The role of local suppliers among the location factors in the automotive industry

ANITA FUZI, TAMAS TOTH

Key Words:

Capital flow, Location indicators, Regional development level

By the 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 analized the location factors behind the decision makings. After uncovering the theoretical background we set up a 6 factors model which consists of the industrial traditions, business environment, labor market, taxation, infrastructure and local supplier network. As a final conclusion we have tried to set a ranking with the 10 analized countries.

Introduction

The purpose of our study is to identify the economic indicators which are able to infuence the industrial location decisions. The focus of the analyzes is on the Central and Eastern European 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 which basis 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. Excepted 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 a huge contribution to the regional economic performance.

Flow of capital

The economic literature offers heaps of possibilities to measure competitiveness, considered as a general economic index. It is widely spread especially in the field of finance. The most common 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 experienced. Its main driver is the cost efficient production. By the beginning of the 90's the 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 in different timescale depending on the development and predictability of an economy. The *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. Though the CEEC's appeal has sharply risen. The Czech Republic, Poland and Hungary strictly fall into line with the top, so as the other countries of the region tend to increase their competitiveness (*Pavlinek* 2004).

It is worth examining the proportion of the capital inflow to the GDP, which can be 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.

TABLE 1
Foreign direct investment stock and flow

	Flow (million USD)		*Stock (2010)*	
	2001-2005	*2006-2010*	*(million USD)*	*GDP %*
Austria	36 029	99 917	170 581	45
Bulgaria	182	1 279	1 575	3,3
Czech Republic	1 580	10 375	14 018	7,3
Croatia	1 407	1 915	5 416	8,9
Poland	4 769	28 509	30 983	6,6
Hungary	5 633	13 627	19 423	15,1
Germany	156 179	580 308	1 394 225	42,5
Romania	21	907	1 455	0,9
Slovakia	540	2 668	3 316	3,8
Slovenia	2 129	4 574	7 318	15,6

Source: Own countruction after World Bank (2011).

However to determine the general competitiveness we choose the direct capital investment, the competitiveness and deployment factors are 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, their analysis, because in one hand it helps the regions to keep their automotive industrial companies and in another hand it helps to find new investors.

Bossak és Bienkowski (2004) conducted a 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 centers, the availability of raw material, the guarantees given by the government, the operating clusters, so as the cooperation between the role players of the industry, the universities, the R&D institutions and the consultancies.

According to a research of Murray et. al (1999) the relevant location factors for the vehicle manufacturers can be categorized in 3 groups. Those indicators belong to the first group, which influence the level of the operating costs, for example salaries (the average and the minimal), overhead, price of the raw materials, upcoming costs due to the real estate, and taxes. Furthermore there are the work productivity, nivou and availability of the infrastructure belong to the first group. 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, the possibilities of education and criminal rate.

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

- nearness of the markets,
- proper 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 a research in this field in 2009. Its main goal was to examine the deployment strategies of the vehicle industrial suppliers. It says there are 4 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) emphasizes 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, that is why the indicator described by Werner (2003) is a summarizing category, its elements should be identified individually.

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

Rechnitzer et al. (2003) divides the factors in two big groups and named them hard and soft deployment factors *(Table 2)*.

TABLE 2
Classification of location factors

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

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

Based on the literature we struggled to design a model which simply and clearly describes the motivations by the deployment, and counts with the factors, which help making the decision. In the followings we examine 6 different deployment factors (industrial traditions, economic environment, taxation system, infrastructure, human resources, 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). The European and the Asian car manufacturers built spare-part manufactures and assembly capacities based on the competitive advantages of the region. One of the most important competitive advantages the ability to adapt new production technologies, so it is good to count with the automotive industrial traditions in each country, which was a stable basis for the greatest car manufacturers.

The used-to-be Czechslovakia had the strongest traditions in this field: the Skoda car manufacture was established in 1899, and by 1990 it had become the the biggest and oldest car manufacturer among the CEE countries (*Werner* 2003). It was the first which specialized for designing vehicles. The Tatra factory produces vans. It is also a relevant 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 et al.* 2008).

Poland also has great traditions: the first Fiat manufacture was established in the 1930s. The inexpensive and well educated human resource, the large inner market and the 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 manufacture was established in 1929, which operated with licenses. Another important year is 1954, when the production on cars had begun based on the Fiat license (*ibid*).

