EUROPEAN INTEGRATION AND ADJUSTMENT IN BORDER REGIONS IN ACCESSION COUNTRIES

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Abstract

This paper aims at exploring and analysing on a comparative basis the impact of the East enlargement of the EU on border regions in Bulgaria, Estonia, Hungary, Romania and Slovenia. In order to achieve the overall objective, the paper will first provide a definition and identification of border regions in the candidate countries and, then, a descriptive analysis of their relative position within each country and with respect to the EU-15 average. Thirdly, it will develop an econometric model able to analyse the determinants of regional specialisation and growth in different type of regions (internal vs border; western versus eastern border regions, etc.). The results will be used to understand which are the winning and loosing regions in this process, in terms of regional growth prospects. This classification will be used to evaluate the likely distributional implications of enlargement for the accession countries under considerations. The overall empirical results, though limited in some counts, may serve as a reminder of border regions' challenges. They allow to identify present patterns and trends, and represent a good baseline to make inference on what changes border regions in candidate countries might expect the integration process to bring.

JEL codes: F15, R12

Keywords: economic integration, border regions, industry location, transition countries

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1. Introduction

In Central and Eastern Europe the process of economic change and liberalisation occurred during the 90s has had important spatial consequences, often neglected by the literature on the effects of the enlargement, which has focussed mainly on the national level (Baldwin, Francois and Portes, 1997; Avery, Cameron, 1998). Within these spatial and socio-economic dynamics, borders and border regions[1] are likely to play a critical role for several reasons. First of all, border regions in accession countries are not the exception but the rule, accounting for almost 66 percent of the land area and 58 percent of total population (EC, 2001). Secondly, the fall of the Berlin wall and the ongoing process of economic integration with the European Union (EU) have put borders in a state of flux, with changes occurring in their physical location and economic and political significance as well. Borders are no longer considered as a fixed separating lines, but as "contact" areas, a bridge toward new markets and cultures. Old borders have been vanishing, and a new geo-political and economic map is emerging, with a different distribution of roles and possibilities at nation and regional level (Njikamp, 1994). Indeed, the re-orientation of the economic links from East to West has raised new challenges and opportunities for development for western border regions, and serious concerns for regions located along the Eastern border, potentially more sensitive to the collapse of the CMEA and the former Soviet Union.

International trade and Foreign Direct Investment (FDI) – the two driving forces behind economic integration – have undoubtedly a considerable impact on the economy, at national and regional level as well. The possibility to exchange goods and services internationally opens opportunities to specialise and to use economies of scale and therefore may result in the concentration of economic activities in few locations, close to international markets. Furthermore, trade occurs in an heterogeneous space, where distance and quality of infrastructure matter, so that integration may have different consequences for the centre and the periphery. Even more than trade, FDI affects domestic economy through technical –

transfer of technology, skills, knowledge and governance – as well as pecuniary – backward and forward linkages with domestic firms – externalities, which may generate positive spillovers to domestic economies. Since, however, FDI tends to cluster geographically in Central and Eastern Europe (Resmini, 2000), it can generate or further increase regional disparities within candidate countries.

This paper aims at exploring and analysing on a comparative basis the impact of the East enlargement of the EU on border regions in five candidate countries, i.e. Bulgaria, Estonia, Hungary, Romania and Slovenia. These countries have different development levels and geographical co-ordinates that make their comparative analysis interesting. Hungary and Slovenia are relatively more advanced than Estonia, Bulgaria and Romania. In addition, Estonia is a North European country sharing its border with Finland, while Hungary is a Central European country showing common border with Austria. Slovenia and Bulgaria are Southern European countries bordering, respectively, with Italy and Austria, and Greece. Romania does not share any border with the EU-15. As a result, Hungary and Slovenia seem to have the advantage of geographical proximity to Western European core countries, while the others do not.

In order to achieve the overall objective, the paper will first provide a brief overview of the main theoretical predictions on regional adjustments to trade liberalisation and economic integration (section 2). Then, it will provide a definition and identification of border regions in candidate countries, as well as a descriptive analysis of their relative position within each country and with respect to the EU-15 average (section 3). Thirdly, it will develop an econometric model able to analyse the determinants of regional specialisation and adjustments over time. In particular, the work will explore how the ongoing process of economic integration with the EU is affecting the location of economic activity in candidate countries and which are the winning and loosing regions in this process, in terms of regional growth prospects. This classification will be used to evaluate the likely distributional implications of enlargement for the accession countries under considerations.

[1] Borders are defined as "external state boundaries" (Anderson, O'Dowd, 1999), while border regions are "sub-national areas, whose economic and social life is directly and significantly affected by proximity to an international frontier" (Hansen, 1997a, 1997b, pag. 1).

2. Economic integration and border regions

Although a systematic theory of border regions have never been developed, the location theory has traditionally considered them as disadvantaged areas because of international barriers to trade and the threat of military invasion (Anderson, O'Dowd, 1999). National borders negatively affect regional economies by artificially cutting up spatially complementary regions and by increasing transaction costs. Tariffs, differences in language, culture and business practices inhibit cross-border trade, while the conflict between political and economic objectives – which is at the basis of the potential political and social instability of border areas – decreases the incentive to localise in these regions for domestic and foreign producers. Moreover, it has been demonstrated that the larger the market area the fewer will be the entrepreneurs who choose a location close to the frontier, other things being equal (Hansen, 1977a).

The reversal of this unfavourable picture is that greater international economic integration – with the consequent removal of national boundaries and trade barriers – should create new prospects for growth for border regions, as it happened in Europe with the completion of the Single Market in 1993[2] and in North America, after the creation of NAFTA (Hanson, 1996, 1998).

From the theory of location standpoint, thus, the East enlargement of the EU should benefit all regions directly affected by the removal of national borders, i.e. regions directly bordering with the EU, as well as with other countries interested by the enlargement process, with a negligible impact on internal regions and possible negative effects on regions still interested by a frontier, such as regions bordering with a third country not involved in the enlargement process, because of their peripheral position within a large market area.

However, the location theory is just one theoretical field able to explain how trade liberalisation affects industry location. An answer to this question may also be found in traditional international trade theories, which emphasise international (or inter-regional) differences in factor endowments (Hecksher-Ohlin) or technologies (Ricardo), as well as in the New Trade Theories (NTT) and in the New Economic Geography (NEG), which try to explain the spatial structure of economic activities using models with increasing returns to scale and imperfectly competitive markets (Venables, 1998; Krugman, 1998; Fujita, Krugman and Venables, 2000).

[2] In this case, however, it is hard to see some advantages for border regions, since regions affected by trade liberalisation can no longer been considered as border areas, as pointed out by Hansen (1977a).

The NTT, developed during the 1980s, are useful to understand the importance of market access for economic activities. The more interesting prediction for the scope of this analysis, is that since firms have increasing returns to scale, they will locate in a few locations, chosen among regions which are geographically well placed, in terms of market access and transportation networks. This suggests that a reduction in trade barriers will lower transportation costs, thus increasing firms' incentives to relocate to regions with a better access to the foreign markets, such as border regions or coastal areas.

Although geographical advantage plays a role in NTT, it is however considered as exogenous, as if it was determined by physical rather than economic characteristics. However, the key determinant of geographical advantage is the interaction among different economic agents – suppliers, consumers, institutions – which of course is not fixed, but endogenous, as the raising and declining of economic centres over the years and across regions suggest. According to this idea, firms locate in an economic centre, which can be considered as it only because other firms locate there. This indicates the existence of a cumulative causation process according to which the entry of new firms in a location makes it a more attractive location to further firms. The functioning of this cumulative causation process depends on the presence of pecuniary – backward and forward linkages – as well as technological externalities – knowledge spillovers and learning by doing – between firms.[3] To the extent that such externalities are localised, also production is geographically concentrated, and the logic of increasing returns to scale implies that once a pattern of industrialisation has been established, it will persist over time. In case of trade liberalisation, the presence of externalities alters firms' incentives to relocate close to foreign markets since that would mean for them to lose the benefits of being near to their suppliers, customers, source of information or technology, or, more generally, firms from which they derive positive externalities.

The consideration of agglomeration forces makes the impact of the enlargement process on the location of economic activities in candidate countries more uncertain. The sharp increase and diversification of trade flows between the EU and the candidate countries indicate that domestic producers in candidate countries might have an incentive to relocate close to EU border in order to exploit economies of scale and better market access. However, the presence

[3] This idea is not new in economics. It can be find in the pioneering works of Myrdal (1957), Hirschman (1958) and Pred (1966). Only its formal analysis can be ascribe to NEG. See Fujita, Krugman, Venables (2000) for a survey of links between old and new agglomeration stories.

of old industrial poles often located far from the Western border, may represent an incentive for firms not to relocate.

Overall, both traditional and more recent theories of location seem to suggest that the enlargement process is likely to have an uneven impact on border and non border regions, with the greatest impact on regions bordering with the EU, because of their geographical proximity to large potential markets. Next sections will be devoted to understand if these theoretical predictions apply to transition countries in Central and Eastern Europe.

