Openness to Globalization and Regional Growth Patterns in CEE Countries: From the EU Accession to the Economic Crisis*

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Introduction

In 1989, when central and eastern EU countries (CEE) opened their markets to global capital for the first time since the beginning of the socialist era, a profound process of institutional, social and economic reforms, aimed at reconversion to market economies, was launched. The first European Union enlargement was a further step towards economic integration, followed by the second wave of accession in 2007. Each period was characterized by clear patterns of economic growth accompanying the institutional reforms: a severe recession after the fall of the Iron Curtain, followed by an economic recovery and steady expansion from the late 1990s until the recent economic crisis.

The period of institutional reforms in the CEE countries was characterized by the long-term, contemporary acceleration of many parallel integration processes, which reinforced and integrated each other in multiple ways. For almost 30 years, international trade has been steadily growing at a rate double that of world gross domestic product (GDP). Foreign direct investments (FDI), in their turn, have grown at rates that are double those of international trade, and four times higher than world GDP. Most of these investments are directed towards developed countries (80 per cent in the years 1986–90, around 60 per cent in 1993–7) and seem particularly attracted by accelerations in economic integration processes (Camagni, 2002). Inward FDI in CEE countries grew at a yearly average rate of about 24 per cent between 1995 and 2009, compared with the 11 per cent average rate

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observed in EU-15 countries. In 2012, considering all EU-27 countries, the value of extra-EU trade flows was more than double that registered in 1999. In the same period, the share of imports and exports of CEE countries on the EU-27 total rose, respectively, from 5.2 to 9.3 per cent and from 2.8 to 8.1 per cent.

A large body of literature concerned with the effects of globalization on economic growth has pointed out its positive impact on countries' development, which has been interpreted as space invariant (Badinger, 2005; Giavazzi and Tabellini, 2005; Dreher, 2006; Gambardella *et al*., 2006; Gurgul and Lach, 2014). At regional level, on the other hand, the economic payoff of globalization is expected to be mediated by structural local assets and by a region's already established degree of openness. The huge theoretical heritage of the endogenous development literature – industrial districts, *milieux innovateurs*, production clusters – has long directed regional scholars' attention to the idea that local competitiveness consists in local tangible and, especially, intangible elements that influence the ways in which economic agents perceive economic reality, are receptive to external stimuli, can react creatively and are able to co-operate and work synergistically. The degree of openness of individual firms and their ease of access to international markets capture local actors' already established capacities to compete on global markets (Camagni, 2001; Scott and Storper, 2007).

These local features also matter when assessing the performance of regions in dealing with integration processes. In the case of CEE regions and their integration with the EU, several studies, even if with sometimes contrasting results, have suggested that geographical proximity to western markets (Gorzelak, 1998) and the attractiveness of FDI (Resmini, 2003; Eller *et al*., 2006) matter in explaining regional growth imbalances. Among the local peculiarities that may explain the regional effects of EU integration on regional growth, of particular importance is the general degree of openness to the global market that characterizes a region since this is a good indicator of its relative competitiveness and ability to face competition on international markets.

The purpose of this article is to determine the extent to which the regional degree of openness to globalization and structural characteristics jointly influence the growth advantages that CEE regions have derived from economic integration. Moreover, the article also seeks to understand the role played by the regional degree of openness to globalization in the presence of an external shock to local economies like the one represented by the recent financial crisis. In particular, the intention is to test whether the degree of openness to global markets enhances the economic payoffs of the integration process. Our expectations are the following. Given their competitive economic structure, open regions should be better able than the others to face international competition and to attract the largest flows of capital and labour. In a period of crisis, on the other hand, we do not have any *a priori* expectations, since two alternative logical assumptions can be formulated. Open regions may be more exposed to global macroeconomic trends, and they may therefore suffer, in the short run, the most intense economic slowdown. Nevertheless, in the long run they may achieve a faster recovery due to their capacity to convert their economic systems.

The article focuses on CEE regions. For the purpose of comparison, the same analysis is also run for EU-15 areas. With regard to the latter, we expect the impact of integration to be more balanced across different types of regions than it is in CEE countries since western areas have experienced a gradual process of change and opening to foreign markets.

The article is structured as follows. The next section reviews the literature on the impact of globalization and other forms of integration on economic growth. A definition of the institutional periods of our analysis is provided, jointly with some empirical evidence on the economic trends at national and regional level occurring in those periods. A method with which to identify different types of regions according to their degree of openness to the global world is presented. The later sections are devoted to an interpretative analysis performed in order to test whether regions with different degrees of openness to globalization have achieved different results in terms of GDP growth.

