TESTING FOR FISCAL CONVERGENCE IN THE EU COUNTRIES

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Abstract
This paper tests for the presence of fiscal convergence in 27 EU countries during 1995-2012. We use the methodology proposed for β convergence in order to check for similarities and divergences between the old and the new EU member states as regards the convergence speed. We are also interested if the pace of convergence was maintained during the whole period or if there are differences between the years 1990s and 2000s. The panel data model is used in order to analyse the convergence on groups of countries and time periods. The results point to the existence of the fiscal convergence process in both the old and the new EU member states, but with major differences depending on the period analysed.

Keywords: *fiscal convergence, β convergence, panel data, European Union*

JEL codes: *C23, E62, O47*

1. Introduction

The abolition of economic frontiers for the establishment of a new economic space (known as dynamic integration, according to Dragan, 2005) is still a debatable and controversial topic among scholars as regards the construction of the European Union (EU). The main instrument of European construction is the voluntary disposal of certain aspects of national sovereignty in order to achieve the common good of the Union. This means that some components of the national economy continue to operate separately, coupled with the integration of several policies (Lupu et al (2014)).

The European Union is far from being completed. At present, common EU policies are coupled with divergences that are still waiting to be negotiated. The ultimate goal, categorically expressed at the beginning of

2014 by Viviane Reding, former Vice President of the European Commission is that "the euro area should become the United States of Europe". In this context, the idea of convergence is the leitmotiv of the European construction. The EU membership implies the responsibility of adopting euro as the single currency, as stated in the Treaty establishing the European Economic Community, and thus being part of the Economic and Monetary Union (EMU).

Still, the single currency leads to an asymmetry in the monetary and fiscal governance of the EU (Demertzis and Peeters, 2001). While the monetary policy is conducted at supranational level, with the precise aim of ensuring medium-term price stability, the fiscal policy rest in the authority of each Member State, with the main purpose of absorbing the country-specific shocks. This calls for a certain flexibility of fiscal policies. But the coordination of the fiscal policy and more exactly its results have a distinctive manner of being assessed. The fiscal policy is in the competence of each Member State, but the failure in the compliance of the fiscal policy criteria falls under the excessive deficit procedure for both the euro area countries and the ones that are simple EU members.

Therefore, fiscal convergence is a central element for the monetary unification (Blot and Serranito, 2006), emphasized with the entry into force of the Maastricht Treaty, which imposed the limit of 3% of GDP for the budget deficit and of 60% of GDP of the public debt in each Member State. The criteria for fiscal stabilization were included in the Stability and Growth Pact (SGP) in 1997; according to this, the obligation of the EU countries is to limit the budget deficit to maximum 3% of GDP and to aim for balanced budgets or for surplus; penalties are added in case of failure. At the time of its entry into force, SGP was considered the strictest commitment voluntarily adopted by a sovereign state (Buti and van den Noord, 2004) with the objective of establishing and maintaining solid public finances.

The present paper investigates the presence of fiscal convergence in 27 EU member states. The paper is structured as follows: section 2 provides some interesting issues in the literature of the fiscal convergence, section 3 presents the data and the methodology used; section 4 discusses the results while we draw several general conclusions in the last section.

2. Literature Review

The studies on fiscal convergence are less numerous; their relative higher frequency in recent years is due to the intensified measures at European level for the coordination of fiscal policies and the surveillance of financial stability. The concept of fiscal convergence is used in empirical studies in various versions, as we shall see below. However, although we note the scarcity of studies in this area and the different variables used to

check for the fiscal convergence, the results prove the existence of convergence in particular in the EU-15, i.e. the countries that formed the EU between 1995-2004.

Esteve, Sosvilla-Rivero and Tamarit (2000) study fiscal convergence in tax burden for the 15 EU member states during 1967-1994 using the method of cross-sections and time series. The authors use the notions of β and σ convergence and find both types of convergence for the period 1979-1994, with a significant period of divergence during the years 1967-1979. Based on the long term properties of time series, the results signal several differences in the evolution of convergence. Therefore, increases in convergence are found in Belgium, Italy, Portugal, Spain, Sweden and United Kingdom (for the first four countries, only during 1967-1990), and in Austria and Finland when compared to Germany. Sosvilla Rivero et al. (2001) reach a similar result. Their empirical study checking for σ convergence during 1967-1995 in 15 EU member states state for a lack of continuity in this type of convergence. Basically, convergence is noticed between 1967-1974 and 1984-1995 and divergence is registered in the decade between them. Moreover, convergence is stronger in the core EU countries and lower in the countries on the periphery.