3. The economic situation of Border regions

3.1 Definition of border regions

For the purpose of the analysis, this study defines border regions as regions at NUTS III level eligible for PHARE-CBC programs. Within this broad category, three different sets of relatively homogeneous regions can be identified:

- borders with present EU members (BEU hereinafter)
- borders with other candidate countries currently negotiating accession (BAC, hereinafter)
- borders with external countries (BEX, hereinafter)

which differs from internal regions (INT hereinafter) because of their geographical position along international borders.

According to this definition, the sample includes 105 regions (table 1): 63 border regions – 14 bordering with the EU, 21 with external countries and 28 with other candidate countries – and 42 non border regions, located in Bulgaria, Hungary and Romania. Estonia and Slovenia, being small countries, have virtually only border regions.

Border regions display many dimensions of difference and asymmetry. From a geo-economic point of view, they may have different shapes and sizes; be highly or scarcely populated, stagnate in their economic and social peripherality or turn it into political and economic advantages (Anderson, O'Dowd, 1999). So, rather than concentrating only on internal characteristics, it is more fruitful to study a border region in terms of its comparison with other regions in its own state, as well as across states and in direct relations with the EU, the integrated economic space to which they already belong to. Next section focuses on this multi-level comparative analysis. Four economic indicators have been applied to compare different sets of regions within and across countries. They refer to the spatial distribution and changes of population, GDP per capita, unemployment rate and relative employment at sector level.

Table 1 - Regions' classification in candidate countries

	BEU	BEX	BAC	INT
Bulgaria	Blagoevgrad	Bourgas	Vidin	Varna
	Kardjali	Kustendil	Vtratza	Veliko Tarnovo
	Smolyan	Pernik	Dobrich	Gabrovo
		Haskovo	Montana	Lovech
		Yambol	Pleven	Pazardjik
			Russe	Plovdiv
			Silistra	Razgrad
				Sliven
				Sofia
				Sofia region
				Stara Zagora
				Targoviste
				Shumen
Estonia	Norther Estonia		Central Estonia	
	North Eastern Estonia		Southern Estonia	
	Western Estonia			
Hungary	Gyor-Moson-Sopron	Baranya	Komárom-Esztergom	Budapest
	Vas	Somogy	Zala	Pest
		Bács-Kiskun	Borsod-Abaúj-Zemplén	Fejér
			Nógrád	Veszprém
			Hajdú-Bihar	Tolna
			Szabolcs-Szatmár-Bereg	Heves
			Békés	Jász-Nagykun-Szolnok
			Csongrád	
Romania		Botosani	Constanta	Bacau
		Iasi	Calarasi	Neamt
		Suceava	Giurgiu	Braila
		Vaslui	Teleorman	Buzau
		Galati	Dolj	Vrancea
		Tulcea	Mehedinti	Arges
		Caras-Severin	Olt	Dambovita
		Maramures	Arad	Ialomita
			Timis	Prahova
			Bihor	Gorj
			Satu Mare	Valcea
				Hunedoara
				Bistrita-Nasaud
				Cluj
				Salaj
				Alba
				Brasov
				Covasna
				Harghita
				Mures
				Sibiu
				Mun. Bucuresti (inclusiv Ilfov)
Slovenia	pomorska regija	savinjska regija		zasavska regija
	podravska regija	spodnejposavska regija		
	koroška regija	dolenjska regija		
	gorenjska regija	osrednjeslovenska regija		
	goriška regija	notranjsko-kraška regija		
	obalno-kraška regija			

BEU= regions bordering with the EU-15; BAC= regions bordering with other candidate countries
BEX= regions bordering with third countries; INT= non border regions.

3.2 Comparative analysis within and across states

Table 2 considers the first three economic indicators.[4] There are striking differences between border regions in terms of socio-economic development. In 1998 border regions had a population of about 22 million inhabitants, about 50 percent of total population in the countries considered. The border with the EU does not seem to have had any effect on population location, since only 5.4 per cent of total population lived there. However, the available statistics suggest that regions bordering the EU have already benefited from their location. On average, in 1995, the economic conditions in these regions were very similar to those in Eastern border regions (BEX), while BAC regions were more close to the level of development showed by internal regions. Proximity to the EU, however, seems to have contributed to stimulate growth: in the second half of the 1990s, GDP per capita has grown, on average, at about 6 per cent a year, while the unemployment rate decreased on average of about 0.5 per cent a year. All other regions show opposite patterns for both variables. Thus, in 1998, BEU regions' GDP per capita was higher and the unemployment rate was lower than the average of other groups of border regions.[5] Consequently, one can conclude that convergence and catching-up processes between regions bordering the EU and non border regions have been occurring in candidates countries during the second half of the 1990s.

In evaluating the economic performance of internal regions, it is worth noting the dominant role of capital cities. Their economic impact is impressive. To give just two examples, the Tallin area (Estonia) has 95 percent of FDI and 48 percent of all registered firms. Budapest accounts for about 20 percent of total population, 48 percent of total employment in the service sectors and 52 percent of total FDI, contributing to a GDP per capita level three times that of the worst-placed county in the country.[6] The absence of other urban centres similarly dominant means that, outside the capital cities spatial disparities in growth are more limited, as it is shown by figures reported in the bottom part of table 2. At the end of the 1990s, BEX regions were, on average, the poorest ones. Their geographical location at the extreme periphery of Europe, and the poor economic conditions of the countries they border with – Russia, Ukraine, Belarus, Serbia, Croatia – partially explain their overall economic weakness.

[4] The aggregate analysis considers mainly Bulgaria, Hungary and Romania. Estonia and Slovenia have been studied separately for two reasons. First, figures cover a period of time shorter than the other three countries. Secondly, the large proportion of "border area" into the countries makes any comparison between border and non border regions worthless. For an in-depth analysis of the relative position of border regions in each country see Bosco, Resmini (2001).

[5] Non border regions as a whole perform better than BEU regions only when capital cities are considered.

[6] On the dominant role of capital city regions see also Weise, Butcher, Downs et al. (2001).

BAC regions do not show significant changes in their economic conditions during the second half of the 90s, becoming more similar to BEX regions.

A more comprehensive analysis reveals different pictures across countries. In 1998 border regions in Bulgaria had a population of 3.5 million inhabitants, or 42 per cent of the country population. These figures are 5.5 and 54 per cent for Hungary and 9.9 and 44 per cent for Romania. As the border area is so large in Slovenia and Estonia, these figures are not significant for both countries. As far as GDP per capita and unemployment are concerned, border regions show different levels of development across countries. In Bulgaria, at the beginning of the period, regional disparities did not seem particularly large, with BEX and INT (Sofia included) regions above (below) and BEU and BAC regions below (above) the national average, in terms of GDP per capita (unemployment rate). However, BEU and BAC regions experienced GDP per capita growth rates above the national average during the second half of the 1990s, thus reducing disparities with the other groups of regions. These patterns remain unchanged when Sofia is not included in the calculation, though in this case the rate of growth of GDP per capita in non border regions is substantially higher than before, indicating that Sofia suffered more for economic restructuring and transition than other internal regions, thus reducing regional disparities within the country. Unemployment rate has increased over time in all regions but those bordering with the EU, with the highest increases in BAC and INT regions.

In the second half of the 1990s, economic development has been positive in Hungarian BEU regions and in the internal ones (Budapest included), which were more similar in 1998 than at the beginning of the transition. BEX regions show a deterioration in their relative position within the country, becoming more and more similar to BAC regions, which stagnated during the second half of the period. The dominant role of Budapest is evident from the comparison of the performance of internal regions with and without Budapest district.

In Romania, GDP per capita in internal regions (Bucharest included) was in 1998 more than double that in border regions, which show the better (BAC regions) and the worst (BEX regions) position in term of unemployment rate. Differently from the other countries of the sample, regional differences among border and non-border regions seem to increase over the period, due to the bad performance of border regions, taken as a whole. However, when the district of Ilfov which includes Bucharest is excluded from calculations, regional disparities become less evident.

