Working Paper Series
GRINCOH
Growth-Innovation-Competitiveness
Fostering Cohesion in Central and Eastern Europe
Serie 1
Growth, structural change, development

Paper No. 1.11

Globalization and Growth Patterns in Eastern European Regions: From the Transition Period to the Economic Crisis

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2013

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This paper was funded under the FP7 project "Growth– Innovation – Competitiveness: Fostering Cohesion in Central and Eastern Europe (GRINCOH)" under the Programme SSH.2011.2.2-1: Addressing cohesion challenges in Central and Eastern Europe; Area 8.2.2 Regional, territorial and social cohesion. Project Nr. 290657

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Please cite as:
Capello R., Giovanni P., (2013), 'Globalization and Growth Patterns in Eastern European Regions: From the Transition Period to the Economic Crisis', GRINCOH Working Paper Series, Paper No. 1.11

Globalization and Growth Patterns in Eastern European Regions: From the Transition Period to the Economic Crisis

Abstract

Globalization is certainly not a new phenomenon, and in many periods of the last century it reached very high levels, even comparable with those of today. What is new is the long-term, contemporary acceleration of many parallel integration processes, which reinforce and integrate each other in multiple ways. In 1989, when Eastern EU countries opened their markets to global capital for the first time after the beginning of the socialist era, a deep process of social and economic integration was launched. These programmes led to an intensification of trade and international investments: in the last decade of the 20th century EU countries received more than 50 percent of world FDI. The intensity of this process calls for analyses on its role in different historical periods for Eastern regions. In particular, it is interesting to understand the role that the globalization process played in different institutional periods, from the early stage of transition of Eastern Europe to the recent economic crisis.

Content

Abstract 1
Content 1
1. Introduction 2
2. The performance of regions with a different degree of openness 4
2.1. Globalization and economic development: regional perspectives and testable hypotheses 4
2.2. A categorization of European regions based on their openness to globalization 5
3. Globalization as a driver of regional growth: an interpretative approach 9
4. Globalization and economic growth: an interpretative analysis 11
4.1. The impact of globalization in different institutional periods 11
4.2. The impact of globalization in different Western and Eastern regions 14
Conclusions 16
References 17

1. Introduction

Globalization is certainly not a new phenomenon, and in many periods of the last century it reached very high levels, even comparable with those of today. What is new is the long-term, contemporary acceleration of many parallel integration processes, which reinforce and integrate each other in multiple ways. For almost thirty years, international trade has been steadily growing at a rate which is double that of world GDP. Foreign direct investments (FDI), in their turn, have grown at rates which are double that of international trade, and four times higher than world GDP. Most of these investments are directed towards developed countries (80 percent in the years 1986-1990, around 60 percent in 1993-97) and seem particularly attracted by accelerations in economic integration processes (Camagni, 2002). Evidence in this direction is provided by the last 20 years of European history.

In 1989, when Eastern EU countries opened their markets to global capital for the first time after the beginning of the socialist era, a deep process of social and economic integration was launched. These programmes led to an intensification of trade and international investments: in the last decade of the 20th century EU countries received more than 50 percent of world FDI (UNCTAD, 1997).

The intensity of this process calls for the analysis of its role in different historical periods for Eastern regions. In particular, it is interesting to understand the role that the globalization process played in different institutional periods, from the early stage of transition of Eastern Europe to the recent economic crisis[1].

The aim of this paper is to investigate the role of globalization in different periods through which Eastern countries went, defined by generalized macroeconomic trends and by the main institutional changes on the road to EU integration. Even if all Eastern countries applied between 1994 and 1996 to become members of the EU, each of them adopted a peculiar programme of reforms to manage the transition to a market economy (Godoy and Stiglitz, 2006). As a consequence, some of them joined the EU in 2004, while Romania and Bulgaria became NMS three years later. The present analysis is partitioned in three institutional periods and the impact of globalization on economic growth is assessed for each phase. The first one is represented by the so-called *transition period* (1995-2004), in which the most intense changes and reforms have occurred. The second stage – renamed as the *accession period* – is included between the two EU enlargements (2004-2007), while the third one (the *crisis period*, 2007-2009) is defined by two distinct events. The first one refers to the further enlargement of the EU, joined by Romania and Bulgaria. The second event is represented by the generalized economic slowdown generated by the recent financial crisis.

Moreover, it is interesting to analyse the effects of globalization in Eastern countries characterized by different political, social and economic framework conditions when compared with Western Europe. In the last 20 years massive public interventions reduced, but did not eliminate, the gap in the endowment of physical infrastructures between the two blocks. Moreover, structural reforms in Eastern Europe led to differentiated degrees of privatization and liberalization (Falcetti et al., 2002). Therefore, the analysis of the effect of globalization on regional growth must account for these differences. In the present paper this issue is addressed in two ways. First of all the effect of globalization is analysed separately for Eastern and

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

Western countries[2]. Secondly, beyond the extent of openness to the global economy, regional growth is interpreted in connection with the local endowment of some specific endogenous factors pointed out in the relevant literature.

At the empirical level, the main difficulty is the identification of "global regions". Globalization is not an unequivocally defined process, directly measurable through official statistics like GDP or international trade, or indirectly computable through single figures on migration and population ageing; it is a multifaceted synthesis of a vast number of factors of different nature – economic, social, technological, and institutional – difficult to find in official data. Moreover, globalization is not a state of the world economy, but a process involving social, institutional, economic and technological changes bundled together in such a way that a clear distinction between causes and effects is difficult to draw (CEC, 2009).