I. Globalization and Economic Development: The Need for a Regional Perspective

The role of globalization – and global markets more generally – in economic development has been assessed in a large body of research. According to a number of studies (for example, Rivera-Batiz and Romer, 1991; Soubbotina, 2004; Giavazzi and Tabellini, 2005), economic and trade liberalization is likely to foster GDP growth. Referring to the EU common market, Badinger (2005) claimed that if no integration had taken place, per capita GDP growth between 1950 and 2000 would have been one fifth lower.

Moreover, integration processes impose deep quali-quantitative changes on the structure of the economic systems involved (Panagariya, 1999). In the new international trade patterns, developing and emerging countries are increasingly the exporters of manufacturing goods. They thus force industrialized countries to shift their specialization towards high-quality goods and services (Kucera and Milberg, 2003; Bergoeing *et al*., 2004). A new composition of intermediate versus final goods traded at international level arises. It does so also as a result of new strategies by multinational firms (Hummels *et al*., 1998; 2001; Hanson *et al*., 2005), new location patterns of FDI and the consequent new growth opportunities for developing economies (Lall and Narula, 2004; Moran *et al*., 2005; Hansen and Rand, 2006). Migration trends and international trade flows (Lucas, 2008) are enhanced. From the perspective of the above-mentioned studies, globalization can be regarded as neutral in its spatial effects: opportunities and threats may seem equivalent and specular. There are, however, a number of good reasons for claiming that a regional perspective is fundamental for understanding the real economic effects of globalization, and that conceptual and empirical analyses at regional level are crucial (Cooper *et al*., 2007).

Globalization provides greater access to other countries' markets and resources, while granting other countries greater access to the European market. Overall, this process is mutually beneficial. However, the benefits are not evenly distributed across the European territory and economic sectors; and the consequence of increasing globalization is the creation of additional pressure on local economies obliged to face tougher competition (Cooper *et al*., 2007).

Open regional economies are theoretically more dependent on innovation (required to face competition, and at the same time generated by linkages with international firms; Gorodnichenko *et al*., 2008); on the presence of high-value functions as important factors in attracting further high-value functions (Kenney and Florida, 2004); on the high-quality human capital that allows control to be maintained over the processes of tasks unbundling at the international level which de-localize mostly low-value tasks (Baldwin, 2006); on the attraction of FDI, which is expected to be growth-enhancing by enabling the incorporation

of new inputs and foreign technologies into the production function of the recipient economy, and by increasing the productivity of already existing input factors of the recipient economy through labour training and skill acquisition (Borensztein *et al*., 1998; De Mello, 1999; Beugelsdijk *et al*., 2008).

II. Economic Growth and Processes of International Integration: Specificities of the Present Study

After the fall of the Iron Curtain, the CEE countries had to undertake large-scale programmes of political, social and economic reforms. These changes occurred in a context of general economic integration. In fact, on the one hand, the EU enlargement programme was launched (all CEE countries applied to become EU members between 1994 and 1996), strongly supported by the European Union. On the other hand, the globalization of the world economy was characteristic of this historical phase.

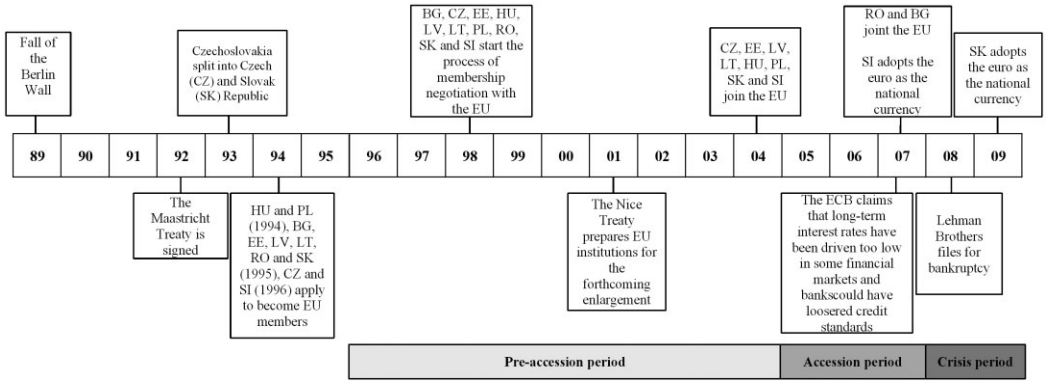
Many works in the literature have analyzed how openness to international markets impacts on economic growth in the presence of ongoing EU integration processes. Several studies on the CEE countries have highlighted the contribution to economic development of international trade (Awokuse, 2007; Singh, 2010), FDI (Resmini, 2003) and proximity to western markets (Gorzelak, 1998). The findings in this literature are contradictory, and it is difficult to determine a clear causal effect between openness and growth. More in detail, most of these analyses suffer from some specific drawbacks. First, an economy's degree of openness is usually assessed on the basis of FDI and trade flows, which are sensitive to the economic cycle, especially in integrated capital markets. Second, some studies have pointed out that the impact of openness is likely to change when different periods (Lipsey and Sjöholm, 2005) and countries (Nicolini and Resmini, 2010) are considered. Third, apart from a few exceptions, empirical evidence is discussed at country, rather than regional, level. Finally, global and European integration processes are analyzed jointly, so it is not possible to analyze the synergic effects that the two processes might exert on each other in terms of economic payoffs.