Delgado (2006) expands the period of analysis starting with 1965 until 2013 for analysing the β and σ convergence in taxes and fiscal burden. The countries seem to follow a convergence trend especially during 1975 to 1990. After this year, the progress is slower.

Țibulcă (2014) analyses the σ convergence during 1965-2011 on a variable expressing the GDP share of income from taxes. The lack of convergence is signalled during 1965-1988 and 2008-2011, especially as a result of the economic crisis. Instead, starting with 1989 until 2007, there is a period of fiscal convergence, largely as a result of the European regulations in this regard. With the crisis, Member States chose to focus on fiscal needs in their own countries, leaving aside the efforts in increasing convergence that were achieved before.

Based on the Gini coefficients, the results of Gemmell and Kneller (2003) indicate the presence of convergence in 10 EU countries for the period 1970-1995. The notion of convergence is verified for the fiscal pressure.

The Eurozone accession could be a favourable moment for increases in convergence. In this view, Fatas and Mihov (2003) analyse the position of the fiscal policy in the first two years of the EMU functioning by using a comparison between a measure on the cyclically adjusted primary balance with a measure of discretionary fiscal policy for the 10 countries of the euro area in 1999 and 2000. The results point that the fiscal convergence is more important than the budgetary convergence started with the Maastricht

Treaty. There is an increase in the symmetry of fiscal policies as compared to the previous years and a decrease in discretionary policies. The efforts towards fiscal stabilization continued after the accession to the euro area. The fiscal convergence has been accompanied by a convergence of average rates of taxation, which was stronger than the real convergence process.

Blot and Serranito (2004) test if the fiscal policy in the EMU countries has led to enhanced convergence. They find that the convergence process preceded the Maastricht Treaty. Convergence is noticed only for fiscal revenues adjusted for the cyclical component, but not in the case of the fiscal expense.

De Bandt and Mongelli (2000) seek to determine whether the integration of economic, financial and monetary policy on the one hand, and institutional factors on the other hand, led to a gradual convergence in the key fiscal variables in the euro area. The authors use cross-correlations, dispersion and cointegration tests during 1970-1998 for variables such as the net government borrowing, the total current revenue and current expenditure. Their aim is to discover common trends as signs of fiscal convergence. The results point to an increase in cross-correlations during the whole period of analysis, a constant reduction of dispersion for the fiscal variables used and cointegration for several countries in the euro area as regards the total current revenues and expenses.

The main objective of Onorante's (2006) research is to identify if the reduction of public deficits is necessary or useful in adopting the single currency. The author uses a game theory model where he analyses the interactions between the monetary, fiscal and wage policies. The process of reducing deficits should be finished before a country become part of a monetary union, since the incentives to reduce them after this moment are lower.

Furceri (2009) concludes that there is a positive relationship between fiscal convergence and the volatility of the business cycles. The author uses a panel model where 21 OECD countries are included, among which 11 countries in the Euro Area. A 1% increase in fiscal convergence will reduce the volatility of the business cycles by 0.6%; for the countries that are EU members, the impact on business cycles is stronger. Moreover, a reduced volatility due to fiscal convergence is responsible for stimulating economic growth. Fiscal divergence, caused by a 1% increase in the volatility of the business cycle, will reduce by 2.4 percentage points the average rate of economic growth. Therefore, the importance of fiscal convergence especially for an economic and monetary union could be seized in boosting the long-term economic growth by reducing volatility in business cycles and in reducing the cost of stabilization arising from the creation of a single currency.

Delgado and Presno (2010) use an empirical approach based on time series, while the fiscal convergence is expressed as the GDP's share of total fiscal revenues in the EU countries as compared with the benchmarks in Germany, United Kingdom and the EU average in the period 1965-2004. For the analysed period, the authors find that the convergence process is rather low, despite the efforts made in this period for the tax harmonization. UK and Germany are the most important countries where convergence can be found.

