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Comparative Analysis of Three Accession Countries on Impact of Changes in Competitiveness on Labour Market Developments[1]

Abstract

The paper attempts to analyse the links between both domestic and external competitiveness and labour market developments in manufacturing industry branches in the three new member states of the European Union – Poland, Hungary and the Czech Republic.

Generally, we can conclude that the research carried out so far only partially confirms the hypothesis of a positive effect of the rising competitiveness on labour market developments. These are mostly the industries of deteriorating competitiveness, which reduced employment. The industries, where positive changes in the level of competitiveness occurred, showed no clear pattern with regard to employment changes. We believe that among the possible factors of this situation are the restructuring and modernisation processes, which have been experienced in the industrial branches of the transition economies with differentiated intensity and range.

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1. Introduction

The main goal of the analysis is to discuss impact of changes in competitiveness on labour market developments in manufacturing industries of three countries: Czech Republic, Hungary and Poland. To this purpose industry has been divided into two and three digit level sections in order to identify sections of improving and worsening competitiveness. For assessing changes in competitiveness two competitiveness indicators were used. In the further parts of the paper we present theoretical hypotheses, common methodology of research and empirical results in the three countries.

The paper is based on three analytical papers devoted to labour market impacts of changes in competitiveness in Hungary, the Czech Republic and Poland. The paper on Hungary was prepared by Sandor Buzas (Buzas, 2005), the paper on the Czech Republic – by Lenka Filipova, Jaromir Gottvald and Milan Simek (Filipova, Gottvald, Simek, 2005), whilst the Polish one was prepared by Pawel Gajewski, Pawel Kaczorowski and Tomasz Tokarski (Gajewski, Kaczorowski, Tokarski, 2005).

The structure of the paper is following. The next part discusses briefly the relations between competitiveness and employment in the light of economic theory and formulates the hypotheses. The third part is devoted to main methodological issues of research regarding both competitiveness measures and theoretical assumptions underlying the analyses. The fourth section contains the empirical part of the paper, focusing on comparative analysis of research results in the Czech Republic, Hungary and Poland. Finally the fifth section sums up and draws main conclusions.

2. Economic competitiveness and employment – theoretical hypotheses

The notion of competitiveness encompasses a range of meanings. It can be related to both microeconomic aspect, linked with economic efficiency of enterprises and their market position, as well as macroeconomic aspect, which is revealed in the performance of industries in international trade, the level of development and prosperity. Another issue, which is of great importance, is an improvement of competitiveness. The latter should be understood as an improvement (increase) of measures and indices representing competitiveness. These indices, mentioned above, will be specified further on.

Considering the mechanisms of relations between improving economic competitiveness and the labour market performance, we should refer to two

fundamental mechanisms exposed in the mainstream economic theories: demand-oriented and supply-oriented.

The demand-oriented mechanism was specified and emphasised by the Keynesian economics. An improvement in enterprise (or industry) competitiveness, is reflected by an increase of market demand (domestic or external) for goods manufactured by them. This in turn should enhance production growth, which would finally translate into the rising demand for labour in these enterprises or industries.

The supply-oriented mechanism refers to the neoclassical economic tradition. The relation between competitiveness and labour market performance can be traced in the following way. An improvement in competitiveness leads to a higher efficiency and profitability of production, which leads to better opportunities of development in industries or firms. The higher production potential translates into the growth of demand for labour. This is a typical long-run supply-oriented mechanism.

Considering both the mechanisms mentioned, a hypothesis can be formulated that an improvement in competitiveness should contribute to an increase of the demand for labour, thus an increase of employment. This positive influence of competitiveness on labour demand is expected to be particularly pronounced in the long-run.

