</i>	1.51	1.88	1.92	1.81	
<i>Crit. Value at 10%</i>	1.21	1.58	1.65	1.54	

Note: The dependent variable is the consolidated debt to GDP ratio in country i minus the core (or periphery) debt ratio (hence a negative number indicates a debt ratio worse than that of the core or the periphery and a positive trend indicates lowering comparative debt ratios).

Table 3c: Consolidated Debt/GDP Convergence to the EU15 periphery debt to GDP ratio

<i>Countries</i>	<i>PSW test with endogenous break selection (regression of y_i with J_T correction)</i>				<i>Break date</i>
	μ_1	δ_1	μ_2	δ_2	
<i>Cyprus</i>	32.61** (17.72)	-0.83** (-8.83)	-0.26 (-0.08)	0.09 (0.18)	2003Q1
<i>Czech Rep</i>	67.59** (10.66)	0.69 (0.55)	73.55** (26.56)	-1.00** (-7.66)	1996Q4
<i>Estonia</i>	74.86** (42.90)	-0.33** (-4.03)	67.43** (16.88)	-0.06 (-0.08)	2003Q4
<i>Hungary</i>	-0.21 (-0.04)	1.51** (2.46)	16.50** (5.41)	-0.09 (-0.56)	1998Q1*
<i>Latvia</i>	73.88** (28.88)	-0.60** (-4.94)	58.09** (9.92)	0.22 (0.19)	2003Q4*
<i>Lithuania</i>	62.12** (17.18)	-0.63** (-2.09)	38.29** (11.67)	0.62** (2.70)	1999Q4**
<i>Malta</i>	49.12** (11.76)	-1.60** (-3.48)	19.16** (6.54)	-0.88** (-5.18)	1998Q3
<i>Poland</i>	33.28** (11.91)	0.33 (1.16)	33.51** (16.20)	-0.29** (-2.32)	1998Q4
<i>Slovak Rep.</i>	65.28** (22.05)	-0.72** (-3.48)	34.57** (10.59)	-0.09 (-0.33)	2000Q4*
<i>Slovenia</i>	73.25** (40.31)	-1.28** (-8.45)	47.10** (28.58)	-0.21** (-1.86)	1999Q4**
<i>Crit. Value at 5%</i>	1.51	1.88	1.92	1.81	
<i>Crit. Value at 10%</i>	1.21	1.58	1.65	1.54	

Note: The dependent variable is the consolidated debt to GDP ratio in country i minus the core (or periphery) debt ratio (hence a negative number indicates a debt ratio worse than that of the core or the periphery and a positive trend indicates lowering comparative debt ratios)

Table 4 – Institutional Indices of Budget Process

<i>Countries</i>	1997	1998	1999	2001
<i>Bulgaria</i>	5.33	6.08	6.08	6.08
<i>Czech Rep.</i>	6.43	7.42	7.42	7.19
<i>Estonia</i>	8.32	8.32	8.32	8.32
<i>Hungary</i>	5.46	5.46	5.46	5.46
<i>Latvia</i>	8.00	8.00	8.00	8.00
<i>Lithuania</i>	6.20	6.20	6.95	6.29
<i>Poland</i>	5.43	7.53	7.78	7.78
<i>Romania</i>	5.19	5.19	5.19	5.19
<i>Slovakia</i>	6.29	6.29	6.29	6.29
<i>Slovenia</i>	7.69	7.69	7.69	7.69

Source: Table 2 in Gleich (2003) and extended calculations by authors.

Note: The index is based on a cumulative score for preparation, legislation, and implementation. See Table 7 for details. Maximum score is 12. A higher score indicates a higher level of institutional quality of The budget process and hence better fiscal discipline.

Table 5 – Sub-indices of the Budget Institutional Index in 2001

<i>Countries</i>	Preparation	Legislation	Implementation
<i>Bulgaria</i>	1.75	1.33	3.00
<i>Czech Republic</i>	2.50	2.69	2.00
<i>Estonia</i>	2.25	2.40	3.67
<i>Hungary</i>	1.25	1.87	2.34
<i>Latvia</i>	3.00	1.33	3.67
<i>Lithuania</i>	1.75	1.87	2.67
<i>Poland</i>	2.53	2.25	3.00
<i>Romania</i>	1.25	0.27	3.67
<i>Slovakia</i>	1.75	1.87	2.67
<i>Slovenia</i>	2.75	2.27	2.67

Source: Table 2 in Gleich (2003) and extended calculations by authors.

