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Convergencia estructural entre los países de la adhesión y la unión europea. reformas, niveles de renta o modelos de especialización

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Resumen:

Este papel investiga las características estructurales del empleo en los países de la adhesión, y su posible relación con el proceso de reforma. Se argumenta que la identificación de los sectores viejos y nuevos pueden basarse en el proceso de convergencia, con las estructuras ocupacionales en los países de Europa central y oriental evolucionando hacia las que presentan las economías más desarrolladas de la Unión Europea. El trabajo suministra algunas indicaciones sobre la existencia de un vínculo entre las reformas y el ajuste estructural. Adicionalmente, se discute medidas alternativas de cambio estructural y los modelos de evolución estructural.

Structural Convergence Between Accession Countries and the European Union. Reforms, Income Levels or Specialisation Patterns?

Summary*:

This paper investigates the structural characteristics of employment in accession countries, and the possible link with reform process. It argues that the identification of 'old' and 'new' sectors may be based on convergence process, with the employment structures in Central and Eastern Europe (CEE) evolving towards those present in most developed European Union (EU) economies. The paper provides some indication that there is a link between structural adjustment and reforms. Additionally, it discusses alternative measures of structural change and patterns of structural evolutions.

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**STRUCTURAL CONVERGENCE BETWEEN ACCESSION
COUNTRIES AND THE EU. REFORMS, INCOME LEVELS
OR SPECIALISATION PATTERNS?**

Tomasz Mickiewicz¹²

The aim of this paper is to investigate the link between structures of employment and reform process in transition countries. It argues that the identification of ‘old’ and ‘new’ sectors may be based on convergence process, with the employment structures in CEE evolving towards those present in most developed EU economies. That follows the line of argument present in 1997 and 1999 ‘Transition Reports’ (EBRD 1997, 1999). The paper provides some indication that there is a link between structural adjustment and reforms. It also discusses alternative measures of structural change and patterns of structural evolutions.

Section one discusses data on most aggregate level, where employment is classified as agriculture, industry and services. It presents patterns of structural change in post-communist

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countries and compares it with the standard relationship between GDP per capita levels and structures. Section two moves to ISIC-3 classification and discusses structural changes in transition countries on more disaggregate level. Section three introduces some measures of structural change and analyses their usefulness. Next, a possible link between unemployment and structural change is discussed. Finally, section five tackles the possible link between reforms and restructuring.

1. GDP per capita and structures of production

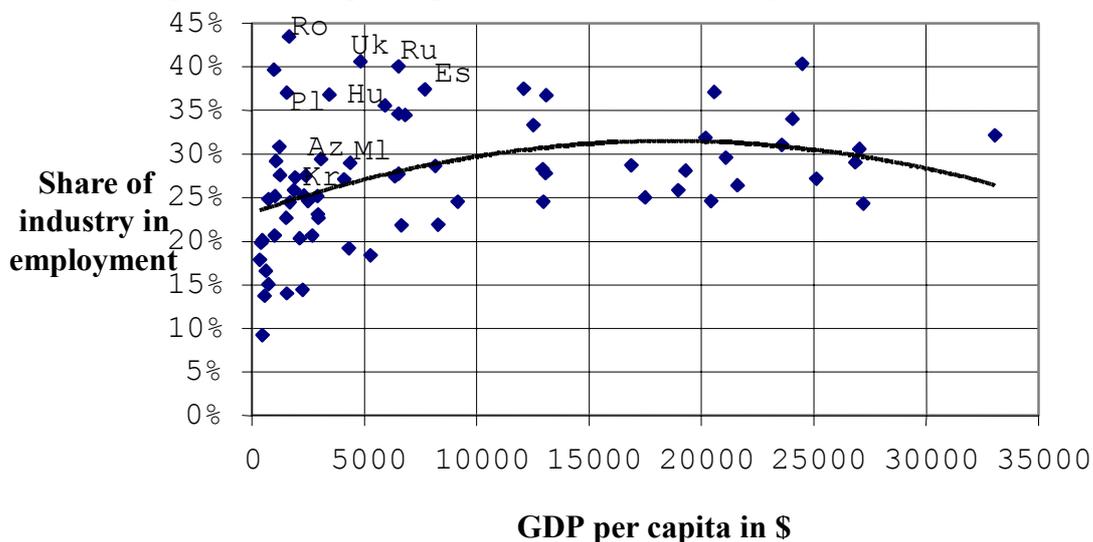
The process of the reallocation of labour during post-communist transition may be analysed within wider comparative perspective. Typical development path of economic structures corresponds to the well documented empirical relationship between the level of per capita GDP and the sectoral patterns of production and employment. Low income countries' economies are almost entirely agricultural. Economic development brings in an increased share of manufacturing and services. In the later phase, the share of industry stabilises, then starts to fall, while the service sector increases further (Rowthorn and Wells, 1987; Dohrn & Heilemann, 1993, 1996; EBRD 1997, 1999).

The communist countries did not follow this pattern. The share of industry was much higher than for comparator countries with similar level of income per capita.³ This is illustrated by the figure below:⁴

³ The difference between the Soviet block and the rest of world would be even more striking with non-employment added as a fourth sector, as employment rates were exceptionally high in the socialist countries.

⁴ When the socialist countries are excluded from the sample, coefficient of determination increases from 0.15 to 0.29.

Figure 1. GDP per capita and share of industry, 1990, 71 countries



Source: UN, *Statistical Yearbook 1995, New York 1997* and *WIIW database*.

The relationship between income per capita and size of industrial sector is not perfect. The more exact fit could result from (i) controlling for the phase of the business cycle (as, say, measured by some unemployment indicators) and (ii) controlling for export specialisation (Rowthorn and Wells, 1987). Dohrn & Heilemann (1996) introduce some additional elements including natural resource endowment and investment, and (iv) they exclude some groups of countries, including all low income, for which dispersion is large. Natural resource endowment is correlated with the share of primary sector in exports (i.e.: ii). Exclusion of low income countries is more problematic, as it seems to have no basis in theory. The resulting improvement in results is purely mechanical.

What is the economic significance of the relationship illustrated by Figure 1? Rowthorn and Wells (1987) present a simple (but not trivial) dynamic model, where structural change is driven by two factors:

(i) improvement in productivity, with different rate for the three sectors (low for services and high for both agriculture and manufacturing), and

(ii) differences in income elasticities of demand, with the demand for food being income-inelastic.

Combined together, those two driving forces are sufficient to result in the dynamic structural evolutions corresponding to Figure 1.

If this model is correct, any econometric exercise, which tries to explain sectoral composition of employment (or output) by GDP per capita should take into account that the real model has more than one dimensions, with the pace of productivity change in different sectors being the major driving force. For instance, it is not the case that some countries are poor due to excessive share of employment in agriculture, but rather that this share is excessive due to low productivity.

More generally:

$$(1) V = f(E_1, E_2, \dots, E_n),$$

where V is value-added, E corresponds to share of employment in a sector of economic activity and function f may be either additive, or not. In the latter case, there are complementarities between sectors. For instance, efficiency of manufacturing is enhanced by the existence of developed financial sector, other business-oriented services, transport services and educational system.

Income per capita corresponds to average productivity level, but it also affects the structure of demand. In particular, income elasticity for some services is high. As they are nontradables, their production is driven by domestic demand, which is increasing more than proportionally with real incomes.

Thus, the link between structures and GDP per capita results from a mixture of demand and supply factors. Part of the process is well explained by standard factors, which are affecting economic growth. Capital accumulation, human capital, infrastructure, legal and macroeconomic stability result in increased productivity in agriculture, and next in industry. Transfer to services is a mixture of a shift towards more efficient production structures (including increased financial sector and business services, transport networks and educational systems) and a respond to a shifting pattern of demand.