Table 2 - Border regions: comparative facts and figures

a) with capital cities

		BEU			BEX			BAC			INT			COUNTRY		
		95	**98**	**Var %**	**95**	**98**	**Var %**	**95**	**98**	**Var %**	**95**	**98**	**Var %**	**95**	**98**	**Var %**
BG	GDP pc	1058.43	1270.86	6.29	1301.62	1435.34	3.31	1153.02	1343.45	5.23	1201.94	1309.96	2.91	1194.9	1331.42	3.67
	POP	721.43	710.93	-0.49	1240.97	1270.86	0.8	1619.67	1573.41	-0.96	4802.65	4735.8	-0.47	8384.72	8291	-0.37
	UNEMPL	16.83	15.18	-3.38	11.66	12.72	2.95	15.2	16.69	3.16	11.85	13.24	3.77	13.11	14.09	2.43
HU	GDP pc	4706.86	5499.42	5.32	3418.02	3385.42	-0.32	3373.11	3382.05	0.09	5308.43	5797.71	2.98	4542.09	4640.26	0.72
	POP	698.1	698.1	0	1291.87	1275.98	-0.41	3545.09	3232.26	-3.03	4710.62	4660.04	-0.36	10245.68	9866.38	-1.25
	UNEMPL	10.77	7.9	-9.81	18.46	19.71	2.21	22.24	22.7	0.68	17.76	15.89	-3.64	16.5	14.1	-5.1
RO	GDP pc				3104.52	3066.41	-0.41	3403.42	3285.51	-1.17	6244.8	6749.58	2.62	4944.34	5188.49	1.62
	POP				4268.9	4268.43	0	5662.79	5602.55	-0.36	12749.26	12631.83	-0.31	22680.95	22502.8	-0.26
	UNEMPL				12.06	12.98	2.48	7.83	7.97	0.59	10	11.73	5.46	9.51	10.4	3.03
Total	**GDP pc**	**2852.67**	**3375.04**	**5.77**	**2835.13**	**2834.43**	**-0.01**	**3056.87**	**3031.11**	**-0.28**	**4958.79**	**5378.73**	**2.75**			
	POP	**1419.53**	**1409.04**	**-0.25**	**6801.74**	**6754.64**	**-0.23**	**10827.55**	**10408.21**	**-1.31**	**22262.523**	**22067.99**	**-0.29**			
	UNEMPL	**14.41**	**12.35**	**-5**	**12.94**	**13.94**	**2.53**	**14.46**	**14.58**	**0.26**	**11.87**	**12.89**	**2.79**			
EE*	GDP pc*	3433.43	3733.66	4.28				1996.45	1976.57	-0.5				2981.42	3180.23	3.28
	POP*	1002.22	990.27	-0.6				459.91	455.31	-0.5				1462.13	1445.58	-0.57
	UNEMPL	5.09	4.8	-1.45				6.34	5.47	-4.79				5.04	4.75	-1.96
SLO**	GDP pc	6455.73	7519.55	7.93	5578.19	6397.68	7.09				20152.24	22975.57	6.78	6339.2	7318.09	7.44
	POP	940.32	938.27	-0.11	1000	999.96	0				47.16	46.71	-0.48	1987.5	1984.94	-0.06
	UNEMPL	13.96	13.31	-2.35	13.6	12.85	-2.8				17.74	18.48	2.08	15.1	14.88	-0.73

b) without capital cities

		BEU			BEX			BAC			INT			COUNTRY		
		95	**98**	**Var %**	**95**	**98**	**Var %**	**95**	**98**	**Var %**	**95**	**98**	**Var %**	**95**	**98**	**Var %**
BG	GDP pc	1058.43	1270.86	6.29	1301.62	1435.34	3.31	1153.02	1343.45	5.23	1167.69	1293.83	3.48	1176.54	1326.97	4.09
	POP	721.43	710.93	-0.37	1240.97	1270.86	0.8	1619.67	1573.41	-0.96	3609.91	3536.09	-0.69	7191.98	7091.29	-0.47
	UNEMPL	16.83	15.18	-3.38	11.66	12.72	2.95	15.2	16.69	3.16	12.48	14.01	3.92	13.4	14.47	2.59
HU	GDP pc	4706.86	5499.42	5.32	3418.02	3385.42	-0.32	3373.11	3382.05	0.09	3542.26	3927.2	3.5	3548.62	3747.18	1.83
	POP	698.1	698.1	0	1291.87	1275.98	-0.41	3545.09	3232.26	-3.03	2780.6	2798.66	0.22	8315.66	8005	-1.26
	UNEMPL	10.77	8.11	-9.02	18.46	19.71	2.21	22.24	21.82	-0.63	19.55	17.95	-2.81	19.74	19.18	-0.95
RO	GDP pc				3104.52	3066.41	-0.41	3403.42	3285.51	-1.17	3246.61	3144.46	-1.06	3260.44	3167.08	-0.96
	POP				4268.9	4268.43	0	5662.79	5602.55	-0.36	10416.64	10338.89	-0.25	20348.33	20209.86	-0.23
	UNEMPL				12.06	12.98	2.48	7.83	7.97	0.59	10.24	12.05	5.58	9.9	10.99	3.54
Total	**GDP pc**	**2852.67**	**3375.04**	**5.77**	**2835.13**	**2834.43**	**-0.01**	**3056.87**	**3031.11**	**-0.28**	**2929.93**	**2883.37**	**-0.53**			
	POP	**1419.53**	**1409.04**	**-0.25**	**6801.74**	**6754.64**	**-0.23**	**10827.55**	**10408.21**	**-1.31**	**16807.15**	**16673.63**	**-0.27**			
	UNEMPL	**14.41**	**12.35**	**-5**	**12.94**	**13.94**	**2.53**	**14.46**	**14.58**	**0.26**	**13.01**	**13.56**	**1.39**			

GDP pc = GDP per capita; POP= population; UNEMPL= unemployment rate; * 1996-1998 ** Slovenia: GDP pc ,POP 1995-1997; UNEMPL 1997-98

3.3. Comparison at the EU level

This section focuses on the position of border and non border regions in candidate countries relative to the present EU average. The discussion is based on the transition matrix (Puga, 2001; Overman, Puga, 1999) that tracks changes over time in the relative position of regions within a given distribution. The transition matrix in figure 1 reports changes between the 1992 and the 1999 distributions of GDP per capita relative to the EU average.[7] The transition matrix gives several pieces of information. The first column gives the classes that divides up the distribution of relative regional income levels. The second column gives the number of regions that begin their transition in that range of the distribution and their sub-division among types of regions. Rows refer to 1992 distribution and column to the distribution at the end of the period. The main diagonal gives the most important piece of information: it shows the fraction of regions that were in the same range of the distribution in 1992 and in 1999. The top row of the matrix indicates that in 1992 only 4 regions (one for each type, all belonging to Bulgaria) had a GDP per capita below 0.05 times the present EU average.[8] Half of them remained in the same range in 1999, while the other 50 per cent saw its relative income rise up between 0.05 and 0.1 times the present EU average. Both of them are border regions: Blagoevgrad, bordering with Greece, and Montana, at the Northern border with Romania. The proportion of regions that experienced little relative change is very high for all ranges of the distribution, although regions with the highest 1992 relative GDP per capita (first two rows from the bottom) showed more mobility: most of them, however, saw their relative income fall. Considering the different types of regions, only one non border region (Fejér, Hungary) improved its relative GDP per capita, while BEX and BAC regions saw their relative per capita income decrease. BEU regions (all located in Hungary) remained in the same range.

It is interesting to compare the distribution of GDP per capita with unemployment rates. Reading the corresponding transition matrix (figure 2) along the main diagonal, it shows that of the 12 regions that in 1992 had an unemployment rate below 0.75 times the European average, none remained in that range in 1999. All of them but one (an internal Hungarian region, i.e. Budapest) saw their relative unemployment rate increase. Jumping to the bottom, we see a strong persistence amongst the regions with highest unemployment rate. However, 40 percent of BEU regions and 12 percent of BEX ones saw their relative unemployment

[7] Estonia and Slovenia are excluded from this exercise since data cover a different time period.

[8] Considering EU-27 instead of EU-15, would make these figures less dramatic since the EU average would be lower than the present one. See for example EC (2001).

rates fall in an inferior range, as well as 20 percent of non border regions, while BAC regions did not seem to have been able to decrease their unemployment rates over the 1990s.

Figure 1 - Transition matrix (GDP per capita)

			1998				
			[0-0.05)	**[0.05-0.10)**	**[0.10-0.15)**	**[0.15-0.20)**	**[0.20-)**
1995	**[0-0.05)**	**4**	**0.50**	**0.50**			
	BEU	1		*1.00*			
	BEX	1	*1.00*				
	BAC	1		*1.00*			
	INT	1	*1.00*				
	[0.05-0.10)	**32**		**1.00**			
	BEU	*2*		*1.00*			
	BEX	*5*		*1.00*			
	BAC	*9*		*1.00*			
	INT	*16*		*1.00*			
	[0.10-0.15)	**22**			**0.91**	**0.09**	
	BEU						
	BEX	*4*			*1.00*		
	BAC	*6*			*1.00*		
	INT	*12*			*0.83*	*0.17*	
	[0.15-0.20)	**24**			**0.13**	**0.83**	**0.04**
	BEU						
	BEX	*6*			*0.17*	*0.83*	
	BAC	*8*			*0.25*	*0.75*	
	INT	*10*				*0.90*	*0.01*
	[0.20-)	**7**				**0.14**	**0.86**
	BEU	*2*					*1.00*
	BEX						
	BAC	*2*				*0.50*	*0.50*
	INT	*3*					*1.00*
			[0-0.05)	**[0.05-0.10)**	**[0.10-0.15)**	**[0.15-0.20)**	**[0.20-)**
		N.	***3***	***33***	***24***	***23***	***7***
		BEU		*3*	*1*		*2*
		BEX	*1*	*5*	*5*	*5*	
		BAC		*10*	*8*	*7*	*1*
		INT	*2*	*15*	*10*	*11*	*4*

Hungary, Romania and Bulgaria 1995-1998

The contrast between changes in relative GDP per capita and changes in relative unemployment rates can be seen more clearly by comparing the two matrices. It shows that while regions exhibited a strong persistence in their relative income per capita levels, they have experienced a polarisation of regional unemployment rates towards the superior extreme of the distribution. As a result, in 1999 there were more regions with very high unemployment rates and fewer regions with very low relative unemployment rates. This polarisation does not seem to have a geographical component since it involves both border and non border regions.