Note: Maximum score for each category is 4. A higher score indicates a higher degree of quality of budget design and hence better fiscal outcome.

Table 6a: Current Federal Expenditures and Components (% of GDP; 2000/2004 figures)

<i>Countries</i>	<i>Total</i>	<i>Subsidies</i>	<i>Interest Payments</i>	<i>Social Benefits</i>	<i>Social Transfers in kind</i>	<i>Collective Consumption</i>	<i>Employee Compensation</i>
<i>Cyprus</i>	33.5/44.1	1.4/1.1	3.5/3.4	9.4/11.6	8.2/8.3	8.6/10.2	14.2/14.8
<i>C. Republic</i>	42.1/51.3	2.8/3.0	0.9/1.3	12.3/12.6	10.5/10.3	11.3/9.8	7.2/8.0
<i>Estonia</i>	43.5/37.1	1.1/1.4	0.3/0.3	10.4/14.6	11.0/9.6	10.1/9.5	11.5/9.9
<i>Hungary</i>	47.7/45.5	1.3/1.5	5.6/ 4.3	12.9/13.4	11.1/13.1	9.7/11.6	10.7/13.5
<i>Latvia</i>	40.0/38.8	1.1/0.8	1.1/0.8	13.5/11.0	10.4/9.2	9.3/9.1	11.8/9.7
<i>Lithuania</i>	35.8/35.5	0.8/2.1	1.8/1.4	10.9/10.1	12.3/12.6	9.7/7.7	13.1/11.5
<i>Malta</i>	42.1/48.7	1.4/ 1.7	3.8/ 4.1	12.1/ 13.1	10.5/12	9.2/10.5	13.3/ 15.0
<i>Poland</i>	39.4/42.4	0.7/0.1	3.2/3.2	16.6/17.3	8.9/8.2	9.1/9.0	11.1/11.3
<i>Slovakia</i>	48.9/39.0	2.5/1.4	4.1/2.7	12.3/11.1	8.9/8.6	10.9/10.9	8.8/8.8
<i>Slovenia</i>	48.0/47.4	1.5/ 1.6	2.4/ 1.9	17.2/ 17.1	11.4/11.8	7.9/7.7	11.8/ 11.8
<i>EU15</i>	43.0/43.8	1.3/1.2	3.8/3.1	16.1/16.5	11.9/12.8	8.0/8.2	10.3/10.5
<i>Euro Area</i>	43.7/44.2	1.4/1.2	4.1/3.4	16.6/17.1	11.7/12.3	8.2/8.3	10.6/10.7

Source: Public Finance in the EMU 2004 Statistical Annex and EuroStat, ESA95 definition.

Note: The components do not sum to 100 because of "other expenditures" or "other revenues" that are not included in the table.

Table 6b: Current Federal Revenues and Components (% of GDP; 2000/2004 figures)

<i>Countries</i>	<i>Total</i>	<i>Direct Taxes</i>	<i>Indirect Taxes</i>	<i>Social Contributions</i>
<i>Cyprus</i>	35.3/ 39.4	11.1/ 9.2	12.7/ 16.1	6.7/ 8.4
<i>C. Republic</i>	38.5/ 42.7	8.4/ 9.4	11.5/ 11.9	14.5/ 14.8
<i>Estonia</i>	37.7/ 40.9	8.1/ 8.7	12.9/ 12.7	11.4/ 11.2
<i>Hungary</i>	45.3/ 47.5	9.9/ 9.7	16.4/ 16.3	13.9/ 13.6
<i>Latvia</i>	35.1/ 35.2	8.3/ 8.4	11.7/ 11.3	10.2/ 8.8
<i>Lithuania</i>	35.8/ 31.8	8.5/ 7.9	12.5/ 11.1	9.4/ 8.4
<i>Malta</i>	36.0/ 49.0	9.3/ 11.9	12.9/ 15.3	7.7/ 8.3
<i>Poland</i>	42.5/ 43.8	7.4/ 7.0	14.8/ 15.1	14.0/ 13.14
<i>Slovakia</i>	47.6/ 35.2	7.6/ 5.7	13.0/ 11.8	13.8/ 12.4
<i>Slovenia</i>	44.7/ 45.8	7.6/ 8.4	16.5/ 16.7	15.1/ 14.8
<i><u>EU15</u></i>	45.6/44.1	13.7/13.7	14.3/12.8	14.3/14.4
<i>Euro Area</i>	46.1/44.5	13.6/13.5	13.0/11.6	16.2/16.1

Source: Public Finance in EMU 2004 Statistical Annex and EuroStat, ESA95 definition.