In the context of this paper, globalization is mainly interpreted as a process of internationalization of production and markets which can take various forms – like increasing international trade or increasing foreign direct investments – all of which give rise to the growing integration and interdependency of European economies with other main world economies. According to this definition of globalization, its impacts are mainly of an economic nature and associated with long-run structural changes in the economy caused by the integration and internationalization of production and markets.

Few works have been devoted to the analysis of globalization processes from a regional perspective. Polasek and Sellner (2011) focused on the impact of exports, imports and FDI inward flows on GDP growth in EU27 regions. Their findings show decreasing growth elasticity for globalization as GDP per capita rises. Still concerning EU regions, Badinger and Tondl (2005) interpreted trade flows as a source of technology and knowledge transfer, linked to higher GDP growth rates. The literature devoted to the development of Eastern regions implicitly dealt with globalization, pointing out the major role, as growth determinants, of FDI (Tondl and Vuksic, 2007; Eller et al., 2006; Resmini, 2003), of accessibility to Western markets (Gorzelak, 1998) and of the presence of capital cities (Kallioras and Petrakos, 2010).

Compared with these contributions, the innovative aspect of the present paper relies in a clear distinction between intra and extra-European internationalization processes. Being globalization defined just by the latter, this work is expected to shed some light on an issue only marginally inspected in the literature.

The structure of the paper is as follows. The next section (section 2) briefly reviews some literature on globalization, pointing out its expected role on economic growth. An operational way to identify different kinds of regions according to their degree of openness to the global world is presented. The taxonomy will turn to be useful for our empirical analysis given the different growth patterns characterizing the different groups of regions (section 2.3). The paper then shows an interpretative analysis, run with the aim to test whether regions with different degrees of openness to the world economy perform differently (sections 3 and 4).

[2] The data set covers 259 NUTS2 regions. Overseas French departments (Guadeloupe and Martinique), the Azores, Madeira and the Canaries are not included in the analysis.

2. The performance of regions with a different degree of openness

2.1. Globalization and economic development: regional perspectives and testable hypotheses

Much theoretical and empirical work has been developed on globalization, trying to capture different effects of the quali-quantitative changes imposed by the integration of markets through either multilateral or "regional" liberalization policies (Panagariya, 2000); new international trade patterns which see more and more developing and emerging countries as exporters of manufacturing goods, thus forcing industrialized countries to change their specialization towards high quality goods and, mainly services (Bergoeing et al. 2004; Kucera and Milberg, 2003), new composition of intermediate *vs.* final goods traded at international level, also as a result of multinational firms' new strategies (Yi, 2004; Hummels et al., 1998 and Hummels et al. 2001; Hanson et al. 2005), new location patterns of foreign direct investments and consequent new growth opportunities for developing economies (Hansen and Rand, 2006; Lall and Narula, 2004; Moran et al., 2005), migration trends and international trade flows (Soubbotina, 2004; Lucas, 2008), represent some of the main issues treated in the recent literature. From the perspective of the above mentioned studies, though, globalization can be regarded as neutral for what concerns its spatial effects: opportunities and threats may look equivalent and specular. A number of good reasons exists, however, for claiming that a regional perspective is instead fundamental in order to understand the real economic effects of globalization, and that conceptual and empirical analyses at regional level are fundamental (Cooper et al., 2007; Capello et al., 2011).

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 to attract additional high-value functions (Kenney and Florida, 2004); on high quality human capital, that allows keeping control over processes of tasks unbundling at the international level, that de-localize mostly low-value tasks (Baldwin, 2006); on the attraction of FDI, expected to be growth-enhancing by allowing the incorporation of new inputs and foreign technologies in 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 (Beugelsdijk et al., 2008; Borensztein et al, 1998; De Mello, 1999).

Based on these considerations, what is the expected role of globalization in Eastern regions, and how is it assumed to vary across time? Table 1 could be useful in order to formulate some hypotheses. The table reports the deviation from the country means of employment and productivity growth rates in the three institutional periods defined in the introduction. In Eastern regions, the regional deviations from the national values are larger than the ones observed in Western countries, even if decreasing in time. This applies in particular to the productivity growth rate.

These results suggest that economic growth in Eastern countries has been boosted, especially in the first phases of transition, by a group of leading regions. Some other territories, more heavily involved in a

process of industrial reorganization, obtained a performance definitely below the country mean. Globalized regions are expected to pertain to the first group: a stable economic system, jointly with a minimum degree of market liberalization, is a precondition for the attraction of foreign investments and for the openness to international markets.

Table 1. Employment and productivity growth rates: deviation from the country means (set equal to 0) in the three institutional periods

Employment growth								
	Western Europe (obs.=207)				*Eastern Europe (obs.=51)*			
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
Productivity growth								
	Western Europe (obs.=207)				*Eastern Europe (obs.=51)*			
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

The divergences in the employment and productivity growth rates of Eastern regions reduced in the second and third institutional period. This evidence can be explained by the assumption that non-globalized areas have filled part of their gap in economic development. But who benefited more from the EU enlargements, and who suffered more from the consequences of the financial crisis? In the former case, the accession to the EU is expected to have had a positive impact on all those regions connected to both intra and extra-European markets, while it probably generated weaker effects on local economies. The outcomes of the crisis cannot be easily predicted. On the one hand global regions, generally specialized in financial intermediation activities, could be assumed to have experienced the most intense slowdown. On the other hand, economic systems characterized by the presence of multinational companies, selling their products worldwide, are expected to be less affected by the crisis than the others. Sections 3 and 4 are devoted to the empirical verification of these hypotheses.