The present article adopts this framework in order to assess the impact of European integration on regional economic growth for regions with different degrees of openness to globalization. Compared with the previous literature, however, it tries to overcome the drawbacks just discussed. First, it eschews measurement of globalization through pure economic indicators, like FDI and trade flows, since these are subject to cyclical effects. It seeks to add to the economic aspects the structural elements behind the degree of globalization of regional economies – such as regional industrial specialization in open sectors, attractiveness, accessibility, presence of high-value functions – that are stable at least in the short to medium run and whose change requires long-term mechanisms of accumulation or deprivation. Moreover, a diachronic analysis is developed since the effect of openness on economic development is not expected to be stable over time.

The analysis is partitioned into three institutional periods defined by the main institutional changes that occurred in CEE countries between 1995 and 2007.[1] Figure 1 reports

[1] The administrative regional boundaries in NMS were defined, consistently with the NUTS classification, in 1995. Hence, regional data previous to that year are not available.

Figure 1: The Three Institutional Periods



Source: Authors' own calculations.

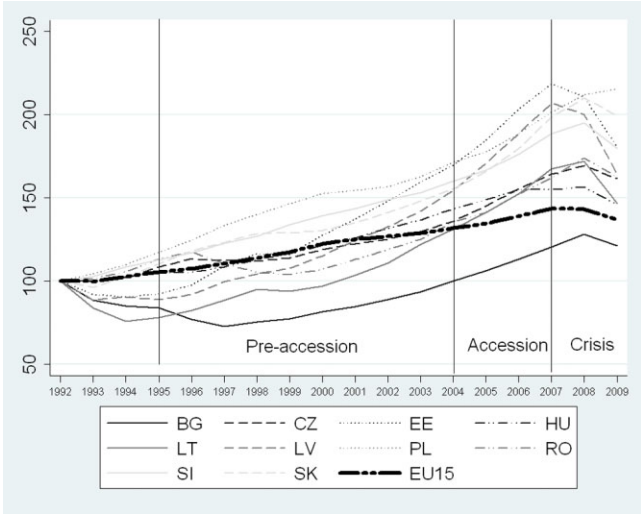
the three periods with the main events that occurred over time. The first period is represented by the so-called '*pre-accession* period' (1995–2004). All CEE countries[2] applied to join the EU between 1994 and 1996. The first phase is therefore characterized by intense economic restructuring (Kaminski and Ng, 2005) and political changes aimed at preparing for accession to the EU. The second stage – labelled the '*accession* period' (2004–7) – is found between the two EU enlargements, while the third one – the '*crisis* period' (2007–9) – is defined by two distinct events: the further enlargement of the EU, joined by Romania and Bulgaria; and the generalized economic slowdown generated by the recent financial crisis. The first two periods are therefore characterized by the process of EU integration, whose strength increased after the first wave of accession. In the third phase, the process of integration is still ongoing, but it is associated with an external shock.

The three periods have different time spans. The first lasted for nine years, while the second and third did so for three and two years, respectively. This periodization is justified by the fact that each is characterized by institutional breaks, as well as by clear economic growth patterns. Figure 2 shows the evolution of national GDP taking 1992 as reference year. Following the severe post-communist recession, in the first institutional period most CEE countries experienced a steady growth in GDP, with the exceptions of the two EU latecomers, Romania and Bulgaria. This trend strengthened between 2004 and 2007, while the first effects of the crisis are visible in the last two years.

Another peculiarity of our analysis with respect to the limits of the previous literature is that it is run at regional level so as to take account of the variety of regional growth patterns within each CEE country. The importance of this issue is illustrated by the evidence reported in Table 1, which shows the deviation from the country means of employment and productivity growth rates in the three institutional periods defined in the introduction.

