

Vehicle Industry Competitiveness in Central and Eastern Europe

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By writing of this study we had an objective to set up a model which is able to explain the location decisions in the Central and Eastern European region. As an initial presumption we have connected the local capital flow to the regional competitiveness and have analysed the location factors behind the decision-makings. After uncovering the theoretical background we set up a six factors model which consists of the industrial traditions, business environment, labour market, taxation, infrastructure, and local supplier network. As a final conclusion we have tried to set up ranking with the 10 analysed countries. As a research question we wanted to prove that the competitiveness gaps are existing and are even wider in the last 10 years in the Central and Eastern Europe (CEE) region. The research based on a global vehicle industry research implemented by the Szechenyi Istvan University Hungary and participated by economists and engineers as well between 2011 and 2013. The research group with economist has been dealing with different competitiveness, location and innovation issues which are occurring in the automotive industry. Besides, the engineering group tried to solve different logistics and supply chain management problems. This article shares the results about competitiveness and location factor questions.

Keywords: capital flow, location indicators, regional competitiveness, foreign direct investment, automotive industry

Introduction

The purpose of our study is to identify the economic indicators which are able to influence the industrial location decisions. The focus of the analyzes is on the Central and Eastern Europe (CEE) region compared to the control group, the developed Western European German and Austrian markets. In the first part of the study we build up a general competitiveness report among the regional countries, the basis of which is the stock and flow of yearly foreign direct invested money. After collecting these macroeconomic details we tried to collect the location indicators and set up a model that explains the flow of capital. Except for the industrial traditions and local supplier network we could provide general economic figures but in this two areas we had to choose a leading industrial sector. We have choosen the automitive industry because beside its leading position it has a tight connection to the German and Austrian market and has made a huge contribution to the regional economic performance. The input data of the research are public details from World Bank, OECD, EuroStat and so on which were base for your model. The finally created hierarchy shows just an ordinal scale which helps to

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understand the ranking between the Central and Eastern European countries in case of an automotive industry location.

Flow of Capital

Economic literature offers a wealth of possibilities to measure competitiveness, considered as a general economic index. It is widely spread especially in the field of finance. The most common method is to follow the flow of direct international capital investments. This clearly describes the appeal of an economy (Lengyel, 2003). During the past two decades since the significant changes in the regime of the Eastern-European countries a general flow of capital can be seen. Its main driver is cost efficient production. At the beginning of the 1990s Western-European companies reached the inner boundaries of their growth. Its result was that they opened towards Eastern Europe—they found new markets and outsourced a part of the production for cost efficiency reasons (Lemoine, 1998; Kinkel & Zanker, 2007).

The opening of new markets in the region happened on a different timescale depending on the development and predictability of an economy. Table 1 gives a summarizing overview of this process, which took 20 years. In this context the international direct capital investment is shown in separate regions, differentiating between the current substance and the inflow per year. The chart shows that the performance level of the German and Austrian economy is far higher than any Eastern European countries. Both of the two countries have the highest indexes in terms of current substance and inflow per year. However the Central and Eastern European Countries (CEEC) appeal has sharply risen. The Czech Republic, Poland, and Hungary strictly fall into line with the top, as other countries of the region tend to increase their competitiveness (Pavlinek, 2004).

Table 1

Foreign Direct Investment Stock and Flow

Country	Flow (million USD)		Stock (2012)	
	2003-2007	2008-2012	(million USD)	GDP %
Austria	33,044	2,906	261,371	65.4
Bulgaria	6,121	4,041	48,581	95.2
Czech Republic	6,946	5,678	132,264	67.6
Croatia	2,676	2,558	30,986	54.9
Poland	15,089	12,952	223,837	45.7
Hungary	20,855	14,234	101,410	80.8
Germany	29,477	30,186	968,883	28.5
Romania	7,379	4,907	75,551	44.6
Slovakia	2,911	2,001	54,505	59.5
Slovenia	936	583	15,033	33.2

Note. Source: Own construction after World Bank (2013).

It is worth examining the proportion of the capital inflow to the GDP, which can act as a guideline by estimating the growth potential of an economy. Based on the above mentioned facts it can be claimed that Germany and Austria are still able to increase their national economy's growth potential, while there is a significant potential in CEEC, which can be used under stable economic circumstances.