Avi-Yonah (2010) found evidence for the convergence in the tax rates during 1980-2010. Still, the asymmetry in the income tax rates endangers the distribution of revenue growth rates and the mobility of capital and labour, as notifies Frenkel and Razin (1996), cited by Sosvilla et al. (2001). Convergence in tax rates would solve and eliminate such problems.

3. Data And Methodology

The aim of the empirical analysis is to complete the studies in the literature by using a similar methodology for all the 27 EU countries (except for Croatia, due to relatively few available data to cover the period of analysis) in order to check for β convergence.

We will also emphasize the differences or the similarities between the old and the new EU member states as regards the speed of the fiscal convergence. The first group of countries is composed by 15 countries (Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden, United Kingdom), while the second one comprises 12 countries that joined the EU in 2004 and 2007 (Bulgaria, the Czech Republic, Cyprus, Hungary, Estonia, Latvia, Lithuania, Malta, Poland, Romania, Slovakia, Slovenia).

The division between the two groups of countries rather took into account their level of development than the membership of the euro area. The first reason for such a division is the different years of adopting the single currency in the countries that joined the EU starting with 2004; under these circumstances, the remaining period for testing the convergence would not have been relevant as regards the econometric requirements. The second reason is that Denmark, Sweden and United Kingdom are among the countries that have not adopted the single currency, and their introduction among countries like Lithuania, Hungary, Bulgaria or Romania would distort the results, given the different levels of economic development.

We analyse the convergence during 1995-2012, which encompasses the efforts of the old EU member states to meet the convergence criteria established through the Maastricht Treaty and of the new EU countries for joining the economic structure. Vintilă and Țibulcă (2012) use a similar

period, considering that a country that is not interested in the EU adhesion has no interest for measures in realising the fiscal convergence. In 1995, the countries in EU-12 started the adhesion process, therefore is reasonable to encounter signals of fiscal convergence.

We split the period of analysis into two sub-periods: the years 1995-2003 and 2004-2012. The importance of different analyses on both groups of countries and periods of time is emphasized in other studies, even on other topics, such as Popovici (2015). For the first period, we expect a higher speed of convergence for the old EU countries, which introduced the single currency in 1999. The convergence speed should increase in the second sub-period for the new EU countries due to the fact that some of them meet the Maastricht criteria for convergence and adopted the euro and that EU intensified its efforts in fiscal stability, through the strengthening of the SGP. Still, we expect that part of these efforts to be offset by the fiscal divergences arisen during the economic crisis (the period 2008-2012), which led to the explosion of budgetary deficits and public debt in some countries and meant austerity measures that affected the national tax system (increases in taxes, expansion of tax base, etc.).

We proxy the fiscal convergence by using three variables found in the literature: the budgetary deficit (DB), the public debt (DP) and the fiscal burden (expressed as the share of tax revenues to GDP). All the variables are expressed as percentage of GDP. The data sources are the Eurostat database and several editions of the report „Taxation trends in the European Union", issued by the European Commission. Since the negative values registered for the budgetary deficit do not allow the use of logarithms, necessary in modelling the β convergence, we proceeded to summing the minimum value of the deficit for each variable, thus obtaining positive data only. The procedure is accurate since we are concerned in observing the evolution of the variable.

The empirical model

β convergence is frequently used in the case of a group of countries which register, at the beginning of the analyzed period, an average income below the income of the whole group of countries (that is, for example, the case of the less developed countries) and whose incomes have a growth rate higher than another group of countries which, at the start of the period, had an average income over the average of all the analysed countries, such as the advanced countries (Esteve et al, 2000). More simply, the revenues from less developed countries grow faster than those of developed countries.

Moving this logic to the fiscal variables - such as the tax burden - the β convergence will occur if there is a negative relationship between the average growth of the fiscal pressure and the logarithm of its initial level.

The concept of the β convergence is derived from the neoclassical growth theory developed by Solow. The production factors and especially the capital register negative yields. The growth process should lead to a long term equilibrium characterized by a growth rate depending on the technological progress and the growth of the labour force. The decreasing return implies that, for less developed economies, the growth rate is higher, and therefore their revenues or the level of GDP per capita should become similar to the one in the rich countries.