This simple exercise allows to conclude that transition towards a market economy and economic integration with the EU do not seem to have given a positive contribution to regional convergence in Europe.

Figure 2 - Transition matrix (unemployment)

			1999				
1992	**[0-0.6)**	**4**	**0.00**	**0.25**	**0.25**	**0.25**	**0.25**
	BEU						
	BEX						
	BAC	1			*1.00*		
	INT	3		*0.33*		*0.33*	*0.33*
	[0.60-0.75)	**8**	**0.13**	**0.00**	**0.13**	**0.63**	**0.13**
	BEU						
	BEX						
	BAC	*3*		*0.00*	*0.33*	*0.66*	
	INT	*5*	*0.20*	*0.00*		*0.60*	*0.20*
	[0.75-1)	**17**	**0.06**	**0.12**	**0.18**	**0.24**	**0.41**
	BEU						
	BEX	*1*				*1.00*	
	BAC	*6*		*0.33*	*0.17*	*0.33*	*0.17*
	INT	*10*	*0.10*		*0.20*	*0.10*	*0.60*
	[1-1.30)	**18**	**0.00**	**0.00**	**0.06**	**0.17**	**0.78**
	BEU						
	BEX	*7*				*0.29*	*0.71*
	BAC	*3*				*0.33*	*0.67*
	INT	*8*			*0.12*		*0.88*
	[1.30-)	**42**	**0.00**	**0.02**	**0.02**	**0.10**	**0.86**
	BEU	*5*		*0.20*	*0.20*		*0.60*
	BEX	*8*				*0.12*	*0.88*
	BAC	*13*					*1.00*
	INT	*16*				*0.19*	*0.81*
			[0-0.6)	**[0.60-0.75)**	**[0.75-1)**	**[1-1.30)**	**[1.30-**
		N.	**2**	**4**	**7**	**17**	**59**
		BEU		*1*	*1*		*3*
		BEX				*4*	*12*
		BAC		*2*	*3*	*5*	*16*
		INT	*2*	*1*	*3*	*8*	*28*

3.4 Regional Employment in border regions

In order to identify regional patterns of specialisation, it is useful to analyse employment structure and its changes at regional level. Table 3 shows regional shares of national employment by groups of economic activity for 1992 and 1999, while average annual relative employment growth rates are summarised in table 4.[9]

Although the time period is too short to highlight clear patterns of change, some interesting features emerge. The first is that employment adjustments seem to be *country* and *sector* rather than *region* specific. Economic activities are spread between border and non-border regions relatively more evenly in Romania than in Bulgaria and Hungary. At sector level, it is worth noting the almost overall geographic concentration of natural resource based activities – such as agriculture and mining and quarrying – in border regions. In 1992, 53 per cent of employment in agriculture and 61 per cent of employment in mining and quarrying concentrated in border regions in Bulgaria. These percentages are respectively 66 and 65

percent in Hungary and 53 and 29 percent in Romania. Relative employment remained more or less unchanged over the 1990s in all countries, with the exception of Bulgaria whose mining and quarrying sector experienced a dramatic change in favour of internal regions. Most of the adjustment occurred in BEU regions. Services are mainly concentrated in internal regions, which include the capital city.[10]

As far as the manufacturing sector is concerned, it is worth noting that relocation activity was very intensive, and mainly in favour of border regions, though marked differences across countries do exist. In Bulgaria, border regions reinforced their specialisation only in textiles and clothing production, while other sectors relocate mainly in internal regions. Regions bordering with the EU were the only ones to benefit from the increased specialisation in textiles and clothing. Data also indicate a relocation of furniture and other manufacturing products from BAC to BEU regions. In Hungary, relocation activity within manufacturing sector was very intense. Overall, it occurred in favour of border regions, and especially regions bordering with the EU. Negative adjustments, i.e. a decrease in the relative employment, happened only for furniture and other manufacturing n.e.c. in BAC regions. In Romanian border regions, relative employment increased mainly in wood and paper products and in machinery, equipment and motor vehicles. Most of this adjustment, however, is within border regions, from BAC to BEX regions. In Estonia, it is interesting to notice that adjustments in relative employment occurred from BEU to BAC regions in all sectors, but machinery, equipment and motor vehicles whose level of agglomeration in BEU regions increased over time.

[9]Groups of economic activities include agriculture, mining and quarrying, manufacturing, energy, construction and services. Manufacturing sector has been further split up into seven sub-sectors. A more disaggregated analysis was not possible because manufacturing activity's classification varies across countries.

[10] This is true for all countries but Estonia and Slovenia. See table 1.

Table 3 - Regional shares of national employment by groups of economics activities