How to determine general competitiveness we choose direct capital investment, competitiveness, and deployment factors depending on the characteristics of the industry. An area from the angle of competitiveness

can be attractive for a multinational company, which deals with services—while for other reasons (like human resources or infrastructure) is not satisfying for a vehicle factory. The next chapters of the study deal with the production sector, the indicators of the deployment of the automotive industry, taking the advantages/disadvantages and the future of the developed and the transformed countries into consideration.

Location Indicators

Both the theories and the practice oriented models emphasize the identification of the deployment factors, and their analysis, because on the one hand it helps the regions to keep their automotive industrial companies and on the other hand, it helps to find new investors.

Bossak and Bienkowski (2004) conducted research on the deployment factors of the manufacturers:

- low transaction costs;
- low investment risk;
- developed market of capital;
- ensured ownership;
- high input into R&D;
- developed infrastructure;
- liberal economic policy;
- no barriers to enter or to leave the market;
- institutions, which help innovation, are available;
- low taxes and incidental expenses;
- well-educated experts;
- expanded local market;
- stable political and economic circumstances;
- positive vision about the development of the country.

In the case of companies operating in the field of manufacturing vehicles special factors also count, like the number of suppliers with ISO 9000/2000 standard, the distance from the centres, the availability of raw material, the guarantees given by the government, the operating clusters, as well as the cooperation between the role players of the industry, the universities, the R&D institutions, and the consultancies.

According to the research by Murray, Dowell, and Mayes (1999), the relevant location factors for vehicle manufacturers can be categorized into three groups. Those indicators belonging to the first group, which influence the level of the operating costs, are, for example salaries (the average and the minimal), overheads, price of raw materials, upcoming costs due to real estate, and taxes. Furthermore, work productivity, *niveau* (level) and availability of infrastructure belong to the first group. Following that there is the regulation environment, the distance from the markets, demographical characteristics, and the volume of urbanization. The third group contains the factors regarding the standard of living, like the condition of the natural environment, education opportunities, and crime rate.

The German Investment Agency also recited most of the above mentioned factors in its study of 2008. According to the study of this institution the following points should be considered:

- nearness of the markets;
- properly educated human resources;
- R&D institutions;

- the development of R&D support;
- availability of other manufacturers and suppliers in connection with vehicles and their market position;
- infrastructure;
- stable investment environment, and different motivation systems.

KPMG also conducted research in this field in 2009. Its main goal was to examine the deployment strategies of the vehicle industrial suppliers. It says there are four main factors to observe, which appear on a different scale in a different country: the nearness of the markets, the costs, the ability for innovation (meaning the advantages or disadvantages of a given location), and finally the low political, economic and social risks (KPMG, 2009).

Werner (2003) emphasized the nearness of the markets (like the EU) in his study, the advantages ensured by the government, the well-educated workers, and the favorable economic expectancies. These expectations are influenced by many factors, which is why the indicator described by Werner (2003) is a summarizing category, and its elements should be identified individually.

The Allan & Overy (2008) study concentrates on the CEEC region. Within this framework, the taxation system, the availability of the EU structural and cohesive system, adequate human resources, the transportation infrastructure, the availability of the buyers, and the stable economy are given importance.

Rechnitzer, Edelényi, Németh, and Smahó (2003) divided the factors in two big groups and named them hard and soft deployment factors (see Table 2).

Table 2

Classification of Location Factors

Hard location factors	Soft location factors
Industrial traditions	Attractiveness of the region, city
Logistic, and infrastructural network	Value of free time
Potential local suppliers	Cultural factors
Taxation system	Quality of government
Labour market	Living environment
Business environment	R&D basis
	Opportunity for industrial cooperations
	Innovation potential

Note. Source: Own construction after Rechnitzer et al. (2003).

Based on the available literature we strived to design a model which simply and clearly describes the motivations by the deployment, and takes into consideration the factors, which help make the decision. In the following part we will examine six different deployment factors (industrial traditions, economic environment, taxation system, infrastructure, human resources, and supplier network), which explain the process of the flow of capital.