In the short-run there might be various opposing factors, which could undermine the hypothesis expressed above. These factors are particularly likely to appear in the transition economies. The level of competitiveness there was low at the beginning of the transition period and resulted from some characteristic phenomena occurring in the centrally-planned economies, such as: low efficiency, outdated technology and hidden unemployment. The pressure for improving competitiveness during the period of transition is linked with higher inflow of foreign investments, introducing modern labour-saving technologies, reducing hidden employment, increasing labour productivity and large-scale enterprise and industrial restructuring. In this situation, an improvement in competitiveness must not necessarily translate into the growth of employment, especially in the short-run.

3. Methodological issues

In order to carry out an analysis of impact of changes in competitiveness on labour market developments, a methodology was employed assuring comparability of outcomes.

The two competitiveness indices employed in the research were suggested by the CASE. These indices are calculated as:

- A share of domestic production in total domestic demand (CCA index), and
- A share of exports from Poland/Hungary/Czech Republic in total internal exports of the European Union (CCC index).

The **CCA** index (share of domestic production in total domestic consumption) is given by the following formula:

$$CCA_{it} = \frac{Y_{it}}{Y_{it} - Ex_{it} + Im_{it}}$$

where:

CCA_{it} – value of competitiveness indicator CCA of *i*-th branch in year *t*;

Y_{it} – volume of domestic production sold in *i*-th branch in year *t*;

Ex_{it} – volume of export of i-th branch in year t;

Imit – volume of import of *i*-th branch in year *t*.

An increase of the CCA reveals relative improvement of the domestic production against import, which means a rising competitiveness of the industry.

A **CCC** index was introduced on the recommendation of the CASE. In fact, it is a modification of the CCB index and is defined as the share of export from an investigated country in total internal exports of the European Union, which can be written as:

$$CCC_{it} = \frac{Ex_{it}^{UE}}{IEx_{it}^{UE}}$$

CCC_{it} – value of competitiveness indicator CCC of *i*-th branch in year *t*;

Ex_{it}^{UE} – volume of export of *i*-th branch in year *t* in a given country to the European Union;

IEx_{it}^{UE} – volume of total internal exports in the European Union comprising products manufactured by *i*-th industry in year *t*.

An increase of the CCC index value would indicate more favourable assessment of goods brought from the given country, thus rising competitiveness. In other words, the CCC evaluates the ability of an industry to compete in external markets.

4. Comparison of empirical research

The most impressive growth in employment (over eight-fold) of all three countries was seen in Hungarian NACE 267 (Cutting, shaping and finishing of ornamental and building stone). A substantial increase of employment in this industry was also recorded in Poland (by 80%). Another well performing industry turned out to be NACE 323 (Manufacture of television and radio receivers…), which revealed second highest growth of employment in the Czech Republic (by 130%) and took third position in this ranking among Hungarian industries (increase by 326%). In Poland employment increased most in NACE 296 (Manufacture of weapons and ammunition), mainly due to its high jump in 2001, by almost 200%.

Table 1. NACE 3-digit branches with highest reported increase in employment in Hungary (1998-2003), the Czech Republic (1997-2003) and Poland (1995-2003)

Hungary		**Czech Republic**		**Poland**	
Best 6 branches (NACE 3-digit)					
NACE	Change (1998-2003, 1998=1)	NACE	Change (1997-2003, 1997=1)	NACE	Change (1995-2003, 1995=1)
267	8.28	300	4.74	296	3.52
314	4.32	323	2.30	267	1.80
323	4.26	372	2.15	343	1.76
312	2.21	343	2.06	252	1.76
365	2.07	174	2.03	282	1.65
354	2.03	313	1.66	281	1.64

Source: own elaboration based upon the country reports.

Table 2. NACE 3-digit branches with highest reported decline in employment in Hungary (1998-2003), the Czech Republic (1997-2003) and Poland (1995-2003)

Hungary		Czech Republic		Poland	
Worst 6 branches (NACE 3-digit)					
NACE	Change (1998-2003. 1998=1)	NACE	Change (1997-2003. 1997=1)	NACE	Change (1995-2003. 1995=1)
173	0.30	176	0.44	271	0.35
284	0.25	193	0.40	191	0.32
176	0.25	273	0.40	293	0.3
355	0.21	183	0.35	172	0.28
181	0.16	191	0.25	247	0.23
191	0.14	355	0.23	363	0.18

Source: own elaboration based upon the country reports.