Before World War II. in Slovenia the first vehicles were produced in the capital city. The Avtomontaža factory manufactured autobuses, and after that they manufactured vans also. Those times the Avtomontaža have already dealt with international companies. These partnerships nowadays are still living. The production of cars has begun 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 manufacture. It began with the production of Dacia models based on Renault licenses in 1967. The car manufacture

was launched in 1927 in Bulgaria. Later on the activity was expanded to assemblage based on western and soviet licenses (*ibid*).

In the case of Hungary the story of the Rába Magyar Vagon- és Gépgyár (nowadays it is called Rába Holding Rt.) is prominent. Győr was an excellent venue for establishing bigger works, because there was an important railway crossing and 4 rivers meet in the city. After the establishment of the factory the main product of the next time was the railway carriage, and they also have begun to make vans and cars. The other prominent car manufacturer was Ikarusz, which was the biggest autobus manufacturer in Europe with its 15,000 bus per year in the '90s.

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

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

Table 3 gives an overview of the role-players of 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 the lives of these countries the automotive industry played an important role during the time of the communism. The industrial positions remained strong. Such a positive process can not be seen in Romania, it adds a little value to the GDP since the End of the Communism. The greenfield investments were changed by brownfield investments. The volume of foreign capital flow to Slovakia decreased, because the only car manufacturer, Renault, was present before the End of Communism. Unlike the other 2 countries Slovakia had no automotive industry at all – after the End of Communism Volkswagen, PSA Peugeot – Citroen and Hyundai-Kia abruptly appeared.

TABLE 3
Vehicle manufacturing companies in Central-Eastern Europe

	Estimating of vehiche 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	-	-

Source: Own construction (2012).

Business environment

One of the most important competitive disadvantages of the CEEC is that the economic and social culture does not follow the western trends at all, so the instability of the economic environment causes them a relevant competitive disadvantage on the 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 form 2009 assigned.

TABLE 4
Business environment

	Business-frendly 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
Slovénia	37	5 836

Source: Own construction after World Bank (2011).

Corruption

The global flow of capital has a relevant barrier: corruption, which seems to be invincible. By the analysis of the economic circumstances corruption can not be skipped, because it 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 lubber in the fields of public procurements and other licensing. The law salaries of the governmental employees enable bribery to be a daily habit. Because from the side of the society no serious efforts are taken against, 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 concerned in it. Its proof 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 is particularly disagrees with the culture of the Western-European and American parent company. The counteraction of subornation 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 West and East.

The investors should decide about the volume of risk taking – not only monetary, but in time 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
Slovénia	27	6,4

Source: Own construction after Transparency International (2011).

Business start-up

A corner stone of certain and predictable economic environment is the simplicity of the company start-up process. The government agencies' company incentives' main goals can be the destructions 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 simplified the process of the start-up. Though large enterprises are less sensitive for such monetary and temporal inputs, a dynamic development of the SMEs can be observed thanks to this actions.

TABLE 6
Corporate set-up process, 2012

	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
Slovénia	18	6
Austria	6	2

Source: Own construction after World Bank (2011).

Labor market

Blue-collar workers

The low wage demand of the blue-collar workers was that helped the outsourcing trend of the automotive industry to rise sharply. In the frame of the socialist systems the quality education was hard to reach, the obligate employment took the market's regulation and selection ability away. The total employment induced inner unemployment, which fell down to the real market causing mass unemployment. This shock was also a possibility for the investors: they had the chance to choose the most appropriate employees. Their main characteristics were low wage demand, middle education, high productivity (*MacNeill–Chanaron* 2005).

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

Table 7 contains the minimal wages of CEEC. Their extent 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 labor market, 2011

	Monthly minimal wage (€)	*Minimal wage to avarage wage*	*Minimal wage to valeu 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%

Source: Own construction after World Bank, Eurostat (2011).

White-collar workers

As we mentioned the mass of inexpensive blue-collar workers among the most attractive indicators of the 90's, the main base of the location factors is the educated employments in the 21th century. The traditional CEE education is high-level (particularly in the Czech Republic and in Hungary), it has become available for a wide range of the society. The result is that the investors can easily find the right white-collar workers. This class is a stable and reliable segment of the market, above all their wage demand is not much higher than the wage demand of the non-educated employees (*Gauselmann–Knell–Johannes* 2010).