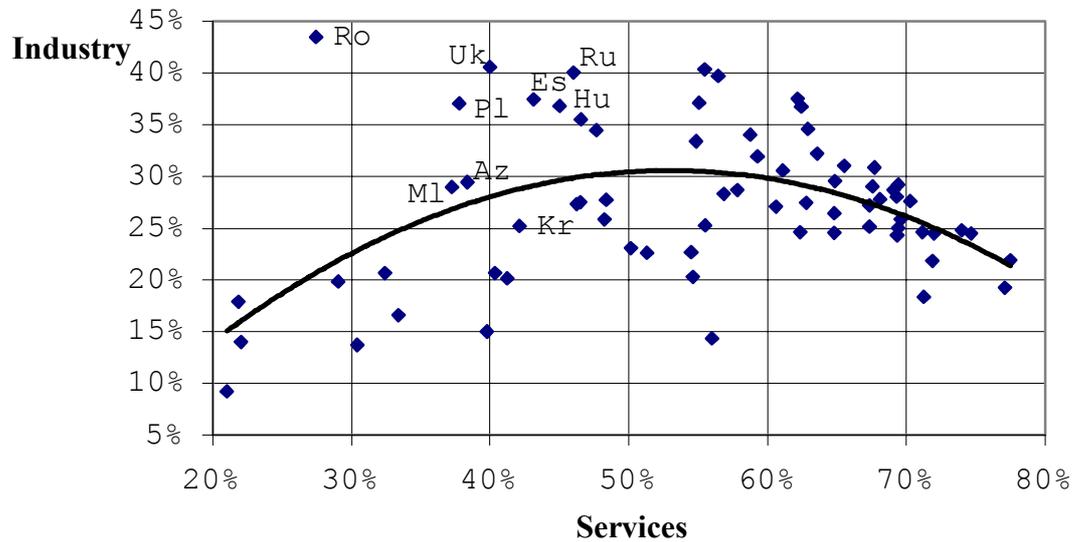
2. Post-communist countries: 'horizontal' versus 'vertical' convergence

Figure 1 confirms the well-known fact: socialist economies were characterised by exceptionally high shares of industry. Romania, Russia and Ukraine are clear outliers, followed by Poland, Hungary and Estonia and three former Soviet Union republics, slightly above the trend line (Azerbaijan, Moldova, Kirgistan). The large share of industry is an explicit effect of the imposed pattern of development under socialism. So is the workforce's high level of literacy and education, extensive urbanisation, and the predominance of large scale organisation in agriculture (resulting from earlier collectivisation in all the transition countries except Poland) (EBRD, 1997, p.64).

Before focusing the discussion on post-communist countries, it is convenient to map Figure 1 into purely structural space (Figure 2 below). The fact that the link becomes stronger, as compared with Figure 1 is not particularly surprising, as the shares of both sectors (plus agriculture) must add to one, so they are correlated. Again, the post-socialist group is a clear outlier.⁵

⁵ Similarly to Figure 2, when the socialist countries are excluded, coefficient of determination for the trendline increases from 0.24 to 0.42.

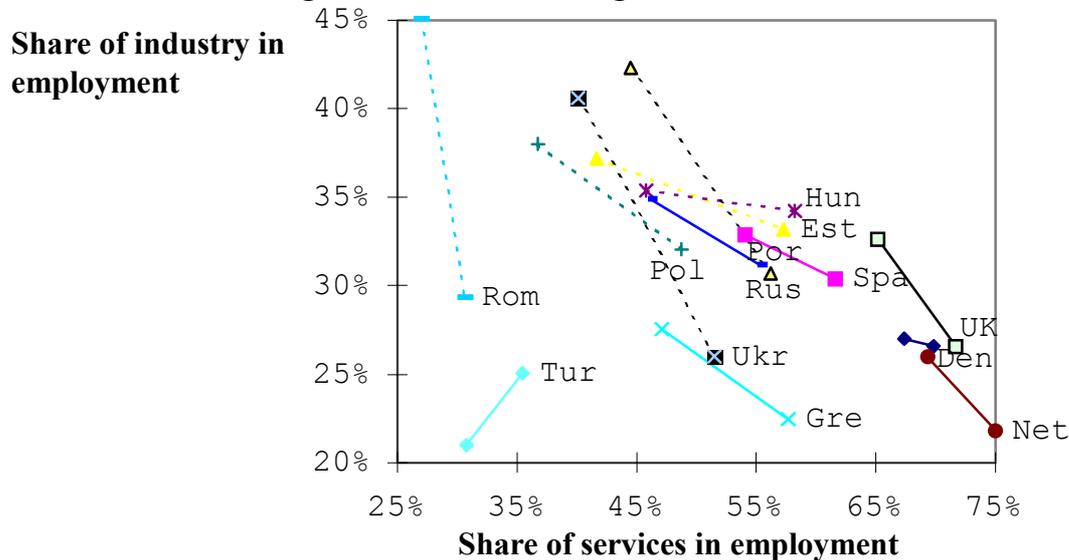
Figure 2. Employment structures, 1990, 71 countries.



Note: Agriculture (=100%-industry-services) corresponds to either ISIC2, division 1 or ISIC3, categories A and B; industry means either ISIC2, divisions 2-5, or ISIC3, categories C-F, while services relate to remaining sections

What is the direction of change in the region? Figure 3 below uses the same aggregate structural framework to present basic data on structural evolutions in Central and Eastern Europe, with several other countries presented for comparison.

Figure 3 Structural changes, 1989-1998



Source: International Labour Office, 1998,1999, Yearbook of Labour Statistics, Geneva; WIIW database.

Note: Greece, Portugal - 1989/1997, Russia, Ukraine: 1990/1998.

Everywhere, the share of services increased; therefore the direction of change is always from left to right, with the first point representing 1989 and the second point corresponding to 1998. As the distances on both axes are approximately the same, the measure of slope matters. If the slope is positive, then both the share of industry and of services increased (Turkey). The slope of the vector between 0 and -45° corresponds to the faster growth in services than decrease in industry, which implies a decrease in agriculture. On the contrary, a steep slope (i.e. $\leq -45^\circ$) would represent an increased share of agriculture, which corresponds to rapid deindustrialisation not matched by growth in services. That relates to Romania, Ukraine and to lesser extend Russia.⁶ In the latter economy, the share of agriculture increased from 13.2% in 1990 to 15.4% in 1994 and next started to fall, back to 13.0% in 1998 (WIIW database). It is interesting to notice that the three economies were also characterised by largest initial shares of industry in employment.⁷

⁶ Term 'rapid' (or 'vertical') deindustrialisation is used here to describe the process. However, there are some analogies with some long term cases of structural evolutions described by Rowthorn and Wells (1987) as 'negative deindustrialisations'.

⁷ The flows in and out of labour force (changes in the activity rates) are left aside. That is an interesting topic for future work. Here, only the composition of labour force is analysed. Therefore, restructuring

The length of the vector may be interpreted as a measure of speed of restructuring, as it is given by:

$$(2) \quad d(i,s) = (|i_{97} - i_{89}|^2 + |s_{97} - s_{89}|^2)^{1/2}$$

where i corresponds to the share of industry and s to the share of services.

Poland, Hungary and Estonia started with fairly similar structures of employment (relatively high shares in industry, but not as high as three other transition economies mentioned above) and they all seem to be converging towards the EU countries represented on the graph. Noticeably, these three countries are very close to two South European ‘cohesion’ countries, Portugal and Spain. The pace of restructuring (as measured directly by the length of the vector) was faster in Central European countries than in the two southern EU economies over the same time period. As a matter of fact, in 1997 both Estonia and Hungary already had a service sector larger than in Portugal and close to the same size as that in Spain. On the other hand, the process of change in Central Europe did not consist of rapid deindustrialisation, as represented by the relatively flat slopes of the vectors.

Both central and southern European economies appear to be following a course similar to the earlier development path of three north European economies: Netherlands, Denmark and the UK. Yet, between 1989 and 1998, the pace of change in those three was slow (again, as measured by the length of the vectors), with almost no change in Denmark, mild adjustment in Netherlands and relatively faster deindustrialisation in the UK, resulting in convergence towards the other two countries. Greece seems to be on a different path, parallel to all the above but characterised by a much lower share of industry.