[2] Croatia joined the EU in 2013 and is not considered in the analysis.

Figure 2: Real GDP Growth Rates in CEE Countries (1992 = 100)



Source: Authors' own calculations.

Table 1: Employment and Productivity Growth Rates: Deviation from the Country Means (Set to 0) in the Three Institutional Periods

					Employment growth			
	Western Europe				*CEE Countries*			
Period	*Mean*	*Variance*	*Skewness*	*Kurtosis*	*Mean*	*Variance*	*Skewness*	*Kurtosis*
1995–2004	–0.015	0.006	–0.027	7.181	–0.004	0.009	1.039	4.810
2004–2007	–0.014	0.001	–0.046	2.587	–0.007	0.002	–0.262	3.774
2007–2009	0.001	0.001	0.396	3.869	0.000	0.001	–0.182	4.855
Observations		207				51		
					Productivity growth			
	Western Europe				*CEE Countries*			
Period	*Mean*	*Variance*	*Skewness*	*Kurtosis*	*Mean*	*Variance*	*Skewness*	*Kurtosis*
1995–2004	0.008	0.011	–0.331	9.117	–0.039	0.102	–0.343	5.114
2004–2007	0.009	0.003	–0.570	4.994	–0.012	0.006	0.135	2.759
2007–2009	–0.002	0.001	–0.497	10.574	–0.010	0.002	0.182	2.497
Observations		207				51		

Source: Authors' own calculations.

In CEE regions, the regional deviations from the national values are much larger than those observed in western countries, even if they are decreasing over time. This applies in particular to the productivity growth rate. This evidence suggests that economic growth in CEE countries has been boosted, especially in the first phases of transition, by a group of leading regions. Some other territories achieved performance definitely below the country mean. Regions with a higher degree of openness to global markets are expected to belong in the first group. The divergences among the employment and productivity growth rates

of CEE regions diminished in the second and third institutional periods. This finding can be explained by the assumption that less open areas made up some of their shortfall in economic development.

Last, but not least, our analysis focuses on the synergic effects that regions can enjoy between the different degrees of openness to external markets: in particular, the peculiarity of the present study is that it highlights where a region's capacity to compete on international (global) markets can explain the economic payoffs that it obtains from EU integration. Thanks, on one hand, to a taxonomy of the degree of openness to global markets of EU regions and, on the other, to the definition of different phases in which EU integration of CEE countries has taken place, the analysis seeks to capture the economic impact of the two types of integration. The next section presents the taxonomy for identification of the degree of openness to global markets.

III. Openness to Globalization: A Taxonomy of EU Regions

The classification of EU regions according to their degree of openness to globalization follows the taxonomy proposed by Capello *et al*. (2011). The dimensions used to identify the degree of openness of regions – capturing structural regional characteristics, stable in the short term, so as to avoid correlation with the business cycle – derive from two main streams of literature: the first is concerned with territorial/functional aspects, and the second with economic aspects of the local economy (Table 2). The former strand of analysis identifies the competitive advantages of regions undergoing global processes in the presence of a large city in which the international headquarters of multinationals, high-value service functions (like international-level finance and insurance), intense agglomeration economies (Gordon, 2002) and high-qualified human capital attracted from outside find an efficient location thanks to agglomeration externalities and physical accessibility. This idea stems from a well-defined body of studies (Friedmann, 1986; Sassen, 1991; Scott, 2001; Taylor *et al*., 2007). 'World cities', as they are termed by Friedmann (1986), are those cities at the top of a world city hierarchy. The 'global cities' described by Sassen (1991) are major cities that are strategically global in their function, while Scott's (2001) 'global-city regions' are those in which economic (and social) development is linked to a global rather than a national growth pattern. The feature shared by all these concepts is the idea that one way to be integrated into the global economy, and to gain advantages from it, is to have international high-value functions, qualified human capital, increasing returns in production activities and physical accessibility.

Table 2: Taxonomy of Regions According to Their Degree of Integration into Global Markets

	Functional/territorial dimension: Openness to external world outside Europe	
	Above average	*Below average*
Economic specialization:		
Specialization in open growing sectors	1 Global players	2 Regional players
De-specialization in open growing sectors	4 Pure gateways	3 Local players

Source: Authors' own calculations.