While analysing industries, which saw substantial decline in employment, it can be concluded that the light industry branches (NACE 171 to 193) were among those most severely affected in all three countries, especially in Hungary and the Czech Republic. NACE 191 (Tanning and dressing of leather) saw sharp decrease of employment in all three countries as well as NACE 176 (knitted and crocheted fabrics)[2]. The apparent exception from the rule of general deterioration in textile industry is NACE 174 (made-up textiles articles) in the Czech Republic (see: table 1).

[2] Employment in Poland in this sections went down by more than 50% between 1995 and 2003.

Table 3. NACE 3-digit branches of highest growth in domestic competitiveness in Hungary (1998-2003), the Czech Republic (1997-2003) and Poland (1995-2003)

	Hungary			Czech Republic			Poland		
	NACE	CCA Change 1998-2003 1998=1	Employment Change 1998-2003 1998=1	NACE	CCA Change 1997-2003 1997=1	Employment Change 1997-2003 1997=1	NACE	CCA Change 1995-2003 1995=1	Employment Change 1995-2003 1995=1
1	192	18.02	0.70	247	2.55	1.49	263	1.57	1.23
2	267	6.28	8.28	268	1.81	1.03	296	1.56	3.52
3	262	3.81	1.07	343	1.75	2.06	342	1.32	0.77
4	322	3.03	0.40	322	1.45	0.81	221	1.15	1.44
5	274	2.81	0.79	315	1.39	0.76	205	1.13	1.62
6	312	2.37	2.21	331	1.30	1.28	267	1.11	1.80

Source: own elaboration based upon the country reports.

Table 3 gives some preliminary conclusions regarding relations between domestic competitiveness and employment. In the Polish case only one out of six industries where highest improvement in competitiveness was seen (NACE 342 – bodies for motor vehicles) recorded negative change in the level of employment. There are two such industries in the Czech Republic and three in Hungary, which suggests that our theoretical hypothesis formulated in section 2 has not been fully confirmed. The most severe were the employment reductions in Hungarian NACE 322 (television and radio transmitters). A more general conclusion can be drawn that especially industries manufacturing highly processed goods often (although not always) decreased employment, despite improving domestic competitiveness.

Table 4. NACE 3-digit branches of highest decline in domestic competitiveness in Hungary (1998-2003), the Czech Republic (1997-2003) and Poland (1995-2003)

	Hungary			Czech Republic			Poland		
	NACE	**CCA** Change 1998-2003 1998=1	**Employment** Change 1998-2003 1998=1	**NACE**	**CCA** Change 1997-2003 1997=1	**Employment** Change 1997-2003 1997=1	**NACE**	**CCA** Change 1995-2003 1995=1	**Employment** Change 1995-2003 1995=1
1	176	0.09	0.25	292	0.43	0.90	322	0.32	0.54
2	287	0.09	0.63	297	0.41	0.77	191	0.26	0.32
3	293	0.08	0.71	286	0.37	0.71	341	0.20	0.44
4	366	0.03	0.91	175	0.23	0.61	192	0.19	0.46
5	152	0.02	0.63	272	0.12	0.76	321	0.11	0.37
6	294	0.01	0.99	191	0.04	0.25	351	0.11	0.63

Source: own elaboration based upon the country reports.