For the central and east European economies, adjustment towards the countries with a similar level of per capita GDP (i.e. ‘vertical convergence’) would mean that a large share of industrial employment would be lost. It is more likely that this will happen for two reasons: (i) existence of oversized, distorted industrial structures, characterised by negative value-added and difficult to restructure⁸, (ii) inadequate reforms that did not result in both incentives and

means shedding labour in one sector, taking up in another or both. This will be elaborated further in the next sections of this paper.

⁸ In 1992, 51.75% of USSR employment was in value-subtracting branches (world prices). The figure for Bulgaria was 33.81%. Hungary and Czechoslovakia had correspondingly 16.83% and 16.84%. In Poland, which started the major reform programme earlier (in January 1990), only 0.47% of employment was

resources for restructuring. The first factor affected the size of industrial decline in the initial period of transition. Reforms were crucial for employment creation in new sectors (including ‘winning’ sections of manufacturing) in the more recent period. This is a conclusion that can be drawn from existing econometric studies on growth in the region (see Berg *et al.* 1999).

Thus, the scenario of rapid deindustrialisation was followed by Ukraine and Romania, and to a greater or lesser extent Russia. Yet there is an alternative path, which is more typical for those countries, where liberalisation programmes were more effectively implemented (‘horizontal convergence’). After the initial period of transformational recession and employment shedding, employment levels in industry stabilised (see data on 1994-1998, below). As a result, the process of deindustrialisation has been much slower and brought about mostly by the development of the service sector, not by a reduction of employment in industry. Thus, efficient transition paths do *not* appear to be correlated with the highest levels of job shedding in industry.

3. Structural change on disaggregate level, accession countries: description

More detailed evidence on structures is provided by Tables 1 and 2, which compare employment between 1994 and 1998.

located in value-subtracting branches (Hughes and Hare 1992 and ILO 1996). Moreover, Hughes and Hare found that ‘most industries in Poland had DRCs which are compressed into a small band around the average, whereas in the USSR the distribution is much more dispersed’ (Ibid., p.89). According to this, the potential for restructuring was more evenly distributed across Polish industries, while in USSR, there were some sectors, with very high potential cost of restructuring (machinery, metallurgy), almost doomed to collapse.

TABLE 1
EMPLOYMENT IN THOUSANDS, 1994, ACCESSION COUNTRIES (FIRST WAVE), SLOVAKIA, ROMANIA

Category	ISIC 3	Czech R	Hungary	Poland	Romania	Slovakia	Slovenia	Estonia
Agriculture	A+B	346	328	3514	4261	214	98	101
Mining	C	98	39	440	261	34	9	11
Manufact	D	1476	889	3106	2687	564	293	143
Utilities	E	100	108	232	185	48	9	19
Construct	F	456	201	904	452	187	48	50
Trade, rep.	G	628	467	1703	662	204	97	88
Hotels, res t.	H	153	111	163	147	54	30	19
Transp, com	I	382	314	794	552	163	51	58
Finance	J	85	73	308	77	25	18	8
Real Estate, Administ	K	247	126	246	181	83	30	30
rat	L	282	320	680	451	126	37	36
Educatio n	M	324	339	997	461	178	46	48
Health, soc.	N	295	239	932	348	141	52	47
Other serv.	O	168	188	610	188	77	28	27
Priv. hous eh	P	1	1	8		1	1	6
Int. Organ is.	Q	1	8			1		
Not classif.	X	3	1	21		3		
TOTAL		5045	3751	14658	10914	2103	847	692

Source: International Labour Office, 1998, Yearbook of Labour Statistics 1998, Geneva.

Table 1 presents 1994 employment structures for all five of the Central European countries, which were in the first group of countries invited to start accession talks with the EU,

plus Slovakia and Romania, which joined EU negotiations more recently⁹. The post-recession development may be assessed by comparison with the more recent 1998 data on all ten accession countries plus Croatia.

TABLE 2

EMPLOYMENT IN THOUSANDS, 1998, ACCESSION COUNTRIES AND CROATIA.

ISIC	Cz.R.	Hun	Pol	Romania	Slovak	Sloven	Eston	Lat	Lith	Bulgaria	Croatia
A+B	285	278.8	2946	4342.171	164.7	109	61.1	209.	295.4	796.8	33.2
C	89	25.7	381	201.913	31.1	8	7.3	0.5		56.2	8.2
D	1373	912.1	3205	2313.693	574.3	290	140.7	191.	312.8	706.5	273.8
E	92	96.5	265	234.974	50.4	9	17.2	24.4	41.2	58.2	26.9
F	480	230.0	1071	433.519	197.9	51	48.0	54.9	106.0	137.0	71.7
G	660	472.2	2117	925.894	266.5	111	89.8	141.	234.0	326.0	156
H	165	121.6	219	142.112	63.1	38	15.6	15.5	25.9	75.8	42.2
I	383	301.9	958	529.360	168.2	51	59.5	86.0	106.4	223.9	83.8
J	97	81.8	354	81.764	36.8	18	7.1	9.8	19.1	40.8	28.3
K	253	163.0	464	153.923	82.0	47	37.0	29.5	46.7	96.7	46.3
L	321	294.3	779	504.564	149.1	41	36.8	59.8	77.2	80.1	118.6
M	307	305.5	972	428.123	164.1	60	57.4	90.6	149.3	233.0	78.8
N	272	237.8	1056	335.391	143.6	41	35.1	51.8	107.0	170.0	75.7
O	160	171.8	558	217.513	72.0	29	29.8	48.0	67.1	105.0	27.7
P	1	1.5	8		2.7	1		1.9			
Q	2	3.0	1		0.4						
X	2	0.2				4					
TOT	4942	3697.7	1535	10845	2167	908	642	1015	1588	3106	1071
AL			4								

Source: International Labour Office, 1999, Yearbook of Labour Statistics 1999, Geneva; WIIW database.

Note: Czech Republic and Latvia: 1997.

While the period of 1989-1994 was characterised by an intensive process of labour shedding, the situation has changed more recently. In particular, comparing categories D in

⁹ Following decisions of the Luxembourg Summit (1997), the EU enlargement process was launched on March 30, 1998 and negotiations started with Czech Republic, Estonia, Hungary, Poland and Slovenia ('First Wave' candidates). Helsinki Summit (December 1999) abolished First/Second Wave differentiation. Bulgaria, Latvia, Lithuania, Romania and Slovakia were invited to join negotiations. The enlargement process relates also to three countries outside former Soviet block: Malta, Cyprus and Turkey.

both tables, one can see that employment in manufacturing has stabilised, with a rate of change varying between +3% for Poland and Hungary, +2% for Slovakia, -1% for Slovenia, -2% for Estonia. Only Czech Republic¹⁰ (-7%) and Romania (-13%) experienced significant job losses in manufacturing.

However, the interpretation for each of those two countries is different. The Czech Republic appears to be on a convergence path (see evidence below). Yet its policy choice was to delay employment reductions in manufacturing, mainly by delaying bankruptcies (see: Hoshi *et al.*, 1998). This is confirmed by the fact that of the six Central European countries analysed by Jackman and Pauna (1997), the Czech Republic was characterised by the smallest percentage decrease of employment in manufacturing between 1989 and 1994. On the other hand, Romania is not converging towards the EU. It has sustained a protracted economic contraction to the point where it is dismantling its manufacturing sector without making much progress in services¹¹ (see both Figure 3 and more detailed analysis below).

While employment in manufacturing stabilised in most countries, agricultural sector has been losing employment fast in all countries except Romania and Slovenia. All of the central/east European countries are already below the world middle-income averages for the share of employment in agriculture. From this perspective, it is not the high share of agriculture in Poland which is exceptional but the low share in other transition countries. This can be linked to the forced collectivisation in the past, which was not implemented in Poland.¹²

Within the service sector, the development of the financial services is quite visible, as all the countries moved from a system which neglected the active role of money to one which is

¹⁰ Figure for 1994-1997 period, which does not take into account the recent employment/ unemployment shock in the Czech Republic. Thus, comparative difference would be in fact even higher.