2.2. A categorization of European regions based on their openness to globalization

The aim of the analysis conducted in this work is to identify local assets able to explain positive and increasing growth trajectories of European regional economies in a globalised competing world. If it is easy to understand that this aim has important consequences in terms of regional competitiveness policies, its implementation finds a first problematic issue in the identification of the degree of openness of regions to globalization.

Our approach, already applied in Capello et al. 2011, is based on two main dimensions that reinforce and complement each other in capturing the different aspects of integration (Table 2). They derive from two main streams of literature: the first oriented to the territorial/functional structure of the local economy in order to capture integration processes, the second to economic integration processes. 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), 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 (Scott, 2001; Taylor et al., 2007; Friedmann, 1986; Sassen, 1991). '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 cities 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 comprise international high-value functions, qualified human capital, increasing returns in production activities, and physical accessibility.

The second dimension on which to measure a local economy's degree of integration into the world market is a pure economic dimension 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 in 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;
- regions with high market integration, i.e. specialized in competitive and dynamic open sectors (sectors in search of new markets, more open to competition, and better able to gain advantages from world competition).

Table 2. ***Taxonomy of regions according to their degree of integration into global markets***

		Functional/territorial dimension: openness to external world outside Europe	
		Openness above average	Openness below average
Economic dimension: sectoral 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: Capello et al., 2011; Fratesi, 2011

Only those regions well endowed with physical connections and possessing the appropriate specialization in competitive and dynamic sectors have the potential to be global players, these being defined as regions where globalization's impact is felt first and most strongly. Global players are able to benefit from globalization if they can exploit the opportunities offered by globalization, minimize the risks associated with it, and turn threats into opportunities.

On the basis of these two dimensions, four main theoretical regional types are identified:

1. Global players. These are regions at the core of globalization processes: they 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. These regions are therefore expected to be able to lead Europe and drive patterns of response to globalization also for the other regions of the EU.

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. These regions are therefore expected to take advantage of their specialization, but they are also expected to be somewhat penalised 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. The economic dynamics of these areas are expected to be due to a MIX effect deriving from the presence in the region of sectors that are more dynamic and more open than average at regional level because of increasing demand in those sectors. The label "regional" is attached to these players because their sectoral specialization would allow them to play a worldwide role, but, given their lack of an urbanised settlement structure, they normally have to resort to global regions as gateways to world markets. The term "regional" is hence to be understood in its trade literature meaning, which interprets Europe as a region of the world. At the same time, the term recalls the limited physical accessibility to and from the world.

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 and will hence be used as a control category by all the analyses conducted in the following sections. Trends that pertain to globalization forces are expected to be limited in this category. We label them "local" players because their markets are expected to be local, i.e. normally limited to their own region and, possibly, country.

4. The last category, gateway regions, are regions with a puzzling behaviour, i.e. regions with structural openness but specialized in closed sectors. This strange behaviour does not appear to exist in the reality, as evidenced in Capello et al. (2011) and in Fratesi (2011), where the statistical analysis leading to the empirical identification of the category of actual regions is presented in details.

Empirically, the creation of an indicator of openness (defining the regions falling in the left and right quadrants of Table 2) arises from a PCA on five relevant indicators, listed in Table 3.

Table 3. ***Indicators used in the openness index***

Indicator	Proxy for	Source of data
Extra-EU born population	Attraction of foreign labor	Census data for Eurostat completed by LFS for Greece; National statistics for Belgium and Germany
Extra-EU airflow connections	Integration of a region with global networks	OAG (Global Leader in Aviation Information)
Number of offices of advanced services firms	Presence of value-added functions	GAWC (Globalization and World Cities)
Headquarters of transnational corporation	Attraction of international high-value functions	IGEAT calculations from Fortune magazine
Extra-EU FDI in the region	Attraction of extra-EU capital	FDIRegio database

Source: Capello et al., 2011; Fratesi, 2011

Each of these indicators captures a different element in the functional/territorial integration of EU regions with the extra-European world and economy.

The economic dimension of globalization, i.e. the industrial specialization in open and growing sectors, has been measured through location quotients of NUTS2 regions. The first step of the analysis consisted in the

identification of open growing sectors. The latter are defined as those with good economic performances in either extra-EU FDI attraction or extra-EU trade.

Concerning FDI, positively affected sectors are those characterized by a growing inward FDI flows (between 1997 and 2007). As far as trade is concerned, an open growing sector is defined by the fulfilment of three conditions:

- when increasing openness over time is present, which is measured by the positive change in the sum of sectoral imports and exports (relative to regional GVA) between 1995 and 2006;
- when growing exports over time is registered, i.e. when the sectoral exports grows more than the EU27 average between 1995 and 2006;
- when increasing EU trade balance over time is present, i.e. when the change in the sectoral trade balance (relative to regional GVA) between 1995 and 2006 is positive[3].

Based on both these two dimensions, EU27 regions were assigned to the proper group (Table 2).

2.3 The performance of regional typologies

Table 4 presents the average annual real GDP growth rates in two periods of time of the three types of NUTS2 regions, as well as the results of a test to determine whether these growth rates are significantly different.

The descriptive analysis shown in Table 4 was replicated across all the three institutional phases. Since Eastern countries significantly outperformed on average their western counterparts, and this could induce a bias in the analysis, we chose to present the results also for the two groups separately[4].