Note: The components do not sum to 100 because of "other expenditures" or "other revenues" that are not included in the table.

Figure 1: Budget Deficit to GDP ratios

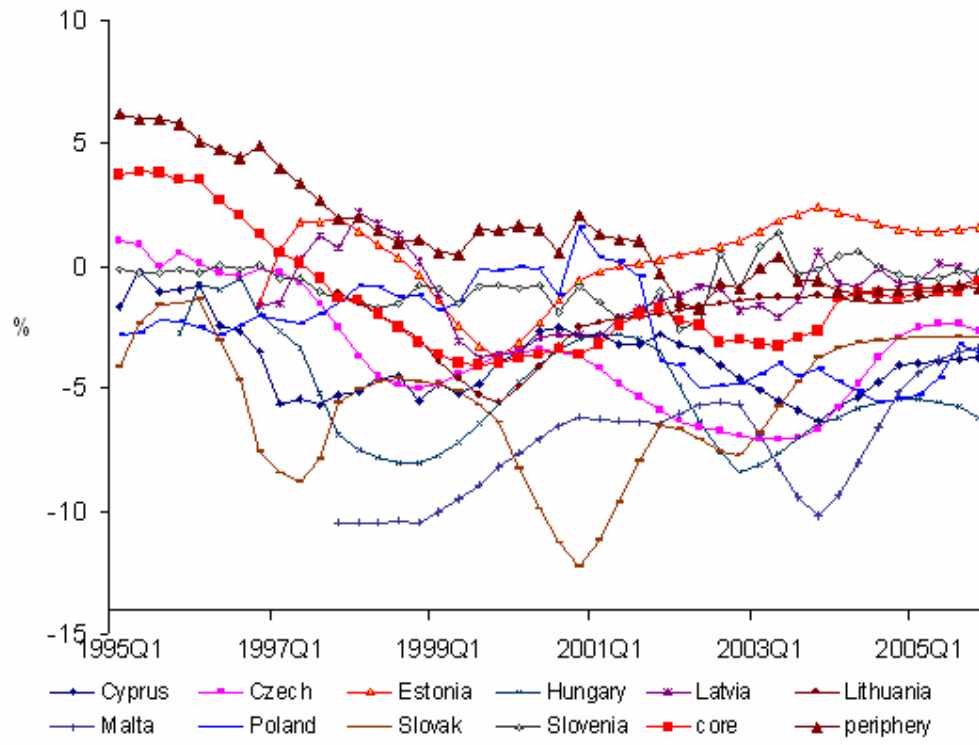


Figure 2a: Deficit (sigma) convergence

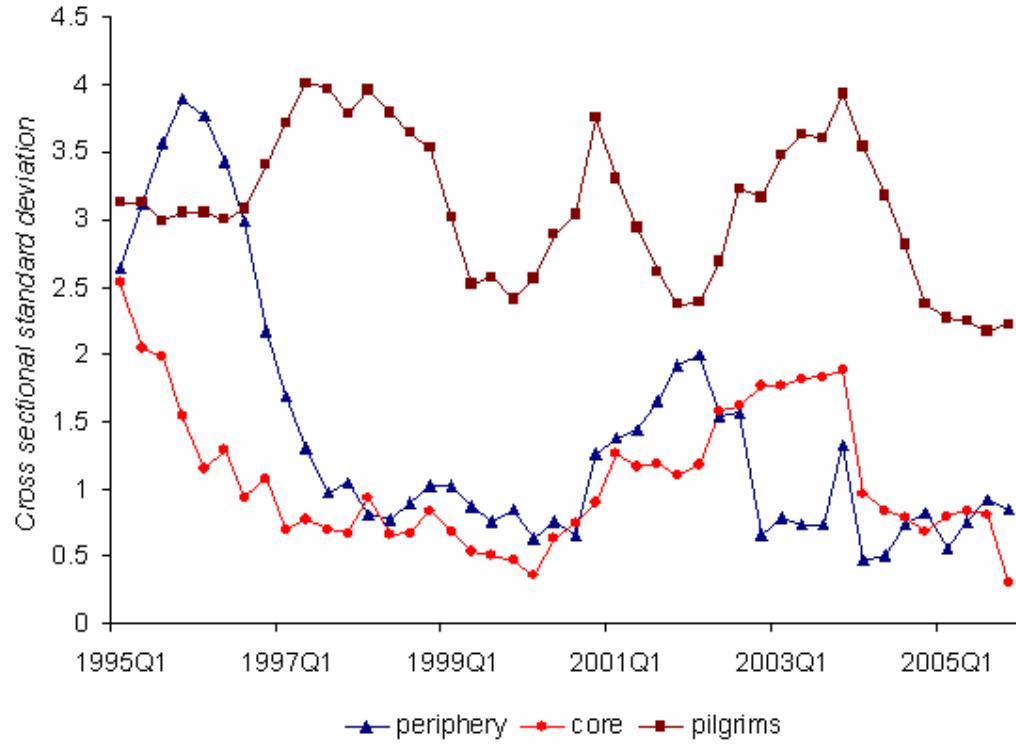


Figure 2b: Average Deficit Levels

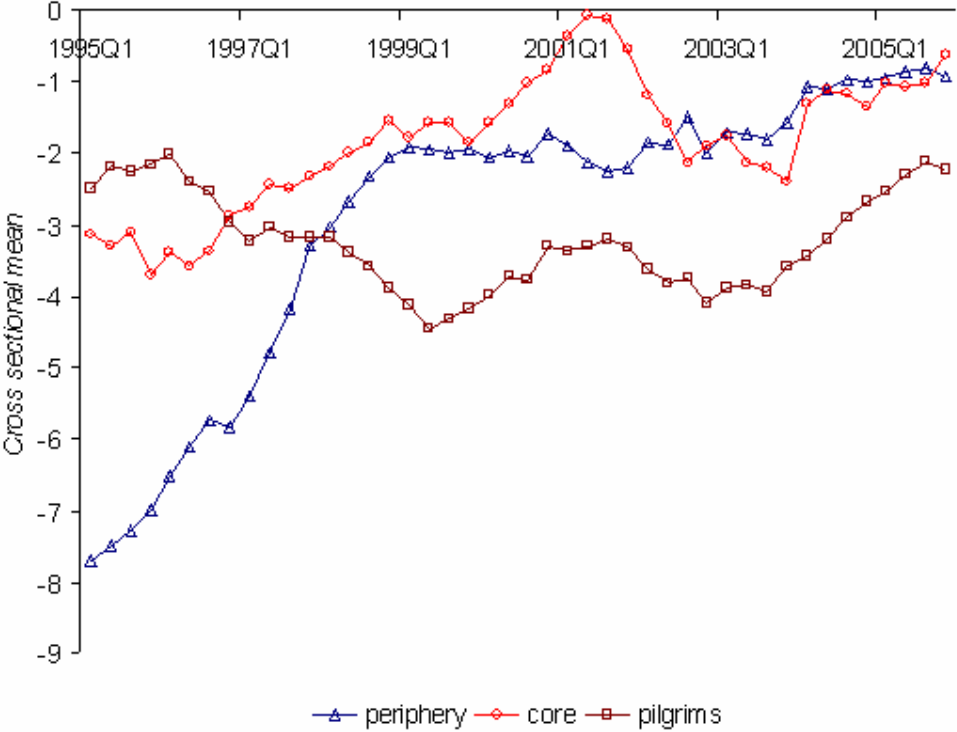