¹¹ There are some interesting implications for macro modelling. Is progress in services inhibited by insufficient aggregate demand, which in turn is caused by falling productivity in other sectors? Here, in addition to a distinction between supply and demand factors, we may have the implications of failed restructuring being transformed into longer-term effects.

¹² Bean *et al.* (1998, p.61) present data on the size of farming population at the date of accession for cohesion countries. It was correspondingly: 24.1% for Ireland (1973), 30.8% for Greece (1981), 23.8% for Portugal (1986) and 16.2% for Spain (1986). From this point of view, Polish agricultural sector does not look unique. Moreover, as the comparison of corresponding entries in Tables 1 and 2 reveals, agricultural employment in Poland has been shrinking fast recently. This fact is not always noticed by observers, who concentrate on data based on ownership of farms. Yet, only 43% of private farm households in Poland consider farms as their main form of income at present (Wos 1999). Thus, the farm owners are strongly pushed to search for their main employment outside agriculture, and the process is captured by ILO-type survey data that this text is based on. No wonder, that Polish farmers are notorious in blocking roads. It seems that there is more in it than an inherited inclination to fight against authorities.

based on financial control. But much larger numbers of jobs were created in trade and catering, another sector once suppressed by central planners.

Net employment creation in services relates both to “market-oriented services and “non-market-oriented services.”¹³ The increase in employment in non-market (public) services may come as a surprise, but it reflects the fact that both social welfare and political control functions were located within the productive sphere in pre-transition socialist economies. An important part of the transition process consisted of disentangling specialised welfare services from enterprises. Similarly, with the rise of democratisation, political control by communist party committees within socialist firms was replaced by a diversified government administration, which in many cases had to be created from scratch. The magnitude of the increase in public administration employment is striking. Employment in this sector (excluding defence) increased by 83 percent in Poland between 1990 and 1996, from 159,000 to 290,000 (*Rocznik Statystyczny Pracy 1997*, p.48).

4. Structures, reference point: the EU

To assess the convergence process, one has to use a benchmark. Following Jackman and Pauna (1997), the chosen comparator structure is based on four high-income northern EU economies (Germany, UK, Denmark and Netherlands).¹⁴ The corresponding employment figures are presented below:¹⁵

¹³ EBRD Transition Reports (1997 and 1999, sections 4.1) include ‘transport and communication’ in ‘market-oriented services’ and shifts ‘other services’ to the ‘non-market-oriented’ sector. The second may be justified by the lack of detailed data. Yet the first is highly questionable, as the old transport sector (most of employment in the ‘transport and communication’ category) was functionally linked to both industry and construction and has been characterised by inefficiency and excessive employment as much (or even more) as the two others.

¹⁴ In respect to manufacturing, Germany is an interesting outlier, among the high-income EU economies. The share of industry in employment was still 34.3% in 1998 (services: 62.8% and agriculture: 2.9%). It is related to the specialisation in exports (see section 1 above and in more detail: Rowthorn and Wells, 1987). However, in discussion on this paper it was pointed out that the structural composition may be due to organisational characteristics prevailing in German manufacturing, i.e. internalisation of some business services (this should have corollary related to market structures, as we know from Coase, 1937).

¹⁵ The results for indices based on southern EU (Greece, Portugal, Spain and Italy) are available on request from the author. The southern European economies are placed close to the convergence path between the CEE countries and northern EU (the inclusion of high-income Italy in southern group is justified by the fact that its employment structures are greatly affected by its underdeveloped southern regions).

TABLE 3
EMPLOYMENT IN THOUSANDS, 1998, NORTHERN EU

Category	ISIC3	Denmark	Germany	Netherlands	UK
Agricultur e	A+B	96.66	1024	236	465.0
Mining	C	3.20	182	11	99.8
Manufact.	D	516.03	8461	1104	4986.9
Utilities	E	20.48	305	47	178.6
Construct.	F	177.54	3183	451	1896.0
Trade, rep.	G	367.65	5154	1220	4117.3
Hotels,rest	H	71.30	1130	267	1238.7
Transp,co m	I	181.89	1920	442	1755.5
Finance	J	79.15	1273	264	1184.3
Real Estate,	K	227.58	2581	833	2768.0
Administr at	L	168.30	3174	525	1563.7
Education	M	198.84	1927	465	2040.8
Health, soc.	N	458.79	3534	1028	2964.1
Other serv.	O	118.49	1826	318	1452.4
Priv.house h	P	5.40	150	22	143.2
Int.Organi s.	Q	0.87	36	161	20.7
Not classif.	X	5.20			72.6
TOTAL		2697	35860	7394	26948

Source: International Labour Office, 1999, Yearbook of Labour Statistics 1999.

There are obviously some differences in employment structures of those four countries. How much diversity is lost by taking averages? To what extent the four high-income EU economies differ between each other? To check this, Table 4 presents coefficients of variation for the percentage shares in employment, for all sectors. The Table presents the list of sectors ranked from the most similar percentage shares to the most diverse. To get some additional intuition, the sectors was divided into four groups, according to the degree of similarity between the four economies (the division was not arbitrary, i.e. the cuts were made, where the

differences between the two adjacent coefficient were highest).¹⁶ The last two categories correspond to the differences in natural endowment and export specialisation, but also to the size and organisation of the welfare system, with the size of health and social work sector much higher in Denmark (17.0% of total employment) than in the other three (between 9.9% and 13.9% of employment). The category ‘households employed persons’ is also diversified, with highest share in employment in Britain (0.5%), however this category is too small to have any significant impact on subsequent measures of restructuring. It is interesting to notice that manufacturing is not a diversified category, in spite the relatively high share in Germany (23.6%). Apparently, patterns of specialisation relate more to branches of manufacturing than to its total aggregate share in employment. In general, list of similar sectors is not surprising, with the size of trade, transport, finance, construction but also educational system being similar in all four countries.

¹⁶ Except that mining and quarrying and household employed persons should be further separated into two categories, one-entry each. As they are already in ‘most diverse’ category that does not change much.

TABLE 4
COEFFICIENTS OF VARIATION FOR PERCENTAGE SHARES IN TOTAL EMPLOYMENT,
NORTHERN EU, 1998

Category	ISIC Code	Coefficient of Variation
<i>Highly similar shares</i>		
Trade and Repair	G	8.27%
Transport, Storage, Communication	I	10.06%
Other Services	O	11.09%
<i>Similar shares</i>		
Utilities	E	13.47%
Education	M	15.36%
Financial Intermediation	J	16.59%
Construction	F	16.98%
Manufacturing	D	18.67%
Public Administration	L	19.26%
Real Estate & Business Activities	K	19.62%
<i>Dissimilar shares</i>		
Hotels & Restaurants	H	23.73%
Health & Social Work	N	24.74%
Agriculture & Fishing	A+B	28.17%
<i>Highly dissimilar shares</i>		
Private Households with Employed	P	39.79%
Mining and Quarrying	C	64.73%

Before moving to indices of restructuring, one can use Tables 2 and 3 to find the major structural differences between Northern Europe and Central European accession countries. The comparison reveals that in finance and real estate and other business services, the share of employment is more than twice as large in Northern Europe as in Central Europe (simple averages). The third largest negative difference relates to health services and social work. While the first two categories correspond to the way the modern economic system is organised (supply factors, see above, section 1), the third one is indicative of the level of wealth and

higher spending on social consumption (demand factors). It is also interesting to note that difference in shares of education is small and the sector is actually slightly larger in Central Europe on average (as it is affected by both policy choices and demographic structures).

While some ‘market-oriented services’ and ‘public services’ are much more developed in Northern Europe than in Central Europe, the reverse is true in relation to the primary sector. In both agriculture and mining, the ratio of the shares of employment in Northern Europe and Eastern Europe is smallest.