All of the industries, in which highest decline in domestic competitiveness was observed, experienced also reductions in employment (see: table 4). This is in line with the hypothesis formulated in section 2. The deterioration in the level of competitiveness in the domestic market was caused by various reasons. Table 4 contains, on one hand, industries which were going through major problems. This is probably the case of most of the sections listed. On the other hand table 4 contains also some industries, which reoriented their policy towards expansion to foreign markets. The most evident example is Hungarian NACE 152 (processing and preserving of fish and fish products), which almost vanished from the domestic market to become one of the Central European leaders regarding the dynamics of expansion into the EU markets (see table 5). His does not mean however that the necessary condition to compete effectively in external markets was to withdraw from the domestic market. The examples of industries, which belong to the group of top expanding industries in the domestic and external markets are Hungarian NACE 322 (television and radio transmitters) and Polish NACE 263 (ceramic tiles and flags). Interestingly, the former could reconcile expansion with employment reductions by as much as 60%.

The industries, which on general performed well in external markets in the researched countries, were: NACE 157 (prepared animal feeds), 245 (soap and detergents, toilet preparations, etc.) and 353 (manufacture of aircraft, see: table 5). These industries did not see outstanding changes in the level of employment over the analysed years. Table 5 does not provide simple answers to the question of relations between external competitiveness and employment changes. Only in the case of Hungary the correlation seems to be strong and negative. Industries, which confirm our hypothesis of positive dependency between competitiveness and employment are Polish NACE 157 (manufacture of prepared animal feeds) and 263 (ceramic tiles and flags) as well as Czech NACE 222 (printing, etc.), 343 (manufacture of parts and accessories for motor vehicles) and 316 (other electrical equipment). The only Hungarian section from table 5, which stands in line with our hypothesis is NACE 245 (soap and detergents, toilet preparations, etc.). In case of the remaining industries negative relation between external competitiveness and employment was exhibited.

Table 5. NACE 3-digit branches of highest growth in external competitiveness in Hungary (1998-2003), the Czech Republic (1997-2003) and Poland (1995-2003)

	Hungary			**Czech Republic**			**Poland**		
	NACE	**CCC** Change 1998-2003 1998=1	**Employment** Change 1998-2003 1998=1	**NACE**	**CCC** Change 1997-2003 1997=1	**Employment** Change 1997-2003 1997=1	**NACE**	**CCC** Change 1995-2003 1995=1	**Employment** Change 1995-2003 1995=1
1	322	30.12	0.40	222	4.19	1.28	157	33.50	1.21
2	152	24.39	0.63	353	4.09	0.76	314	23.29	0.79
3	353	15.45	0.97	362	3.70	0.63	334	11.86	0.72*
4	265	7.56	0.59	245	3.35	0.92	263	10.17	1.23
5	157	7.18	0.88	343	3.32	2.06	243	9.61	0.86
6	245	6.16	1.08	316	3.27	1.63	352	8.71	0.54

Source: own elaboration based upon the country reports.

Table 6. NACE 3-digit branches of highest decline in external competitiveness in Hungary (1998-2003), the Czech Republic (1997-2003) and Poland (1995-2003)

	Hungary			Czech Republic			Poland		
	NACE	CCC Change 1998-2003 1998=1	Employment Change 1998-2003 1998=1	NACE	CCC Change 1997-2003 1997=1	Employment Change 1997-2003 1997=1	NACE	CCC Change 1995-2003 1995=1	Employment Change 1995-2003 1995=1
1	181	0.65	0.16	244	0.62	1.36	321	0.63	0.37
2	191	0.58	0.14	242	0.55	1.52	182	0.62	0.55
3	263	0.57	0.86	191	0.51	0.25	244	0.56	0.98
4	264	0.46	0.81	351	0.43	1.82	351	0.36	0.63
5	242	0.41	0.95	265	0.28	0.52	265	0.12	0.40
6	243	0.33	0.95	335	0.21	0.68	296	0.11	3.52

Source: own elaboration based upon the country reports.