Industrial Traditions

The automotive industry has great traditions in the CEEC area, which can be a baseline by the choice of the location both in the case of a West-European and a Far East company (ACEA, 2011). European and Asian car manufacturers built spare-part plants and assembly capacities based on the competitive advantages of the region. One of the most important competitive advantages is the ability to adopt new production technologies, so it is good to examine the automotive industrial traditions in each country, which was a stable basis for the largest car manufacturers.

The former Czechoslovakia had the strongest traditions in this field: The Skoda car industry was established in 1899, and by 1990 it had become the biggest and oldest car manufacturer among the CEE countries (Werner, 2003). It was the first which specialized in designing vehicles. The Tatra factory produces vans, it is also a prominent company in this region. The Trnavské automobilové závody (TAZ, manufacturer of trucks), and the Bratislavské automobilové závody (BAZ) operating with Skoda license models are the determining companies in the Czech Republic (Jakubiak, Kolesar, Izvorski, & Kurekova, 2008).

Poland also has great traditions: The first Fiat factory was established in the 1930s. Inexpensive and well educated human resources, a large home market, and a highly qualified human capital were available—all of these factors contributed to give the country an acknowledged and preferred position on the market (KPMG, 2007).

In Yugoslavia an engine factory was established in 1929, which operated with licenses. Another important year is 1954, when the production of cars began, based on the Fiat license (Jakubiak et al., 2008).

Before World War II, in Slovenia the first vehicles were produced in the capital city. The Avtomontaža factory manufactured buses, followed by the production of vans. At that time the Avtomontaža was already dealing with international companies. Nowadays these partnerships are still alive. The production of cars began in 1954 in Novo Mesto. Another milestone is that they started to manufacture caravans and commercial vehicles together with the French Renault (ACEA, 2011).

Romania has a 60-year-old past in terms of car manufacturing. It began with the production of Dacia models based on Renault licenses in 1967. Car manufacturing was launched in 1927 in Bulgaria. Later on the activity was expanded to assemblage based on western and soviet licenses (ACEA, 2011).

In the case of Hungary the story of the Rába Magyar Vagon és Gépgyár (nowadays it is called Rába Holding Rt.) is significant. Győr was an excellent location for establishing larger works, because there was an important railway crossing and four rivers meeting in the city. Following the establishment of the factory its first main product was railway carriages, and they also began to make vans and cars. The other prominent car manufacturer was Ikarusz, which was the biggest coach manufacturer in Europe with its 15,000 buses per year in the 1990s.

The roots of the automotive industry in the CEE region origin can be traced back to the first decades of the 20th century. Its dynamic development and competitiveness were halted by World War I and II and the economic policies of the Soviet Union. Socialist industrialization considered the automotive industrial traditions, which played a determining role in the life of every country concerned. They wanted the countries to manufacture their own cars, which could be exported through the use of Western-European and Asian licenses.

Despite great support this industry decreased after the fall of Communism, and in order to turn this process around, foreign capital was needed (Husan, 1997). Assembly industry was installed upon its own production capacities in the greenfield investment framework. Thanks to these efforts the automotive industrial districts came alive after the fall of Communism and development could be experienced again. The investors were foreign companies like Fiat, Citroen, and Renault. They had already domiciled automotive industrial factories in the region during socialism. Their activity is still operating in the 21st century.

Table 3 gives an overview of the role-players of the CEEC's automotive manufacturers, emphasizing the timing of their establishment. The operation of the companies in brackets is over, or due to a transaction (fusion, acquisition) they lost their independence. The data of the chart exemplify that the Czech Republic, Poland, and

Hungary have the greatest traditions. In these countries the automotive industry played an important role during the communist era. Their industrial positions remained strong. Such a positive process can not be seen in Romania, which has added little value to its GDP since the fall of communism. The greenfield investments were replaced by brownfield investments. The volume of foreign capital flow to Slovakia decreased, because the only car manufacturer, Renault, was present before the end of communist regime. Unlike the other two countries, Slovakia had no automotive industry at all—after communism Volkswagen, PSA Peugeot—Citroen and Hyundai-Kia abruptly appeared.