The second dimension on which to measure a local economy's degree of integration into the world market is a purely economic one captured by the degree of that local economy's specialization in activities that are particularly open to international markets. This dimension explains the capacity of a region to grow by virtue of the presence within it of dynamic open sectors. It captures a MIX effect of a traditional shift-share analysis (Perloff, 1957; Perloff *et al*., 1960).

On the basis of these two approaches, global players are identified as:

- regions with high functional/territorial integration with global processes; and
- regions with high market integration – that is, specialized in competitive and dynamic open sectors (that is, those in search of new markets, more open to competition and better able to gain advantages from world competition).

Only those regions well endowed with physical connections and the appropriate specialization in competitive and dynamic sectors have the potential to be global players. On the basis of these two dimensions, four main theoretical regional types are identified:

1. Global players. These regions are structurally open and have all the necessary physical and functional linkages with the rest of the world. Moreover, they are specialized in sectors which are open and growing, so that their role in world trade flows and FDI attractiveness is maximum. The openness to global markets is expected to enhance the impact of integration processes.
2. Regional players. These regions are specialized in open growing sectors but have below-average physical and functional connectedness with other areas in the world. They are expected to take advantage of their specialization, but they are also expected to be somewhat penalized with respect to global regions because their good sectoral mix does not take advantage of a strong and efficient territorial settlement structure, and does not exploit the agglomeration advantages guaranteed by a city-region.
3. Local players. This category consists of regions which have neither the functional/territorial elements to connect with the world nor the appropriate specialization in open growing sectors. These regions are rather peripheral to globalization processes. Trends that pertain to integration processes are expected to be limited in this category. We label them 'local' players because their markets are expected to be local – that is, normally limited to their own region and, possibly, country.
4. Regions in the last category are characterized by puzzling behaviour. They are areas with structural openness, but are specialized in closed sectors. This strange behaviour does not appear to exist in reality.[3]

Empirically, the creation of an indicator of openness (defining the regions falling in the left and right quadrants of Table 2) arises from a principal component analysis (PCA) on five relevant indicators: attraction of foreign labour, integration of a region with global networks, presence of value-added functions, attraction of international high-value functions and attraction of extra-EU capital. The economic dimension of globalization is measured through the industrial specialization of regions in open and growing sectors. Given the lack of data at regional level on trade-by-sector for all NUTS2 regions in Europe, identification of the industrial specialization has followed the logic of identifying

[3] More methodological details are available in Fratesi (2011).

open sectors and attributed them to regions according to the regional industrial specialization on the assumption that each open sector has the same propensity to openness in whatever region it is located.

Based on both these two dimensions, EU-27 regions were assigned to the appropriate group (Table 2).

IV. Openness to Globalization, EU Integration and Regional Growth: A Descriptive Analysis

Table 3 presents the average annual real GDP growth rates in two periods of time of global, regional and local players as well as the results of a test to determine whether these growth rates are significantly different. The descriptive analysis shown in Table 3 was replicated across all three of the institutional phases and separately for CEE and EU-15 countries.

In the pre-accession period, global players significantly out-performed the other types of regions in terms of real GDP performance. In particular, this was the case for CEE regions, while in western countries the difference with respect to the other groups of areas is not statistically significant. In both blocs, regional players are the second performers. This evidence is confirmed for the accession period (2004–7). While the economic performance of EU-15 regions is roughly comparable with the one of the first period, the GDP growth rates of CEE countries exhibit a sharp increase, spread across all the types identified in the previous section.

The effect of the financial crisis is clearly visible in the last period, marked by the stagnation of European economies. Interestingly, resilience to the crisis is significantly linked to the degree of openness to international trade and investments, but only in CEE, where global regions are associated with the most severe slowdown in GDP growth.

The results presented in Table 3 are consistent with those shown in Table 1 and pointing out how the performance of globally open regions explained most of national growth of CEE countries, while the economic performance within the Old Member States is more spatially diffused among different types of regions. Even if this descriptive

Table 3: Growth Performance of EU Regions in the Three Institutional Periods

	Global players	*Regional players*	*Local players*	*F*
EU-27 regions				
Pre-accession period	3.15	2.55	2.27	6.68***
Accession period	3.79	3.16	2.59	6.12***
Crisis period	−2.02	−1.41	−2.23	0.94
CEE regions				
Pre-accession period	5.41	2.64	2.17	18.36***
Accession period	8.43	4.64	4.19	13.40***
Crisis period	−1.37	−0.26	−0.40	2.86*
EU-15 regions				
Pre-accession period	2.68	2.52	2.29	1.27
Accession period	2.83	2.66	2.24	2.99*
Crisis period	−2.16	−1.79	−2.62	0.62

Source: Authors' own calculations.
Note: *** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$.

evidence suggests a positive relationship between openness to globalization and economic growth, this issue calls for an interpretative analysis so that account can be taken of all the structural local assets fostering regional development.