In the first period of time, i.e. 1995-2004, global players significantly outperformed the other types of regions in terms of real GDP performance. In particular, this was the case of Eastern regions, while in Western countries the difference with the other groups of areas is not statistically significant. In both East and West regional players are the second performers. This evidence is confirmed for the accession period (2004-2007). While the economic performance of Western regions is roughly comparable with the one of the first period, the GDP growth rates of Eastern countries exhibit a sharp increase, spread over all the typologies 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 enough, resilience to the crisis is significantly linked to the degree of openness to international trade and investments, but only in Eastern Europe. Even if both Western and Eastern regional players

[3] The source of FDI data is the FDIRegio database. The main source of trade data is the CHELEM – International Trade Database. Finally, location quotients were calculated based on IGEAT data. More methodological details are available in Capello et al. (2011).

[4] Notice that, with the inclusion of national dummies, this separation is no longer necessary in the following sections.

outperformed the other areas, in the latter case global regions are the ones associated to the most severe slowdown in GDP growth.

Table 4. ***Growth performance of EU regions in the three institutional periods***

	All European regions			
	Global players	Regional	Local	F
Growth rate 1995-2004	3.15	2.55	2.27	6.68***
Growth rate 2004-2007	3.79	3.16	2.59	6.12***
Growth rate 2007-2009	-2.02	-1.41	-2.23	0.94
	Old 15 country			
	Global players	Regional	Local	F
Growth rate 1995-2004	2.68	2.52	2.29	1.27
Growth rate 2004-2007	2.83	2.66	2.24	2.99*
Growth rate 2007-2009	-2.16	-1.79	-2.62	0.62
	New 12 country			
	Global players	Regional	Local	F
Growth rate 1995-2004	5.41	2.64	2.17	18.36***
Growth rate 2004-2007	8.43	4.64	4.19	13.40***
Growth rate 2007-2009	-1.37	-0.26	-0.40	2.86*

**** p<0.01, ** p<0.05, * p<0.1*

These results show that global players had a higher capacity on average to pro-act and re-act to global trends, at least in the two first periods. Results presented in Table 4, however, clearly evidence that the performance of global regions explains most of national growth of Eastern countries, while the economic performance in Western countries is more spatially diffused among different typologies of regions.

This important result requires an interpretative analysis on the role of globalization in Eastern countries in the different institutional periods and in the two blocks of areas, represented by Western and Eastern Europe.

3. Globalization as a driver of regional growth: an interpretative approach

The goal of this section is to provide an interpretative analysis on the link between globalization and regional growth, once controlled for some endogenous factors which, based on existing literature, are expected to promote economic growth.

To proceed in this direction, globalization is inserted into a regional growth model, together with control variables. The model therefore explains the regional growth rates with explicative variables belonging to the following groups:

- a set of dummies representing the taxonomy of regions defined on their degree of globalization (section 2);

- control variables, namely knowledge and innovation creation, that in the interpretation of a modern economic pattern of growth, are recognized to have an important role on regional growth in well-established economic theory. Factors directly linked to the accumulation of knowledge and innovation have in fact become the main sources of growth. Examples include the extensive literature on human capital (Lucas, 1998), on the impact of R&D investments on productivity (Bronzini and Piselli, 2009). The presence of FDI has been interpreted by this new literature as an external sources of innovation (Barrell and Pain, 1997);

- control variables that come from the literature that highlights the territorial conditions enabling innovation and knowledge creation to take place. Physical accessibility is traditionally interpreted as a pre condition for achieving new information and knowledge. However, even if knowledge is achieved, an innovation process 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 been aimed at identifying innovation enabling factors, that allow sharing ideas and knowledge, like trust and sense of belonging (Becattini, 1987; Camagni, 1995; Capello and Faggian, 2005; Iyer et al. 2005) and atmosphere-effects typical of urban areas (Pred, 1965 and 1977);

- finally, as a further control, per capita GDP is added in order to take converge effects into account. An important issue in the literature on Eastern Europe concerns the evolution of regional inequalities (Artelaris et al., 2010; Monastiriotis, 2011; Petrakos et al., 2011).

The proxies employed in our analysis are summarized in Table 5, jointly with the source of the data and the reference in the literature linking each variable to economic growth. The estimated model takes 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,...,3*) groups of regions defined by their degree of 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[5] for the NUTS2 regions (*r =1,...,256*). The unobserved homogeneity within countries is controlled for through country fixed effects (γ_C). This model allows investigating the impact of globalization in the three institutional periods, through a cross-section for each temporal break.

In order to address the second research question, i.e. the overall impact of globalization in Eastern *vs.* Western Europe, the same model is estimated in a short panel, taking the form:

$$\Delta GDP_{tr} = \beta_0 + \beta_1 \lambda_g + \beta_2 high_educ_{tr} + \beta_3 patents_{tr} + \beta_5 LUZ_{tr} + \\ + \beta_6 phys_accessibility_{tr} + \beta_7 social_capital_{tr} + \beta_8 percapita_GDP + \gamma_C + \alpha_t + u_{tr} \quad (2)$$

where *t* is the institutional period, a_t represents time fixed effects and *r* the 259 NUTS 2 regions of both Eastern and Western countries.