In today's innovative economic environment a national economy can not keep its competitive advantage only because of the low wages. In the knowledge intensive industries, like automotive industry the human challenging the governments. The right education system and strategy can ensure 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 tha national economy in each region. The participants spend 4-5% of the GDP for public education – from pre-school to the universities (*OECD* 2011).

TABLE 8
Portion of graduates on the labor market, 2009

	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%

Source: Own construction after World Bank, Eurostat (2011).

By the choice of a car manufacturer's location the availability of graduates is important. The consequences of *table 8* are there is no strong correlation between the number of fresh graduates and the volume of foreign capital input. But the education of work craft labor is an important task in each country – it it wants to prevail on the global market. The efforts take 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 labor market in the CEE region, which can be felt in higher-education. Putting the reforms into effects and the reconstruction of the educational system requires serious efforts from the decision-makers and executives. The conformity is the only way to get and sustain the competitive advantage (*OECD* 2007).

Taxation

The indicatiors connected to the human resources are playing admittedly a very important role by the location decisions of the industrial companies but in the point of view of the cash flow and financial return we have to examine some fiscal aspects as well like the tax system of the analized country. The tax burden settled by the states is measurable with exact figures but showing the real indexes it is essential to take into account different taxes and rates. Although the European Union force the unified tax system since the establishment the implementing has failed so far all of the member states are working with the own different taxation systems. The new member CEE states stand out especially which taxation is so complicated and intransparent that it makes more difficult the financal planning (relating the investments) both in a short and long run (*Limpók* 2010).

A department of the World Bank is following up continuously the changes of the mentioned national economies and examines the total tax burden separated into 3 classes (*World Bank* 2011). According to the *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 can face govenments 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 repulsive from the perspective of the investors but as we previously presented the FDI figures are showing actually the opposite processes. The reason of the relatively attractive business environment that in the last 15-20 years the goverments of the analized countries provided tax benefits for the invester companies that could reduce the burden making more attractive the country for investing foreing capital. This practice had visible outcome, however the directives of the EU are refusing it so the method can not be applied in the future.

TABLE 9
Corporate taxes, 2011

	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%

Source: Own construction after World Bank (2011).

We can summarize that although the tax policies of the analized countries are different both in theoretical and practical approach we can not recognize close contact between the foreign direct investments and the total tax burdens. Checking the growing paths of the different countries we could not wait for the single EU taxation system in the near future because the goverments would loose one of the most important fiscal instrument with they could be able to regulate the operating of inside markets. The expectations of the EU however sharply separate the concept regulation and interventions so we could not calculate with a technique in the future with the goverments would be able to intervene the operation of a sector prefering this way an invester company.

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

Infrastructure

Because of the intensive material flow the industry puts serious expectations to the logistics and transport. The existence of appropriate transport connections, railway and highway networks and airports are basic requirements. The efficiency and competitiveness of the production is determined by the availability of the remote sales markets the transaction costs and the contact with the different headquaters (*Klauber* 2008). One of the most determinative element of the location decisions is the availability of the sites because this way the competitiveness is

raising inside the industry. The easy availability and the right intermodal connections can boost the influx of foreign direct investment place into the focus the time factor because it brings closer the purchase and sales markets and ensures more space to the workforce mobility.

Examining the quality and quantity criterions of the road and railway infrastructure we can summarize that CEE has a perceived competitive disadvantage against Western Europe.

The analized Central and Eastern Europe countries have noticeably different highway supply figures that shows the *table 10*. We can see that the pre-accession funds had a positive effect on the highway constructions, the CEE economies could connect to the european area, its availability was improved so they could become a potencial site of the Western European az Asian multinational companies. According to the Eurostat figures from 2009 Hungary has a 1.273 km long highway line that means the best result in the region and Romania is standing on the worst position with 321 km. Beside the quantitative datas we should investigate the changing of lengths. Among the CEE countries this value has tripled in Hungary in the last 10 years period but Croatia and Romania could also exceed owing to the constructions between 1999 and 2009.

TABLE 10
Total length of motorways between 1998 and 2009, km

	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%
Poland	448	569	1 273	184%
Hungary	11 515	12 174	12 813	11%
Germany	317	552	849	168%
Romania	113	228	321	184%
Slovakia	399	483	747	87%
Slovenia	295	316	391	33%

Source: Own construction after Eurostat (2011).