Table 3

Vehicle Manufacturing Companies in Central-Eastern Europe

	Estimation of vehicle industry companies		
	Before 1990	Between 1990 and 2000	After 2000
Czech Republic	Tedom, Tatra, Avia Ashok Leyland Motors, Skoda	Fiat, Volkswagen AG, SOR	Toyota Peugeot Citroen, Hyundai
Poland	Fiat, FSO	Solaris, Opel-GM, Volkswagen, MAN, Scania, Volvo	Toyota
Hungary	MÁVAG, Rába, Ikarusz	Suzuki, Audi, GM	Mercedes-Benz
Romania	Dacia-Renault, ARO, MARTA, Citroen	Daewoo	Ford
Slovakia	-	Volkswagen	PSA Peugeot-Citroen, Hyundai-Kia
Slovenia	Renault	-	-

Note. Source: Own construction (2013).

Business Environment

One of the most important competitive disadvantages of the CEEC is that the economic and social culture does not follow western trends at all, so the instability of the economic environment causes a relevant competitive disadvantage on a global scale. Independent studies mention corruption and white-collar criminality as primary sources of risk—but there are also difficulties in a company start-up (PWC, 2007). Table 4 is a ranking by the World Bank which shows the elements of a business-friendly environment (the ranks can be seen in the brackets) with the number of company start-ups from 2009 assigned.

Table 4

Business Environment

Country	Business-friendly environment ranking (2011)	Registered business set up (2009)
Austria	32	3,228
Bulgaria	59	35,545
Czech Republic	64	21,717
Croatia	80	7,800
Poland	62	14,434
Hungary	51	42,951
Germany	19	64,840
Romania	72	56,698
Slovakia	48	15,825
Slovenia	37	5,836

Note. Source: Own construction after World Bank (2013).

Corruption

The global flow of capital has a relevant barrier; corruption, which seems to be invincible. In an analysis of the economic circumstances corruption can not be ignored, because its negative effect can be so efficient that no other factor can compensate it.

Corruption is especially strong in the public sphere—there is no countable transaction time and the financial planning is also lax in the fields of public procurements and other licensing areas. The low salaries of governmental employees encourage bribery to become a daily habit. Due to the fact that society takes no serious steps to fight it, corruption and its most common form, bribery, blossom in the CEEC. Besides the critical mass government agencies should oppose corruption—unfortunately many members of this sphere are also involved in it. Proof of this is a survey of Transparency International (2011), which examined the measures against corruption in different European countries. Almost all of the participants received negative qualifications.

Corruption interrupts the normal process of corporate procurement in the B2B relations of the CEE region—it particularly disagrees with the culture of the Western-European and American parent company. The counteraction of subordination in the private sector is not the states' responsibility—it belongs to the internal controlling division of a company (Transparency International, 2011).

Table 5 shows the continuously up-dated corruption index collected by Transparency International. It clearly shows the different attitude of the West and East. Investors should decide about the volume of risk taking—not only monetary, but also in the terms of the measurement represented.

Table 5

Corruption Index and Ranking, 2011

Country	Ranking	Index
Austria	15	7.9
Bulgaria	73	3.6
Czech Republic	53	4.6
Croatia	62	4.1
Poland	41	5.3
Hungary	50	4.7
Germany	15	7.9
Romania	69	3.7
Slovakia	59	4.3
Slovenia	27	6.4

Note. Source: Own construction after Transparency International (2013).

Business Start-up

A corner stone of certain and predictable economic environment is the simplicity of the company start-up process. The main goals for the company incentives of government agencies can be the destruction of the formation constraints, the minimization of the authority processes and transit time.

Table 6 shows that the CEEC pay particular attention to ensure a business-friendly environment—so they have simplified the process of the start-up. Although large enterprises are less sensitive to such monetary and temporal inputs, a dynamic development of the SMEs can be observed thanks to these actions.

Table 6

Corporate Set-up Process, 2012

Country	Time to set up a business (days)	Process to set up a business (steps)
Austria	28	8
Bulgaria	18	4
Czech Republic	7	6
Croatia	20	9
Poland	15	9
Hungary	4	4
Germany	32	6
Romania	14	6
Slovakia	13	7
Slovenia	18	6
Austria	6	2

Note. Source: Own construction after World Bank (2013).