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

Table 5. ***Territorial assets: variables, sources and description***

Group	Name	Description	Source	Reference
1	Globalization	Taxonomy of global regions, regional players and local areas	Capello et al. (2011)	See section 2
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, 1998; Barro, 1991). Evidence from Eastern Europe is extremely scarce
2	Patents	Patents application to the EPO (European Patent Office) per million inhabitants	Eurostat	Several works (Bilbao-Osorio and Rodríguez Pose, 2004) focused on the role of R&D on regional economic growth. A focus on Eastern economies is provided by Radosevic (2002)
Group	**Name**	**Description**	**Source**	**Reference**
3	Share of urban population	Share of residents living in a LUZ on regional population	Eurostat	The variable is aimed at capturing urbanization economies
3	Physical accessibility	Length of motorways per square km	Eurostat	Evidence from the EU12 is provided in Vickerman et al. (1999). When congestion effects prevail, this variable may have a negative impact on economic growth
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) and Mihaylova (2004)
4	Per capita GDP	Per capita GDP	EUROSTAT	This topic has been addressed by a broad literature focused on the catching up process of Easter countries with respect to Western Europe (Artelaris et al., 2010; Monastiriotis, 2011; Petrakos et al., 2011).

4. Globalization and economic growth: an interpretative analysis

4.1. The impact of globalization in different institutional periods

The goal of this subsection is to shed some light on the effect of globalization in the three institutional periods, pointing out its role in Eastern European regions compared with Western areas. Estimates are based on the model specification described by the equation (1).

The first step of the analysis consists in a test of spatial dependence in the error terms. Moran's I on the residuals are reported in Table 6. The spatial autocorrelation test was performed on the three cross-sections (one for each institutional period) defined by the equation (1). Interestingly enough, spatial autocorrelation characterizes the second and third periods, but not the first one. Nevertheless, this finding is not completely unexpected based on the output reported in Table 1. As a consequence, with the exception of the cross-section for the first period, in the other cases SEM are required[6].

[6] For the cross-section the STATA routine *spatreg* (Pisati, 2011) was employed. Spatial panel estimates were generated by using the STATA routine *xsmle* (Belotti et al., forthcoming).

Table 6. ***Autocorrelation test on the residuals***

Moran's I (1st period)	-0.001
Moran's I (2nd period)	-0.017***
Moran's I (3rd period)	-0.040***

Table 7 shows the estimation results. The output reported in the table conveys some messages, which can be summarized as follows.

- In Eastern regions the extent of globalization has a positive impact on economic growth, at least in the transition and accession period (models [2] and [4]). This result is consistent with the assumptions formulated in section 2: global regions were presumably able to reorganize their economic systems in the very early stage of transition and, as a consequence, to immediately compete on international markets;

- Eastern regional players benefited from the accession to the EU, being marked by a positive and significant coefficient only in the second period (model [4]). Again, this finding is not surprising since regional players are represented by those areas whose degree of openness to foreign markets is restricted to the EU but goes beyond the domestic borders;

- the role of globalization on economic growth in Eastern Europe vanishes when considering the crisis period (model [6]). In this phase, none of the category described in the taxonomy is linked to higher GDP growth rates. In other words, the intensity of openness to external markets does not have a payoff in terms of resilience to the economic downturn also in Eastern countries;

- the results described above apply to Eastern Europe, but not to Western countries. With the exclusion of the period of generalized growth (the *accession* period), in which global and regional Western areas performed better than the local ones, the degree of globalization does not have a clear effect in fostering economic growth;

- concerning the endogenous factors included as controls in the model, their effect on the regional economic performance leads to partially unexpected results;

- in the first period, for instance, human capital and the R&D activities (captured respectively by the share of high-skilled professionals and by the number of patent applications to the EPO on population) are the two main factors enhancing economic growth, jointly with urbanization economies. This finding contradicts the literature on economic growth in Eastern countries, which pointed out that the main sources of development in the transition phase were represented by the differentiated regional capabilities to react to external influences (Gorzelak, 1998; Nicolini and Resmini, 2010). Hence, the result from Table 7 captures a mechanism of growth typical of Western regions[7];

[7] This can be explained by the fact that Western regions (203) are overrepresented in the sample compared with Eastern areas (53).

Table 7. ***Globalization, endogenous factors and economic growth in the three institutional periods: regression results***

	Transition period		*Accession period*		*Crisis period*	
	OLS [1]	OLS [2]	SEM [3]	SEM [4]	SEM [5]	SEM [6]
Global players	0.003		0.007**		0.008	
Global players (East)		0.0181*		0.042***		0.008
Global players (West)		0.002		0.004		0.007
Regional players	0.002		0.004**		0.003	
Regional players (East)		0.002		0.008*		0.006
Regional players (West)		0.002		0.003*		0.002
High education	0.013***	0.013***	0.001	-0.003	0.023**	0.024**
Patents	2.843**	3.144***	0.902	1.250	-0.480	-0.478
Share of urban population	0.002***	0.002***	0.002**	0.002**	-0.001	-0.001
Share of urban population (East)	0.001***	0.000	0.001***	0.000	0.000	0.000
Physical accessibility	-0.055**	-0.052**	-0.109***	-0.107***	-0.026	-0.026
Social capital	0.011	0.010	0.019**	0.018**	0.053**	0.053**
Per capita GDP	-0.239*	-0.223*	0.073	0.104	-0.271	-0.273
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	256	256	256	256	256	256
R-squared	0.689	0.699				
Squared correlation			0.671	0.695	0.654	0.667

**** p<0.01, ** p<0.05, * p<0.1*

- the same applies to the physical accessibility. The prevailing congestion effect shown by the negative and significant coefficient associated to this control (Table 7) has a straightforward interpretation for Western regions. At the same time, it is not realistic in the case of Eastern areas, characterized by low endowments of transport infrastructures compared with the rest of Europe;

- even if the inclusion of these controls is justified, form the methodological point of view, in order to isolate the role of global and regional players on economic growth, their interpretation is not clear. As pointed out by several other works (Capello et al. 2008), the Western and Eastern blocks followed completely different models of growth. In the next part of the analysis the link between the endogenous assets and the economic performance is considered separately for the two groups of areas.