The density of the highway lines *(table 11)* is concentrated mainly to the capital city regions that results from the crossing of the roads. By the location decisions the distance to the capital cities was determinative almost in every CEE countries: in case of Hungary it shows the location of Audi in Győr, in Slovakia the Volkswagen in Bratislava and the Skoda in Mlada Boleslav in Czeck Republic.

TABLE 11
Density of motorways and railway network, 2008, km

	Density of motorway lines 2008, km/1.000 km²	*Density of railway lines 2008, km/1.000 km2*
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

Source: Own construction after Eurostat (2011).

Checking the railway networks we can summarize that density of the network is relatively low in the Central and Eastern Europe region beside that the fleets are old and in poor condition. The proportion of the electrified lines is also low and has a need for modernization. However the lines between their own and other Western European capital cities are satisfactory so the automotive industry companies have a special attention to the proximity of the railway junctions.

Local supplier network

In the industrial area is basically important whether in the sector exist the local supplier competitive market and whether there is an opportunity to bulid it up or not. One of the main principle in the industrial production is that the finished product manufacturing plants are producing only essential components they purchase the other parts from the suppliers. There manufacturers have special meets and expectations to the partners and have stricht 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 are 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 inverstors in the last 2 decades and could integrate to the supplier pyramid. The region has a competitive advantage through the cheep and flexible workforce and because of the fast availability of the sales markets (*Gyukics-Klauber et al.* 2011).

The supplier companies located in the region have built up an at least 3 levels pyramid. The most of these corporations are subsidiaries in the CEE region we could hardly find locally owned companies. However the second and lower levels are available they have a lot of benefits but only for the partners which are able to fulfill the conditions. The quality is not negotiable the finished product manufacturers put very stricht requirements in the area of flexible deliery and production. The competition among the part suppliers is excessively heavy they could be replaced anytime that generates continuously a chance to decrease the purchase prices. Primarily the companies are able to survive and ask for higher sales prices which are producing complex special highly innovated products and do that with applying systems of quality standards (*Gyukics-Klauber et al.* 2011). The *chart 12* shows the proportion of ISO certificated companies in the analized countries. We can summarize this region can not meet the quality requirements so far and the dispersion is also remarkable high among this figures.

TABLE 12
ISO certification ownership, 2009

	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

Source: Own construction after World Bank (2011).

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

TABLE 13
Best 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		

Source: Own construction after Unicredit Group (2011).

The key for the success is the presence of the innovation and the build-up of tight collabirative strategies. It is excessively important by the location decisions to find the strategically appropriate supplier partner. The key for long term partnership is the R&D potencial and the technological development. The automotive industry dictates the one of the fastest technical progress in the industrial sector, the claims are continuously changing it is easy to loose the market if someone can not keep up. The *table 14* summarizes the regional R&D activities which most widely used index is the expenditure to GDP beside that 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

Source: Own construction after World Bank (2008).

There is some exremes in the supplier networks of the CEE region the located Western European and Asian companies usally bring our own suppliers and rely hardly on the local network. Sometimes the local companies do not force the partnership even the multinational company locates 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.

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

Conclusions

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

During making decisions about enterprise location the economic environment and the economic region could be attractive but over the examination of the mentioned

factors we also have to calculate up the status of the location's saturation. Practically, it's no use of existing a labour market with stable base in the long run and a well developed infrastructural environment in the region, if the earlier settled industry took up the labour force and the infrastructure is also at the top of utilization. The saturation process can redraw the economic map of a state and can open gates for regions which produced 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. The capital's flow clearly observes the direction from west to the east, in turn the meso level, regional centers saturate, developed with this the economic map of the vehicle industry.

As the sealing of the study we sets up a ranking for all six location factors which shows the achievement the examined ten countries in each category *(table 15)*.

TABLE 15
Ranking of regions after location factors

	Industrial traditions	*Business environment*	*Taxation*	*Labor market*	*Infrastructure*	*Supplier system*	*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*

Source: Own construction (2012).

The table shows that exception of the tax load in the case of all location factors Germany and Austria completed on the top, proven with this 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 of all because of the blue and white collar labour force with low wage demands and favorable tax system but his doubtful economic environment can be unattractive for the foreign capital investments. 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 modell which proves that we have choosen the factors of the analyses right.