5. Structural change: measures of convergence

The employment structures presented above may be used to assess the convergence process on a multidimensional scale. The first measure, ‘restructuring index’ (RI), is taken from Jackman and Pauna (1997). It is defined as “a proportion of the workforce in each country which would need to change sector to enable the country to attain the same structure of employment as that of a comparable Western European economy” (Ibid., p.377).¹⁷ Thus, the restructuring index has a straightforward, intuitive interpretation, in terms of the extend of intersectoral reallocation of labour force, unlike other measures of similarity, starting with correlation coefficient. A lower value of the index corresponds to less restructuring required for convergence. Based on the above definition, the formula for RI, for a give country a and comparative structure c , is simply:¹⁸

$$(3) \quad RI = \frac{\sum |s_i^c - s_i^a|}{2}$$

where s relates to shares in employment of sectors i . Results are presented in Table 5.

¹⁷ Here, as characterised by the Northern EU Group in 1998.

¹⁸ Jackman and Pauna (1997) do not provide formulae for their indices, but there are relatively easy to derive using their Table A (in the appendix).

TABLE 5
RESTRUCTURING INDICES: 1994 AND 1998

Country	RI-N94	RI-N98
Bulgaria	.	31.1%
Croatia	.	15.9%
Czech Republic	20.5%	18.5%
Hungary	19.8%	17.2%
Poland	27.0%	21.5%
Romania	44.9%	42.5%
Slovakia	23.2%	19.5%
Slovenia	25.4%	23.6%
Estonia	20.0%	18.1%
Latvia	.	24.1%
Lithuania	.	21.6%
Spain	17.2%	15.0%
Greece	23.0%	22.9%
Portugal	17.6%	18.3%

Note: Czech Republic, Latvia, Greece, Portugal: 1997.

For 1994, the indices reported here may differ from those obtained by Jackman and Pauna for two reasons. First, here, the Northern EU 1998 structure was used for both 1998 and 1994, to avoid a problem of “moving goalposts.”¹⁹ We are interested in the convergence process towards the structures prevailing today. Second, the number of categories is doubled, as RI here are based on ISIC-3 instead of ISIC-2 classifications. Thus, the indices could show that more restructuring is required, as there is more cross-sectoral movement. However, in practice the impact of this factor is negligible, as the categories which are expected to shed labour remain the same (primary sector, manufacturing).

All Central European countries have made some progress in restructuring, with Croatia, Hungary and Estonia being closest to structures found in the Northern EU. This is entirely consistent with Figure 3. Similarly, Romania is again an outlier, with employment structures farthest from the EU.

Yet comparison with Figure 3 reveals different results for the three South European countries. While Spain is converging (with the 1997 index lower than 1994), there is no indication of a convergent change in either Greece or Portugal. Even if the service sector is

¹⁹ In fact, RI are not affected (in terms of ranking) by the choice of a year. In Mickiewicz, Bell (2000) we present results for 1997.

growing in these two countries (Figure 3), this change has not been convergent recently in terms of the composition of the service sector.

The speed of restructuring is captured by the first column of Table 6 below, which corresponds to the new index, which will be called the “pace of restructuring” (PR), defined simply as a rate of change in the restructuring indices:²⁰

$$(4) \quad PR = (RI_{94} - RI_{98}) / RI_{94}$$

It is easily observed that the rate of change was fastest in Poland: 5.5% of its employment was transferred from old to new sectors within the four years. If the transfers remain as high as in the current period, it would take another 16 years to achieve all the transfers necessary to converge with 1998 North European structures (21.5% of employment to be reallocated). It is also interesting to notice that Slovakia comes second and assuming present speed of reallocation, it would take another 21 years to converge.

The pace of restructuring is slowest in Romania and Slovenia, but the problem is more serious for Romania, which has both a high value of the index of (required) restructuring (RI) and a slow pace of change (PR). It is interesting to notice that Spain still has a relatively fast rate of change, comparable with the best-performing Central European economies. One may speculate that this acceleration of structural change in Spain may have something to do with labour market reforms introduced in 1997,²¹ however it may be too early to assess its impact yet.

²⁰ Jackman and Pauna use a different measure called ‘speed of restructuring’, defined as a proportion of the labour reallocation required for convergence that has taken place during a given period of time (1997, p.380). The problem with their measure is that it does not take into account the non-convergent changes, which may counterbalance the impact of convergent shifts. In the latter case, the index of speed would remain high, with no change in the distance from target structures.

²¹ On those, see: Guell-Rotllan and Petrongolo, 2000.

TABLE 6
“SECOND ORDER” INDICES: 1994-1998

	Pace (PR)	Efficiency (EI)	Job Creation (JB)	Job Destruction (JD)
Czech Rep	12.9%	79.3%	2.7%	4.8%
Hungary	13.3%	87.7%	2.4%	4.3%
Poland	20.5%	88.8%	8.8%	4.4%
Romania	5.2%	75.8%	3.2%	4.0%
Slovakia	15.9%	82.5%	5.3%	3.3%
Slovenia	7.2%	65.8%	7.7%	0.5%
Estonia	9.6%	69.9%	1.7%	8.2%
Spain	12.8%	64.9%	8.8%	0.8%
Greece	0.4%	48.4%	2.1%	1.2%
Portugal	-5.4%	40.4%	1.4%	4.0%

Note: PR, JC and JD indices were multiplied by (4/3) for Czech Republic, Greece and Portugal, to make them compatible with others, as computations were based on shorter period (1994-1997) for those three countries.

The three other indices relate to efficiency, job creation and job destruction. The first is based on Jackman and Pauna’s definition, the other two are new.

The efficiency measure shows “the proportion of the total employment change that has been convergent towards the warranted structure” (Jackman and Pauna, 1997, p.380). The computational equivalent of this definition is relatively more complex than the previous two indices, as we have to take into account possibility of overshooting. If e_i relates to the level of employment, s_i to the percentage share in total employment (both in sector i), and E to total employment, the comparator level of employment is given by: $e_i^c = s_i^c E^{98}$.

Next, using comparator level of employment, we may define convergent change in sector i in the following way:²²

(5) def. Δe_i^{con} :

$$\Delta e_i^{con} = \min(e_i^{98} - e_i^{94}, e_i^c - e_i^{94}) \quad \text{for } e_i^{98}, e_i^{94}, e_i^c: \quad \text{sign}(e_i^{98} - e_i^{94}) = \text{sign}(e_i^c - e_i^{94}) = 1$$

$$\Delta e_i^{con} = \max(e_i^{98} - e_i^{94}, e_i^c - e_i^{94}) \quad \text{for } e_i^{98}, e_i^{94}, e_i^c: \quad \text{sign}(e_i^{98} - e_i^{94}) = \text{sign}(e_i^c - e_i^{94}) = -1$$

²² Again, this definition is derived from Table A of Jackman and Pauna (1997), as the formula is not given there.

$$\Delta e_i^{con} = 0 \quad \text{for } e_i^{98}, e_i^{94}, e_i^c: \quad \text{sign}(e_i^{98} - e_i^{94}) = \text{sign}(e_i^c - e_i^{94}) = 0$$

$$\Delta e_i^{con} = 0 \quad \text{for } e_i^{98}, e_i^{94}, e_i^c: \quad \text{sign}(e_i^{98} - e_i^{94}) \neq \text{sign}(e_i^c - e_i^{94}).$$

And the efficiency index (*EI*) is given by the ratio of convergent change to total change in employment:

$$(6) \quad EI = \frac{\sum \Delta e_i^{con}}{\sum |e_i^{98} - e_i^{94}|}$$

The intuition behind this measure is that all sectoral changes are costly; therefore, non-convergent changes should be avoided. For instance, if employees are moving back from industry to agriculture, only to move again to services in the future, an avoidable social cost is involved. In general, it may be plausible to assume that the liquidation of jobs in a given sector leads to higher risk of unemployment if those jobs are “replaced” by new ones in another sector (i.e. higher risk than if jobs shift between different firms within the same sector). The more structural changes, the higher the chance that transfers to “new” sectors would become more difficult, some human capital would be lost and that new employment will be less productive, at least initially. Therefore, “unnecessary” structural changes are not efficient.