Table 6 lists industries, which recorded highest decline in the level of external competitiveness. Taking under consideration all three countries, a group of industries, which underperformed in the EU markets can be created: NACE 191 (Tanning and dressing of leather), which also experienced serious problems in internal markets (see: table 4), 242 (pesticides and other agro-chemical products), 244 (pharmaceuticals, etc.) and 265 (cement, lime and plasters). The majority of industries from table 6 saw reductions of employment. This confirms our theoretical hypothesis. The high growth of employment in the Polish NACE 296 (weapons and ammunitions) can be explained by the fact that this industry reoriented their activities towards domestic expansion, and did so successfully, as it can be seen in table 3.

5. Concluding remarks

The main goal of the three country studies was to answer the question about dependency between competitiveness and employment in industrial branches of economy. Having compared and analysed all the main findings

reported by the Czech, Hungarian and Polish teams, the following key conclusions can be drawn.

- The most unequivocal results were achieved for Poland. They show that growth in domestic competitiveness of a branch is most commonly accompanied by an increase of employment. On contrary, in order to compete effectively in foreign markets, industrial enterprises often tend to reduce employment. However, branches which recorded deterioration in external competitiveness reduced employment confirming our hypothesis.
- The Czech results are more ambiguous and the interpretation is not that straightforward. Branches ranked at the top regarding improvement of domestic competitiveness do not reveal a positive relationship with employment. Moreover, no significant dependency has been found between external competitiveness and employment in the Czech industry.
- Perhaps the biggest problems were reported by the Hungarian side. The analysis undertaken does not entitle to propose unequivocal conclusions regarding the character of an impact of competitiveness in an industry on level of employment. However, at NACE 2-digit level, some negative dependency was found between domestic competitiveness and employment (see: Buzas, 2005). No clear evidence of an influence of external competitiveness on labour markets was found.

The research carried out confirms in many cases the hypothesis of positive dependency between competitiveness and employment in the analysed branches. It is especially the case of these industries, where the competitiveness index showed declining tendency. In these branches (of declining domestic and external competitiveness index) a decrease of employment usually was taking place, which confirms our theoretical hypothesis.

On the other hand, in industries where either domestic or external competitiveness were improving we recorded both increasing tendencies in employment (which stands in line with our hypothesis) and decreasing employment trends (which oppose our hypothesis). The latter cases, undermining the hypothesis, can be explained based on the processes of deep restructuring and modernisation in the domestic and external markets. The pressure of competition lead to rationalising employment in those industries, which in turn resulted in the fact that improving competitiveness was accompanied by declines of employment.

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ANNEX

NACE 3-digit classification of branches analysed in the paper

NACE	Name
151	Production, processing and preserving of meat and meat products
152	Processing and preserving of fish and fish products
153	Processing and preserving of fruit and vegetables
154	Manufacture of vegetable and animal oils and fats
155	Manufacture of dairy products
156	Manufacture of grain mill products, starches and starch products
157	Manufacture of prepared animal feeds
158	Manufacture of other food products
159	Manufacture of beverages
160	Manufacture of tobacco products
171	Preparation and spinning of textile fibres
172	Textile weaving
173	Finishing of textiles
174	Manufacture of made-up textile articles, except apparel
175	Manufacture of other textiles
176	Manufacture of knitted and crocheted fabrics
177	Manufacture of knitted and crocheted articles
181	Manufacture of leather clothes
182	Manufacture of other wearing apparel and accessories
183	Dressing and dyeing of fur; manufacture of articles of fur
191	Tanning and dressing of leather
192	Manufacture of luggage, handbags and the like, saddlery and harness
193	Manufacture of footwear
201	Sawmilling and planing of wood; impregnation of wood
202	Manufacture of veneer sheets; manufacture of plywood, laminboard, particle board, fibre board and other panels and boards
203	Manufacture of builders carpentry and joinery
204	Manufacture of wooden containers
205	Manufacture of other products of wood; manufacture of articles of cork, straw and plaiting materials
211	Manufacture of pulp, paper and paperboard
212	Manufacture of articles of paper and paperboard
221	Publishing
222	Printing and service activities related to printing
231	Manufacture of coke oven products
232	Manufacture of refined petroleum products
233	Processing of nuclear fuel
241	Manufacture of basic chemicals
242	Manufacture of pesticides and other agro-chemical products
243	Manufacture of paints, varnishes and similar coatings, printing ink and mastics
244	Manufacture of pharmaceuticals, medicinal chemicals and botanical products
245	Manufacture of soap and detergents, cleaning and polishing preparations, perfumes and toilet preparations
246	Manufacture of other chemical products