	Regional share of national employment, 1992					Regional share of national employment, 1999				
	border regions				internal regions	border regions				internal regions
	total	BEU	BEX	BAC		total	BEU	BEX	BAC	
BULGARIA										
agriculture	0.53	0.11	0.16	0.25	0.47	0.52	0.12	0.16	0.25	0.48
mining and quarrying	0.61	0.22	0.32	0.07	0.39	0.52	0.12	0.33	0.08	0.48
manufacturing	0.39	0.08	0.13	0.18	0.61	0.39	0.09	0.14	0.17	0.61
food, beverages & tobacco	0.44	0.07	0.15	0.22	0.56	0.40	0.07	0.14	0.18	0.60
textiles, clothing and leather	*0.50*	*0.15*	*0.13*	*0.22*	*0.50*	*0.54*	*0.20*	*0.13*	*0.21*	*0.46*
wood and paper products	*0.32*	*0.10*	*0.10*	*0.12*	*0.68*	*0.25*	*0.08*	*0.08*	*0.09*	*0.75*
fuel & chemicals, rubber & plastic	*0.49*	*0.04*	*0.27*	*0.19*	*0.51*	*0.47*	*0.04*	*0.26*	*0.17*	*0.53*
non metalic mineral product	*0.33*	*0.03*	*0.12*	*0.19*	*0.67*	*0.30*	*0.02*	*0.11*	*0.18*	*0.70*
metallurgy, machinery&equip., motor vehicles	*0.32*	*0.05*	*0.11*	*0.16*	*0.68*	*0.29*	*0.04*	*0.11*	*0.14*	*0.71*
furniture and other manufacturing products	*0.40*	*0.09*	*0.10*	*0.20*	*0.60*	*0.37*	*0.11*	*0.09*	*0.16*	*0.65*
energy	0.45	0.04	0.13	0.27	0.55	0.45	0.04	0.15	0.26	0.55
construction	0.35	0.06	0.14	0.15	0.65	0.34	0.06	0.14	0.14	0.66
services	0.39	0.07	0.13	0.17	0.61	0.35	0.07	0.13	0.15	0.65
HUNGARY										
agriculture	0.66	0.09	0.19	0.38	0.34	0.67	0.09	0.20	0.38	0.33
mining and quarrying	0.65	0.00	0.17	0.48	0.35	0.62	0.01	0.07	0.54	0.38
manufacturing	0.47	0.08	0.09	0.29	0.53	0.51	0.12	0.10	0.29	0.49
food, beverages & tobacco	*0.62*	*0.08*	*0.15*	*0.39*	*0.38*	*0.63*	*0.09*	*0.14*	*0.40*	*0.37*
textiles, clothing and leather	*0.56*	*0.15*	*0.12*	*0.29*	*0.44*	*0.64*	*0.18*	*0.14*	*0.33*	*0.36*
wood and paper products	*0.45*	*0.08*	*0.11*	*0.26*	*0.55*	*0.45*	*0.08*	*0.12*	*0.26*	*0.55*
fuel & chemicals, rubber & plastic	*0.32*	*0.04*	*0.03*	*0.25*	*0.68*	*0.38*	*0.08*	*0.04*	*0.25*	*0.62*
non metalic mineral product	*0.47*	*0.03*	*0.08*	*0.36*	*0.53*	*0.58*	*0.08*	*0.07*	*0.44*	*0.42*
metallurgy, machinery&equip., motor vehicles	*0.38*	*0.08*	*0.06*	*0.24*	*0.62*	*0.43*	*0.12*	*0.09*	*0.22*	*0.57*
furniture and other manufacturing products	*0.58*	*0.07*	*0.12*	*0.39*	*0.42*	*0.53*	*0.12*	*0.10*	*0.31*	*0.47*
energy	0.61	0.10	0.14	0.38	0.39	0.60	0.07	0.13	0.40	0.40
construction	0.46	0.08	0.10	0.28	0.54	0.46	0.07	0.11	0.27	0.54
services	0.44	0.06	0.10	0.27	0.56	0.37	0.05	0.09	0.23	0.63
ESTONIA										
agriculture	1.00	0.56	…	0.44	…	1.00	0.47	…	0.53	…
mining and quarrying	NA	NA	…	NA	…	NA	NA	…	NA	…
manufacturing	1.00	0.79		0.21			0.73		0.27	
food, beverages & tobacco	*1.00*	*0.70*	*…*	*0.30*	*…*	*1.00*	*0.72*	*…*	*0.28*	*…*
textiles, clothing and leather	*1.00*	*0.81*	*…*	*0.19*	*…*	*1.00*	*0.80*	*…*	*0.20*	*…*
wood and paper products	*1.00*	*0.73*	*…*	*0.27*	*…*	*1.00*	*0.52*	*…*	*0.48*	*…*
fuel & chemicals, rubber & plastic	*1.00*	*0.95*	*…*	*0.05*	*…*	*1.00*	*0.78*	*…*	*0.22*	*…*
non metalic mineral product	*1.00*	*0.87*	*…*	*0.13*	*…*	*1.00*	*0.75*	*…*	*0.25*	*…*
metallurgy, machinery&equip., motor vehicles	*1.00*	*0.77*	*…*	*0.23*	*…*	*1.00*	*0.85*	*…*	*0.15*	*…*
furniture and other manufacturing products	*1.00*	*0.72*	*…*	*0.28*	*…*	*1.00*	*0.67*	*…*	*0.33*	*…*
energy	NA	NA	…	NA	…	NA	NA	…	NA	…
construction	NA	NA	…	NA	…	NA	NA	…	NA	…
services	1.00	0.74	…	0.26	…	1.00	0.73	…	0.27	…
SLOVENIA (1997 and 1999)										
agriculture	0.99	0.53	0.47	…	0.01	1.00	0.54	0.46	…	0.00
mining and quarrying	0.80	0.13	0.67	…	0.20	0.80	0.12	0.68	…	0.20
manufacturing	0.98	0.48	0.50		0.02	0.98	0.48	0.49	…	0.02
food, beverages & tobacco	*0.99*	*0.51*	*0.48*	*…*	*0.01*	*0.99*	*0.52*	*0.47*	*…*	*0.01*
textiles, clothing and leather	*0.98*	*0.53*	*0.45*	*…*	*0.02*	*0.98*	*0.53*	*0.45*	*…*	*0.02*
wood and paper products	*0.99*	*0.38*	*0.61*	*…*	*0.01*	*0.99*	*0.38*	*0.61*	*…*	*0.01*
fuel & chemicals, rubber & plastic	*0.99*	*0.42*	*0.56*	*…*	*0.01*	*0.99*	*0.45*	*0.54*	*…*	*0.01*
non metalic mineral product	*0.89*	*0.42*	*0.47*	*…*	*0.11*	*0.89*	*0.44*	*0.45*	*…*	*0.11*
metallurgy, machinery&equip., motor vehicles	*0.97*	*0.51*	*0.46*	*…*	*0.03*	*0.97*	*0.51*	*0.46*	*…*	*0.03*
furniture and other manufacturing products	*0.98*	*0.40*	*0.58*	*…*	*0.02*	*0.98*	*0.39*	*0.59*	*…*	*0.02*
energy	0.95	0.41	0.54	…	0.05	0.94	0.41	0.54	…	0.06
construction	0.98	0.45	0.53	…	0.02	0.98	0.44	0.54	…	0.02
services	0.98	0.44	0.54	…	0.02	0.98	0.44	0.54	…	0.02
ROMANIA										
agriculture	0.53	…	0.22	0.31	0.47	0.53	…	0.22	0.30	0.47
mining and quarrying	0.29	…	0.15	0.14	0.71	0.31	…	0.13	0.17	0.69
manufacturing										
food, beverages & tobacco	0.44	…	0.16	0.28	0.56	0.39	…	0.15	0.25	0.61
textiles, clothing and leather	0.43	…	0.20	0.23	0.57	0.44	…	0.19	0.25	0.56
wood and paper products	0.31	…	0.16	0.15	0.69	0.36	…	0.24	0.12	0.64
fuel & chemicals, rubber & plastic	0.24	…	0.09	0.15	0.76	0.25	…	0.09	0.17	0.75
non metalic mineral product	0.28	…	0.12	0.16	0.72	0.25	…	0.12	0.13	0.75
metallurgy, machinery&equip., motor vehicles	0.33	…	0.15	0.18	0.67	0.37	…	0.17	0.19	0.63
furniture and other manufacturing products	NA	…	NA	NA	NA	NA	…	NA	NA	NA
energy	0.38	…	0.14	0.24	0.62	0.39	…	0.15	0.24	0.61
construction	0.37	…	0.14	0.24	0.63	0.39	…	0.15	0.24	0.61
services	0.40	…	0.15	0.24	0.60	0.41	…	0.17	0.25	0.59

Table 4 shows average annual relative employment growth rates by region and economic activity for the period 1992-99. Again, the data indicate that sector specific effects are stronger than region specific effects. Rates of growth, in fact, are more homogenous across regions than across sectors and countries, with few remarkable exceptions. Border regions taken as a whole perform better than internal ones in Hungary and in Romania but not in Bulgaria. In Hungary, relative employment growth rates in BEU and to a lesser extent BEX regions have a positive sign in several manufacturing sectors, while the country trend is negative. In Romania, differences in relative employment growth rates among border and non border regions are less pronounced than in Hungary and both follow the same negative trend. In Bulgaria, relative employment growth rates in manufacturing sector are negative in all regions and larger in border than in non-border regions, with the exception of textiles and clothing sector, which show a positive relative employment growth rate in the BEU regions.

4. The econometric model

In this section I start to study how relative employment at regional level in candidate countries respond to economic integration using more formal empirical techniques. Estimation has been undertaken using data for 94 regions and 7 manufacturing sectors in Bulgaria, Estonia, Hungary and Romania during the period 1992-1999.[11] This data set has the advantage of having a relative straightforward geography, with a clear set of border and internal regions, and of covering a period of increasing economic integration with the EU.

The easiest way to identify region specific factors able to condition adjustments to trade liberalisation and economic integration is to study the determinants of industry location in different type of border and non border regions and verify in which locations industry employment grows faster (Hanson, 1998).[12]

To test these simple hypotheses, it is useful to start by considering the following general expression for labour demand in industry *j* located in region *i* at time *t*:

$$E_{ijt} = \alpha_{ijt} + \beta W_{ijt} + \gamma X_{ijt} + \varepsilon_{ijt} \qquad (1)$$

[11] Slovenia is not included in the analysis because its figures cover a shorter period of time (1997-99). Concerning economic activity, I omit agriculture, mining and quarrying – whose location is mainly natural resource driven – services – given the impossibility to distinguish between tradable and non tradable services – and metallurgy, machinery and equipment and transportation vehicles, a composite sector made by industries very different from each other, created only to harmonise data across countries.

[12] From the theory standpoint, the location of economic activities is endogenous, since it can generates cumulative causation agglomeration (Fujita, Krugman and Venables, 2000).