Labour Market

Blue-collar Workers

The low wage demand of blue-collar workers was what helped the outsourcing trend of the automotive industry to rise sharply. Within the frame of the socialist systems, high standards of education were hard to reach. Obligate employment removed the market's regulation and selection ability. Total employment induced inner unemployment, which collapsed in the face of the real market causing mass unemployment. This shock was also a possibility for investors: They had the chance to choose the most appropriate employees. Their main characteristics were low wage demand, middle education, and high productivity (MacNeill & Chanaron, 2005).

The differences between western and eastern wages are still present. There is no compulsory minimum wage in Austria, whereas in Germany its level is determined by profession and education and these differences can be felt all over Europe. Another typical feature of the CEEC is that the unions place pressure on the companies and on the government, which results in a minimum wage that can not be substituted by the market's selective power, such as already happened in Western-European countries (World Bank, 2011).

Table 7 contains the minimal wages of CEEC. The range itself gives information, furthermore compared to the average wage and connected to the corporate added value it represents the competitiveness of the local blue-collar workers. Based on these facts we can claim that the officially determined minimum wages dispersion is high. In accordance with the productivity it makes the added value predictable (World Bank, 2011).

Table 7

Minimum Wages on the Labour Market, 2011

Country	Monthly minimal wage (€)	Minimal wage to average	Minimal wage to value added
Bulgaria	123	40.4%	22%
Czech Republic	319	35.0%	21%
Croatia	381	37.8%	32%
Poland	349	35.7%	27%
Hungary	281	38.8%	25%
Romania	157	30.5%	24%
Slovakia	317	33.5%	23%
Slovenia	748	43.5%	37%

Note. Source: Own construction after World Bank, Eurostat (2013).

White-collar Workers

As previously mentioned while the mass of inexpensive blue-collar workers is among the most attractive indicators of the 1990s, the main base of the location factors is educated labour in the 21st century. Traditional CEE education is high-level (particularly in the Czech Republic and Hungary), and has become available for a wide range of society. The result is that investors can easily find the right white-collar workers. This class is a stable and reliable segment of the market, and above all their wage demand is not much higher than the wage demand of the non-educated employees (Gauselmann, Knell, & Stephan, 2010).

In today's innovative economic environment a national economy can not keep its competitive advantage only because of low wages. In knowledge intensive industries, like automotive industry the human element is challenging the governments. The right education system and strategy can ensure a competitive advantage for a country on a global scale. The modernization and customization of higher education can form a base for the investments. The educational expenses in Table 8 orient to the performance of the national economy in each region. The participants spend 4%-5% of the GDP on public education—from pre-school to university education (OECD, 2011).

Table 8

Portion of Graduates on the Labour Market, 2009

Country	Number of graduates in a year	Proportion of graduates to the population	Graduates in real areas	Education expenditure to GDP (2008)
Austria	52,157	0.62%	26%	5.5%
Bulgaria	57,803	0.76%	25%	4.6%
Czech Republic	96,207	0.92%	26%	4.1%
Croatia	31,693	0.72%	24%	4.3%
Poland	574,972	1.51%	21%	5.1%
Hungary	68,158	0.68%	20%	5.1%
Germany	466,196	0.57%	30%	4.6%
Romania	310,886	1.45%	22%	n/a
Slovakia	75,364	1.39%	23%	3.6%
Slovenia	18,103	0.88%	25%	5.2%

Notes. n/a: No data available. Source: Own construction after World Bank, Eurostat (2013).

For the choice of a car manufacturer's location the availability of graduates is important. The conclusion of Table 8 is that there is no strong correlation between the number of fresh graduates and the volume of foreign capital input. Yet the education of work craft labour is an important task in each country—if it wants to prevail on the global market. The efforts taken to strengthen higher education in the CEEC can be seen from the rate of graduates. We have to admit that there is a lack of economic and engineer experts.

Besides this positive process we have to mention the differences of the demand and supply sides of the labour market in the CEE region, which can be felt in higher-education. Putting reforms into effect and the reconstruction of the educational system requires serious effort from the decision-makers and executives. The conformity is the only way to get and sustain the competitive advantage (OECD, 2007).