NACE 3-digit classification of branches analysed in the paper – continuation

NACE	Name
247	Manufacture of man-made fibres
251	Manufacture of rubber products
252	Manufacture of plastic products
261	Manufacture of glass and glass products
262	Manufacture of non-refractory ceramic goods other than for construction purposes; manufacture of refractory ceramic products.
263	Manufacture of ceramic tiles and flags
264	Manufacture of bricks, tiles and construction products, in baked clay
265	Manufacture of cement, lime and plaster
266	Manufacture of articles of concrete, plaster and cement
267	Cutting, shaping and finishing of ornamental and building stone
268	Manufacture of other non-metallic mineral products
271	Manufacture of basic iron and steel and of ferro-alloys
272	Manufacture of tubes
273	Other first processing of iron and steel
274	Manufacture of basic precious and non-ferrous metals
275	Casting of metals
281	Manufacture of structural metal products
282	Manufacture of tanks, reservoirs and containers of metal; manufacture of central heating radiators and boilers
283	Manufacture of steam generators, except central heating hot water boilers
284	Forging, pressing, stamping and roll forming of metal; powder metallurgy
285	Treatment and coating of metals; general mechanical engineering
286	Manufacture of cutlery, tools and general hardware.
287	Manufacture of other fabricated metal products
291	Manufacture of machinery for the production and use of mechanical power, except aircraft, vehicle and cycle engines
292	Manufacture of other general purpose machinery
293	Manufacture of agricultural and forestry machinery
294	Manufacture of machinetools
295	Manufacture of other special purpose machinery
296	Manufacture of weapons and ammunition
297	Manufacture of domestic appliances n.e.c.
300	Manufacture of office machinery and computers
311	Manufacture of electric motors, generators and transformers
312	Manufacture of electricity distribution and control apparatus
313	Manufacture of insulated wire and cable
314	Manufacture of accumulators, primary cells and primary batteries
315	Manufacture of lighting equipment and electric lamps
316	Manufacture of electrical equipment n.e.c.
321	Manufacture of electronic valves and tubes and other electronic components
322	Manufacture of television and radio transmitters and apparatus for line telephony and line telegraphy.
323	Manufacture of television and radio receivers, sound or video recording or reproducing apparatus and associated goods
331	Manufacture of medical and surgical equipment and orthopaedic appliances

NACE 3-digit classification of branches analysed in the paper – continuation

NACE	Name
332	Manufacture of instruments and appliances for measuring, checking, testing, navigating and other purposes, except industrial process control equipment
333	Manufacture of industrial process control equipment
334	Manufacture of optical instruments and photographic equipment
335	Manufacture of watches and clocks
341	Manufacture of motor vehicles
342	Manufacture of bodies (coachwork) for motor vehicles; manufacture of trailers and semi-trailers
343	Manufacture of parts and accessories for motor vehicles and their engines
351	Building and repairing of ships and boats
352	Manufacture of railway and tramway locomotives and rolling stock
353	Manufacture of aircraft and spacecraft
354	Manufacture of motorcycles and bicycles
355	Manufacture of other transport equipment n.e.c.
361	Manufacture of furniture
362	Manufacture of jewellery and related articles
363	Manufacture of musical instruments
364	Manufacture of sports goods
365	Manufacture of games and toys