In general, Central European countries are doing well on this measure, with Poland and Hungary scoring best. Relatively low figures for Greece and Portugal are noticeable. It is possible to argue that the process of change was becoming noisier for the countries closer to the benchmark EU group. However, structural differences between these two countries and the EU (i.e. the restructuring indices presented in Table 6) are not much different from those for Central Europe. Thus, the reason why the process is becoming noisier may be related to the differences in patterns of specialisation in southern and northern EU.

The final two measures attempt to distinguish between structural changes brought by job destruction in ‘old’ sectors and job creation in ‘new’ sectors. They are different from the measure used by Jackman and Pauna (1997), called “new job creation.” The latter one is described by “the number of new jobs created in the sectors with deficient employment as a proportion of the total new job creation required for convergence” (Ibid., p. 381). “Sectors with deficient employment” relate to those, for which the initial levels of employment are lower than

those derived from comparator structure imposed on final level of employment ($e_i^c = s_i^c E$, as discussed above). Yet, there are two problems with the index:

First, it does not correspond to actual computations presented by the two authors. A check on data, shows that, similarly to efficiency index, Jackman and Pauna take only convergent new job creation, that is exclude overshooting in deficient sectors. That is, a more exact definition of the index should possibly read: the actual convergent job creation as a proportion of the total job creation required for convergence.²³

The second problem is more serious. Convergence is defined by imposing comparator shares of employment on actual final aggregate level of employment. Yet, the aggregate level is affected by both actual job destruction and actual job creation. Whenever the resulting aggregate change in employment is small, the ‘new job creation’ index will show higher values. Thus, the index does not measure job creation, but, implicitly, the relation between job creation and job destruction, because the final level of employment is affected by the latter. The more general problem is that any change in sectoral employment cannot be defined a priori as convergent, without reference to changes in other sectors, as they affect final level of employment.

The way out is to separate entirely job creation from job destruction. Therefore, the new proposed index is called ‘job creation’ (JC). First, job creation (in ‘deficient’ sectors) is defined as:

(7) def. Δe_i^{cre} :

$$\Delta e_i^{cre} = e_i^{98} - e_i^{94} \quad \text{for } e_i^{98}, e_i^{94}, e_i^c: \quad \text{sign}(e_i^{98} - e_i^{94}) = \text{sign}(e_i^c - e_i^{94}) = 1$$

$$\Delta e_i^{cre} = 0 \quad \text{for } e_i^{98}, e_i^{94}, e_i^c: \quad \text{sign}(e_i^{98} - e_i^{94}) = \text{sign}(e_i^c - e_i^{94}) = -1$$

$$\Delta e_i^{cre} = 0 \quad \text{for } e_i^{98}, e_i^{94}, e_i^c: \quad \text{sign}(e_i^{98} - e_i^{94}) = \text{sign}(e_i^c - e_i^{94}) = 0$$

$$\Delta e_i^{cre} = 0 \quad \text{for } e_i^{98}, e_i^{94}, e_i^c: \quad \text{sign}(e_i^{98} - e_i^{94}) \neq \text{sign}(e_i^c - e_i^{94}).$$

²³ More formal definition of convergent new job creation may be easily constructed by setting Δe_i^{con} in the second row of (8) equal to zero, that is by excluding convergent job destruction.

And ‘job creation’ index is given by:

$$(8) \quad JC = \frac{\sum \Delta e_i^{cre}}{E_{94}},$$

which is the ratio of job creation in deficient sectors to initial level of employment.

Following similar logic, we can construct ‘job destruction’ index, first by defining job destruction (in ‘overpopulated’ sectors):

(9) def. Δe_i^{des} :

$$\Delta e_i^{des} = 0 \quad \text{for } e_i^{98}, e_i^{94}, e_i^c: \quad \text{sign}(e_i^{98} - e_i^{94}) = \text{sign}(e_i^c - e_i^{94}) = 1$$

$$\Delta e_i^{des} = |e_i^{98} - e_i^{94}| \quad \text{for } e_i^{98}, e_i^{94}, e_i^c: \quad \text{sign}(e_i^{98} - e_i^{94}) = \text{sign}(e_i^c - e_i^{94}) = -1$$

$$\Delta e_i^{des} = 0 \quad \text{for } e_i^{98}, e_i^{94}, e_i^c: \quad \text{sign}(e_i^{98} - e_i^{94}) = \text{sign}(e_i^c - e_i^{94}) = 0$$

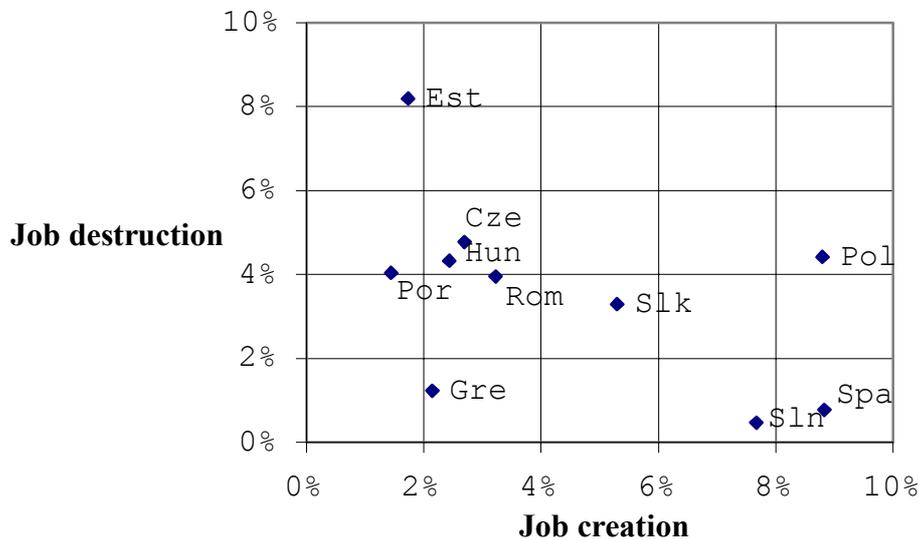
$$\Delta e_i^{des} = 0 \quad \text{for } e_i^{98}, e_i^{94}, e_i^c: \quad \text{sign}(e_i^{98} - e_i^{94}) \neq \text{sign}(e_i^c - e_i^{94}),$$

and next by identifying the ‘job destruction’ index as:

$$(10) \quad JD = \frac{\sum \Delta e_i^{des}}{E_{94}}.$$

Values for both indices are presented in Table 6, above. Comparison between the “job creation” (in deficient sectors) and “job destruction” in overpopulated sectors is instructive. Approximately, it amounts to the decomposition of structural adjustment, i.e. the sum of the two indices is strongly correlated with the “pace of restructuring” index (see Table 6). This decomposition helps to distinguish between the countries where restructuring was done mostly by liquidating jobs in “old” sectors and those, where change was achieved by job creation in the “new” sectors. The result is presented by Figure 4 below.

Figure 4 Decomposition of restructuring



The comparison between Poland and Slovenia is interesting. Both countries have been characterised by high rate of job creation in ‘new’ sectors. Yet, in Poland there was parallel destruction of jobs in ‘old’ sectors, while in Slovenia those are not downsizing. Interestingly, the position of Slovenia is very similar to Spain in this respect. As a result, the aggregate pace of restructuring (PR index, Table 6) is much faster in Poland than both in Slovenia and Spain. The case of the two latter countries may be also contrasted with Estonia. It is a country, where the pace of restructuring is similar to Slovenia, however it is predominantly achieved by job destruction in old sectors, without corresponding job creation in new sectors.²⁴ Hungary and Czech Republic are both characterised by relatively radical downsizing of old sectors, similar to Poland. However, the process of job creation in new sectors is slower than in Poland, Slovenia

²⁴ It is interesting to notice that Estonia has also the largest informal sector (hidden economy) among the seven countries discussed here, according to the estimates presented by Lacko (2000). Rapid job destruction in old sectors may be correlated with emergence of large informal sectors; this is characteristic not only for Estonia, but also for the two other Baltic States and CIS as contrasted with Central Europe.