The next subsection is aimed at pointing out whether Eastern global regions are more efficient in the exploitation of their local assets. The next section is devoted to this issue.

4.2. The impact of globalization in different Western and Eastern regions

The relationship between globalization and endogenous factors is investigated through the estimation of a spatial SEM model, based on the model described by the equation (2). The results are reported in Table 8.

The first step of the analysis consists in a consistency check of the findings pointed out in the previous subsection. Model [7] contrasts global regions (without the distinction between West and East of Europe) to the other categories identified by our taxonomy. The positive and significant coefficient underlines the better performance of global players compared with the other groups of areas.

Compared with model [7], in model [8] global and regional players belonging to Eastern Europe are isolated from the others. Again, the results confirm what suggested by the output of Table 6: the overall effect linking global areas to higher GDP growth rates is, as a matter of fact, due to the achievement of Eastern global regions, while their Western counterparts do not outperform the other typologies of areas.

The recognition of this effect, however, raises another question: why did global Eastern regions perform better than the others? On the one hand, the positive results achieved by global regions are assumed to be generated by the impact of external factors on regional economic growth. As mentioned in the third section, FDI and trade promote innovation and knowledge accumulation which, in turn, foster economic development. On the other hand, global regions could be expected to make a more efficient use of some of their endogenous assets compared with regional and local players.

In order to be sure that the results are not affected by multicollinearity, which would lead to a circular reasoning between the Eastern global region dummy and the endogenous assets for growth, we estimated the Variance Inflation Factor (VIF) among our regressors. The results contained in Table 9 guarantee the non-existence of such a technical issue.

The role of endogenous elements on global regions is addressed by models [9] and [10] reported in Table 8. Model [9] is characterized by a set of interactions between the global areas and the endogenous factors. Results show that none of these interacted terms is significant, highlighting that no difference in the impact of the endogenous assets on economic growth exists between global and regional or local players. However, this result can again hide structural differences between Eastern and Western global regions. In fact, when the same approach is run only for eastern global regions (model [10]), all the interacted terms turn out to be statistically significant.

Table 8. ***Globalization and endogenous growth factors: Eastern vs Western Europe***

	SEM [7]	SEM [8]	SEM [9]	SEM [10]
Global players	0.004*		0.017**	0.008*
Global players (East)		0.021**		
Global players (West)		0.003		
Regional players	0.004		0.004	0.003
Regional players (East)		0.005		
Regional players (West)		0.004		
High education	0.024***	0.023***	0.0267***	0.026***
High education (global)			0.001	
High education (Eastern global)				-0.037*
Patents	1.185	1.367	0.8732	3.061**
Patents (global)			-3.204	
Patents (Eastern global)				-3.826*
Share of urban population	0.001	0.001	0.001	0.001
Share of urban population (East)	0.000***	0.000	0.000*	0.000
Physical accessibility	-0.070	-0.0681	-0.012	-0.076*
Phy. Accessibility (global)			-0.140	
Phy. Accessibility (Eastern global)				0.867**
Social capital	0.033***	0.032***	0.038***	0.030***
Social capital (global)			-0.023	
Social capital (Eastern global)				0.093*
Per capita GDP	-0.401*	-0.388*	-0.400*	-0.415**
Country fixed effects	Yes	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes	Yes
Observations	768	768	768	768
Log-likelihood	1718.418	1719.564	1721.173	1723.548

**** p<0.01, ** p<0.05, * p<0.1*

The net effect of each factor on economic growth in Eastern global regions is given by the sum of the "pure" coefficient and the interacted one. Based on this interpretation, the following messages can be delivered:

- the overall positive impact of high education on GDP growth does not apply to Eastern global regions. The same evidence holds for the other dimension of knowledge and innovation creation, measured by the patents application to the EPO;

- the effect of the territorial elements enabling innovation and knowledge formation is emphasized in Eastern global regions. In the case of physical accessibility, the relatively (compared with Western countries) limited endowment of transport infrastructures explains the positive effect of infrastructure on regional growth. These areas are in fact far from a conditions of congestion revealed in the previous results (Table 7). Concerning social capital, this plays an important and significant role, reflecting the different social environment characterizing Eastern countries with respect to Western ones (Mihaylova, 2004);

- even after controlling for the set of interactions included in model [10], the coefficient of the dummy for global regions is still significant. This result implies that the interactions, by themselves, do not fully explain the peculiar performance of the areas characterized by a greater degree of openness to global markets. This evidence is consistent with the idea that Eastern global region performance depends both on external sources of growth and on the endowment of endogenous factors and the capacity of exploiting these assets more that characterize Eastern global regions.

Table 9. ***Multicollinearity diagnostics: Variance Inflation Factor***

Variable	**1st period**	**2nd period**	**3rd period**
Global players (East)	2.88	2.68	2.68

Global players (West)	2.26	2.23	2.24
Regional players (East)	2.00	1.96	1.93
Regional players (West)	1.71	1.70	1.71
High education	1.38	1.62	1.61
Patents	1.79	1.65	1.64
Share of urban population	1.14	1.25	1.24
Physical accessibility	1.59	1.38	1.34
Social capital	1.32	1.46	1.47
Per capita GDP	2.99	3.03	2.93

Conclusions

This paper is devoted to an issue only incidentally addressed in the literature: the role of globalization on the economic growth of Eastern countries from the early stages of transition to the more recent years. One innovative aspect of this work is represented by the focus on extra European economic relationships only for the definition of global regions.