Taxation

The indications related to human resources admittedly play very important role in the location decisions of

industrial companies but from the point of view of cash flow and financial return we have to examine some fiscal aspects as well like the tax system of the analysed country. The tax burden settled by the state is measurable with exact figures but to show the real indexes and it is essential to take into account different taxes and rates. Although the European Union enforces a unified tax system since the establishment this implementation has failed so far and all of the member states operate with their own different taxation systems. Those new member CEE states stand out where taxation is so complicated and intransparent that it makes financial planning more difficult (relating the investments) both in the short and long run (Limpók, 2010).

A department of the World Bank is continuously following up the changes of the mentioned national economies and examines the total tax burden separated into three classes (World Bank, 2011). According to Table 9 we can identify that in the developed welfare countries (Austria, Germany) we can meet the ordinary high burdens and in the CEE region we are faced with governments with hardly 30 percent total tax rates (Bulgaria, Croatia). Hungary and Czech Republic stand out among the CEE region countries using a high total tax burden that seems unattractive from the perspective of investors but as we previously presented the FDI figures actually shows the opposite. The reason for the relatively attractive business environment is that in the last 15-20 years the governments of the analysed countries have provided tax benefits for the investor companies that could reduce the burden thus making the country more attractive for investing foreign capital. This practice had a visible outcome, however as the directives of the EU forbid it so the method can not be applied in the future.

Table 9

Corporate Taxes, 2011

Country	Taxes on profit	Taxes on work	Other taxes	Total tax rate
Austria	15.0%	34.8%	3.4%	53.1%
Bulgaria	4.9%	19.2%	4.1%	28.1%
Czech Republic	7.5%	38.4%	3.2%	49.1%
Croatia	11.5%	19.4%	1.5%	32.3%
Poland	17.4%	23.6%	2.6%	43.6%
Hungary	14.8%	34.1%	3.5%	52.4%
Germany	19.0%	21.8%	5.9%	46.7%
Romania	10.4%	31.8%	2.2%	44.4%
Slovakia	7.2%	39.6%	2.0%	48.8%
Slovenia	14.1%	18.2%	2.4%	34.7%

Note. Source: Own construction after World Bank (2013).

We can summarize that although the tax policies of the analysed countries are different both in their theoretical and practical approach we can not see a close connection between the foreign direct investments and the total tax burdens. If we examine the developing routes of the different countries we can not expect a single EU taxation system in the near future because the governments would loose one of the most important fiscal instrument with which they could regulate the operation of internal markets.

Probably the most essential factor of the taxation policy is a predictability in a long run that can facilitate the checking of the cash flow and fosters the influx of the foreign direct investments. Both the European Union and its member states must enforce the single taxation system in the future because with this common policy the affected regions could become more competitive from the viewpoint of foreign investors.

Infrastructure

Due to the intensive material flow the industry places serious pressure on logistics and transport. The existence of appropriate transport connections, railway and motorway networks and airports is basic requirements. The efficiency and competitiveness of production is determined by the availability of remote sales markets, transaction costs, and contact with the different headquarters (Klauber, 2008). One of the most determinative elements of the location decisions is the availability of the sites because in this way the competitiveness is raised inside the industry. The easy availability and the right intermodal connections can boost the influx of foreign direct investment and place into focus the time factor because it brings the purchase and the sales markets closer together and ensures more space for the workforce mobility.

Though examining the quality and quantity criterions of the road and railway infrastructure we can conclude that CEE has a perceived competitive disadvantage compared to Western Europe.

The analysed CEE countries have noticeably different highway supply figures which are the Table 10. We can see that the pre-accession funds had a positive effect on motorway construction, the CEE economies could connect to the European area and its availability was improved so they could become a potential site for Western European and Asian multinational companies. According to the Eurostat figures of 2009, Hungary has a 1.273 km long motorway network which is the best result in the region with Romania in the worst position with 321 km. Besides, the quantitative data we should investigate the changing of lengths of motorway. Among the CEE countries this value has tripled in Hungary in the last 10 year period but Croatia and Romania were able to exceed these figures owing to construction between 1999 and 2009.

Table 10

Total Length of Motorways Between 1998 and 2009 (km)

Country	1999	2004	2009	Change (%) 1999 = 100
Austria	1,634	1,677	1,696	4%
Bulgaria	324	331	418	29%
Czech Republic	499	546	729	46%
Croatia	382	742	1,097	187%
Hungary	448	569	1,273	184%
Germany	11,515	12,174	12,813	11%
Poland	317	552	849	168%
Romania	113	228	321	184%
Slovenia	399	483	747	87%
Slovakia	295	316	391	33%

Note. Source: Own construction after Eurostat (2013).