Figure 3: Debt to GDP Ratio

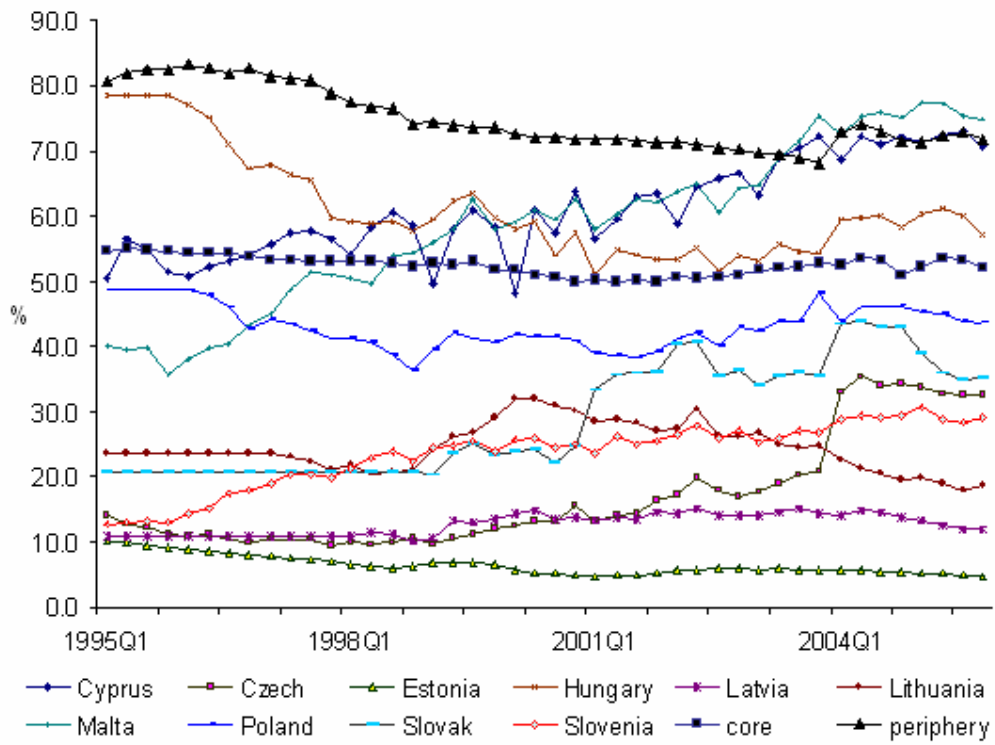


Figure 4a: Debt (sigma) convergence

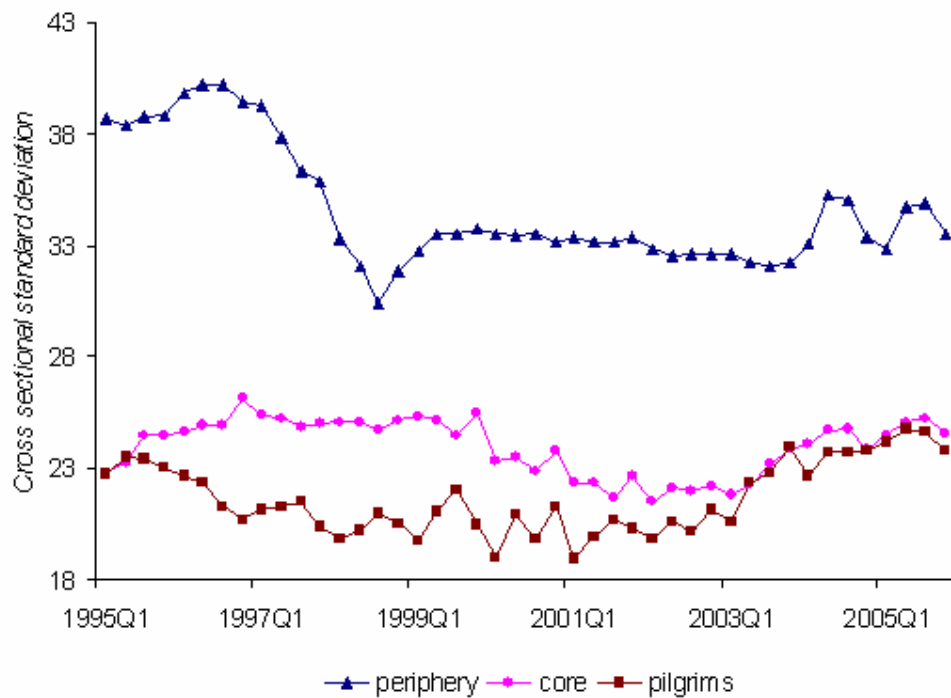


Figure 4b: Average Debt Levels