V. Openness to Globalization, EU Integration and Regional Growth: An Interpretative Analysis

A Regional Growth Model

This section reports an interpretative analysis conducted on the link between the degree of globalization and regional growth, after controlling for some endogenous factors that, in light of the literature, are expected to promote economic growth in different periods characterized by different intensities of EU integration. To this end, openness to globalization was inserted into a regional growth model, together with control variables. The model therefore explains the regional growth rates with explanatory variables belonging to the following groups:

- a set of dummies representing the taxonomy of regions defined on their degree of openness to globalization;
- control variables – namely knowledge and innovation creation – that in the interpretation of a modern economic pattern of growth are recognized in well-established economic theory as having an important role in regional growth. Factors directly linked to the accumulation of knowledge and innovation have become the main sources of growth. Examples include the extensive literature on human capital (Lucas, 1988), and on the impact of research and development investment on productivity (Bronzini and Piselli, 2009);
- control variables taken from the literature that highlights the territorial conditions enabling innovation and knowledge creation to take place. Innovation processes cannot be replicated with the same intensity in any local environment. Knowledge accumulation is deep-rooted in the socio-economic, cultural and institutional characteristics of places, so that there are some places that are much more innovation-prone than others. Many studies have sought to identify innovation-enabling factors, like trust and sense of belonging, that allow the sharing of ideas and knowledge (Becattini, 1987; Camagni, 1995; Capello and Faggian, 2005; Iyer *et al*., 2005) and atmosphere effects typical of urban areas (Pred, 1965; 1977);
- finally, as a further control, per capita GDP was added in order to take convergence effects into account (Artelaris *et al*., 2010; Monastiriotis, 2011; Petrakos *et al*., 2011).

The proxies employed in our analysis are summarized in Table 4, jointly with the source of the data and the reference in the literature linking each variable to economic growth.

The estimated model took the following form:

$$\Delta GDP_r = \beta_0 + \beta_1 \lambda_g + \beta_2 high\_educ_r + \beta_3 patents_r + \beta_5 LUZ_r + \beta_6 phys\_accessibility_r + \beta_7 social\_capital_r + \beta_8 percapita\_GDP + \gamma_C + u_r \quad (1)$$

where the dependent variable (average annual regional growth rate) is regressed on the set of dummies (λ_g) identifying the three ($g = 1, \ldots, 3$) groups of regions defined by their

Table 4: Territorial Assets: Variables, Sources and Description

Group	*Name*	*Description*	*Source*	*Reference*
1	Openness to globalization	Taxonomy of global players, regional players and local areas	Capello *et al*. (2011)	See Section II.
2	High education	Highly educated professionals over manual workers	ISCO	The role of human capital on economic growth was pointed out by a broad literature (Lucas, 1988; Barro, 1991). Evidence from eastern Europe is extremely scarce.
2	Patents	Patents application to the European Patent Office (EPO) per million inhabitants	Eurostat	Several works (Bilbao-Osorio and Rodríguez-Pose, 2004) focused on the role of research and development on regional economic growth. A focus on eastern economies is provided by Radosevic (2002).
3	Share of urban population	Share of residents living in a Larger Urban Zone (LUZ) on regional population	Eurostat	The variable is aimed at capturing urbanization economies.
3	Social capital	Share of people interested in politics	European Value Survey	The inclusion of this regressor is based on Putnam (1993). Some evidence on the poor endowments of eastern regions in terms of social capital is provided by Howard (2003).
4	Per capita GDP	Per capita GDP	EUROSTAT	This topic has been addressed by a broad literature focused on the catching-up process of CEE countries with respect to western Europe (Artelaris *et al*., 2010; Monastiriotis, 2011; Petrakos *et al*., 2011).

Source: Authors' own calculations.

degree of openness to globalization, and on a set of variables belonging to the previous groups of assets that can explain growth, measured at the beginning of each institutional phase[4] for the NUTS2 regions ($r = 1, \ldots, 256$). The unobserved homogeneity within countries was controlled for through country fixed effects (γ_C).

Equation (1) was estimated for each institutional period so as to show the relationship between openness to globalization and economic growth in different institutional and economic phases. The choice of the specification of the model crucially depended on the degree of spatial autocorrelation dealt with in the econometric exercise presented in the next section.