To determine the β convergence, we use the following formula:

$$ln\left(\frac{y_{it}}{y_{i,t-1}}\right) = \alpha + \beta ln(y_{i,t-1}) + e_{it} \quad (1)$$

Where y is the variable where convergence is examined at the beginning of the period and throughout each year, α is the constant, β is the parameter that allows for checking the existence of the convergence, t is the year, i represents each of the countries analyzed, and e_{it} is the error term.

A significant negative relationship captured by the β coefficient indicates a convergence process. Also, the value of the coefficient indicates the rate at which the country is approaching the equilibrium - so it provides the speed of convergence.

We will use the panel data model as proposed by Baltagi (2005) and Hsiao (2006), as we consider that is the most appropriate in fulfilling our objective of analyzing convergence on groups of countries and time periods. We will estimate, totally, 27 cross-sections and period fixed-effect panels, as a result of the division in group of countries and periods.

4. Results

a) The results for the budgetary deficit

The results of the panel analysis confirm the existence of β convergence for both the EU-15 and EU-12 as regards the budgetary deficit. The result is validated for all the three periods of analysis and each of the coefficients is significant at 1% (Table 1). The signs of the β coefficients are negative, as expected, in each of the 9 panels for which we estimated the equations.

For the whole period of 16 years, the countries in EU-12 register a faster rate of convergence than those in the EU-15, given the higher value of the β coefficient. The convergence process was faster during 1996-2003 in EU, EU-15 and EU-12. The EU-15 countries converge faster to the equilibrium level in the 1996-2013 period than in the second period analyzed, for two reasons: the necessity of keeping the deficit at a low level

in the first 7 years in order to adopt the single currency and the divergence that followed in the next 8 years, imposed as a result of the economic crisis.

The pace of convergence is not similar between the two groups of countries. In both periods analyzed, the EU-12 converges towards the equilibrium faster than EU-15. The pace of convergence of the EU-12 is almost double the one in EU-15 in 1996-2003 and is kept higher in 2004-2012. Moreover, the results for the whole period of analysis indicate that the speed of convergence for the EU-12 countries is two times higher than that of EU-15.

Table 1. The results of the β convergence for the budgetary deficit

		β		α		Adj. R^2
		Coefficient	t-Statistic	Coefficient	t-Statistic	
Period 1996-2012	**EU**	-0,434279	-11,699,100	1,445,527	11,710,820	0,455023
	EU-15	-0,302283	-7,081,738	1,013,604	7,091,113	0,597708
	EU-12	-0,660294	-10,172,610	2,177,826	10,180,250	0,436120
Period 1996-2003	**EU**	-0,807843	-13,702,540	2,700,631	13,746,830	0,486215
	EU-15	-0,535344	-7,641,398	1,820,260	7,707,117	0,602459
	EU-12	-1,063,920	-10,861,710	3,493,441	10,862,760	0,531381
Period 2004-2012	**EU**	-0,383209	-7,361,610	1,266,596	7,332,287	0,580494
	EU-15	-0,344473	-4,838,319	1,134,965	4,790,180	0,609175
	EU-12	-0,438606	-5,472,179	1,453,121	5,482,653	0,545310

Note: all coefficients are statistically significant at 1%.
Source: authors' computations

b) The results for the public debt

Regarding the results for the public debt, although the negative sign of the β coefficients indicate the existence of convergence, the coefficients are significant only for the whole sample of countries and for EU-12 (Table 2).

In comparison to the previous situation for the budgetary deficit, the convergence speed is lower. We notice that the effects of the economic crisis are negatively affecting the fiscal convergence. This time too, the speed of convergence is higher in the period 1996-2003 that in the following years in both EU-12 and EU.