The presence of informal sector distorts any employment statistics. Yet, from the perspective of links between structures and growth, the problem may not be so important as it appears. Informal activities are typically located in low value-added branches, with no potential for growth (see: de Soto 1989). Thus, even if part of agricultural employment or unemployment is in fact equivalent to employment in informal sector, it may still be considered as a ‘reserve sector’, as described in section 1. Thus, the classification would not change negative implications for economic development.

and Slovakia. It is interesting to notice that position of Romania is close to Hungary and the Czech Republic. The reason why the pace of restructuring (see: Table 6) is much lower in Romania in spite radical changes in employment structures, is that those are dominated by non-convergent flows, not accounted for by Figure 5 (inflow back to agriculture, in particular). Finally, there is almost no structural change in Greece, along both dimensions, which is confirmed by the value of PR index close to zero.

6. Pace of restructuring and unemployment

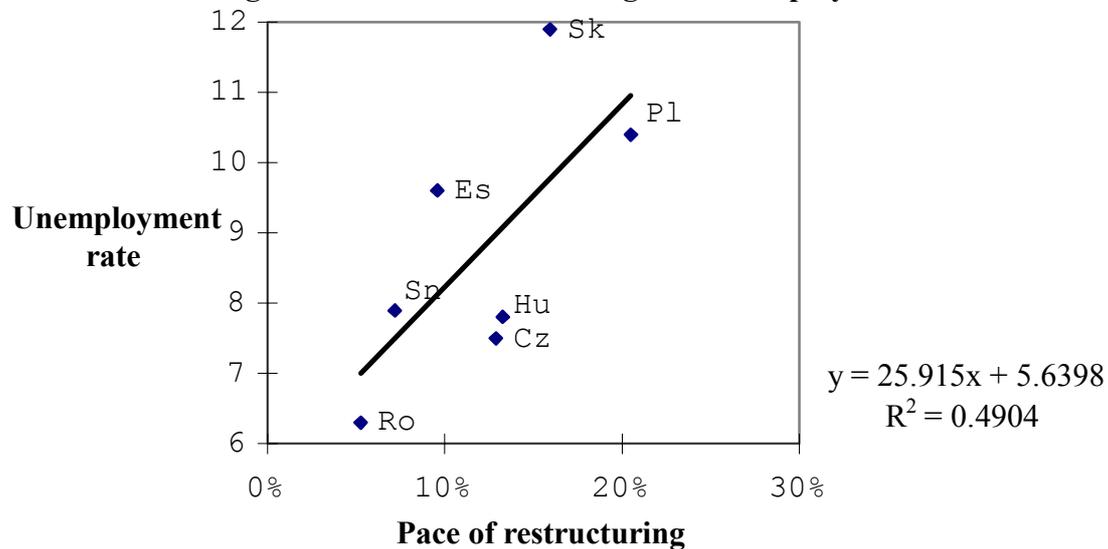
The differences between individual countries, as illustrated by Figure 6, show that there are alternative paths of restructuring. Radical job shedding is not the only possible way. This conclusion has important implications for labour markets. If it is true, than the corollary is that unemployment is not a necessary prerequisite for restructuring. This is the point reiterated by Jackman (1998).

However, for transition countries, job shedding in *old sectors* typically resulted in an increase in unemployment, even if most flows were between jobs (at least in the initial phase). Additionally, the effect of restructuring was in some cases mitigated by outflows outside the labour force – in Hungary in particular (Mickiewicz and Bell, 2000, chapter 1).

On the other hand, Jackman and Pauna (1997) produce a scatter diagram showing no relationship between convergent job creation in *new sectors* and unemployment. Indeed, the impact of availability of new jobs on unemployment may be ambiguous. While directly reducing unemployment by some outflows, new jobs may also lead to increased separations and additional search activity.

However, there seems to be some link between our *global* measure of restructuring (“pace of restructuring”) and unemployment. This is illustrated by Figure 5, below (the “pace of restructuring” index for 1994-1998 and the 1998 figure for unemployment).

Figure 5 Pace of Restructuring and Unemployment



While Figure 5 does not prove anything, it indicates that at least part of unemployment may be explained by turbulence created by inter-sectoral restructuring processes. It supports conclusions on link between restructuring and unemployment derived from empirical research on micro level (see esp. Newell and Pastore, 1999).

7. Reforms, incomes per capita and restructuring

As already discussed, transition countries started with distorted employment structures. They do not conform yet with the typical relationship between structures and income levels, as illustrated by Figure 1. Simple econometric checks reveal no relationship between income levels and structures. Structural evolutions in transition countries seem to be affected by the speed of reforms, not by the GDP levels.

Table 7 and Figures 8-10 below present the results of regressions, with 1998 restructuring indices and income levels as independent variables, and three different measures of structural reforms as dependent variables.

TABLE 7
RI EXPLAINED BY TRANSITION INDICATORS, EU ACCESSION CRITERIA AND GDP PER CAPITA (1998)

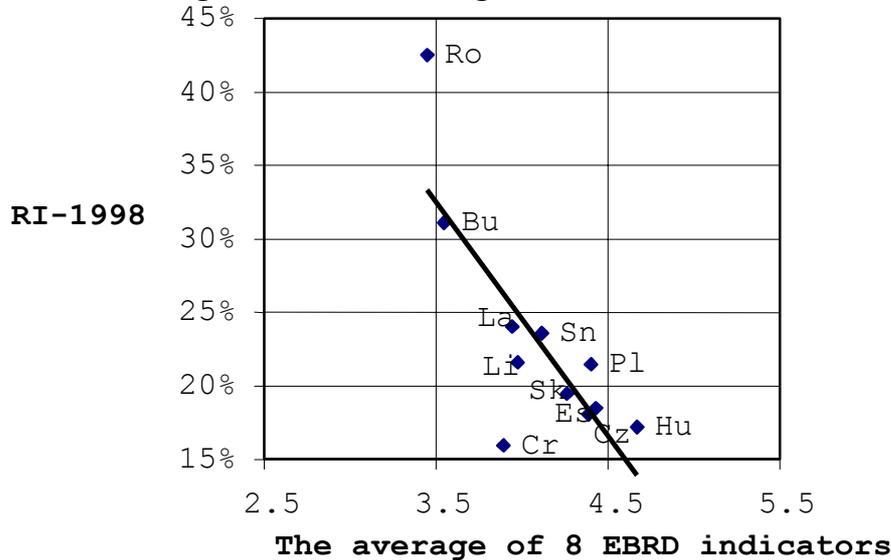
	(1)	(2)	(3)	(4)
Constant	0.91 (0.20)**	0.88 (0.17)***	0.83 (0.13)***	-66.40 (12.87)***
Average of 8 EBRD indicators	-0.17 (0.05)*	-0.16 (0.42)***		
Average of 3 enterprise indicat.			-0.17 (0.04)**	
Expected date of EU accession				0.033 (0.006)***
GDP per capita in \$, PPP	-0.00 (0.05)			
R ²	0.62	0.61	0.70	0.77
Adjusted R ²	0.53	0.57	0.67	0.74
F-statistics	6.53*	14.3***	21.1**	26.8***
Number of observations	11	11	11	10

*Notes: LOS, standard errors in parentheses; * - significant below 0.05 level; ** - significant below 0.005 level; *** - significant below 0.001 level. GDP data (purchasing power parity) from World Bank Atlas 2000.*

The most widely used aggregate measure of institutional reforms is the one constructed annually by the European Bank of Reconstruction and Development. Therefore, in equation 1 (Table 7) average values of eight indicators measuring the progress of transition (EBRD 1999, Table 2.1, page 24) were used as an explanatory variable²⁵, together with GDP per capita. Results reveals that income per capita has no explanatory power whatsoever, while the reform measure is significant, despite small number of observations (11) and controlling for income levels. In equation 2, income per capita is excluded, and the results are also illustrated by Figure 6, below.