Empirical Results

The goal of this section is to shed some light on the effect of globalization in the three institutional periods, pointing out its role in CEE regions compared with EU-15 areas. Estimates are based on the model specification described in the Equation (1). Compared with the latter, the first step of the analysis was estimation of a restricted specification of the model including only the set of endogenous territorial factors. At this stage, exclusion of the taxonomy measuring openness to globalization made it possible to check for potential multicollinearity and endogeneity in the econometric results. We will refer to this model as 'model *a*'. As a second step ('model *b*'), the classification of regional openness to globalization was added to the model specification, treating CEE and EU-15 areas separately, as in Table 3, to show the role of openness to international markets in each block. Finally ('model *c*'), interactions between CEE global players and the set of endogenous factors were included in order to investigate the role of these elements in this subset of regions. These three models (*a*, *b* and *c*) were estimated for each institutional period.

A potential source of bias was represented by the issue of spatial dependence. This was addressed by running for each cross-sectional model a spatial autocorrelation test on the results of the OLS regression. Lagrange Multiplier test statistics are reported in Table 5.[5] Interestingly, the extent of spatial autocorrelation is higher in the second and third institutional periods compared with the first one. Nevertheless, this finding is not completely unexpected given the output reported in Table 1. LR tests contrasting different model specifications suggested the choice of Structural Regression Models (SEM) for the first[6] and the third institutional periods and Spatial Durbin Models (SDM) for the second one. The regression results are reported in Table 6, which conveys the information reported hereafter.[7]

First, conceptually some multicollinearity could be expected between territorial assets and the dummies explaining the degree of openness, since the latter could be due to the presence of the former. Empirically, the results of model *a* with the sole territorial assets variables are instead consistent with the other models estimated by introducing also the dummy for the degree of openness, thus testifying to the absence of multicollinearity. In CEE regions, the openness to global markets is linked to higher GDP growth rates, at least

[4] All independent variables were lagged in order to reduce problems of endogeneity and reverse causation.

[5] The spatial weight matrix adopted was a matrix of distances between regional centroids. The same result holds when assuming distance decay matrices.

[6] Apart from model *a*, where the spatial models did not perform significantly better compared with OLS.

[7] As a consistency check, a GMM model was estimated in order to test potential departures from normality. The results were consistent with those in Table 6. The results of the GMM are available from the authors upon request.

Table 5: Diagnostic tests for spatial dependence in OLS regression

	Pre-accession period			*Accession period*			*Crisis period*		
	[a]	*[b]*	*[c]*	*[a]*	*[b]*	*[c]*	*[a]*	*[b]*	*[c]*
Spatial error									
Moran's I	0.003	0.008	0.011*	–0.029***	–0.026**	–0.022**	–0.131***	–0.126***	–0.125***
Lagrange Multiplier	0.090	0.726	0.928	6.406**	5.175**	3.629*	132.749***	123.032***	121.074***
Robust Lagrange Multiplier	1.645	2.545	3.035*	0.858	2.465	1.066	38.073***	25.275***	18.289***
Spatial Lag									
Lagrange Multiplier	0.612	0.174	0.203	6.153**	2.734*	2.634	107.849***	104.932***	106.282***
Robust Lagrange Multiplier	2.166	1.993	2.311	0.605	0.024	0.071	13.172***	7.175***	3.497*

Model [a]: only territorial assets as explanatory variables.
Model [b]: the taxonomy of regional openness to globalization is added to model [a].
Model [c]: interactions between territorial capital assets and global CEE regions are added to model [b].
Note: *** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$.

Table 6: Openness to globalization, endogenous factors and economic growth in the three institutional periods – regression results

	Pre-accession period			***Accession period***			***Crisis period***		
	OLS [a]	*SEM [b]*	*SEM [c]*	*SDM [a]*	*SDM [b]*	*SDM [c]*	*SEM [a]*	*SEM [b]*	*SEM [c]*
Global players (CEE)		0.028***	0.067***		0.039***	0.053***		0.012	0.042
Global players (EU15)		0.001	0.001		−0.001	−0.002		0.008	0.012
Regional players (CEE)		0.002	0.002		0.008*	0.007		−0.001	−0.002
Regional players (EU15)		0.002	0.002		0.001	0.001		0.000	−0.000
High education	0.013***	0.012***	0.014***	0.003	−0.005	−0.003	0.002***	0.018**	0.022***
Patents	0.288***	0.299***	0.341**	0.037	0.091	0.089	0.087	0.045	0.169
Share of urban population	0.002***	0.002***	0.002***	0.002**	0.002**	0.002**	0.000	−0.000	−0.000
Social capital	0.016	0.011	0.011	0.011	0.012	0.012	0.053***	0.052***	0.049***
Interactions for CEE global regions									
CEE global players • High education			−0.085***			−0.014			−0.025
CEE global players • Patents			−0.008			−0.012			−0.316
CEE global players • Social capital			−0.034			0.003			−0.034
Per capita GDP	−0.190	−0.246*	−0.245*	0.112	0.190	0.232	−0.242	−0.356	−0.413
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	0.046***	0.049***	0.048***	0.062	0.111	0.057	−0.041	−0.035	−0.036
Observations	256	256	256	256	256	256	256	256	256
R-squared	0.607								
Squared correlation		0.687	0.708	0.651	0.716	0.744	0.181	0.174	0.181