The density of the motorway lines (see Table 11) is concentrated mainly in the capital city districts that results in a crossing of the roads. In the location decisions the distance to the capital cities was determinative in almost every CEE countries.

Table 11

Density of motorways and railway network, 2008 (km)

Country	Density of motorway lines 2008, km/1.000 km ²	Density of railway lines 2008, km/1.000 km ²
Austria	20.7	70
Bulgaria	3.9	37
Czech Republic	9.3	122
Croatia	20.1	49
Poland	2.7	62
Hungary	13.7	79
Germany	35.9	106
Romania	1.4	45
Slovakia	8.5	73
Slovenia	38.6	61

Note. Source: Own construction after Eurostat (2013).

When examining the railway networks we can conclude that the density of the network is relatively low in the CEE region, beside which the trains are old and in poor condition. The proportion of electrified lines is also low and is in need of modernization. However the lines between their own and other Western European capital cities are satisfactory so the automotive industry companies place particular importance on the proximity of railway junctions.

Local Supplier Network

In the industrial area is of fundamental importance whether there is a competitive market for local suppliers within the sector and whether there is an opportunity to build it up or not. One of the main principles in the industrial production is that the end-stage product manufacturing plants produce only essential components and they purchase the other parts from the suppliers. These manufacturers have specific needs and expectations from their partners and have strict technical requirements and deadlines (Klauber, 2008). The finished product manufacturing plant does the assembly function schedules the procurement and organizes the logistic tasks. This special manufacturing organization results in a very competitive production where the supplier is organized in a multilevel system highlighted the outsourcing and specification functions in the 21 century.

The CEE region became a target area by the multinational investors in the last two decades and could integrate to the supplier pyramid. The region has a competitive advantage through the cheap and flexible workforce and because of the fast availability of the sales markets (Gyukics, Klauber, Palócz, Pácz, & Vakhal, 2011).

The supplier companies located in the region have built up a pyramid of at least three levels. Most of these corporations are subsidiaries in the CEE region. We could hardly find locally owned companies. The second and lower levels are available, however, and they hold many benefits but only for the partners which are able to fulfill the conditions. The quality is not negotiable as the end product manufacturers place very strict requirements on the area of flexible delivery and production. The competition among the part suppliers is excessively heavy as they could be replaced anytime, which subsequently continuously generates a chance to decrease the purchase prices. Primarily those companies are able to survive and ask for higher sales prices which produce complex, special highly innovated products and do so by applying systems of quality standards

(Gyukics et al., 2011). Table 12 shows the proportion of ISO certificated companies in the analysed countries. We can conclude that this region can not meet the quality requirements so far and the dispersion is also remarkably high among these figures.

Table 12

ISO Certification Ownership, 2009

Country	ISO certificated companies proportion (%)
Bulgaria	19.9
Czech Republic	43.5
Croatia	16.5
Poland	17.3
Hungary	39.4
Romania	26.1
Slovakia	28.6
Slovenia	28.0

Note. Source: Own construction after World Bank (2013).

The proximity of the suppliers also makes the programming of the production more flexible and easier as well as the logistics and purchasing functions so that numerous suppliers want to locate close to its main sales market. Table 13 gives a summary of the 10 biggest automotive supplier companies in the CEE region detailing their activities and locations.

Table 13

Top 10 Vehicle Industry Supplier of the CEE Region

Company	Profile	Countries					
		Czech Republic	Poland	Hungary	Romania	Slovakia	Slovenia
Bosch (Germany)	Automotive electronics, chassis, break systems	X	X	X	X	X	
Denso (Japan)	Air conditioning	X	X	X		X	
Delphi (USA)	Integrated systems, modules	X	X	X		X	
Johnson Controls (USA)	Seat, door technics, dashboard	X	X	X		X	X
Magna (Canada)	Chassis, seats, lighting systems	X	X			X	
Aisin Seiki (Japan)	Gear shift, clutch	X					
Lear (USA)	Seats, electronic systems	X	X	X	X	X	
Visteon (USA)	Inside accessories, driving systems	X	X	X		X	
Faurecia (France)	Seats, exhausting	X	X		X	X	
TRW (USA)	Break systems, steering wheels	X	X		X		

Note. Source: Own construction after Unicredit Group (2013).