Table 2. The results of the β convergence for the public debt

		β		α		Adj. R^2
		Coefficient	t-Statistic	Coefficient	t-Statistic	
Period 1996-2012	**EU**	-0,112298	-5,664,477	0,439304	5,951,049	0,370487
	EU-15	-0,018972*	-0,700215	0,088872*	0,816815	0,413859
	EU-12	-0,145651	-4,835,374	0,520508	5,152,182	0,411392
Period 1996-2003	**EU**	-0,238606	-7,958,246	0,882058	7,937,420	0,468207
	EU-15	-0,067588*	-1,554,305	0,246408*	1,408,282	0,399635
	EU-12	-0,338942	-7,105,408	1,145,698	7,278,909	0,540712
Period 2004-2012	**EU**	-0,146083	-3,826,565	0,587124	4,121,400	0,408032
	EU-15	-0,062345*	-1,344,662	0,296240*	1,595,255	0,426575
	EU-12	-0,184795	-3,055,460	0,662836	3,233,413	0,449682

Note: all coefficients are statistically significant at 1%, except those market with *, which are not significant.
Source: authors' computations

c) The results for the fiscal burden

On the topic of the tax burden, we notice that the convergence process occurs for all the three group of countries, due to the negative and significant convergence coefficients (Table 3). This time, the countries in EU-15 are converging faster than those in EU-12 in each of the two sub-periods. One possible explanation is given by the fact that the EU accession increased the pressure of the fiscal competition and the equilibrium level is reached faster.

As compared to the previous results for the two variables, the convergence speed is higher in the second period, between the years 2004-2012. Moreover, if in the first seven years there is an important difference between the convergence speeds of the two groups of countries, in the next period they become very similar.

Table 3. The results of the β convergence for the fiscal burden

	β		α		Adj. R^2
	Coefficient	t-Statistic	Coefficient	t-Statistic	

Period 1996-2012	**EU**	-0,204166	-7,764,258	0,730722	7,758,936	0,193217
	EU-15	-0,302475	-6,453,897	1,109,950	6,459,426	0,247745
	EU-12	-0,166123	-4,697,249	0,575036	4,678,532	0,236723
Period 1996-2003	**EU**	-0,326492	-6,373,758	1,169,235	6,365,391	0,210944
	EU-15	-0,333901	-4,993,995	1,228,030	4,996,548	0,373821
	EU-12	-0,261723*	-3,348,033	0,904840*	3,332,519	0,211875
Period 2004-2012	**EU**	-0,386190	-7,100,962	1,381,932	7,103,239	0,235291
	EU-15	-0,390258	-4,802,835	1,428,762	4,807,012	0,165652
	EU-12	-0,385354	-5,001,504	1,339,089	4,999,449	0,322303

Note: all coefficients are statistically significant at 1%, except those markets with *, which are significant at 5%.
Source: authors' computations.

Conclusions

Fiscal convergence appears as a necessity given the need of maintaining the health of public finances and the monetary sustainability at the EU level. The measures taken so far increasingly relate to the coordination and the supervision of the fiscal instruments in order to avoid the collapse of the single currency project and to strengthen the present initiatives for the economic integration. Therefore, the fulfilment of the Maastricht convergence criteria should become durable, which has been implemented already through the SGP reform and the launch of the fiscal compact.

The present study confirms the existence of the convergence for the fiscal variables not only for the EU-15 countries, but for the latest members of the EU in Central and Eastern Europe. The aim of this research was to cover some of the gaps found in the literature especially that the studies on the fiscal convergence are quite few. Therefore, we used three variables for expressing the fiscal convergence and we applied a similar methodology for identifying convergence in all the 27 EU countries. Moreover, our aim was to identify the differences or similarities between the new and old EU Member States as regards the fiscal convergence speed and the periods when the convergence was amplified.

The results of the panels confirm the existence of β convergence for all the groups of countries. Regarding the fiscal convergence criteria established through the Maastricht Treaty, we identify a similar behaviour:

the speed of convergence for both the budgetary deficit and the public debt is higher for the countries in EU-12 and in the period 1996-2003. This situation mirrors the divergent impact of the economic crisis on convergence at the whole EU level. We signal a lack of significance for the coefficient of convergence measured on the public debt for the EU-15 group of countries, the only case where we face such a situation.

The signal of convergence is also available for the fiscal pressure. This time, the highest convergence speed is found for the old EU member states for the period 2004-2012. Still, these results should be carefully interpreted, as they are partially due to the structural reforms or the austerity measures taken for tackling the economic crisis.

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