The findings conveyed some interesting messages. First of all, global regions led economic growth in Eastern countries in the period of transition between planned economies to market ones. The deep industrial reorganization occurred in this phase made the regional players able to compete with the globalized areas immediately after the first EU enlargement. When facing an external shock, such as the one represented by the recent financial crisis, the extent of openness to foreign markets loses its capacity to explain the growth differentials across Eastern regions.

The second conclusion concerns the reasons behind the peculiar performance of global regions. In principle, these areas are assumed to have access to external sources of innovation and knowledge accumulation. Furthermore, they could be more efficient in exploiting some of their local assets compared with other groups of areas. Both hypotheses are verified in the case of Eastern regions. In particular, the latter apparently import knowledge (by way of FDI and trade) rather than accumulating it through internal mechanisms. Nevertheless, the absorptive capacity of these external flows of innovation is reinforced by the exploitation of some territorial factors (social and physical accessibility) enabling knowledge accumulation to take place.

This work is a first attempt in understanding the relevance of important driving forces of growth, such as globalization, in different institutional periods in Eastern regions. Its limit lies in the number of explicative variables that are available in a time series for all NUTS2 European regions. The next step of a research project like this is to expand the regional database so to highlight other specific elements that can explain economic growth in Eastern countries.

Some policy implications can be drawn from our analysis. Our results suggest that regional growth policies in Eastern regions should not be concentrated only on global regions, but also on those areas with a lower degree of globalization, characterised by the presence of second rank cities. Moreover, as far as global regions are concerned, a particular attention should be devoted to some soft elements, like social capital, rather than only on hard elements, like physical infrastructure. However, these kinds of public interventions call for new intervention strategies by policy makers and planners, generally (at least when focusing on Communitarian policies) directed to the expansion of local endowments of hard assets and to large-city policy interventions.

References

Artelaris P., Kallioras D. and Petrakos G. (2010), Regional inequalities and convergence clubs in the European Union new member-states, Eastern Journal of European Studies, 1(1): pp. 113-133

Badinger H. and Tondl G.(2005), The factors behind European regional growth: Trade, human capital and innovation, Jahrbuch für Regionalwissenschaft, 25(1): pp.67-89

Baldwin R. (2006), Globalization: the Great Unboundling, Prime Minister's Office, Economic Council of Finland

Barrell R. and Pain N. (1997), Foreign direct investments, technological change and economic growth within Europe, The Economic Journal, 107(445): pp. 1770-1786.

Barro R.J. (1991), Economic growth in a cross section of countries, The Quarterly Journal of Economics, 106(2): pp. 407-443

Becattini G. (1987) Mercato e forze locali. Il distretto industriale, Il Mulino, Bologna.

Belotti F., Hughes G., Piano Mortari A. (forthcoming), Implementing procedures for spatial panel econometrics in Stata, CEIS Working Papers

Bilbao-Osorio B. and Rodríguez-Pose A. (2004), From R&D to innovation and economic growth in the EU, Growth and Change, 35(4): pp. 434-455

Bergoeing R., Kehoe T., Strauss-Kahn V. and Yi K. (2004), Why Is Manufacturing Trade Rising Even as Manufacturing Output Is Falling?, American Economic Review, 94(2): pp. 134-138

Beugelsdijk S., Smeerts R. and Zwinkels R. (2008), The impact of horizontal and vertical FDI on host's country economic growth, International Business Review, 17(4): pp. 452–472

Borensztein E., De Gregorio J. and Lee J.W. (1998), How does foreign direct investment affect economic growth?, Journal of International Economics, 45(1): pp. 115–135

Bronzini R. and Piselli P. (2009), Determinants of long-run regional productivity with geographical spillovers: the role of R&D, human capital and public infrastructure, Regional Science and Urban Economics, 39(2): pp.187-199

Camagni R. (1995), The concept of innovative milieu and its relevance for public policies in European lagging regions, Papers in Regional Science, 74(4): pp. 317-340

Camagni R. (2002), On the Concept of Territorial Competitiveness: Sound or Misleading?,Urban Studies, 39(13): pp. 2395-2412

Capello R. and Faggian A. (2005), Collective learning and relational capital in local innovation processes, Regional studies, 39(1): pp. 75-87

Capello R., Camagni R., Chizzolini B. and Fratesi U. (2008), Modelling regional scenarios for the enlarged Europe, Springer Verlag, Berlin

Capello R., Fratesi U. and Resmini L. (2011), Globalization and Regional Growth in Europe: Past Trends and Scenarios, Springer Verlag, Berlin

CEC - Commission of the European Communities (2009), Sixth progress report on economic and social cohesion, Report from the Commission to the European Parliament and the Council, COM(2009) 295 final

Cooper R., Donaghy K. and Hewings G. (eds.) (2007), Globalization and Regional Economic Modeling, Springer Verlag

De Mello L. (1999), Foreign Direct Investment-Led Growth: Evidence from Time Series and Panel Data, Oxford Economic Papers, 51(1): pp. 133-151

Eller M., Haiss P. and Steiner K. (2006), Foreign direct investment in the financial sector and economic growth in Central and Eastern Europe: The crucial role of the efficiency channel, Emerging Markets Review, 7(4): pp. 300-319

Falcetti E., Raiser M. and Sanfey P. (2002), Defying the odds: Initial conditions, reforms, and growth in the first decade of transition, Journal of Comparative Economics, 30(2): pp. 229-250

Fratesi U. (2011), A globalization-based taxonomy of European regions. Regional Science Policy and Practice, 4(1): pp. 1-23.