The key for success is the presence of innovation and the build-up of tight collaborative strategies. It is excessively important in location decisions to find the strategically appropriate supplier partner. The key for long term partnership is R&D potential and technological development. The automotive industry dictates that one of the fastest technical progresses in the industrial sector and the claims are continuously changing so it is easy to loose the market if someone can not keep up. Table 14 summarizes the regional R&D activities, the most widely used index of which is the expenditure to GDP besides which we often apply the number of hired researchers per million people.

Table 14

R&D Activity, 2008

	R&D expenditure (GDP %)	Number of researchers (per million people)
Austria	2.66	4,123
Bulgaria	0.49	1,499
Czech Republic	1.47	2,886
Croatia	0.90	1,514
Poland	0.61	1,623
Hungary	0.96	1,733
Germany	2.54	3,532
Romania	0.59	908
Slovakia	0.47	2,331
Slovenia	1.66	3,490

Note. Source: Own construction after World Bank (2013).

There are some extremes in the supplier networks of the CEE region. The located Western European and Asian companies usually bring our own suppliers and rely little on the local network. Sometimes the local companies do not force the partnership even with the multinational company located in its region (Klauber, 2008). The main reasons for the low number of business relationships are the lack of capital and the language and communication deficiencies.

Besides the low activity, numerous corporations want to integrate to the supplier pyramid. One of the most fashionable solutions are clusters which are organized from inside as a bottom-up model. This organization is not so widespread in the Central and Eastern European region but has serious traditions in the Western part of Europe. For example, these clusters have their own management and budget in Germany and Austria and are used in decentralized decision-making processes. The clusters as business forms are not so popular in Hungary as there is a low willingness for cooperation in social and business areas as well (Grosz, 2005).

Conclusions

We have itemized the indicators which play an important role in location decisions in the study but an investor's decision can not be based solely on the review of objective factors. Subjective indicators, the governmental and local governmental lobby often overwrites the return and risk which can be expressed with figures and in turn the calculable, long-term sustainable economic environment can compensate for the short-term competitive disadvantages which stem from other factors' adverse effects (Schwab, 2010).

During the decision-making process regarding enterprise location the economic environment and the economic region could be attractive but in the examination of the above mentioned factors we also have to calculate up the status of the location's saturation. Practically, the existence of a labour market with a stable base is pointless in the long run as well as a well developed infrastructural environment in the region, if previously settled industry has used up the labour force and the infrastructure is also at the top of its utilization. The saturation process can redraw the economic map of a state and can open gates for regions with lower industrial efficiency earlier.

Consequently, decisions are made by considering the objective and subjective, real and human fields but the result of the process is strongly influenced and deformed by the saturation data and the governmental lobby.

To complete the study we set up a ranking for all six location factors which shows the achievement of the examined 10 countries in each category (see Table 15).

Table 15

Ranking of Regions After Location Factors

Country	Industrial traditions	Business environment	Taxation	Labour market	Infrastructure	Supplier network	Total
Germany	1	2	6	1	1	1	12
Austria	2	1	10	5	2	2	22
Czech Republic	3	5	8	4	3	3	26
Poland	4	4	4	2	8	5	27
Hungary	5	6	9	3	5	4	32
Slovenia	8	3	3	9	4	8	35
Slovakia	6	7	7	7	7	6	40
Croatia	10	8	2	8	6	10	44
Romania	7	10	5	6	10	7	45
Bulgaria	9	9	1	10	9	9	47

Note. Source: Own construction (2013).

The table shows that with an exception of the tax load in the case of all location factors, Germany and Austria in the top position, thus proving the capital flow processes presented at the beginning of the study. The eastern and central European region can be competitive on the global market first and foremost because of its blue and white collar labour force with low wage demands and favorable tax system but its uncertain economic environment can be unattractive to foreign capital investment. It is gratifying that the real direction of location in the vehicle industry and the capital's flow are consistent with the conclusions of our model which proves that we have chosen correctly the factors of the analyses.

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