Dependent variable: annual average GDP growth in the three institutional periods.
Note: *** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$.

in the pre-accession and accession period. This evidence is consistent with our initial assumptions. Regions connected to global markets benefited most intensely from the ongoing EU integration process. They were able to convert their economic systems and face international competition a few years after the collapse of the socialist regimes. This mechanism was independent from the territorial elements employed as controls in the empirical analysis. In fact the latter, as expected, had a positive impact on economic growth (model *a*), which did not change once the taxonomy of open regions had been introduced. This result held for the first two institutional periods, but not for the crisis one. In this case, the taxonomy of regions did not suggest any link between the openness to international markets of CEE areas and economic development.

It is worth noting that, when faced by an external shock like the one represented by the financial crisis, the explanatory power of the model significantly diminishes as the GDP trend is mainly explained by exogenous factors.

Another comment concerns the interactions between the endowments of territorial assets and CEE global players. As reported by model *c* in the three institutional periods, the only significant interaction is the one involving human capital. Its negative sign implies that the overall positive impact of this territorial element decreases when considering only the subset of CEE global regions. Although this result requires further investigation,[8] it suggests that the efficiency of CEE global players does not rest on human capital. The source of their economic performance is their sectoral specialization jointly with a high territorial integration with international markets. These characteristics made it possible to mediate and enhance the outcome of the integration process.

Again with regard to CEE countries, regional players show a positive and statistically significant coefficient in the accession period. Nor is this result surprising, since the areas included in this category are those whose degree of openness to foreign markets is restricted to the EU but extends beyond domestic borders. Hence, they were presumably able to benefit from the first EU enlargement.

The findings summarized above are not verified for EU-15 countries. In this case, none of the regional types has a statistically significant impact on GDP growth. One explanation for this result concerns the intensity of the integration process that occurred in the two blocs. In the period analyzed, CEE countries underwent much greater change than did their western counterparts. Openness to international markets can be interpreted as a success factor for regions undertaking transition from a planned to a market economy. On the other hand, its impact on economic growth in developed countries is less significant because their macro-economic trend is expected to rely more on exogenous factors, such as the demand in global markets.

Conclusions

This article has examined an issue only incidentally addressed in the literature: the role of openness to globalization on the economic growth of CEE countries on the road to EU accession and until the most recent years. The findings convey some interesting information. First, global regions led economic growth in CEE countries during the pre-accession period. The profound industrial reorganization that occurred in this phase enabled the

[8] To be noted is that, as pointed out by several other works (Capello *et al*., 2008), the western and eastern blocs followed completely different patterns of growth.

regional players to compete with the globalized areas immediately after the first EU enlargement. In the case of an external shock, like the one represented by the recent financial crisis, the extent of openness to foreign markets loses its capacity to explain the growth differentials across CEE regions. The second conclusion concerns the reasons for the distinctive performance of global regions. In principle, these areas are assumed to have access to external sources of innovation and knowledge accumulation. In particular, global players apparently import knowledge (by way of FDI and trade), rather than accumulating it through internal mechanisms.

This study has been a first attempt to determine the impact of important driving forces of growth, such as openness to international markets, in different institutional periods in CEE regions. Its limitations are due to the number of explanatory variables available in a time series for all NUTS2 EU regions. Future research should seek to expand the regional database so as to highlight other specific elements that can explain economic growth in CEE countries.

Some policy implications can be drawn from our analysis. Our results suggest that globally open regions fostered CEE economic growth in the first phase of transition which led to EU accession. This unbalanced pattern, however, attenuated over time, and the accession period was characterized by the emergence of what we labelled 'regional players'. Therefore, future regional growth policies in CEE regions should concentrate not only on global regions, but also on those areas with a lower degree of globalization and characterized by the presence of second-rank cities.

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