Literature

ACEA European Automobile Manufacturer's Association (2011) http://www.acea.be/

Allan & Overy (2008) http://www.allanovery.com/

Bossak, J. W.-Bieńkowski, W. (2004) *„Międzynarodowa zdolność konkurencyjna kraju i przedsiębiorstw"*. Szkoła Główna Handlowa, Warszawa.

Eurostat (2011) http://epp.eurostat.ec.europa.eu/portal/page/portal/eurostat/home/

Gauselmann, A.-Knell, M.-Stephan, J. (2010) Investment motives of FDI into Central East Europe. – *11th Bi-Annual Conference of European Association for Comparative Economic Studies,* Comparing Responses to Global Instability, 26-28 August, 2010, Tartu.

Grosz A. (2005) *Klaszteresedés és klaszterorientált politika Magyarországon – potenciális autóipari klaszterek az észak-dunántúli térségben*. Doktori értekezés. Győr-Pécs.

Gyukics R.-Klauber M.-Palócz É.-Páczi É.-Vakhal P. (2011) *A magyar kis és középvállalatok beszállítói szerepének erősítéséről szóló stratégia kidolgozása a gép- és gépjárműipari ágazatban: a jelenlegi helyzet tanulságai és a lehetőségek kihasználásának eszközei.* Kopint Konjunktúra Kutatási Alapítvány, Budapest.

Husan, R. (1997) Industrial policy and economic transformation: The case of the Polish motor industry. – *Europe-Asia Studies* 1. 125–39. o.

Invest in Germany (2008) *The Automotive Industry in Germany – Driving Performance ThroughTechnology*. Invest in Germany GmbH, Berlin.

Jakubiak, M. – Kolesar, P. – Izvorski, I. – Kurekova, L. (2008) *The Automotive Industry in the Slovak Republic: Recent Developments and Impact on Growth*. Working Paper No. 29. Commission on Growth and Development.

Kinkel, S.-Zanker, C. (2007) *Globale Produktionsstrategien in der Automobilzulieferindustrie.* Springer-Verlag Berlin Heidelberg, Heidelberg.

Klauber M. (2008) *A járműipari ágazati stratégia kialakítását megalapozó szakmai átvilágító tanulmány.* Kopint-Tárki Konjuktúrakutató Intézet, Budapest.

KPMG (2009) *Global location strategy for automotive suppliers*. KPMG.

KPMG (2007) *The Automotive Industry in Central and Eastern Europe*. KPMG.

Lemoine, F. (1998) *Integrating CEE*. Working Paper No. 107, BRIE Working Paper Series, Berkeley Roundtable on the International Economy, UC Berkeley.

Lengyel I. (2003) *Verseny és területi fejlődés: térségek versenyképessége Magyarországon.* JatePress, Szeged.

Limpók V. (2010) *A működőtőke és az adópolitika kapcsolata, különös tekintettel Magyarországra és Ausztriára.* Doktori értekezés. Széchenyi István Egyetem, RGDI, Győr.

OECD (2007) *Entrepreneurship and Higher Education.* OECD.

OECD (2011) *Local Economic and Employment Development* (LEED). OECD Publishing, Paris.

MacNeill, S.-Chanaron, J. (2005) Trends and drivers. – *International Journal of Automotive Technology and Managemen*t. 5. 83-106. o.

Murray, M. N.-Dowell, P.-Mayes, D. T. (1999) *The Location Decision of Automotive Suppliers in Tennesse and the Southeast.* Center for Business and Economic Research College of Business Administration, University of Tennessee, Research paper

Pavlinek, P. (2004) Regional development implications of foreign dierct investment in Central Europe. – *European Urban and Regional Studies*, 11. 47-70 o.

PWC (2007) *Eastern Influx. Automotive manufacturing in Central and Easter Europe.* PWC.

Rechnitzer J.-Edelényi B.-Németh K.-Smahó M. (2003) Új típusú telepítési tényezők és a gazdasági szereplők térpreferenciái az ezredfordulón. – *NYUTI közlemények 152/b.* MTA RKK NYUTI, Győr.

Schwab, K. (2010) *The Global Competetiveness Report 2010-2011*. World Economic Forum.

Transparency International (2011) *Progress report*.

Unicredit Group (2007) *The automotive sector in CEE*. Unicredit Group.

Werner, R. (2003) *Location, Cheap Labor and Government Incentives: A Case Study of Automotive Investment in Central Europe Since 1989*. Columbia University School.

World Bank (2011) *Doing Business*. World Bank.