Table 4 - Annual average employment growth in region by groups of economic activities

	BEU	BEX	BAC	BORDER	INT	country average
BULGARIA						
agriculture	0.026	0.013	0.018	0.018	0.022	0.02
mining and quarrying	-0.156	-0.071	-0.063	-0.095	-0.045	-0.074
manufacturing	-0.038	-0.052	-0.068	-0.056	-0.053	-0.054
food, beverages & tobacco	*-0.009*	*-0.035*	*-0.051*	*-0.039*	*-0.018*	*-0.027*
textiles, clothing and leather	*0.01*	*-0.029*	*-0.033*	*-0.018*	*-0.041*	*-0.029*
wood and paper products	*-0.103*	*-0.115*	*-0.12*	*-0.113*	*-0.065*	*-0.079*
fuel & chemicals, rubber & plastic	*-0.036*	*-0.038*	*-0.053*	*-0.044*	*-0.029*	*-0.036*
non metalic mineral product	*-0.09*	*-0.07*	*-0.065*	*-0.069*	*-0.051*	*-0.057*
metallurgy, machinery&equip., motor vehicles	*-0.102*	*-0.061*	*-0.089*	*-0.081*	*-0.063*	*-0.068*
furniture and other manufacturing products	*-0.121*	*-0.157*	*-0.169*	*-0.154*	*-0.136*	*-0.143*
energy	0.01	0.013	-0.006	0.001	-0.001	0
construction	-0.056	-0.061	-0.07	-0.064	-0.059	-0.061
services	0.006	0.004	-0.007	-0.001	0.021	0.013
HUNGARY						
agriculture	-0.108	-0.1	-0.103	-0.103	-0.108	-0.105
mining and quarrying	0.083	-0.305	-0.202	-0.22	-0.207	-0.215
manufacturing	0.027	-0.005	-0.023	-0.009	-0.03	-0.02
food, beverages & tobacco	*-0.027*	*-0.059*	*-0.046*	*-0.046*	*-0.052*	*-0.049*
textiles, clothing and leather	*0.003*	*-0.002*	*-0.001*	*0*	*-0.048*	*-0.019*
wood and paper products	*-0.017*	*-0.015*	*-0.02*	*-0.018*	*-0.018*	*-0.018*
fuel & chemicals, rubber & plastic	*0.099*	*0.015*	*-0.02*	*0.002*	*-0.036*	*-0.023*
non metalic mineral product	*0.105*	*-0.065*	*-0.005*	*-0.004*	*-0.065*	*-0.034*
metallurgy, machinery&equip., motor vehicles	*0.058*	*0.066*	*-0.018*	*0.015*	*-0.016*	*-0.003*
furniture and other manufacturing products	*0.067*	*-0.039*	*-0.043*	*-0.025*	*0.002*	*-0.013*
energy	-0.065	-0.026	-0.017	-0.026	-0.022	-0.024
construction	-0.044	-0.028	-0.045	-0.041	-0.039	-0.04
services	-0.027	-0.034	-0.028	-0.03	0.011	-0.006
ESTONIA						
agriculture	-0.154	…	-0.11	-0.133	…	-0.133
mining and quarrying	NA	…	NA	NA	…	NA
manufacturing	-0.059	…	-0.014	-0.048	…	-0.048
food, beverages & tobacco	*-0.023*	…	*-0.038*	*-0.027*	…	*-0.027*
textiles, clothing and leather	*-0.065*	…	*-0.05*	*-0.062*	…	*-0.062*
wood and paper products	*0.028*	…	*0.169*	*0.078*	…	*0.078*
fuel & chemicals, rubber & plastic	*-0.139*	…	*0.086*	*-0.114*	…	*-0.114*
non metalic mineral product	*-0.139*	…	*-0.032*	*-0.12*	…	*-0.12*
metallurgy, machinery&equip., motor vehicles	*-0.068*	…	*-0.131*	*-0.08*	…	*-0.08*
furniture and other manufacturing products	*-0.042*	…	*-0.011*	*-0.033*	…	*-0.033*
energy	NA	…	NA	NA	…	NA
construction	NA	…	NA	NA	…	NA
services	0.003	…	0.011	0.005	…	0.005
SLOVENIA (1997-1999)						
agriculture	-0.073	-0.089	…	-0.081	-0.159	-0.081
mining and quarrying	-0.078	-0.036	…	-0.043	-0.056	-0.046
manufacturing	-0.016	-0.022		-0.019	-0.025	-0.019
food, beverages & tobacco	*-0.005*	*-0.027*	…	*-0.015*	*-0.038*	*-0.016*
textiles, clothing and leather	*-0.066*	*-0.059*	…	*-0.063*	*-0.134*	*-0.064*
wood and paper products	*-0.019*	*-0.017*	…	*-0.018*	*-0.038*	*-0.018*
fuel & chemicals, rubber & plastic	*0.03*	*-0.009*	…	*0.008*	*-0.104*	*0.006*
non metalic mineral product	*-0.002*	*-0.052*	…	*-0.028*	*-0.001*	*-0.025*
metallurgy, machinery&equip., motor vehicles	*-0.002*	*-0.005*	…	*-0.003*	*0.016*	*-0.003*
furniture and other manufacturing products	*-0.048*	*-0.029*	…	*-0.037*	*-0.006*	*-0.036*
energy	-0.034	-0.037	…	-0.036	-0.022	-0.035
construction	0.01	0.035	…	0.024	0.031	0.024
services	0.022	0.022	…	0.022	0.04	0.022
ROMANIA						
agriculture	…	0.001	-0.001	0	0.002	0.001
mining and quarrying	…	-0.093	-0.052	-0.072	-0.08	-0.077
manufacturing	…	-0.06	-0.065	-0.063	-0.075	-0.071
food, beverages & tobacco	…	*-0.047*	*-0.047*	*-0.047*	*-0.018*	*-0.03*
textiles, clothing and leather	…	*-0.059*	*-0.045*	*-0.052*	*-0.057*	*-0.055*
wood and paper products	…	*0.029*	*-0.065*	*-0.018*	*-0.039*	*-0.029*
fuel & chemicals, rubber & plastic	…	*-0.085*	*-0.075*	*-0.08*	*-0.087*	*-0.085*
non metalic mineral product	…	*-0.071*	*-0.098*	*-0.085*	*-0.064*	*-0.07*
metallurgy, machinery&equip., motor vehicles	…	*-0.075*	*-0.082*	*-0.078*	*-0.101*	*-0.093*
furniture and other manufacturing products	…	*NA*	*NA*	*NA*	*NA*	*NA*
energy	…	0.022	0.012	0.017	0.013	0.014
construction	…	-0.062	-0.071	-0.066	-0.078	-0.074
services	…	-0.016	-0.027	-0.022	-0.032	-0.029

where E_{ijt} denotes employment, W_{ijt} the wage, and X_{ijt} a vector of variables able to affect the location of economic activities at region and sector level, while å$_{ijt}$ is an i.i.d labour demand shock that has mean zero e constant variance.

Following the most recent development of the literature, I assume that both comparative advantage and economic geography factors might determine the location of economic activities both at national and sub-national level (Overman, Redding, Venables, 2001). This implies that vector *X* in eq. (1) should include at least two types of variables:

1) *Geography* variables, such as distance between economic agents and agglomeration economies. Distance is directly related to transaction costs, because of the transport costs of shipping goods, the costs of contracting at distance, and of acquiring information about distant economies. Intuitively, this implies that economic activities will concentrate close to large markets to minimise transport costs. Agglomeration economies, i.e. the opportunities to create a network with other firms operating in the same sector or in a different industrial branch, explain why firms locate close to each other. They might reinforced cumulative causation processes of location or refrain firms to re-locate elsewhere;
2) *Comparative advantage* variables, deriving from natural, i.e. exogenous, factors such as proximity, region accessibility, and the endowment of natural resources, a well as characteristics of the local economic environment, such as the structure of the labour force, the level of education, the availability of services related to production activities, etc.

Eventually, the choice of the variables to include in the empirical analysis has to take into account two further elements: the peculiar experience of transition countries and the availability of reliable figures in a sufficient long time series.[13] Concerning the former, several empirical studies have shown the key role played by *foreign direct investment* (FDI) in transition countries.[14] FDI, even more than trade, has driven the integration process with the EU (Döhrn, 2001), has contributed to the economic restructuring process, bringing into the area financial capitals as well as new technology, skills and managerial know-how, which in turns have generated positive spillovers to domestic economy (Konings, 1999; Damijan, Majcen, 2000; Djankov, Hoeckman, 2000). Finally, FDI may also generate agglomeration processes of domestic firms through linkages with local suppliers (Altomonte, Resmini, 2001). These considerations and data constraints yield the equation that will be estimated:

[13] The latter aspect is, needless to say, more serious than the former, especially because I am working at regional level.

$$\ln\left(\frac{E_{ijt}}{E_{jt}}\right) = \alpha_{ijt} + \beta_1 \ln(W_{it-1}) + \beta_2 \ln\left(\frac{DIST_i}{\sum_i w_{ijt} DIST_i}\right) + \beta_3 \ln(FDI_{it}) + \beta_4 \ln(\frac{E_{ist}}{E_{st}}) + \\ + \beta_5 \ln(ROAD_{it}) + \beta_6 \ln(STUD_{it}) + \varepsilon_{ijt} \qquad (2)$$

where *i* indicates regions, *j* industries, *t* time and *s* the service sector.

The dependent variable is regional employment in sector *j*, measured relative to national employment in order to control for national demand effect. The first term on the right side of eq (2) is the average region wage. In order to avoid introducing simultaneity into the regression, I use regional wage lagged one period. To the extent wages reflect market conditions, I expect relative employment to be decreasing in region wage. The second term is a proxy for geographical distance, which I measure as road distance from region *i* to the capital city relative to industry weighted-average distance to the capital. The distance variable should be uncorrelated with relative employment if trade liberalisation and transition have re-oriented core markets towards foreign markets; otherwise it should be negatively correlated with relative employment, since transport costs increase with distance. The third term in eq. (2) captures the role of FDI in developing regional economy. I measured FDI as the number of foreign firms in region *i* at time *t* per 100,000 inhabitants, in order to take into account region size effects. To the extent FDI plays a positive role in promoting local development through spillovers and linkages, I expect relative employment to be increasing in FDI. However, since foreign firms have been heavily involved in restructuring activities, mainly in the early transition, the impact on relative employment might be negative. The fourth term in eq. (2) measures relative employment in the service sector. Since services are supposed to give a positive contribution to the economic activity, I expect that it positively affects the location of economic activities. The fifth term in eq. (2) is a proxy for region's accessibility, which I measure as road density. I expect relative employment to be higher where the endowment of infrastructures is higher. Finally, the sixth term of eq. (2) indicates the endowment of skilled labour force, measured indirectly through the number of secondary and tertiary students per 100,000 inhabitants at region level. Again, the normalisation is needed to take into account effects related to different region size.