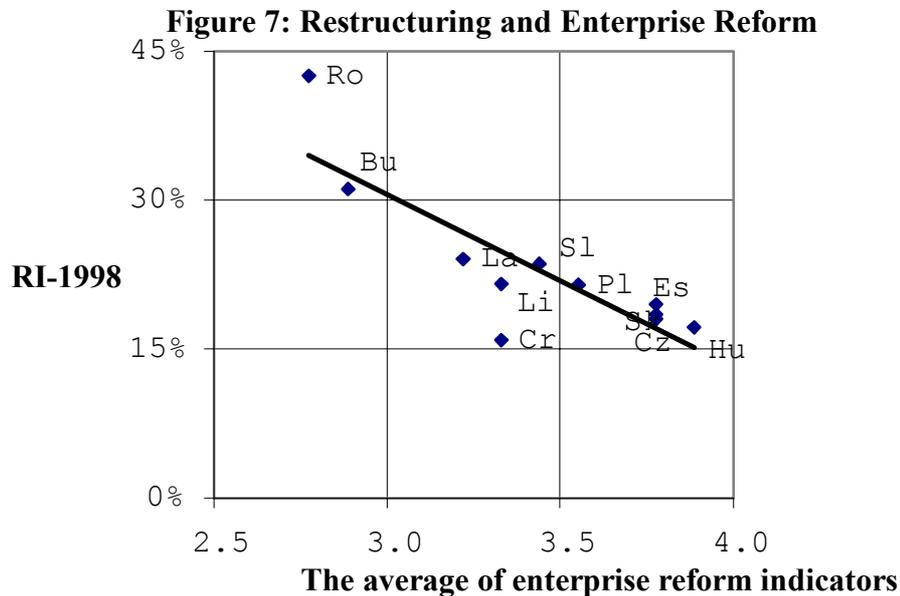
²⁵ EBRD indicators relate to: large-scale privatisation, small-scale privatisation, governance and enterprise restructuring, price liberalisation, trade and foreign exchange system, competition policy, banking reform and interest rate liberalisation, securities markets and non-bank financial institutions. The scores are: 1, 1+, 2-, 2, 2+, 3-, 3, 3+, 4-, 4, 4+. Here, minuses were transformed into -0.333 and pluses into +0.333. Nuti (1999) uses a different transformation for his comparisons between reforms and GDP growth: pluses into +0.5 and minuses into -0.5. However that eliminates any distinction between scores different than round numbers.

Figure 6. Restructuring and EBRD Transition Indicators



The link between liberalisation and restructuring is clear. It would become even stronger, if Romania was excluded, as the country is an outlier in the region in terms of structures of employment. While Romania has the highest positive residual, Croatia has the highest negative. It is characterised by structures of employment, which are most similar to the North-EU comparator, yet this is accompanied by relatively less advanced reform process. The results are more consistent for Hungary, which is most advanced in terms of reforms and second after Croatia in terms of structural convergence.

We may further investigate, which of the eight EBRD indicators are most strongly related to the restructuring outcomes. Examination of correlation coefficients for all indices shows that the three most important factors are: “large-scale privatisation”, “small-scale privatisation” and “governance and restructuring”. Together, they all form a group of indices described jointly by EBRD reports as enterprise reform. Thus, we have the interesting, if not unexpected result: the progress in employment restructuring is mostly related to the privatisation and corporate governance reform. Thus, instead of average transition indicators, we may narrow down our explanation and interpret restructuring as dependent on the average of the three enterprise reform indicators. The results are presented by equation 3 (Table 7) and Figure 7 below.



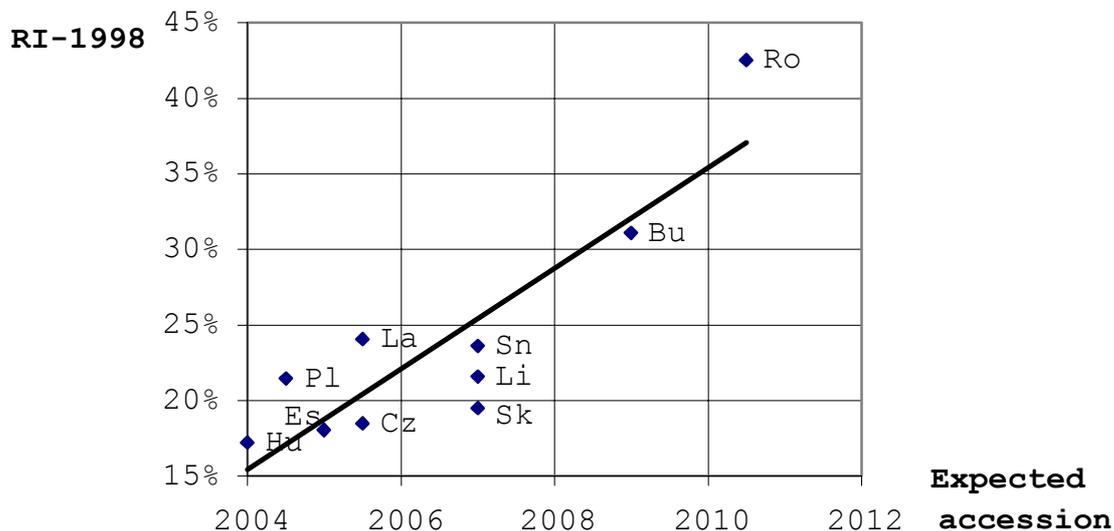
The explanatory power of this equation is stronger. Thus, there is reason to believe that it is the enterprise reform, which is mostly responsible for the restructuring processes. The location of a transition economy on a spectrum between deindustrialisation and successful convergence with the EU seems to be determined by the extent to which reforms have been introduced, in particular, by the extent to which the enterprise reform was successfully implemented. Reform of corporate governance is crucial for efficient downsizing of 'old' sectors. Legal framework, which supports development of small private firms, is important for the growth of 'new' sectors.²⁶

An additional exercise presents another measure of reforms: the EU evaluation of accession countries. To get a continuous quantitative measure, the expected date of accession was calculated.²⁷ This corresponds to the readiness of a given country to meet EU accession criteria. Results are illustrated by both equation 4 (Table 7) and Figure 8, below.

²⁶ This conclusion is supported by one more interesting distinction. The correlation coefficients between RI-1998 and the three individual indicators were: with large-scale privatisation -0.66, small-scale privatisation -0.81, and governance and enterprise restructuring -0.86. The same order of results was obtained for 1997. Thus, it is clear that privatisation of large enterprises was probably less relevant than both introduction of efficient corporate governance and full implementation of small-scale privatisation.

²⁷ On the basis of *The Economist*, 2-8 October 1999. *The Economist* presents a table showing expected time-spans, not time points; in each case the average value of the two limiting years has been taken.

Figure 8: Restructuring and Expected Date of EU Accession



Again, there is a clear link between the reform process (as measured by the expected accession date on the horizontal axis) and restructuring, as measured by achieved proximity to the EU employment structures (Restructuring Index on the vertical axis). Romania has once more the largest positive residual, with low level of restructuring. Yet, Slovakia has even higher (absolute) value of residual: its structural proximity to the EU countries is not reflected by the progress in accession process. Even more, that relates also to Croatia, which was not invited yet to start negotiations and therefore is not included in Figure 8. Again, Hungary offers more consistent result, it is located on the south-west end of the spectrum, being both most advanced in terms of restructuring and having best prospects for the EU accession. Yet the above exercise may be criticised on the ground that there may be reverse causation: estimations of readiness for EU membership may be themselves affected by the achieved structural characteristics of an economy. Thus, EBRD indicators is the preferred measure of the reform progress.

Lack of correlation between income levels and structures indicates that the transition economies are still on a specific structural adjustment path. On the other hand, their positions on this convergence path are affected by the speed of reforms.

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