Friedmann J. (1986), The World City Hypothesis, Development and Change, 17(1): pp. 69-83

Godoy S. and Stiglitz J. (2006), Growth, Initial Conditions, Law and Speed of Privatization in Transition Countries: 11 years Later, NBER Working Papers 11992

Gorodnichenko Y., Svejnar J. and Terrell K. (2008), Globalization and Innovation in Emerging Markets, NBER Working Paper Series, n. 14481

Gorzelak G. (1998), Regional development and planning in East Central Europe. In: Keune M. (Ed.), Regional Development and Employment Policy. Lessons from central and eastern Europe, ILO–CEET, Geneva/Budapest, pp. 62–76

Hansen H. And Rand J. (2006), On the Causal Links Between FDI and Growth in Developing Countries, The World Economy, 29(1): pp. 21-41

Hanson G., Mataloni R. and Slaughter M. (2005), Vertical Production Network in Multinational Firms, The Review of Economics and Statistics, 87(4): pp. 664–678

Howard M. M. (2003), The Weakness of Civil Society in Post-Communist Europe, Cambridge University Press, Cambridge.

Hummels D., Ishii J. and Yi K. (2001), The Nature and Growth of Vertical Specialization in World Trade, Journal of International Economics, 54(1): pp. 75-96

Hummels D., Rapoport D. and Yi K. (1998), Vertical Specialization and the Changing Nature of World Trade, Federal Reserve Bank of New York Economic Policy Review, 4(2): pp. 79-99

Iyer S., Kitson M. and Toh B. (2005), Social capital, economic growth and regional development, Regional Studies, 39(8): pp. 1015-1040

Kenney M. and Florida R. (2004), Locating Global Advantage: Industry Dynamics in the International Economy, Stanford University Press, Stanford Ca.

Kallioras D. and Petrakos G. (2010), Industrial growth, economic integration and structural change: evidence from the EU new member-states regions, The Annals of Regional Science, 45(3): pp. 667-680

Kucera D. and Milberg W. (2003), Deindustrialization and Changes in Manufacturing Trade: Factor Content Calculations for 1978-1995, Review of World Economics, 139(4): pp. 601-624

Lall S. and Narula R. (2004), Foreign Direct Investment and its Role in Economic Development: Do We Need a New Agenda?, The European Journal of Development Research, 16(3): pp. 447 – 464

Lucas R.E. (2008), International Labour Migration in a Globalizing Economy, Carnegie paper n. 92

Lucas R.E. (1988), On the mechanics of Economic development, Journal of Monetary Economics, 22(1): pp. 3-42

Mihaylova D (2004), Social Capital in Central and Eastern Europe: A Critical Assessment of the Literature, Center for Policy Studies, Central European University, Budapest

Monastiriotis V. (2011), Regional Growth Dynamics in Central and Eastern Europe, LEQS Paper No 33/2011

Moran T., Graham E. and Blomström M. (eds.) (2005), Does Foreign Direct Investment Promote Development?, Institute for International Economics, Washington D.C.

Nicolini M. and Resmini L. (2010), FDI spillovers in new EU member states, Economics of Transition, 18(3): pp. 487-511

Panagariya A. (1999), The Regionalism Debate: an Overview, The World Economy, 22(4): pp. 477-511

Perloff H. (1957), Interrelations of State Income and Industrial Structure, The Review of Economics and Statistics, 39(2) : pp. 162-171

Perloff H., Dunn E., Lampard E. and Muth R. (1960), Region, Resources and EconomicGrowth, John Hopkins, Baltimora

Petrakos G., Kallioras D. and Anagnostou A. (2011), Regional convergence and growth in Europe: understanding patterns and determinants, European Urban and Regional Studies, 18(4): pp. 375-391

Pisati M. (2001), Tools for spatial data analysis, Stata Technical Bulletin, 60: pp. 21-37

Polasek W. and Sellner R. (2011), Does Globalization affect Regional Growth? Evidence for EU27 NUTS-2 Regions, IHS-Vienna discussion paper n.266

Pred A. (1965), The concentration of high-value added manufacturing, Economic Geography, 41(2): pp. 108-132.

Pred A. (1977), City systems in advanced economies, Hutchinson, London.

Putnam R. D. (1993), Making Democracy Work. Civic traditions in modern Italy, Princeton, NJ: Princeton University Press

Radosevic S. (2002), Regional innovation systems in Central and Eastern Europe: determinants, organizers and alignments, The Journal of Technology Transfer, 27(1):pp. 87-96

Resmini L. (2003), The determinants of foreign direct investment in the CEECs: New evidence from sectoral patterns, Economics of transition, 8(3): pp. 665-689

Sassen S. (1991), The Global City, Princeton University Press, Princeton

Scott A. (2001), Global City-Regions, Oxford University Press, Oxford

Soubbotina T. (2004), Globalization: International Trade and Migration, The World Bank, Washington D.C., pp. 83-94

Taylor P., Derubber B., Saey P. and Witlox F. (eds.) (2007), Cities in Globalization, Routledge, London

Tondl G. and Vuksic G. (2003), What makes regions in Eastern Europe catching up? The role of foreign investment, human resources and geography, ZEI Working Papers B 12-2003, ZEI - Center for European Integration Studies, University of Bonn.

Vickerman R., Spiekermann K. and Wegener M. (1999), Accessibility and Economic Development in Europe, Regional Studies, 33(1): pp. 1-15

UNCTAD (1997), World Investment Report, UN, Washington