Concerning the error term, I control for the possibility there are idiosyncratic components to economic activity location at region level by allowing it to have the following structure:

$$\varepsilon_{ijt} = \tau_i + \kappa_j + \eta_t + \mu_{ijt} \qquad (3)$$

[14] See UN/ECE (2001) for a comprehensive survey on the role of FDI in transition countries.

where θ_q is a fixed region-type effect[15], ε_j is a fixed industry effect, γ_t is a fixed year effect and ν_{ijt} is an i.i.d. random variable with mean zero and variance σ^2. I choose fixed effects rather than random effects estimation since relative employment is the consequence of both region and industry characteristics. From a technical point of view, this indicates that ν_{ijt} can not be considered uncorrelated across regions and industries. Thus, fixed effects estimation is more appropriate (Baltagi, 2001). Given the size of the sample, using dummy variables to control for fixed effects does not substantially reduce the degrees of freedom of the regression. The relative large number of observations also allows the estimation of a variable coefficient model, which aims at evaluating potential differences in the explanatory power of the exogenous variables in each group of regions.

In order to study in which location relative employment has grown faster, I assume that the average growth rate of the relative employment over the period can be expressed as a function of the initial conditions of the relative employment of industry j in region i, and other regions' characteristics as well. This specification allows to avoid introducing simultaneity in the regression, which have the following structure:

$$\ln\left(\frac{E_{ijT}/E_{jT}}{E_{ijt}/E_{jt}}\right) = \alpha_{ij} + \beta_1 \ln(W_{it}) + \beta_2 \ln\left(\frac{DIST_i}{\sum_i w_{ijt} DIST_i}\right) + \beta_3 \ln(FDI_{it}) + \\ + \beta_4 \ln(\frac{E_{ist}}{E_{st}}) + \beta_5 \ln(ROAD_{it}) + \beta_6 \ln\left(\frac{E_{ijt}}{E_{jt}}\right) + \beta_7 \ln(STUD_{it}) + \varepsilon_{ijt} \quad (4)$$

where T indicates the final period (1999) and t the initial period (1993).

Eq. (4) has been estimated twice, first without controlling for fixed effects and then including dummy variables for region types (different types of borders and non-border regions) and industries. The equation has been estimated by OLS. Since there are two potential sources of heteroscedasticity (across regions and across industries), I use White's (1980) correction in order to obtain consistent standard errors.

[15] Given the objective of the paper, region fixed effects have been considered as constant within the groups of homogeneous regions previously identified (see Table 1).

5. Estimation results

Table 5 gives estimation results on relative employment (equation 2). Column (1) presents estimation results for pooling all observations across sectors, years and regions, while in the following columns the hypotheses of common intercepts across regions, sectors and years have been progressively relaxed.

Tab. 5 - Regression results on regional industry relative employment, 1992-1999

	Pool	FE		
variables	**(1)**	**(2)**	**(3)**	**(4)**
wage	0.066 *(0.026)***	0.08 *(0.026)****	0.081 *(0.026)****	0.12 *(0.027)****
relative distance	-0.08 *(0.013)****	-0.06 *(0.016)****	-0.05 *(0.015)****	-0.05 *(0.015)****
FDI	0.08 *(0.012)****	0.082 *(0.013)****	0.078 *(0.012)****	0.083 *(0.013)****
Roads	0.24 *(0.027)****	0.24 *(0.031)****	0.24 *(0.030)****	0.26 *(0.030)****
services	0.65 *(0.035)****	0.67 *(0.027)****	0.69 *(0.026)****	0.68 *(0.026)****
students	0.05 *(0.011)****	0.05 *(0.011)****	0.05 *(0.011)****	0.05 *(0.011)****
constant	-4.03 *(0.339)****	-3.12 *(0.25)****	-2.95 *(0.243)****	-2.93 *(0.249)****
region dummy		$F_{(3,3814)}$=6.89***	$F_{(3,3807)}$=7.92***	$F_{(3,3800)}$=8.08***
industry dummy	-	-	$F_{(6,3807)}$=37.09***	$F_{(6,3800)}$=36.96***
year dummy	-	-	-	$F_{(6,3800)}$=1.14
n. of obs	*3824*	*3824*	*3824*	*3824*
R2	*0.40*	*0.38*	*0.42*	*0.42*
Root MSE	*0.83*	*0.82*	*0.80*	*0.79*

Robust standard errors are in parenthesis
*** indicates statistical significance at 0.01 level.
** indicates statistical significance at 0.05 level.

All control variables significantly affect the location of the manufacturing activities. The results show that the interaction between relative employment and wage at regional level is significant, though has the opposite sign to that expected from the theory. It is not clear how to interpret this result, particularly because it is not constant across regions, as it is shown in

table 6. One possible explanation is that it does not reflect market conditions because of the presence of some region-specific rigidities.[16] The interpretation of the results for the other explanatory variables is more straightforward. Relative distance to the capital is negatively related to relative employment in all regressions. This suggests distance to capital reduces regional labour demand. Despite trade liberalisation and economic integration with the EU, domestic market is still determines the location of economic activities within a country. The results also show that relative employment is positively correlated with the infrastructure variable, the FDI variable, the number of student and the relative employment in the service sectors. The largest quantitative effects are those related to the service sector and the road variable.

These results hold also when controlling for fixed effects. Relative employment is different across regions and sectors, while the location of economic activities does not seem to have been affected by time flying.

The results discussed above are averages for all regions included in the sample. However, the location of economic activities may respond differently to the explanatory variables according to the geographical position of each region with respect to borders. To determine the individual influence of each explanatory variable, I re-estimate equation (2) allowing for separate slope parameters in each of the four groups of regions previously identified. The resulting coefficients are shown in Table 6. The most striking changes from the previous results concern the distance variable, the infrastructure variable and the wage variable, all able to affect the location of economic activities only in border regions, though to a different extent according to the type of border. Internal regions' capacity to attract economic activities, instead, relies on the presence of foreign firms, the endowment of educated labour force and services as well.

Differences across border regions are less marked, but perhaps more interesting. Relative employment in regions bordering external (BEX) and other candidate countries (BAC) is lower where the functional distance from the capital is higher, indicating a strong dependence of these peripheral regions from domestic markets. In BEU regions, instead, the interaction between relative employment and distance is still significant, but positive. This results indicate that bordering with advanced countries – as the EU may be in comparison with transition countries – may mitigate the disadvantage of being in a peripheral position. Wages reflect market conditions only in BEX regions, while in BEU and BAC regions the interaction

[16] Another possible explanation is that regional wages have been measured in nominal and not in real terms, thus reflecting inflation rather than market conditions. If this were true, however, it would become more and more difficult to explain how wages behave differently across regions as a determinant of the location of economic activities.

between relative employment and wages is significant but positive, though quantitatively not too large. FDI contributes positively to relative employment in all regions, except those bordering with the EU, indicating that in BEU regions foreign firms have a dominant role in the economic system. Road density does not affect the location of economic activities in BEU regions, suggesting that in these regions, economic links with foreign markets are stronger than those with internal markets, thus reducing the importance of a good endowment of infrastructure connecting regions *within* a country. Skilled labour force positively affects relative employment in all regions but BAC, while manufacturing activities in BEX regions do not seem to be affected by the location of tertiary activities within the regions. Finally, it is worth noticing that from a quantitative point of view, the service variable exerts the strongest impact in BEU regions, while road variable coefficient takes its highest value in BEX regions, indicating that external regions need to have a good accessibility in order not to be penalised by its peripheral location.

Overall, these results indicate that economic integration and trade liberalisation with the EU has had a different impact on the location of economic activities in border and non border regions. Moreover, they also confirm that border regions can not be treated as a homogenous set of regions. The location of economic activities in border regions respond differently to the explanatory variables according to their geographical location.

5.2 Prospects for growth

Table 7 gives the estimation results for eq. (4), i.e. relative employment growth over the period 1993-99. Among the control variables, only the initial level of relative employment, FDI and services seem to be able to generate some re-location activities. In particular, relative employment growth is higher where the initial level of relative employment is lower, a sign for converge across regions, and where the initial level of FDI and regional specialisation in services are higher. There is no evidence that relative distance is related to relative employment growth. The coefficient of the variable is negative, but statistically insignificant in all regressions. These effects are common to all sectors, and the hypothesis of heterogeneity among regions is supported by data only at 0.05 level of significance. Consequently, economic integration and trade liberalisation are likely to affect only weakly economic growth across regions depending on their location within the country or along the borders.

Table 6 - Regression results on regional industry relative employment (1992-1999): variable coefficient model

			BEU		BEX		BAC		INT			
variables	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	**Wald test on restrictions (1)**	**Wald test on restrictions (2)**
wage			0.23 (0.088)**	0.26 (0.084)***	-0.39 (0.109)***	-0.31 (0.105)***	0.11 (0.044)**	0.10 (0.043)**	-0.07 (0.046)	-0.06 (0.043)	$F_{(3,3796)}$=23.26***	$F_{(3,3768)}$=8.37***
relative distance			0.24 (0.071)***	0.18 (0.070)**	-0.5 (0.112)***	-0.32 (0.116)***	-0.34 (0.047)***	-0.28 (0.046)***	-0.01 (0.022)	0.002 (0.022)	$F_{(3,3796)}$=24.81***	$F_{(3,3768)}$=15.45***
FDI			-0.32 (0.079)***	-0.34 (0.075)***	0.3 (0.035)***	0.27 (0.034)***	0.14 (0.028)***	0.12 (0.027)***	0.06 (0.016)***	0.05 (0.016)***	$F_{(3,3796)}$=9.01***	$F_{(3,3768)}$=22.29***
Road			-0.15 (0.206)	-0.13 (0.197)	1.26 (0.189)***	1.26 (0.180)***	0.18 (0.058)***	0.21 (0.055)***	-0.01 (0.85)	-0.004 (0.081)	$F_{(3,3796)}$=13.48***	$F_{(3,3768)}$=14.48***
student			0.19 (0.083)**	0.19 (0.080)**	0.09 (0.035)**	0.09 (0.033)***	0.03 (0.02)	0.03 (0.020)	0.05 (0.019)**	0.05 (0.018)**	$F_{(3,3796)}$=1.5	$F_{(3,3768)}$=1.75
services			1.33 (0.163)***	1.24 (0.157)***	0.055 (0.079)	0.08 (0.075)	0.73 (0.063)***	0.71 (0.060)***	0.79 (0.056)***	0.79 (0.054)***	$F_{(3,3796)}$=26.91***	$F_{(3,3768)}$=26.08***
industry dummy			no	yes	no	yes	no	yes	no	yes		
n. of obs	3824	3824	330		505		1208		1781			
R2	0.42	0.48										
Root MSE	0.79	0.76										

Robust standard errors are in parenthesis. Regional fixed effects not reported.
*** indicates statistical significance at 0.01 level; ** indicates statistical significance at 0.05 level and * indicates statistical significance at 0.1 level.
Last two columns give the Wald test statistics for the nul hypothesis of equal slope coefficients among groups of regions

In order to better understand how the enlargement process will affect regions' prospects for growth, I construct predicted growth rates using the estimated coefficients. The results are given in table 8, which points out several striking features. On average, border regions have better prospects for growth than internal one, which are intended for stagnation. Within border regions, BEX ones show the highest rate of growth in relative employment, followed by BEU regions. Regions bordering with other candidate countries enjoy positive rates of growth but they are much lower than those of other border regions, and more similar to those enjoyed by internal regions. With respect to countries, all Hungarian regions are above the average in their respective categories, while Bulgarian and Romanian regions show growth rates under the average, with the exception of Romanian BAC regions, indicating that regional adjustments are not independent from domestic country effects.

Table 7 - Regression results: regional industry relative employment Growth over the period (1993-99)

variables	(1)	(2)	(3)
relative employment	-0.22 *(0.043)***	-0.21 *(0.043)***	-0.21 *(0.042)***
wage	0.05 *(0.036)*	0.05 *(0.037)*	0.06 *(0.037)*
relative distance	-0.004 *(0.017)*	-0.005 *(0.017)*	-0.01 *(0.018)*
FDI	0.06 *(0.026)***	0.06 *(0.03)***	0.05 *(0.027)**
Road	0.05 *(0.050)*	0.05 *(0.05)*	0.03 *(0.054)*
Services	0.08 *(0.046)**	0.08 *(0.05)**	0.07 *(0.047)*
student	-0.01 *(0.023)*	-0.01 *(0.023)*	-0.01 *(0.025)*
constant	-1.05 *(0.41)***	-1.02 *(0.415)***	-1.01 *(0.429)***
industry dummies *region dummies*	-	$F_{(6,461)}$=0.39	$F_{(6,461)}$=0.38 $F_{(3,461)}$=3.53**
n. of obs	*479*	*479*	*479*
R^2	*0.169*	*0.175*	*0.181*
Root MSE	*0.402*	*0.404*	*0.404*

Robust standard errors are in parenthesis
*** indicates statistical significance at 0.01 level. ** indicates statistical significance at 0.05 level.
* indicates statistical significance at 0.10 level.

Table 8 - Predicted growth rates over the period by groups of regions and country (%)

	BEU	BEX	BAC	INT	INT*
group average	**11.8**	**13.9**	**5.6**	**-0.2**	**0.5**
within country:					
Bulgaria	9.9	4.4	-4.0	-2.3	-2.3
Estonia	10.9	…	n.a.	…	…
Hungary	24.1	20.6	7.5	7.4	10.6
Romania	…	12.2	9.6	-2.6	-2.3

* without capital city districts
n.a = not estimated;

6. Concluding remarks

This paper provides a first rigorous framework in which regional adjustments in Central and Eastern Europe may be assessed and understood. The need for an in-depth analysis of the impact of the enlargement process on candidate countries at regional level has often been highlighted, but the lack of consistent and reliable statistics, homogenous across countries and regions made this analysis difficult and limited to qualitative insights on the spatial effects generated by a strengthening of the economic integration with the EU. This paper has aimed to fill this gap. It presents empirical evidence that the location and growth of economic activities in candidate countries may be conditioned by region specific effects. The analysis provides interesting results which, interpreted cautiously can be summarised as follows:

- Border regions do not represent a homogeneous set of regions, since economic performance of frontier areas is affected not only by the relative position within a country with respect to its economic centre – which often coincides with the capital city in transition countries – but also by the economic conditions of the neighbouring foreign countries. Fore these reasons, border areas are more sensitive to region accessibility and distance from the capital city than internal regions, though interesting differences can be identified within each group of homogeneous border regions.
- BEU regions seem to take advantage to their location since it has stimulated a catching up process: economic activity is attracted by high wages, skilled labour force and a well developed service sector, while FDI, increases productivity and efficiency, while reducing relative employment. The peripheral location from their respective capitals do not seem to be a problem, since economic activity is not affected by the region accessibility (measured

with respect to the national dimension). In conclusion, BEU regions seem to have many of the characteristics of what has been defined as an "active contact space" (Nijkamp, 1998; Van Geenhuizen, Ratti, 2001), and the analysis of prospects of growth further reinforces this consideration.

- BEX regions have raised concerns among economists and policy makers as well. It was thought that their very peripheral position, not only within their respective countries but also with respect to the EU, and the proximity to countries economically weak would have represented a serious obstacle to their economic development. However, the paper does not confirm this pessimistic picture. Low wages, FDI, infrastructure connections with the capital city are able to attract economic activities in this regions, and also to overcome the negative effect generated by the distance variable.
- BAC regions do not present serious concerns. Manufacturing activity is penalised by the distance from the capital city, but takes advantages from high wages, infrastructure , FDI, and the presence of service activities. Skilled labour force does not seem to exert any effects on the location of manufacturing within this group of regions, indicating a prevalence of traditional, labour intensive activities.
- Manufacturing activities in internal regions seem to be attracted only by a well developed service sector (as it usually is in the capital city, which belong to this group of regions with the exception of Tallin, Estonia) and to a lesser extent by FDI and skilled labour force.
- Concerning growth rates, two interesting results deserve particular attention. First, employment growth at regional level depends negatively by the initial level of the employment in each sector and positively by FDI and services, though econometric results are very weak for the last two variables. Also region specific effects are weakly supported by data. Overall, these results suggest that a convergence process is working within countries, but not with respect to the EU average, as it is shown by the transition matrices computed in section 3.
- Finally growth prospects seem to confirm the better position of border regions relative to internal one. The former are, on average, expected to grow, while the latter show a stagnation or a small decline, other things been equal. Within border regions, BEX and BEU show the highest predicted growth rates. It is however worth noticing that prospects for growth are country specific.

Many of these results are on the range on what one might have expected and therefore allow some confidence in the reliability of data and methodology. Altogether, they suggest a less dramatic view of the spatial effects of the enlargement process in candidate countries.

However, the time period considered is so short and eventful which makes the availability of more detailed and longer time series data desirable and necessary to completely understand the consequences of the enlargement process.

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